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Abstract

Using a unique dataset, the study fills an important empirical gap in discussions about labor outcomes in the Arab region by estimating the rates of return to education (RoRE) for all 22 Arab countries. Since we use the same global data set and empirical specification for all countries of the world, our estimates are comparable between countries and between regions of the world. Compared to other regions, our results for the Arab region show that the RoRE are low but, in relative terms, those for Arab women are higher than those for Arab men. Similarly we find that the region has on average a zero public sector wage premium for men but a high one for women. The public sector premium is high for men in the GCC but low, even negative, in the rest of the region. Still, the overall RoRE are lowest in the GCC. The region's RoRE are the result of higher than average returns to primary education and a very low ones to secondary and tertiary education. Noting the high prevalence of unemployment, especially among the more educated job seekers in the region, and that the RoRE are affected by both labor supply and labor demand, our results suggest that there should be more policy emphasis on the reasons behind the low labor demand, especially for higher skills, in the region. This is particularly relevant for the private sector that is still characterized by rentier practices though it is tasked to create more employment in the future compared with the public sector. Low labor demand depresses wages and reduces the incentive to invest in education unless there is an expectation for getting a job in the public sector or abroad. In fact, the Arab region has one of the highest rates of skilled emigration in the world. This hurts not only short term prospects of Arab workers but also the long term welfare of citizens in the region.

JEL Classification: J16, J2, J24, J3, J31, I2, N35, O15

Keywords: Returns to schooling; Returns to education; Gender; Earnings functions; Wages; Arab, Middle East and North Africa; Youth; Labor markets

ملخص

باستخدام مجموعة بيانات فريدة من نوعها، تملأ هذه الدراسة فجوة تجريبية مهمة في المناقشات حول نتائج العمل في المنطقة العربية من خلال تقدير معدلات العائد على التعليم (RORE) لجميع الدول العربية الإثنين والعشرون. وبما أننا نستخدم نفس مجموعة البيانات العالمية والمواصفات التجريبية لجميع بلدان العالم، تقديراتنا قابلة للمقارنة بين البلدان وبين مناطق العالم. بالمقارنة مع مناطق أخرى، تظهر نتائجنا للمنطقة العربية أن RORE منخفضة ولكن، من الناحية النسبية، تلك التي للمرأة العربية هي أعلى من تلك التي للرجال العرب. وبالمثل نجد أن في المنطقة لا وجود لعلاوة الأجور فى القطاع العام للرجال ولكن هناك علاوات عالية للنساء. أما في دول مجلس التعاون الخليجي فالعلاوة عالية للرجال ولكنها تكون منخفضة، أو حتى سلبية في باقي دول المنطقة. ومع ذلك، فإن RORE عموما هي الأدنى في دول مجلس التعاون الخليجي. RORE في المنطقة هي نتيجة وجود عائدات على التعليم الابتدائي أعلى من المتوسط من ومنخفضة جدا منها في التعليم الثانوي والعالي. مشيرا إلى ارتفاع نسبة البطالة، وخاصة بين الباحثين عن عمل والأكثر تعليما في المنطقة، وأن RORE تتأثر بكل من عرض العمل والطلب على اليد العاملة، نتائجنا تشير إلى أنه يجب أن يكون هناك مزيد من تركيز السياسة على الأسباب الكامنة وراء الطلب على اليد العاملة المنخفض، وخاصة بالنسبة للمهارات العليا، في المنطقة. وينطبق هذا بشكل خاص على القطاع الخاص الذي لا يزال يتميز بالممارسات الريعية على الرغم من تكاليفه لخلق المزيد من فرص العمل في المستقبل مقارنة بالقطاع العام. الطلب المنخفض على العمالة والأجور يقلل من حافز لاستثمار في التعليم ما لم يكن هناك توقع للحصول على وظيفة في القطاع العام أو في الخارج. في الواقع، فإن المنطقة العربية لديها واحد من أعلى معدلات هجرة العمالة الماهرة في العالم. هذا يضر ليس فقط بالتوقعات على المدى القصير من العمال العرب ولكن أيضا الرعاية على المدى الطويل من المواطنين في المنطقة.

1. Introduction and Summary

One of the most robust econometric relationships, which is also explicitly derived from economic theory, is that between the education one has and his/her labor earnings. Though education is often undertaken for reasons other than finding employment (social demand), the economic demand for education is typically found to be strong and stable, and as such it is considered to be "investment in human capital". The increase in labor earnings associated with additional education is interpreted as "rates of return" to the investments in education in a manner similar to other forms of investments.

Rates of return to education (RORE) have been estimated under various methodologies since the 1950s but today a widely adopted approach is that introduced in 1974 by Jacob Mincer in the form of the so called "earnings functions"[1]. In the half-century since, there have been scores of econometric estimates for the RORE across practically all countries in the world. Several attempts have been undertaken to synthesize the empirical results in order to analyze patterns across countries and over time. For example, it is interesting to see the associations between RORE with levels of country incomes (GDP/capita), different levels and types of education (e.g. general *versus* vocational education, university *versus* secondary and so on), various types of economies and different world regions – such as developing, emerging, transition, high income and so on[2].

The Arab states are obviously underrepresented in these reviews. Moreover the available "data points" are also just a few in the Arab region. For example, Montenegro and Patrinos report on average four estimates at different data points per country in their earlier paper (2013) and as many as six estimates per country in the latest one (2014) that has 819 surveys for 139 countries. Their estimates for the 8 Arab countries come only from 19 surveys. This means that for many non-Arab countries there can be relative confidence in the reported results. This is something that cannot be said for the Arab states that have typically just over two spot estimates.

The objective of this paper is to overcome this numerical deficiency for the Arab countries by estimating the RORE for *all* of them in contrast to the compared aforementioned studies that were limited in number due to the dearth of the necessary information required for the estimation of earnings functions. That information typically comes from micro data such as those included in household surveys, labor force surveys and panel surveys. Instead, this paper uses information from the Gallup Surveys that are administered to approximately 1,000 individuals in more than 164 countries worldwide. Thus, the paper also estimates the RORE for 142 non-Arab countries for benchmarking purposes.

The paper uses a strictly comparable methodology and data both for the Arab and non-Arab countries. Moreover, while previous estimates and comparisons refer to countries that make up the so called "Middle East and North Africa" region (MENA) that includes Iran but excludes a number of Arab countries, the paper focuses exclusively on the 22 countries that make up the Arab League. Within this framework, the paper offers insights into where the Arab region stands and how its education system and labor markets operate.

The next section summarizes the findings of existing studies of RORE in the Arab region. Section 3 describes the empirical approach adopted by the paper. This covers the survey data

[1] Mincer (1974).

[2] Recent examples include Orazem and Montenegro (2008) that covered 49 countries (4 Arab countries), King, Montenegro and Orazem (2010) that covered 86 countries (7 Arab countries), and Montenegro and Patrinos (2013, 2014) that covered 139 countries (8 Arab countries). Regional or global reports of the World Bank, and other international and regional organizations, typically include comparative tables on RORE – see for example the report on MENA by the World Bank (2008). The aforementioned reviews reported initially RORE for Egypt, Jordan, Morocco Tunisia and Yemen, then they included Djibouti and Iraq and more recently added Lebanon, Mauritania, Syria, West Bank and Gaza all of which amount to half of the 22 Arab countries.

we use, the methodology, the definition of the Arab region that, as mentioned, differs from MENA, and, most importantly, the way we summarize and aggregate the regional findings, that is, not in terms of population weighted averages but as country averages. These are important qualifications to be borne in mind while assessing the results. Section 4 initially assesses the integrity of the results before it presents pooled and individually country estimates. It also presents separate estimates for the public/private premium to education. Section 5 compares our results with those from previous studies. Section 6 summarizes the findings and discusses them in the broader development and labor market context of the Arab region, and section 7 concludes.

2. A Review of Previous Findings

Though earnings functions have been estimated many times for many countries over the last half century, the country estimates for Arab countries are relatively few. A rather representative selection of existing estimates of rates of return to education for Arab countries is presented in Table 1. It should be noted that the reported estimates of the average RORE for the region have typically been based on only a small subset of the listed countries – typically 7-8 of them.

Turning now to regional averages, the general picture that has emerged so far is that RORE in MENA are:

- Lowest compared to other regions, with an additional year of schooling adding around 5.4 percent to labor earnings compared to a world average of 7 percent[3]
- Particularly low for secondary education (3.5 percent) followed by tertiary education (8.9 percent); both are almost half the respective world averages (6.9 percent and 16.9 percent)
- High for primary education (9.4 percent) which is almost equal to the world average (10.3 percent)
- Higher for women than for men (nearly 8 percent versus 5 percent)
- Higher in North Africa/ Maghreb than in the Middle East (not shown in the table)

While the focus of this paper is on the left panel of Table 2, it is worth discussing the rates of return by education level. The RORE at primary level are high and vary little by region with MENA being on the higher end lower only that those in Asia (East Asia and Pacific, EAP, and South Asia, SSA). In this respect the labor market seems to be rewarding basic literacy similarly across different regions.

The big difference for MENA is at secondary education level and tertiary level. For both, the RORE are almost half the global estimates. This is a point to which we return later in conjunction with our findings that confirm that the RORE are indeed low in the Arab region.

Returning to the left panel of Table 2, the reported MENA averages are 4.9 percent for men and 7.7 percent for women. Taken together, the average RORE for MENA comes down to 5.4 percent which is indeed the lowest among world regions.

This 5.4 percent is practically identical to the regional average of 5.5 percent reported for MENA in yet another study which is summarized in Figure 1. Figure 1 reports averages not only for regions but separately for different types of economies. Interestingly, even countries amidst their youth bulge have average RORE that are still nearly double at 9.3 percent those of MENA. This also applies if high income countries are considered (10 percent) or those in conflict (9.3 percent) – and MENA is a good mixture of both. With this background, it is now time to turn to our own results. This is done in the next two sections, first explaining the data, method and regional aggregations and then proceeding with the actual estimation.

[3] The world averages reported in Table 2 have been derived from the regional averages weighted by the number of data points in each region (column 1).

3. Data and Regional Averages

There are few available micro surveys in the Arab region and these are available for only a few countries. These surveys include labor surveys, household income/expenditure surveys and in very few cases (such as Egypt) panel surveys. Regional estimates of RORE are available for the so called "Middle East and North Africa" region (MENA) as defined by the World Bank that includes Iran (a non-Arab country) and excludes most Sub-Saharan Arab countries (SSA). However, these estimates are typically confined to a subset of individual countries for which information exists, such as Egypt, Iraq, Jordan, Lebanon, Morocco, Syria Tunisia, West Bank and Gaza, Yemen and, from the SSA countries, Djibouti, and Mauritania.

3.1 The data

To overcome this limitation and importantly update the existing results, and also for comparability with countries in other regions, this paper uses the information in the global database of Gallup Surveys for 164 countries undertaken on average twice (some countries have none, one or more than two waves a year) a year ("waves") since the mid-2000s (2005-13). This comes to 1,154 surveys that have information for more than 1.2 million respondents above the age of 15. The surveys have a common questionnaire addressed to 1,000 respondents per country/wave. They are effectively micro data strictly comparable across countries. This makes them suitable for cross-country as well as inter-regional comparisons.

Table 3 makes clear that the eventual size of the sample for estimating RORE is constrained by the availability of useful variables for the analysis in specific country/ waves. For example, since one of the key variable of interest is whether the respondent works, the effective sample is reduced to around 800000 respondents at the loss of 7 waves – from 25 to 18. And when the RORE are to be estimated separately for the public sector and the private sector almost four-fifths of the previous observations are lost reducing the sample to 150,000 and only 9 waves.

Moreover, the occasionally missing values in various surveys reduce the sample further. In addition, to avoid noise in the estimation we exclude observations where reported incomes (see below) were 10 times higher or lower than 10 percent the average in the specific country/wave[4]. Finally, after an initial exploration of the data, the reported results are based only on citizens of working age (15 to 64 years).

Overall, our estimates for *a single RORE per country* are eventually based on 12 waves and just over 250,000 individual observations for 137 non-Arab countries (138,166 observations for working men and 115,016 observations for working women) and 12 waves and nearly 34,000 observations for 22 Arab countries (24,108 observations for men and 9,744 observations for women)[5]. However, information on sector of employment is reported infrequently and this reduces the size of the sample significantly (Table 4). More specifically the estimates for *the wage premium in the public sector* are based on 4 waves and nearly 30,000 individual observations for 90 non-Arab countries (23,705 observations for men and 20,660 observations for women) and 3 waves and just over 8,000 observations for 18 Arab countries (5,669 observations for men and 2,563 observations for women).

While Gallup data seem to be quite conventional, they have a significant limitation for estimating earnings functions: They have no information on the individual labor earnings

[4] The difference between the originally reported incomes in the Gallup Surveys and the "adjusted" incomes used in the paper was less than 5 percent in 90 percent of the country and time data points. In nearly one quarter of the country and time data points the difference was between 2 percent and 5 percent. From an Arab perspective, the difference between adjusted incomes minus originally reported incomes was positive in Kuwait, Saudi Arabia and the UAE along with Lebanon and Palestine suggesting an under-sampling of higher income families. The difference was negative in Egypt, Iraq, Somalia, Sudan and Syria suggesting under-sampling of low income families. In the remaining Arab countries positive and negative differences were more or less equally divided. There was practically no difference between reported incomes and adjusted incomes in Bahrain and Oman.

(wages) of the working respondents in the surveyed households. What they report is total household income from all sources flagging only whether the household received transfers from domestic sources or abroad. More specifically, Gallup surveys have all the information needed to be included in the right hand side of the regression equation used for estimating earnings functions, which is typically the greater constraint for reliable estimation. *The question therefore becomes whether the limitation arising from the mis-measurement of the dependent variable can be overcome*. And perhaps it can be overcome to a large extent: The problem is one of errors in the dependent variable that, if not heteroscedastic, will still allow for unbiased, albeit less precise, estimates.

Whether one can approximate individual labor earnings with total household income is therefore an empirical question that can be addressed by running "earnings functions" where the dependent variable is total household income but the independent variables include controls that could account, at least in part, for the distortion arising from the use of total household incomes instead of labor earnings. The additional variables include the number of adults in the household in order to control for labor supply effects of additional household members, whether the household received any remittances from members living elsewhere domestically or abroad, location of the household as normally urban incomes tend to be higher than those in rural areas and so on.

3.2 Defining the Arab region

The Arab region is often interchangeably referred to as MENA where the acronym stands for *selected* countries in the Middle East and North Africa. There is nothing wrong with this as long as it is clear to which countries a given metric applies. There is, however, a second issue, that is, how regional statistics are averaged and are subsequently used as representative for the Arab world.

Let's start with the countries that make up the MENA region. First, MENA includes Iran whose population is practically as much as the combined population of the five Arab countries that typically make up the Middle East[6] – excluding the GCC countries that one may be tempted to argue that they should not be aggregated with the other countries in the region.

Moreover, the Arab countries within the MENA region vary even within the same organization. For example, the World Bank's *Little Data Book* (2015) includes the GCC countries in the high income group but not in the MENA group which is the classification adopted by *The MENA Data Book* (2014). And while both include Iran, they exclude Comoros, Mauritania, Somalia and Sudan.

This paper adopts the following classification:

- Middle East: Iraq, Jordan, Lebanon, Syria, oPt and Yemen
- GCC: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and Oman
- North Africa: Algeria, Egypt, Libya, Morocco, Sudan and Tunisia
- Sub-Saharan Africa: Comoros, Djibouti, Mauritania and Somalia.

3.3 Averaging the Arab region

The statistics for the MENA region are typically calculated as population weighted averages. The resulting average thus refers to the *average citizen* in a region, not the *average country* in the region.

Yet, one rarely hears what the "average Arab" does. In most cases the interest is on what "Arab countries do …"or "Arab countries have failed …." etc. A comparison here is Asian regional

[6] Iran has a population of 78 million while Lebanon has 4.5 million, Jordan 6.5 million, Iraq is 34 million, West Bank and Gaza 4.5 million and Syria is 23 million. On the GCC side, the total population is less than 50 million of whom nearly half are expatriates.

(or even global) averages that include population weighted statistics: such averages describe to a large extent the fate of Chinese citizens (for example, see Table 5 top panel with reference to the level of and change in global poverty rates, 1981 and 2004)[7].

The equivalent distortion in the Arab region arises from the fact that Egypt accounts for more than 40 percent of North Africa. Similarly, nationals in Saudi Arabia account for nearly 80 of the nationals in the GCC countries. Two numerical examples make these points clearer. First, the *country* average of female labor force participation rate in the GCC is 26 percent while the population *weighted* average is only 13.8 percent (Table 5, middle panel). Obviously, the rate is disproportionately affected by Saudi Arabia[8].

Second, between 2000 and 2010 the annual real GDP per capita growth in Egypt has been 3.2 percent and was reduced to 0.1 percent in 2011. The corresponding rate among the group of Arab "oil-importers" is reported by the World Bank to have been 3.3 percent and 0.8 percent[9]. This is very misleading as the two respective figures for the other oil importing countries in the region comes to 2.9 percent (that is, *minus* 14 percent difference for the period 2000-2010) and 2.4 percent (that is plus 300 percent difference for the period 2010-11). Obviously other oil importers were not affected as much as Egypt from the Arab Spring (Table 3 bottom panel).

These two qualifications, that is, the definition of the Arab region and the way average statistics are calculated, are not trivial for an additional reason related to the last point: Egypt is not just the most populous Arab country but has also one of the most comprehensive data base and a large number of researchers. This results in Egypt being included in practically all regional estimates while other countries being more selectively represented. In other words, there is a risk that what is true for Egypt may be perceived to be true also for the whole Arab region when this is not necessarily the case.

In conclusion, this paper (a) refers to the Arab region as the 22 countries that are members of the Arab League and (b) uses country, not population weighted, averages for the regional estimates.

4. Regressions Results

In all regressions presented below, the dependent variable is the logarithm of annual income of households to which the working respondent belongs[10]. This is regressed separately on women and men and includes various characteristics of the household to control for effects on incomes that arise from sources other than work, the respondent's education and age, and either the country and wave (in the case of pooled regressions) or only the wave (in case of individual country estimates). In algebraic form the regressions take the form of

Ln(income) = Constant + HH control variables + Education (years) + Age and its square + Country + Wave

We use "control" variables that are commonly available across countries and waves bearing in mind not to lose many countries and observations. The aim is to at least partially control for the fact the surveys collect information on total household income as reported by any randomly selected household member who may work or not. And in the regression we include those

[7] Francisco H.G. Ferreira and Martin Ravallion (2011), Global Poverty and Inequality: A Review of the Evidence. Washington: World Bank Policy Research Working Paper 4623.

[8] ILO/UNDP 2012 p. 132.

[9] The Arab oil importers are Djibouti, Jordan, Lebanon, Egypt, Morocco, Tunisia and West Bank and Gaza. World Bank (2014), MENA Data Book, September; p. 6.

[10] "Adjusted" means that households with more than 10 times or less than 10 percent the average household income in a specific country/wave are excluded.

household members who are nationals of working age (15-64 years) and report that they are working[11]. At the individual household level, we consider control variables to be:

- the number of adults in the household as they may affect positively the total household income as they may themselves be workers
- the number of children in the household to capture demographic effects
- the location of the household as labor incomes for the same education vary across rural areas, villages and cities)
- whether the household received any transfers that obviously increases total household income in addition to the contribution of the working member
- the day of the week the survey was conducted – this was found to have no effect on the common working days (Monday to Thursday); this variable has a positive effect on Saturdays that is uniformly a weekend day across the Arab region and smaller also positive effects on Fridays and Sundays that are observed by some countries but not others.

The regressions were performed in three distinct steps with varying objectives.

In step one the aim was to establish the behavior of the data and reliability of the estimates across all countries, waves and respondents (male and female, working and nonworking). This is done for all respondents[12] before we try to examine the relationship between individual labor earnings and human capital and employment characteristics of respondents. In fact, in this step, and only in this one, we use the logarithm of total household income without any adjustment and all households irrespectively of the age sex, nationality and employment status of the respondent so we can assess the global integrity of the surveys. Moreover, we start with a parsimonious specification so we can use as many as possible observations. Then we sequentially add variables of increasingly greater interest that has unavoidably the effect of reducing the number of observations due to missing values. This is done in order to establish the reliability of the results as the sample size is reduced and its composition in terms of country and waves is changed.

Step two mimics the estimation of conventional earnings functions. It is like step one but changes the dependent variable and sample composition. The dependent variable is now the logarithm of "adjusted" income that excludes very low and very high values to avoid noise in the data at a loss of only a few observations. The sample size is no longer all respondents (working and nonworking) but employed nationals in working age (15 to 65) and the regressions are run separately for women and men. These regressions are far from ideal given the nature of the dependent variable[13]. This will depend on how much and how consistently the earnings of the working respondents account for total household income. Effectively, the main problem is that of measurement error in the dependent variable. However, slope coefficients estimated with OLS (the conventional specification of earnings function) would remain unbiased. And assuming that there is no problem of heteroscedasticity in the measurement error, standard errors will still be valid[14].

[11] In other words, these control variables would have been reported the same way both by a working member and a non-working member

[12] In this step, we included non-nationals as a wrong sign in this variable could flag potential issues. The Gallup Surveys include non-nationals who are Arabs but not of other ethnicity. Predictably our regressions returned a strong negative effect on incomes and particularly so in the GCC countries.

[13] Also in the case of women, one should ideally correct for the fact that working women tend to be a self-selected group something. However, this is uncommon in global studies as it requires significant amount of data that may differ between countries thus reducing the comparative value of the exercise.

[14] This is possibly a reasonable assumption since we have converted the dependent variable into logs. The measurement error should have a positive mean, but this does not matter for the present analysis. Only the intercept will be affected, and we are not interested in it.

Step three is as step two RORE are not estimated for the whole economy but separately for the public sector and private sector. The inclusion of employment sector variables can be contested both theoretically and econometrically though it constitutes a widespread practice. The reason is that education, earnings and employment are simultaneously considered in making human capital investment and broader labor supply decisions. Ideally one would like to have adequate data for simultaneously estimating education and sector of employment decisions and, especially in the case of women, decisions whether to participate or not in the labor force. This is not possible with the data in hand.

With these observations in mind, we present below the regression results. Though not included in the reported results, all regressions include dummies variables to control for the different countries, waves and day in which the survey was conducted.

4.1 Step 1: The broad determinants of total household incomes

Table 6 presents the results of pooled regressions (all countries and waves) of the logarithm of annual total household income on household, personal, human capital and employment characteristics of the respondents. Also included in the regression, though not reported, are the coefficients on the dummies used for the different countries, waves (in a year) and days of the week in which the survey was conducted that were, nevertheless, all significant. The idea is to get a sense of the reliability of data given that they are not as suitable for estimating earnings functions as are, for example, the data in the more conventional labor force surveys. Moreover, the results are for the Arab countries while for the non-Arab countries and the global regression are reported in Appendix Tables A1a and A1b.

The first column includes three purely demographic variables. The first variable is the number of working age members ("adults") in the household. This variable is expected to exercise a positive impact on total household income as the greater the number of adult members in a household, the more likely it is to have more working members[15]. The second variable is the number of children (less than 15 years old) in the household whose effect can be indeterminate: children may put pressure on adults to work more for extra income and even some of them may be working (child labor) or, to the contrary, they can constrain adults from joining the labor force directly (part-time or even no work) or indirectly (impact on earnings due to reduced lifetime work effort). The third variable is whether the respondent is an expatriate compared to a national. This is something that can significantly boost household income in the case of expatriates being significantly more qualified than nationals or may reduce it in the case of unskilled workers or in the presence of different rules applying to them. Noting that the Arab surveys included only Arab expatriates who, even when they are highly skilled, they tend to be paid lower than their non-Arab counterparts, this variable is expected to be negative.

The second, third and fourth columns add three income transfer variables. These variables are to be used later on in an attempt to control the fact that we use total, rather than labor, incomes. The difference between the second and third column is that we add "wave" in the latter case to examine whether there is much change in the results over time. The first of the income transfer variable refers to whether the household got income from somewhere else within the country of the household. While this has a positive effect on the current income of recipient household in an accounting sense, this variable may also capture qualitative effects. For example, households that receive such transfers may have lower incomes to start with and have a household member (or more) who works in the city often in low paid jobs (such as domestic or construction activities in cities) and sends money back to relatives in rural areas. So the coefficient on domestic transfers is indeterminate. However, the coefficients on the second and third transfer variables (that is, foreign transfers and "domestic and foreign" transfers) both

[15] In the Gallup surveys we have information only for the working status of the respondent.

are likely to be positive: Even when work abroad is the same as that at home, it typically pays more. Economic migrants abroad do not receive lower incomes than what they would have gotten if they had stayed home.

The forth column includes two location variables, whether the household is located in a rural area or in a village. Both are expected to have a negative effect, compared to households in a city, with that of rural location being more negative than the effect of living in a village.

The other columns add the conventional human capital variables (education and age – both in years), as well as personal characteristics including gender (reference group is men); marital status such as married, separated, divorced or widowed (reference groups are single or living with a partner); and employment status such as whether the respondent is employed, unemployed, working part-time on a voluntary or involuntary basis, being full-time employee in the public sector or private sector or self-employed (reference group is inactive/ out of the labor force).

The results are reassuring about the integrity of the data notwithstanding the fact that they are based on all observations and respondents regardless of size of income or employment effort – something that can create problems if, for example, reported incomes are many times higher than the average in a country or respondents worked for many or too few hours. In fact, we do not control for hours not only for reason of theoretical and econometric purity (to avoid endogeneity) but also because there is no information on hours.

More precisely, the adjusted coefficient of determination is quite high – nearly double what one would get in similar regressions. And they rise from below .55 to nearly .65 with the additional regressors moving from column 1 to column 9.

There is practically little and in many cases no switching in the sign and change in the significance of the coefficients with the one on education being a prime case in point: its value ranges within a narrow band from 4.9 percent to 4.6 percent as the number of regressors increases. This estimate is already not that far off of the MENA average of 5.4 percent reported in Table 2 (King, Montenegro and Orazem, 2010) or 5.6 percent reported in Figure 1 (Montenegro and Patrinos, 2013)[16].

It is instructive to examine the coefficients of the other variables that can help set a framework for the better understanding of the labor market in the Arab region. First and foremost, let's examine the other human capital variable included in the regression, that is, age. The coefficient is effectively "non-negative" but very small suggesting that an extra year adds at a maximum only 0.6 percent to incomes (compared to almost double that for the non-Arab countries – see Appendix Table A1a). Moreover, the coefficient on "age-squared" is small and almost insignificant and suggests a weak association with age in the present specification. For now, let's say that this lends weight to the hypothesis that experience (and skills) may not be valued much in the Arab labor markets that rely more on credentialism in the public sector and employ basic production techniques in the private sector.

Looking at the other variables, the controls performed extremely well both for Arab countries (and also the non-Arab countries – see Appendix Table A1a):

- "Number of adults in the household": As expected, always positive and significant with little variation indicating that that as household size increases by one adult, household income increases by approximately 4 percent (however, for non-Arab countries the increase is nearly double that at around 8-9 percent)

[16] As discussed below, much of difference is because of sample composition: We include all 22 Arab countries while previous studies had barely more than a handful and practically all excluded the GCC countries that tend to have low RORE as nationality matters more in the labor market than education.

- "Number of children in the household": Its sign is indeterminate *a priori* and the results suggest a small "non-negative" association with incomes of up to 0.8 percent while in the case of non-Arab countries the result is always negative. It is not clear why this is so. In any case, this variable was found to be volatile and of low significance but is kept in the regressions for controlling unobserved family characteristics.
- "Respondent is an expatriate" (compared to "national"): As expected, given that it is unlikely an expatriate respondent would have been asked to provide answers to questions about the incomes and characteristics of nationals in the same household, the coefficient in this variable is always negative, significant and of high value ranging from minus 20 percent to 40 percent (if employment sector is controlled for). In contrast, the corresponding coefficient for non-Arab countries ranges from only minus 2 percent to 7 percent. In fact, the coefficient on this variable for Arab countries has the largest absolute value compared to all other coefficients in the regression, including those on transfers/remittances (see next bullet point).
- "Domestic transfers" (compared to "no transfers"): This variable is defined as remittances to a household from someone living in the same country and its sign is indeterminate *a priori*. The results suggest that incomes of Arab households that receive them are lower by between 10 percent and 20 percent compared to households that do not (however, for non-Arab countries the reduction is small ranging between 1 percent and 8 percent)
- "Foreign Transfers" and "Foreign and Domestic Transfers" (compared to "no transfers"): These two variables include remittances to the respondent's household from someone living abroad and are expected to have a positive sign. In fact, their coefficients are positive, significant and of large values second only to that of the variable indicating whether the respondent is an expatriate. The difference in the values of these two coefficients is not a significant one, each suggesting an impact of around 20-25 percent. This is also the case for non-Arab countries
- Rural or village location of the household (compared to cities and suburban areas): As expected, both variables have negative and statistically significant coefficients. For Arab countries the coefficient on rural varies between 20 percent and 30 percent while that on village is lower and varies between 15 and 20 percent[17]. Unlike in the case of foreign transfers, these two coefficients are much higher in absolute value for non-Arab countries suggesting urban-rural differentials in the Arab region are lower
- Married, separated, divorced or widowed (compared to single): These marital status variables returned a negative coefficient with a particularly high absolute value in the case of widows in the Arab region compared to divorced in the rest of the world.
- Finally, the labor market variables also performed well. More specifically, compared to those out-of-the labor force (the inactive):
- Respondent working: Arab Working respondent reported household income that was about 12 percent higher than that of an Arab non-working respondent (but for non-Arabs the difference was 17 percent that is 50 percent higher)
- Unemployed: The impact of unemployment is negative and significant and the same for both Arab households and non-Arab households taking away around 20 percent of their incomes
- Working part-time voluntarily: The effect of voluntary part-time employment on household incomes in the Arab region ranges from insignificant and practically zero to an unexpectedly positive and significant 17 percent. This may suggest that this variable is capturing other unobserved characteristics in the region (who are the voluntarily part-timers

[17] While the inclusion of location variables in earnings functions is generally subject to theoretical and econometric objections, their inclusion in our case is justified as a further attempt to control for using total incomes instead of labor earnings.

in a region that this type of employment is sparingly used?). This variable probably captures choice and wealth effects in the Arab region but attracts a negative coefficient of between 12 percent and 17 percent in the rest of the world.

- Working part-time involuntarily: Not unexpectedly this time, involuntarily working part-time attracts a penalty of 13 percent but a much higher in the non-Arab countries (23 percent to 29 percent).
- Sector of employment: At face value, Arab households where the respondent was a public sector employee enjoyed a household income premium of nearly 18 percent (compared to the reference (omitted) group made of respondents who were out-of-the-labor force). When examined in conjunction with the coefficients in the other two employment variables, it is higher than those employed in the private sector (where the premium is only 6 percent) but almost on par with those who responded they were self-employed (17 percent). These estimates are in sharp contrast with the rest of the world where there is no significant impact of sector of employment of the respondent on household incomes

One conclusion for the above is that Arab household incomes are determined differently than in households in other parts of the world, especially with respect to labor market variables. However, the relevant conclusion for the purpose of this paper is that it is reasonable to test whether one can estimate earnings functions on the basis of information contained in Gallup surveys.

4.2 Step 2: The effect of education on Arab workers

The regressions that follow adopt the same regression specification used in the previous section (Step 1). However, the previous results were based on responses provided by any household member who was picked up randomly by the survey administrator to answer the questionnaire. In this step we restrict the sample to working respondents only.

Another difference lies in the dependent variable. It is again total household income but "adjusted" in the sense that we exclude cases where reported incomes are lower than 10 percent of the average household income in the relevant country/ wave or higher than 10 times that average income. We nevertheless maintain the country and wave controls as well as household characteristics that are independent of the respondent such as location, receipt of transfers, presence of adult members and children in the household and so on.

Two other differences compared to Step 1 are the restriction of the sample, first, to nationals (that is, the exclusion of expatriate respondents) and, second, those of working age (15 to 64). Moreover, we run separate regressions for working women and men as the determinants of earnings of these two groups are known to be different. The results confirm that there are significant differences in the determinants of labor earnings between women and men.

On the assumption that total household income is to a reasonable extent correlated with the labor earnings of the respondent, regressing total household income on the characteristics of the working respondent may approximate the properties of conventional Mincerian earnings functions. The results are reported below initially pooling all countries together and then running separate regressions for each country. The idea is to examine to what extent results may be affected by the pooling of all countries together, an approach we adopted because of decrease in the sample size as additional variables are introduced. For now we focus again on Arab countries and the comparison with the rest of the world is made later in Section.

Tables 7a and 7b report the results of our "earnings functions" respectively for Arab men and Arab women focusing on the coefficient of education for successive specifications that aim to check for the robustness of the results (see Appendix Tables A2a and A2b for the results of the

full specifications)[18]. The different columns of the tables correspond to regressions that initially contain only age and education to which number of children in the household, location, number of adults in the household, marital status, transfers and part-time work are sequentially added. Our preferred specification is reported in the last column[19].

Though there are differences in the estimates of RoRE depending on the number of other explanatory variables included in the regression, they all point out that a reasonable RoRE for men is around 5.2 and for women around 5.8. This is an encouraging first sign as a typical finding of earnings functions is that the rates of return to education are generally higher for women than men. However, this is not always the case as in almost one-third of Arab countries the reverse is true (see Figure 2).

To test further the consistency of the results obtained under different specifications in the pooled regressions, we also run individual country regressions. As it can be seen, the estimates of the individual country regressions are very much in line with those derived from the pooled regression. In fact, averaging the coefficients from the individual country regressions returns the values of 4.9 percent for Arab men and 5.2 percent for women. These are slightly lower than the estimates from the pooled regression but very well correlated with the latter (Figure 3).

Table 8 summarizes the results. The left panel ranks Arab countries from the lowest to the highest value of the coefficients on the education as reported in the most complete pooled regression (Appendix Table A2a and 2b, last column). The corresponding country average for the effect of education in our paper comes to 5.2 percent for Arab men and 5.8 percent for Arab women.

The right panel also ranks the Arab countries from the lowest to the highest effects of education but this time within their own geographical subgroups as defined in this paper. It seems the lowest values of the effect are found in the GCC and the Middle East and the highest ones in North Africa and the residual group of Sub-Saharan African countries. The highest values are reported for Morocco while the lowest ones are found in Syria, Saudi Arabia and Kuwait.

4.3 Step 3: The public sector premium

We finally examine the case of employment in the public sector. As before, the regressions follow the same regression specification used in the previous section (Step 2) when the respondent reported he or she was working and stated also the sector of employment, public or private. Again, total household income is "adjusted" and we included country and wave controls as well as household characteristics. Also as before, the sample is restricted to nationals of working age.

Like before, we run a series of alternative specifications (Appendix Table A3). Table 9 reports the results of the specification that used effectively most observations (columns 10 and 12 in Table A3). Recall not all waves included all variables and, in the case of employment in the public sector, information was totally missing in two countries, namely Oman and Qatar[20]. At the end our total number of observations was reduced to nearly 10,000 for men and fewer than

[18] The coefficient on the other human capital variable, age, has been found to be small at around 0.5 of one percent for Arab men and 0.3 of one percent for Arab women. This was also the case when age was replaced by a variable proxying experience and calculated as age *minus* years of schooling *minus* school entry age (assuming the latter is six years).

[19] Notice the sample for working men who are also nationals is eventually reduced to only 24,000 for Arab men and 9,700 for Arab women. This total sample size corresponds to 22 Arab countries. It is a pleasant surprise that despite the smallness of the sample only the estimate for Syria is effectively reported to be statistically insignificant and we interpret this as yet another indication that our use of total household income, instead of individual income labor earnings, does not produce unreliable estimates for RORE in general.

[20] The results in this table are based on Gallup surveys for Arab countries in 2009 and 2010 as these were the only ones where the government variable was found for most countries (18-20 countries depending on the specification) and waves (2 to 3 waves).

5,000 for women. As these observations apply to 20 Arab countries, the average sample per country was 500 for men and 250 for women. This is the reason why most coefficients were found to be statistically insignificant though there is no specific reason to believe that in their majority they are biased.

Figure 4 shows that the value of the public sector wage premium for women is above the horizontal line in effectively all but three countries, namely, Algeria, Comoros and Yemen. In the case of men, in about one-third of the countries the premium is to the left of the vertical line, that is, it is negative.

All in all, there are significant differences in the value of the public sector premium across the different countries in the Arab region though for some the distortions arising from the smallness of the sample may be significant. The regional average is nearly zero for men (0.6 percent) but this masks that it is 6.8 percent in the GCC and minus 1 for the non-GCC countries. For women it averages 6.5 percent with 8.3 percent in the GCC and 6.3 percent elsewhere (Table 9).

Though the correlation between the value of the public sector premium for men and that for women across all regional countries is positive (0.33), this depends a lot on which countries are included (Figure 4). Omitting any of the five countries indicated eliminates this relationship or even changes its sign. All in all, there seems to be no clear relationship between the two premiums. This is compatible with the view that there are differences in the way women workers are treated in Arab countries.

To benchmark the Arab region, Table 10 compares the impact of employment in the public sector on incomes. Compared to those who do not work (our reference group), working men and working women in non-Arab countries see their incomes increasing as they move from self-employment to private sector employment and eventually to public sector employment. From a gender perspective, the gender difference in the public sector premium is largest among the self-employed – a sector where family work and informality are more common and, by inference, prevailing norms may be more binding and competitive forces less pressing[21]. The gender gap in the case of government workers is more or less what one might except to see, around 30 percent (35.7/25.9).

The situation is quite different in the case of the Arab countries. The public sector premium for men (14.6 percent) is lower than that for the self-employed (18.7 percent) but higher than that for private sector employees (9.4 percent). This explains why the public sector premium for Arab men is practically zero when compared to the combined private sector (last row, Table 9).

The case of Arab women is even more interesting. In plain terms, employment carries a premium only when a woman works in the public sector. However, the premium is much lower than that for non-Arab women working in the public sector (11.1 percent compared to 25.9 percent). This perhaps explains the overall low female labor force participation rate of Arab women except for highly educated women. On the one hand, it does not pay enough to work as self-employed or private sector employee. On the other hand, the rewards start getting relatively attractive in the case of public sector employment where hiring on the basis of education credentials is more common. This line of reasoning is confirmed in many micro studies that also show that female labor force participation rates are high mainly in the case of educated Arab women. It is also confirmed by economic theory: Women's labor force participation rates depend on whether work is rewarding enough to compensate for the value of lost alternative activities, such a work at home, the invisible economy (hence unrecorded in terms of labor force participation).

[21] Sayed and Tzannatos (1998).

5. Comparison with Previous Studies

Our estimates of the effect on education on incomes across all different specifications using pooled data ranged between 5.2 percent and 5.3 percent for Arab men and between 5.8 percent and 6.3 percent for Arab women. When the effect was estimated on an individual country basis the corresponding values were 4.9 percent for men and 5.2 percent for women. The spot estimates from the most complete specification were 5.2 and 5.8. These estimates are not materially different than the 6.2 percent rate of return to education for men and 8.5 percent for women reported in Table 2 and based on the review by King, Orazem and Montenegro (2010). Though our estimates are somewhat low this is to some extent due to the fact that we include estimates for the GCC countries that are found to be low: excluding the GCC increases the average for the rest of the Arab countries to 5.4 percent for men and 6.4 percent for women.

Patrinos and Montenegro (2014) report a "both sexes average" rate of return to education for the MENA region of 5.6 percent. This falls not only between our two separate estimates for the sexes but is also closer to our estimate for Arab men who are more populous in the labor market than Arab women.

Despite the similarity between Montenegro and Patrinos' estimates for nine MENA countries and our estimates for 22 Arab countries, it is worth probing this issue more. Table 11 presents the results of the 89 countries that are common in the study of Montenegro and Patrinos and ours. The reported estimates for the study of Montenegro and Patrinos are the latest ones they report for each country while those for our study are derived from applying Step 2. The averages are weighted averages by number of countries in each region. The results are shown diagrammatically in Figure 5.

The two sets of results are comparable in terms of rankings though less of a perfect match compared to those we reported earlier (see earlier discussion and, for example, Tables 2 and 8). Despite the relatively good correlation between the previous results and ours, our results suggest that nine countries in MENA have collectively no longer the lowest rates of return to education. In the Gallup case, South Asia (SAS) and East Europe and Central Asia (ECA) have lower rates of return to education than MENA. This is also the case in the Gallup data for women. However, Montenegro and Patrinos report estimates for women in MENA that are higher than all other regions except Sub-Saharan Africa.

It is obvious that measurement, methodological and timing issues create a number of issues in the attempt to estimate regional and global rates of return to education.

In our case, though the Gallup surveys contain a lot of information, they are not ideal in terms of the variables they contain for the study of earnings functions. For example, the information on incomes only in part relates to labor earnings. Other variables, such as hours of work, are missing. And others, such as income transfers to households, are recorded simply as available or not without any information about their magnitude. Of course, issues of mis-measurement and omitted variables are not uncommon but adopting a sequential approach allowed us to see how adding variables and countries/ waves changed the results. We found that the changes were not significant.

Our second test was based on comparing our results against the already existing information and not only for the Arab countries but also for the rest of the world. Again we found that the differences were not significant and, when they existed many in the case of women workers, they were more a matter of scale leaving relativities largely unchanged.

Still we need to address why the Gallup surveys tend to produce lower values of what we believe are reasonable approximations of the rates of return to education. Below we offer some potential explanations.

First, the most obvious culprit is the dependent variable. On the one hand, the inclusion of control variables may not have purged adequately the distortion arising for using total household income instead of the respondent's labor earnings. On the other hand, the fact that total household income is typically greater than the respondent's labor earnings would mechanically result in the regression coefficients being lower than they should actually be. In other words, the effect on household income of an additional year of education for one of its members is lower than the effect on that member's wages.

Second, it is also likely that the independent variables used in our analysis are subject to greater measurement errors than those found in other types of surveys. This is something about which we are agnostic.

Third, our regional averages include the GCC countries that tend to have lower rates of return to education than other Arab countries. Recall our regressions exclude expatriate workers while nationality is an important determinant of employment in the GCC countries.

Fourth, having used the same survey instrument (Gallup) and applied the same specification, our natural comparator should be results obtained from some uniform specification applied to the same set of data. The closer study to this requirement is that of Montenegro and Patrinos (2014). An obvious explanation for reconciling the differences between their results and ours is that the two authors restrict their sample to employees only – a group that is dominated by public sector workers especially in developing countries. We include all working individuals in our sample who are a more heterogeneous and possibly more disadvantaged group of workers. This biases our results downwards.

Fifth, and finally, our estimates are derived from very recent samples from 2005 till 2012. The estimates from earlier studies are much older some going back to the 1980s. Economic theory predicts that the rates of return to education would decline as workers become more educated and empirical evidence confirms that as schooling increases over time the rates decline (Figure 6 and Table 12).

6. Discussion and Qualifications

This paper attempted to estimate indirectly, due to data constraints, the rates of return to education in all Arab countries and compare them to the rest of the world. The indirect way, that is, using household income instead of individual earnings, was explained in Section 3. If the assumptions mentioned therein are at least partially valid, then our estimates may not be far off reality. When compared to previous estimates, our empirical results seems to be generally in line with what one would have derived if more appropriate micro data were available.

If so, the issue becomes how to use the estimates of rates of return to education for analyzing the labor markets, and more broadly the economies, of the Arab region. Below we present a short summary of the theory and cast the empirical evidence from the current paper and previous studies against it.

The way human capital theory envisages education affects the labor market, both from a labor supply side and the labor demand side, can be seen in simplified terms in Figure 7a.

Suppose that there is only one type and level of education in a perfectly competitive labor market. Present workers have this education or none. Similarly, prospective workers can undertake this education or none. One can envisage a demand schedule for education and a supply one. To bring more information into the analysis, let's draw the demand and supply curves in relative terms in the following way: The vertical (price) axis denotes the *relative wage* of educated workers compared to that of uneducated workers (W^{e}/W^{u} where *e* and *u* stand for "educated" and "uneducated"). The horizontal (quantity) axis shows *the percentage of*

workers who would be educated at different relative wages. The curve RD stands for the relative demand for educated labor by firms and the curve RS for the relative supply (that is, somewhat confusingly, for the demand for education by individual workers; in other words, it is not the supply of education such as the available student places in schools, polytechnics, universities and so on).

The two curves have the usual slopes, that is, RD is negatively sloped while RS is positively sloped. Relative demand indicates the education mix of the labor force at various relative wages. It is negative because as the relative wage rises, firms will tend to substitute the cheap factor (uneducated labor) for the expensive factor (educated labor). This is a standard prediction of the economic theory of the demand for inputs in the theory of the firm.

Relative supply (RS) traces out the proportion of workers who would acquire education at different relative wages. It is positively sloped because the costs of acquiring education rise as more people become educated for two reasons. First, the supply of goods and services (including education) is positively sloped. Second, people have different financial endowments, time preferences, satisfaction from learning and so on and at each relative wage only some of them will undertake education. The rest would be attracted only if the relative wage rises. Adding differences in ability reinforces these arguments: The less able find it more "costly" (in mental terms) to acquire education and would therefore need be compensated accordingly through higher wages in order to stay on in the educational system.

The intersection of the two curves determines the equilibrium relative wage, W*. This wage reflects exactly, in theory, the ratio of marginal products of educated to uneducated workers and the compensating differential for the last (marginal) worker who is just attracted to (that is, he is just indifferent between) becoming educated or not).

The comparative statics of the model are the expected ones. For example, a shift of the relative demand curve to the right (for example, because the demand for more sophisticated products -- which are produced by more educated workers -- has increased) will result in higher relative wages and higher equilibrium level of the education mix of the labor force. A shift of the relative supply curve to the right will, as before, increase the percentage of the labor force who is educated but the equilibrium wage will fall.

How do prospective workers decide whether to invest in education or not? This would depend on the return to education which can be calculated as a permanent constant stream equal to the wage gains arising investing in education over the lump-sum costs of acquiring education, that is, foregone earnings during education plus direct costs such as fees etc. The former is the numerator and the latter the denominator of the following equation:

RoRE = (We - Wu)/ (total cost of acquiring education)

Let us assume the wage differential in the numerator is 10 percent and that it corresponds to a RoRE of 10 percent (for normalized costs). This is point E in Figure 7b. Assume that this is what one would have expected to find in a typical economy, let that be the global average.

All estimates reported in this paper, previous and ours, suggest that the RoRE in the Arab countries are on average below the norm of 10 percent, say 5 percent as indicated in Figure 7b. That lower level is compatible with two alternatives: Lower demand for education by firms (point A) or higher demand for (investment in) education by individuals (Point B). If the differential is lower than that, it would imply that demand for education is low while there is an oversupply of education (point C).

Going back to the empirical evidence, what we know is, first, that the RoRE in the Arab region are overall low. In addition, the region has very high, if not always the highest:

- Rates of return to primary education (and very low returns to secondary and especially tertiary education relative to returns to primary education)
- Skill emigration rates
- Educated unemployment rates
- Highest unemployment rates.

Moreover, as shown earlier (Table 2) the rates of return to education in MENA are highest for primary education at almost 10 percent. This is practically on par with the global average. However, the situation reverses at higher levels where the region's rates are almost half the global averages: They are 3.5 percent for secondary education and 8.9 percent for tertiary education compared to global averages of 6.9 percent and 6.6 percent respectively.

Finally, also at regional level, what we know (Table 13) is:

- The percentage of executives reporting inadequately educated workforce is (paradoxically) highest in the GCC (14.4 percent). This is higher than the percentage in the most skills demanding economies of Switzerland, Austria and Germany that report the highest rates of shortages among OECD countries that in turn average only 6.2 percent
- Skills shortages are lower in the other oil-producing countries (8.6 percent) and even lower in remaining resource-poor labor abundant Arab economies standing at 6.6 percent
- Only 25 percent of Arab firms provide training compared, for example, to 57 percent in East Asia, 53 percent in Latin America and 40 percent in East Europe[22]
- The most often cited impediments to investment in MENA are taxes, access to and cost of finance, instability, land constraints and corruption while skills shortages are among the least concerns with a probability of only 31 percent to be found present in the Arab region[23].

One interpretation of the diverse observations made above regarding the empirical evidence is that demand for education and skills by firms is low. This would correspond to point A n Figure 7b and can be justified with reference to:

- the high returns to primary education but not subsequent levels of education;
- high graduate unemployment rates and especially skilled emigration rates that suggests that Arabs have employable skills elsewhere but not in their own countries which in turn suggests that Arab employers are not prepared to pay for higher skills;
- a propos, the skills shortages the GCC countries report, though most of their labor force comes from abroad: Higher wages would have attracted higher and better skills instead of the hordes of low paid expatriate workers;
- the low priority firms attach to skills compared to other constraints for business development and investment.

All in all, this line of reasoning points in demand side explanations regarding the performance of Arab countries. The low RR estimates are compatible with the hypothesis that the region lacks dynamism that has locked their economies into a low value added, low productivity, low wage equilibrium. This can be in turn associated with lack of competition that arises from cronyism, weak accountability and low transparency[24].

However, the facts are also compatible with two alternative interpretations, one that combines both labor demand and "quasi supply" explanations and another purely on the labor supply side.

[22] Almeida, R. and A. Reyes (2010). "Investment in Job Training: Why Are SMEs Lagging So Much Behind?" Washington, DC:
World Bank, Policy Research Working Paper No. 5358

[23] World Bank ICA surveys as quoted in ILO/UNDP (2012)

[24] Cammett et al (2015).

The argument for the labor demand explanation is as follows. Under the traditional "social contract" the population (or, at least, part of it) exchanged political freedom in return for public sector jobs (as well as free public services, low taxes, subsidies and other state handouts)[25]. This is the cause that, apart from resulting in low quality services that required few real qualifications on behalf of public sector workers, it created low incentives for families and individuals to invest in education beyond the point of credentials. Getting employment became a matter of entitlement rather than a privilege to be earned through merit, effort and productive service. Under these conditions, the quality of the education output is low resulting in workers having low productivity. This pushes the demand for labor down giving rise to low returns to the acquisition of additional education.

This is why we labelled the supply side explanation "quasi supply explanation". First, low quality education is not the cause but the result of ill designed policies at the macro and governance level. Second, as Table 2 showed, the returns to primary education are high though this is not the case for secondary and tertiary education. This is compatible that there is higher relative demand for the less educated which in turn is compatible with low capital intensity techniques in production and low value added activities in the economies.

All this challenges any simplistic emphasis on the "low quality and irrelevant" education that puts the blame on teachers, at least to a large part. It also challenges the view of "choosy and picky" citizens who would either go for public sector employment or none that again puts the blame on individuals, especially women in this case as men usually work no matter what. This puts the blame on citizens' culture and all that. The prime suspects for the pathologies of the region's labor markets are the ones rarely mentioned in microeconomic studies: Macroeconomic management (including trade and exchange rate policies), weak governance (and cronyism) and lack of accountability (unrepresentative political leadership). These explanations have started surfacing with force after the Arab Spring but had been previously rarely found in labor market studies.

An example of this jaundiced view that used to blame teachers (and unions – though not always without reason) and citizens (instead those to who run the country) is the perennial reference to the highest unemployment rates Arab youth has had across the world. First, this reference has been rarely juxtaposed against the fact that adult unemployment rates has also been the highest in the world. Second, the numbers of unemployed adults in the Arab region has been higher than that of unemployed youth since the early 2000s. Though this is not smoking gun evidence, put together our findings are compatible with the common view among economists: Unemployment is largely a macroeconomic issue and therefore many of the pathologies in the Arab labor markets lie on the labor demand side. Citizens, teachers and labor supply simply follow incentives. This reinforces the view that the roots of many problems are macroeconomic in nature and related to labor demand: Arab economies do not create enough jobs for all (not just for the youth). And when they do, jobs do not meet the rising aspirations of the increasingly educated middle class.

Irrespective causality, the low quality of education is a fact[26]. The low quality of the education output is manifested by the low performance of Arab students in international comparative tests such as PIRLS, TIMSS and PISA[27]. However, there are significant differences between women and men and also across countries.

[25] Diwan et al (2014).

[26] "Quality" applies to all levels of education. "Low relevance" to the labor market needs applies mainly to postsecondary education.

[27] There are varying assessments of various aspects of the education system in MENA, agreement is lacking especially since the Arab Spring and the quest to understand its causes. For example, Ezzine deconstructs as myths or partial truth several propositions for education in MENA region. These include Education is poor because it has been neglected; Education quality

Arab men's educational attainment is lower than that for Arab women. Though this is becoming an international pattern the main difference between the Arab world and the rest of the world is the size of the gender gap favoring women[28].

Countries with tight labor markets and high emigration rates, such as Egypt, Jordan, Lebanon and Tunisia, have better performing students. Countries where employment of nationals in the public sector is more or less automatic have the lowest performing students (for example, Kuwait, Oman, Qatar and Saudi Arabia)[29].

The relevance of education to labor market needs is a more complicated issue. On the one hand, credentialism can be the driving force for investing in (wrong types of) education in countries where job seekers have an expectation of getting a job in the public sector. This has indisputably been the case in the past (for example, in Egypt) and still is (notably in the GCC). However, the public sector has reduced the rate of hiring in recent years. For example, the proportion of public sector employment in the first jobs of women with secondary education and above[30] was more than 75 percent in Tunisia and Egypt and nearly 60 percent in Jordan in 1975 but it is now around 30 percent in all three countries[31]. In this case, the low quality is less due to myopic behavior of job seekers and more the result of education systems that are unable to change given the archaic qualifications of teachers and sclerotic administrative provisions.

Overall, the critical question is: Is the ***academically*** low education attainment of Arab students and also low relevance of their studies the binding constraint to improved economic performance and better labor market outcomes? Or is this low quality and low relevance still more than what the low sophistication in production would require? This is difficult to answer with certainty but the discussion below suggests that the misalignment of tertiary education[32] may be a lesser factor than it has been previously thought of in practice.

More specifically, the dominance of humanities and social studies in education is not a unique phenomenon in the Arab region. Such fields account for a significant share of university enrolments across the world. This has not been found to have serious adverse effects on graduate employment, unless there are macroeconomic problems of unemployment as in the case of many Arab economies (and this calls for different type of policies). Though some graduates are needed with specific professional skills (e.g. engineering, medicine, law etc.), the great majority of jobs for graduates are managerial or administrative. At the end, graduates of humanities tend to enter civil service or the administrative and managerial ranks of the larger enterprises often with formal graduate training programs.

In the Arab region, especially in the GCC, the employment prospects for graduates in the private sector are less favorable. The problem arises from the structure of private demand for labor. The private sector is made of a few large, capital-intensive enterprises and some large contractors that need graduates for administrative and managerial positions but, as a share of the labor market, the scale of their demand is limited. The majority of private sector employers

is poor; MENA ranks badly on gender indexes; Rich countries of the region have better quality education systems; Education systems lack evidence on student performance because they do not have the capacity to run good student assessment systems; There are not sufficient policies and regulations in place to deliver good quality education in the region; Teachers are not paid enough compared to other regions and so they take on side jobs, contributing to poor service delivery at schools.

[28] ILO-UNDP (2012).

[29] ILO/UNDP (2012): Tables 4.1 and 4.2.

[30] Arab women with lower than secondary education are a very small share of working women. At the other end, female university graduates have the highest labor force participation rate.

[31] Assaad (2015).

[32] Secondary education in it majority provide general education, and low quality – rather misalignment – is a more appropriate concept.

are in microenterprises and SMEs that do not have much need or use for graduates, unless they are professional practices such as law or health.

In conclusion, there are multiple explanations for the low RoRE in the Arab region. The issue is which one is more relevant for identifying the binding constraint that misaligns the education output with the labor market. In some sense, the aforementioned discussion lend more support to demand side explanations if only for two simple facts. First, public sector employment is part of the demand for labor and has been distortionary. Second, firms do not stop their operations when they do not find an input to production. They get it or make it themselves, if only at higher prices and higher costs. Arab firms do offer high wages and do not offer training. And skilled (overeducated) Arabs emigrate and get employment at higher wages than those offered locally. This is compatible with point C in Figure 7b: The region has low demand for skills and over-supply of education skills *at the given market structures* for which neither citizens nor teachers are responsible.

7. Summary and Policy Directions

This paper has identified a number of facts some of which have been previously noted and some that are new. For example, it is common knowledge that statistical information is poor and the Arab states are underrepresented in the previous studies. We addressed the issue of coverage by providing estimates for all Arab countries at the loss of some precision in our estimates that are not, nevertheless, out of line with previous estimates.

The paper also confirmed the previous estimates based on a small sample of Arab countries that the RoRE are indeed lowest when Arab countries are considered in their totality compared to other regions[33]. It also confirmed that the RoRE for Arab men is lower than those for Arab women, and that the quality of attainment of males is significantly lower than that of females.

The low RR estimates are compatible with the hypothesis that the region lacks dynamism. RoRE tend to be higher in periods of disequilibrium whereby the ability to adjust swiftly becomes more valuable -- assuming that Arab workers have the freedom to choose among alternative employment opportunities (a demand issue)[34].

Similarly, the low RoRE are compatible with less open/transparent economic institutions and lack of economic freedom. Countries where production is subordinate to political considerations or the impact of shocks is cushioned though clientelistic practices (e.g. through subsidies) tend to restrict individual choices and constrain the potential benefits of education.

All in all, Arab economies are locked in a low value added, low productivity, low wage equilibrium. It is in this context that the low RoRE in the region suggest the binding constraints for economic performance and better labor market outcomes lie more on the labor demand side than on the labor supply side. What this means is that improving the admittedly low quality of education may not have a noticeable impact. It should also be borne in mind that the high skilled emigration rate in the region depresses "arithmetically" the observed RR at home.

Furthermore, one wonders whether it is possible that the majority of job seekers still invest in education in the form of credentialism in view of the significant reduction in the rate at which the public sector has been hiring in the last two decades or so. In some sense, it is more likely

[33] Some of our estimates at regional level are lower than those reported by other studies and this can be partly explained by the inclusion of GGC countries in our sample and the fact that we have more recent data (RoRE tend to decline over time).

[34] For this see Schultz (1975) who hypothesized that RoRE can vary across markets in the presence of unexpected price, productivity or technology shocks that require managerial decisions to reallocate time and resources. If skilled individuals are not exposed to shocks that require resource allocation decisions or if they are denied the freedom to make those decisions, then they will not be able to capture the returns from their skills. If the impact of shocks is cushioned or individual economic choice is restricted, then returns to skill will be lower in countries that limit exposure and/or individual responses to disequilibria. For an empirical investigation confirming the hypothesis that human capital is more valuable in countries with greater economic freedom, see King, Montenegro and Orazem (2010).

that problems in education outcomes have more to do with outdated offerings by aging academics operating in archaic institutional structures.

It should be emphasized that the problem of low standards in higher education is generally derived from low standards of attainment in secondary education. Solutions should therefore start focusing on issues relating to the quality of attainment in secondary education, and very likely to the quality of attainment in primary education as well. What holds back university academic standards is typically the attainment of the secondary graduates admitted, in terms of critical thinking, problem-solving ability, and, where relevant, mathematical ability. This prior attainment of students immediately places a firm constraint on the teaching ambitions of an institution.

All in all, the findings of this paper confirm an earlier conclusion that:

"The main finding is that the MENA region has made significant strides in the education sector … However, [the region] has not capitalized fully on past investments in education, let alone developed education systems capable of meeting new challenges … The markets were not sufficiently developed to absorb the educated labor force into the most efficient uses. Thus, the region needs to travel a new road … The new road has two features: the first is a new approach to education reform in which the focus is on incentives and public accountability, besides the education process itself; the other feature concerns closing the gap between the supply of educated individuals and labor demand, both internally and externally" (World Bank, 2008)

Following these remarks some promising policy directions can be summarized as follows.

The success of human capital policies depends on two factors, both of which need to be addressed at the same time. It requires high quality teaching, from the beginning of primary education, and it requires motivation on the part of families and their children to take full advantage of the education opportunities provided.

The first factor depends critically on the quality of the education system of which teachers are only part, albeit an important one. Addressing this issue would require reforms of the education system, from modernizing the curriculum to tougher teacher recruitment standards. It will also require rigorous certification and licensing of the increasing number of private sector providers. For example, an increasingly common practice of higher education institutions in the region is to seek some affiliation with an overseas institution. Whether this will be likely to be sufficient to have a significant impact on the standards of the local private universities will become known with the passage of time. However, judging by the identities of some overseas institutions with which some local universities are affiliated with, it is unlikely that these partnerships will provide tangible results.

The second factor has to do with the desire on the part of families and their children that the maximum advantage be taken of this provision. It is not enough to build schools or provide high quality teaching. The difficult part is to provide the right, not populist, incentives to the population to take advantage of the provision. Judging from the experience of many countries, the necessary realignment of expectations and attitudes can be achieved only over a long period of time after the elimination of the perceived advantages of working in the public sector. There will therefore be a need for families to become more aware of the value of education and to play their part in promoting the attainment of their children. Attitudes are notoriously difficult to change, but a realization that future generations will have to compete for a living in the private sector, instead of being assured employment in the public sector, should in time provide a powerful incentive for change.

One obvious priority is therefore to continue rationalizing the size and functions of the public sector for reasons of fiscal sustainability, quality of social services and changing expectations of new entrants to the labor force. As part of this reorientation, consideration should be given

to reducing the proportion of students who lack motivation or are reluctant to acquire skills that are valued in the private sector. If such education is offered in public universities and, more generally, is subsidized, it will continue producing job seekers who, by virtue of being graduates, would feel a sense of entitlement to jobs that they perceive to be appropriate to their of education *that was sponsored by the State*. Indeed, they may even feel that it would be contradictory for the State to provide the opportunity for their studies without also being prepared to provide employment for them on graduation. In fact, it is irrational for the State to make this investment if there were no appropriate employment for them on its completion.

The educational under-attainment of males compared with females poses major economic, labor market and social problems. The divergence between the attainment of males and females is dysfunctional for the economy (loss in productivity of the biggest part of the labor force) and may also have social implications.

In the past there was clearly little willingness by firms to train (the labor demand side) and for nationals to invest in their own human capital development (the labor supply side) in view of the then government policies. New development frameworks are now required, especially after 2010, that would ensure policy coherence across the broad spectrum of economic, education, labor and social policies involving all national actors, that is, the Government, private sector, workers and citizens. Approaches should be comprehensive including fiscal, monetary, financial, industrial, trade, private sector, migration etc. policies from the macro level to the labor market taking into account the implications of education and skills development. To achieve this would require the active involvement of ministries and agencies responsible for the design of relevant polices and implementation of programs together with employers' and workers' associations and the education and training institutions.

In more specific terms, some promising policies can be categorized as follows.

Labor Demand (1): Government employment

As in the recent past, the trend to contain the growth of the public sector should continue and in many cases its size should be reduced through passing on to the private sector what is not inherently part of the functions of the State. And for those functions that would remain under State control, such as education, the quality and motivation of staff should increase through rigorous hiring, rewards and promotion procedures.

Given that the public sector wage premium seems to be declining, if it has not disappeared or even be reversed in some cases, policies for harmonizing employment in the public sector with employment in the private sector should focus on non-pecuniary aspects associated with government employment. This harmonization can address differences in job security, reward practices, working environment, hours of work, leave, effort, shorter service to full pension entitlement and more generous pensions and so on.

Labor Demand (2): Private Sector Competiveness

The road to a more dynamic private sector is well known. It involves moving from a system of political regulation of the market (by granting privileges to regime supporters) which raises feelings of injustice to a system of regulation based on efficiency and job creation. But the sheer natural forces of competition alone are not sufficient to foster a performing private sector. Instead, they need to be catalyzed by institutions with sufficient capacity to effectively regulate competition and markets – it is somewhat of a paradox that a dynamic private sector requires a stronger rather than a weaker state. The privatization drive that started in Tunisia in 1988 and Egypt in 1991 was part of a wider economic reform and structural adjustment strategy often associated with expected efficiency improvements in State Owned Enterprises (SOEs), consolidation of the state budget and support to financial markets. However, for privatization to have a positive effect, the removal of direct political control of governments should not result

in control by the establishment insiders. What is required is that private markets are genuinely competitive. In other words, the privatization process in the Arab region was not independent of political elites. It was more of a denationalization that, instead of giving rise to entrepreneurs, it rewarded the "tenderpreneurs", that is, persons who use their political connections to secure government contracts and tenders for personal advantage.

Effective markets in the Arab region would therefore require a set of regulations and institutions that protect competition, including anti-corruption and anti-monopoly authorities and laws, as well as laws and the regulatory institutions to that ensure a fair playing field among all firms. This includes fair rules and effective institutions to manage state procurement, utilities (which tend to be natural monopolies), consumer protection, Public Private Partnerships, and the financial sector. It is central for the efficient operation of markets that firms are able to access, without discrimination, resources and services to order to undertake projects and initiatives if they happen to have valuable talent and new ideas. Such institutions include a workable justice system and an accountable public administration. Eliminate the "tenderpreneurs" (persons who use their political connections to secure government contracts and tenders for personal advantage).

Labor Demand (3): Manage Migration

This issue is particularly relevant for the GCC economies where students have among the lowest scores in international comparative education tests, lowest rates of emigration and nearly universal access to public sector employment. This has a lot to do with the kind of open migration policies pursued in the sub-region. Such policies depress the wages (therefore, incentives) for nationals to get a job in the private sector where jobs are filled by low wage immigrants. This creates a low wage economy which employers like but does not contribute to the creation of jobs that are acceptable to the values and aspirations of nationals. The dynamics of more or less open immigration policies for low skilled workers lead to a vicious circle that can be described as follows:

- Immigration at low wages for migrant workers induces the use of labor intensive techniques in the private sector
- Labor intensive techniques then lead to low labor productivity
- Low labor productivity then leads to low wages to be offered, also to nationals, in the private sector
- Low wages increase the incentives for nationals to seek employment in the public sector
- The Government understandably tries to accommodate the concerns of the nationals and increases employment, and with it the expectation for employment, in the public sector
- In such an environment, there are few incentives for nationals to really invest in human capital – beyond credentialism
- This results in low productivity also in the public sector due to low skills and over-supply and under-employment
- As a result, the economy is locked into a low productivity equilibrium
- Low productivity means that low wages prevail – and the attractiveness of immigration increases
- And the vicious circle continues.

This line of argument should not lead to an accusation against employers. Employers, like workers, react to incentives. If the law allows migration, then employers see it as their right to make use of migrant labor. Having 5%, 10% or even 20% of migrants who are also gradually absorbed into the national economy and society is not uncommon in migrant receiving countries outside the Arab region.

However, it is a different issue when migrants take up most of the jobs, especially in the private sector, and are treated as a different segment of the labor market, that is, temporary workers under significantly lower levels of wages and different employment conditions than those that apply to national workers. In this case, the nationals face not only low wages but also employment conditions that are prevalent in the country of origin of migrants but hardly acceptable by nationals in their own country. Even employers may fare no much better in the longer run: How sustainable is a model that does not reduce unemployment and, when it does, it does so at wages that are out of tune with the aspirations of citizens?

Labor Supply (1) Higher education

Our discussion suggests that the social demand for higher education greatly exceeds the public provision. In this respect, most Arab countries have removed and in many cases encouraged private education. Official support has taken the form of concessions relating to land, subsidies relating to construction, and the payment of the fees of government-sponsored students. Some private institutions have been accorded the status of universities, others that of single-faculty university colleges, both types awarding four-year bachelor's degrees. Nevertheless, there are issues with standards. Experience elsewhere has shown that accreditation and quality assurance systems serve mostly to eliminate institutes offering services of unacceptably low quality but otherwise have little influence on standards.

The limited demand for graduates in the private sector implies that the excess supply of graduates have three choices: to remain unemployed, perhaps even economically inactive, to migrate to countries with an excess demand for the type of qualifications they possess, or to induce the public sector to provide employment, despite already being fully staffed. The problem of unemployed graduates has been resolved in the past by the third strategy, in some countries with the provision of guaranteed public employment. This ceased to be a solution since the 1990s though at a different scale and speed across the Arab region. However, the problem will recur, regularly and predictably, unless the excess supply of graduates resulting from public subsidies and low academic standards is severely curtailed.

Gender

There has been considerable attention to the unequal treatment and outcomes of women in the private and public spheres in the Arab world[35]. However, there should also be some attention to the "male education deficit", that is lower school enrolment and lower academic performance of Arab men. At the same time, the use of lower university admission standards for males (as it might be contemplated in some countries) should be avoided.

Data

The dearth of statistics in the Arab countries is probably second to no other world region. This results in statistical incomplete profiles of Arab economics and labor markets, ill-designed policies, weak monitoring and misleading evaluation of policies and programs. The statistical challenge becomes even more important during periods of rapid developments, especially adverse ones as in the case of crises. The absence of good statistics on salaries and wages is particularly common: There is very little regional information on the level of wages and the composition of labor earnings, let alone their changes over time. In this respect, it would be advisable to conduct labor force and other micro surveys on a regular basis and, if seasonality is an issue, more often than on an annual basis.

At the present time, a major research project sponsored by ERF is about to investigate the role of labor demand in shaping labor market outcomes in the Arab countries and it is not possible

[35] See, for example, the presentations made at the ERF conference on *Gender Equality in the Mena Region*, Cairo, October 24-25.

to anticipate its findings. However, if our results, including comparisons with previous studies, are relevant to the actual situation in most regional economies then labor demand is the more important factor in the labor market. This is becoming all more important as the recent evidence suggests that the role of the public sector as an employer has declined. The private sector will therefore dominate the generation of jobs for new entrants to the labor force in the future. This could be expected to create an incentive for families—initially parents, but later the students themselves—to be more concerned with educational attainment and selection of academic subjects and skills they will pursue.

Improving education alone will not be enough. This aspect of the supply side of the labor market is a constraint if there are transparent and accountable macro/ trade/ fiscal/ financial/ monetary/ industrial/ business/ investment/ private sector development policies etc., and if there is a balanced public/private partnership and effective social dialogue. Policy gaps in these areas are more pressing to address at present than education reforms: Replacing rentier economies with productive economies by improving governance and creating competitive markets is difficult and takes long time to achieve.

Yet the sooner, and the more vigorously, educational issues are addressed, the better. Improving the quality of the teaching staff will take time, and changing the attitudes of families will take longer. Even when the necessary measures are in place, it will take most of a generation for them to take full effect, given that, for example, university graduates have at least 16 years of schooling.

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Figure 1: Global Returns to Schooling, 120 Countries (Montenegro and Patrinos, 2013)

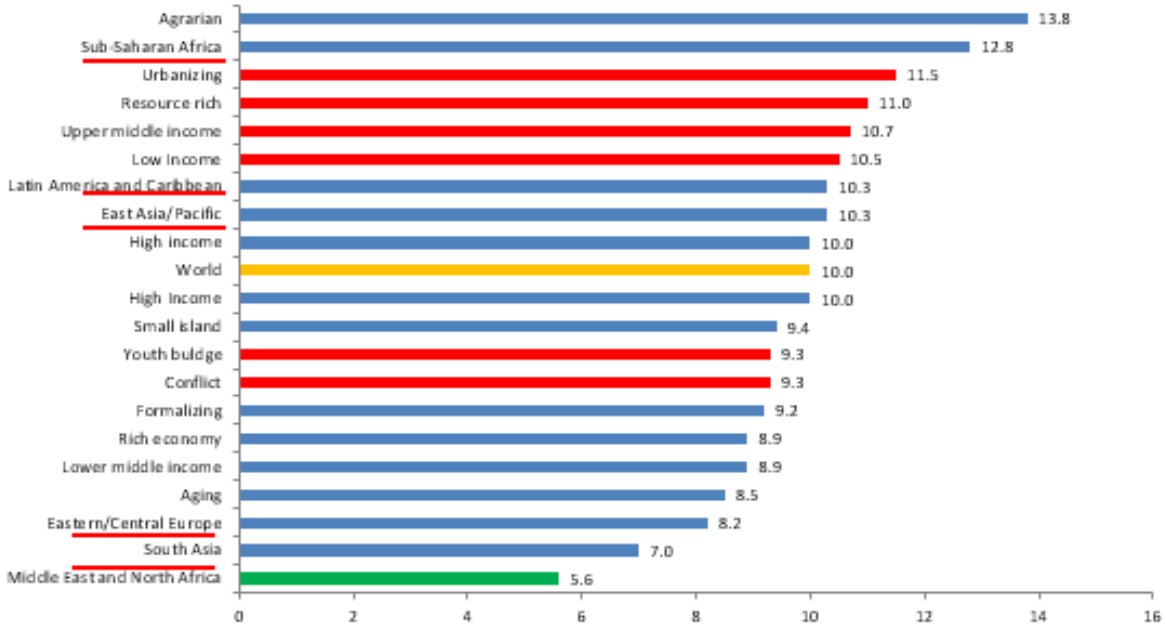
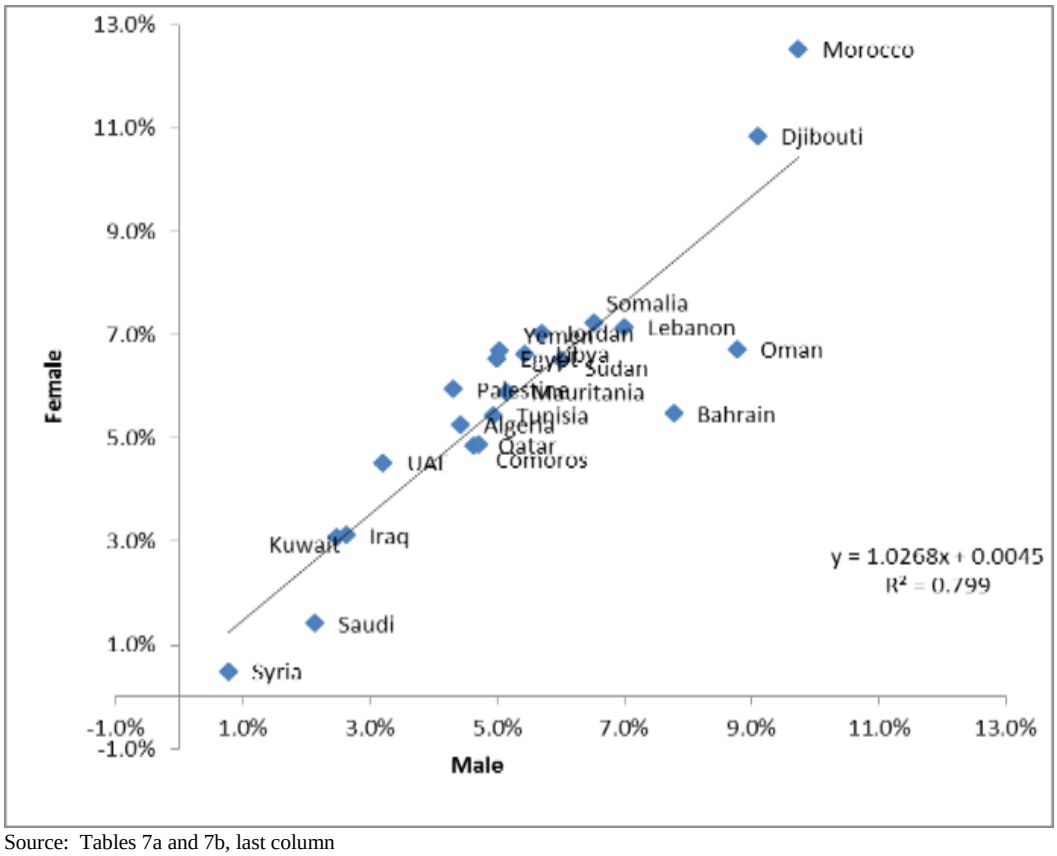


Figure 2: In Most Arab Countries, the Female RoRE is Greater Than the Male Rate



Source: Tables 7a and 7b, last column

Figure 3: Relationship between the Coefficients on Education Derived from the Pooled Regression and Individual Country Regressions

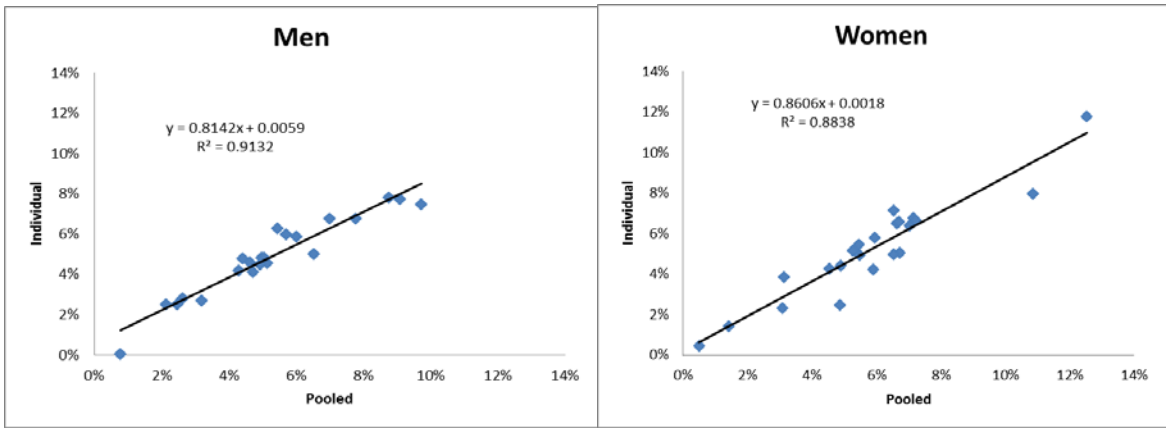
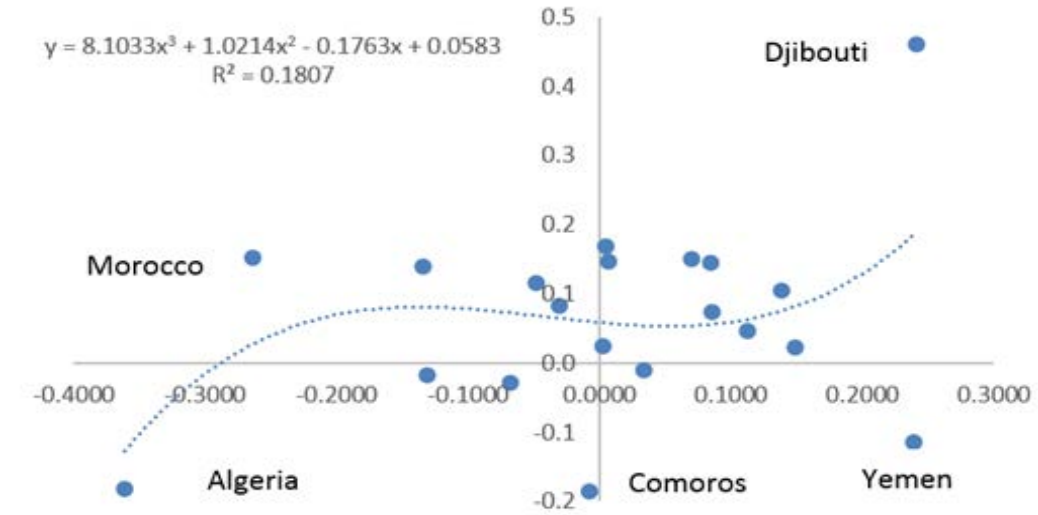


Figure 4: Relationship between the Public Sector Premium for Women and Men



Source: Table 9

Figure 5: Regional Comparison of RORE as Reported by Montenegro and Patrinos and Estimated Using Gallup Data for the Same Countries

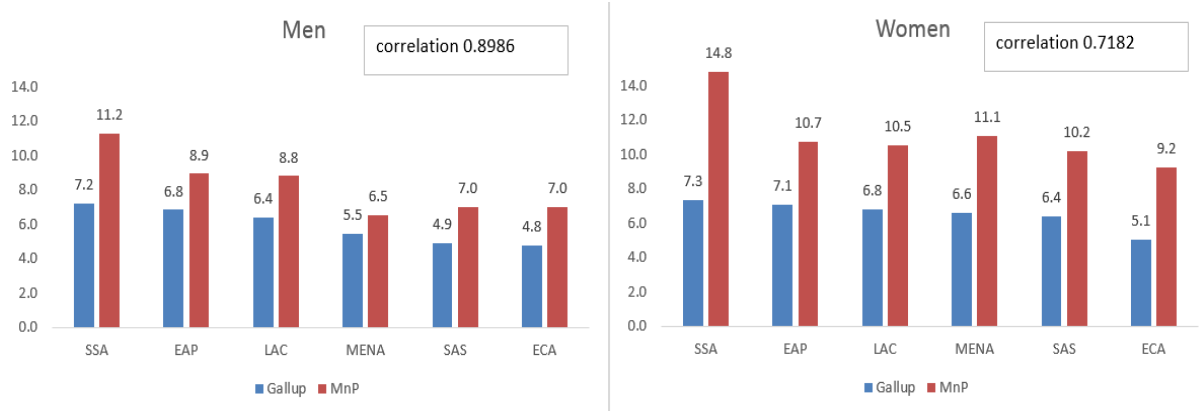


Figure 6: Average Rates of Rates of Return to Education over Time

Source: Montenegro and Patrinos (2014)

Figure 7a: The Market for Education

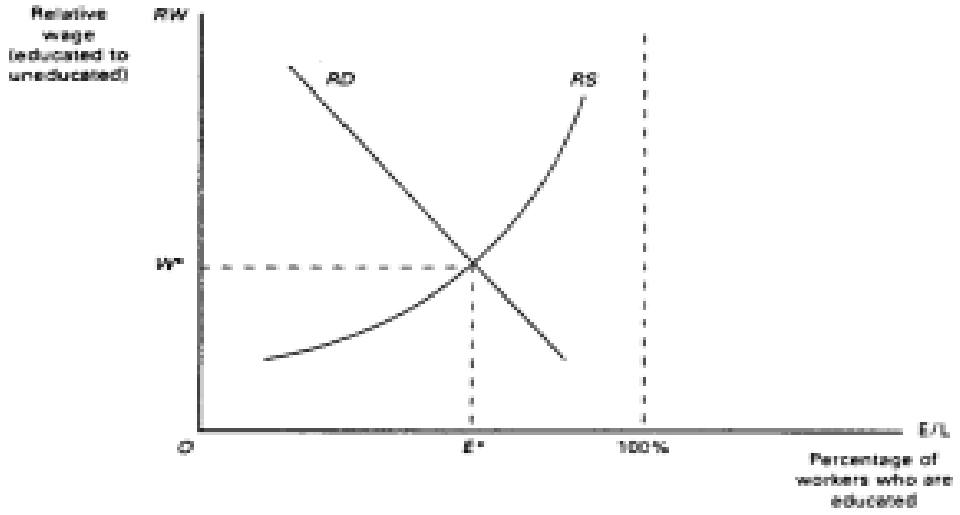


Figure 7b: Is MENA in A, B or C?

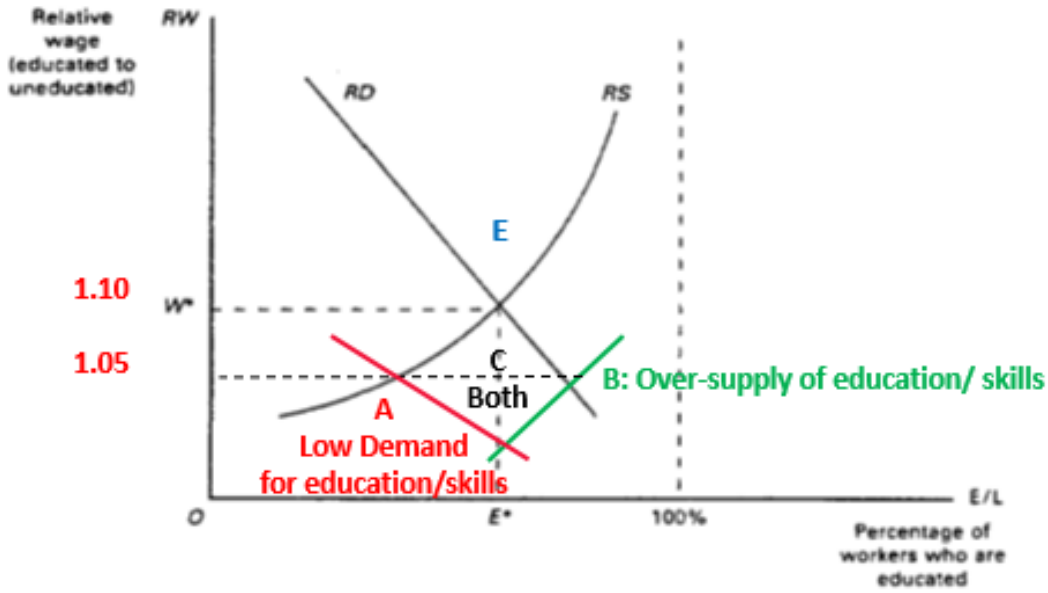


Table 1: Rates of Return to Education to an Additional Year of Schooling

Country	Year	Source	Rate	Notes
Comoros	2004	Montenegro and Patrinos, 2014	6.5/ 2.2/ 5.4/ 17.2	Total / P/ S/ T
	2004	King, Montenegro and Orazem, 2010	5.0	Total
Djibouti	1996	Montenegro and Patrinos, 2014	15.5/ 32.5/ 8.9/ 16.0	Total / P/ S/ T
	1996	King, Montenegro and Orazem, 2010	9.8	Total
Egypt	1997	Lambropoulos and Karadjia, 1999	5.2	Total
	1988	Salehi-Isfahani, Tunali and Assaad, 2009	1.5/ 10.0/7.7	P/ S/ T
	1998	King, Montenegro and Orazem, 2010	2.3	Total
	1998	Salehi-Isfahani, Tunali and Assaad, 2009	2.1/16.8/ 0.3	P/ S/ T
	2006		0.9/ 12.1/7.5	P/ S/ T
			5.4	Total
	1988	Wahba, 2000	3.2/ 5.8/12.9	P/ S/ T
			3.3/ 6.1/8.7	P/ S/ T
	1988	Said, 2007	3.1/ 12.6/8.6	P/ S/ T
	1998		2.8/ 11.5/7.7	P/ S/ T
	1998	Herrera and Badr, 2011	2.7/ 19.4/3.0	P/ S/ T
	2006		1.8/ 4.5/ 8.4	P/ S/ T
	2006	Barouni and Broecke, 2014	1.0/ 3.0/ 8.0	P/ S/ T
	2006	Said, 2015	2.2/ 2.8/ 4.8	P/ S/ T
	2012		1.1/ 2.2/ 4.0	P/ S/ T
	2006	Nugent and Saleh, 2009	3.0 / 3.7	M/ F
			8.7 / 12.9 / 15.8	T Rural/Urban/Cairo
	2009	El-Araby, 2013	-3.0	S ages 15-29
	2012	Assaad, Aydemirn, Dayioglu and Guray	2.0/ 5.7	M aged 20-45
	2012	Kirdar, 2014	close to zero	M full time (40+)
	2011	Rizk, 2016	3.4/ 2.9/ 4.8	T/ M/ F
Iraq	2006	Montenegro and Patrinos, 2014	3.4/ 7.7/ 1.2/ 3.2	Total / P/ S/ T
		King, Montenegro and Orazem, 2010	1.8	Total
Jordan	2002	Montenegro and Patrinos, 2014	8.9/ 10.3/ 4.2/ 8.4	Total / P/ S/ T
		King, Montenegro and Orazem 2010	7.3	Total
Kuwait	1983	Psacharopoulos, 1994	4.5	Total
Lebanon	2002	Galal and Kanaan, ERF 2010	7.0/ 3.5	Public/ Private
	2011	Montenegro and Patrinos, 2014	5.5/ 9.8/ 7.7/ 16.6	Total/ Tt/ Mt/ Ft
Mauritania	2000	Montenegro and Patrinos, 2014	7.4/ 11.7/ 5.8/ 13.5	Total / P/ S/ T
		King, Montenegro and Orazem, 2010	4.9	Total
Morocco	1970	Ben Jelili, Riadh, 2010	15.8	Total
	1991	King, Montenegro and Orazem, 2010	6.9	Total
	1998		7.2	Total
	1991	Montenegro and Patrinos, 2014	10/ 6.6/ 8.7/ 14.6	Total / P/ S/ T
	1998		10/ 11.6/ 6.2/ 16.1	Total / P/ S/ T
Sudan	1989	Cohen and House, 1994	9.3	Total
	1996	Ali, 2006	47/ 0.7/ 15.0	P/ S/ T
	2009	Barouni and Broecke, 2014	10.0/ 7.0/ 21.0	P/ S/ T
	2009	Rizk, 2016	4.9/ 4.5/ 6.6	T/M/F
Syria	2004	Montenegro and Patrinos, 2014	4.4/ 8.9/ 3.4/ 7.4	Total / P/ S/ T
	2005	Huitfeldt and Kabbani, 2007	-2.0 / 3.5	Male P to T
			1.0 / 8.0	Female P to U
Tunisia	2009	Gebel (2012)	5.6	Total
	1980	Psacharopoulos, 1994	8.0	Total
	2001	Montenegro and Patrinos, 2014	8.5/ 12.3/ 8.1/ 17.4	Total / P/ S/ T
	2001	King, Montenegro and Orazem, 2010	6.5	Total
	2010	Barouni and Broecke, 2014	3.0/ 12.0/ 24.0	P/ S/ T
	2011	Rizk, 2016	7.0/ 7.0/ 7.3	T/ M/ F
UAE	2009	Vazquez-Alvarez (2010).	5.5/ 2.6	Men/Women
oPt	1998	Montenegro and Patrinos, 2014	1.4/ 7.9/ 0.7/ 0.1	Total / P/ S/ T
	1999		1.8/ 6.1/ 1.2/ 0.2	
	2000		1.6/ 5.8/ 0.5/ 0.7	
	2001		0.7/ 1.5/ - / 1.6	
	2002		2.8/ 11.6/ - / 5.1	
	2003		3.0/ 10.5/ 0.4/ 4.2	
	2004		4.3/ 11.0/ 1.0/ 5.6	
	2005		4.0/ 17.0/ 1.1/ 5.0	
	2006		5.0/ 13.4/ 1.7/ 5.8	
	2007		5.0/ 8.4/ 1.6/ 5.9	
	2008		3.8/ 28.7/ 0.2/ 5.5	
	2011	Rizk, 2016	5.1/ 4.4/ 7.3	T/ M/ F
Yemen	2005	King, Montenegro and Orazem, 2010	2.9	Total
		Montenegro and Patrinos, 2014	5.4/ 3.8/ 3.7/ 8.0	Total/ Ts/ Ms/ Fs

Table 1: Continued

Country	Year	Source	Rate	Notes
		MENA Regional averages		
Aggregation varies in composition of countries and latest year available		Psacharopoulos, 1994	17.4/ 15.9/21.7	
		Psacharopoulos and Patrinos, 2004	13.8/ 13.6/18.8	P/ S/ T
		Montenegro and Patrinos, 2014	16.0/ 4.5/ 10.5	

Notes: 1) T/ M/ F refer to total / male / female returns. 2) P/ S/ T refer to primary/ secondary/ tertiary levels of education. 3) Total/ Tt/ Mt/ Ft refer to total/ total tertiary/ male tertiary/ female tertiary returns. 4) Total/ Ts/ Ms/ Fs refer to total/ total secondary/ male secondary/ female secondary returns. 5) King, Montenegro and Orazem (2010) use information on 120 countries. 6) Montenegro and Patrinos (2014) use information on 819 country-year points with the advantage of using the same parsimonious Mincerian specification for all countries at the cost of focusing on employees only. 7) Estimates are based on different specifications (e.g. some adjust for occupations/ sectors, regions and so on) and survey coverage (e.g. some estimates are derived from using total labor earnings and others only wages and salaries of employees).
Source: Authors' compilation based on cited sources

Table 2: Rates of Return to Education by Region, Sex and Education Level

	N	Total	Male	Female	N	Primary	Secondary	Tertiary
	1	2	3	4	5	6	7	8
EAP	31	7.7	6.6	9.1	14	11.0	6.3	15.4
ECA	41	6.4	5.7	7.4	18	8.3	4.0	10.1
LAC	12	9.0	8.1	10.2	21	9.3	6.6	17.6
SAS	8	6.3	5.8	9.0	7	9.6	6.3	18.4
SSA	7	9.5	8.7	11.8	32	13.4	10.8	21.9
MENA	**23**	**5.4**	**4.9**	**7.7**	**9**	**9.4**	**3.5**	**8.9**
World	122	7.0	6.2	8.5	101	10.3	6.9	16.8

N=data points; Source King, Montenegro and Orazem (2010) N=countries; Source Patrinos and Montenegro (2014)

Table 3: The Gallup Database: Observations and Variables

	No. of Observations (working and non-working respondents)	Number of Countries (Arab and non-Arab)	Number of Waves
	1,240,956	164	25
Availability of variables			
No. of children (<15)	1,148,050	164	25
Location (urban/rural)	1,100,520	163	25
No. of household adults	1,092,664	162	25
Age & sex	1233025	164	25
Transfers to households	755,316	159	18
Respondent working	801295	159	18
Education (years)	1142151	164	25
Sector (public/private)	150,809	137	9

Note: for the availability
Source: Constructed by the authors based on Gallup Surveys 2005-2013

Table 4: Number of Observations, Countries and Survey Waves Used in the Analysis

		All countries excl Arab		Arab countries only	
		Men	Women	Men	Women
Potential number of observations		154,412	127,658	31,378	12,580
Actually used (single RORE)	Observations	138,166	115,016	24,108	9,744
	Countries	137		22	
	Waves	12		13	
Actually used (public RORE v. private RORE)	Observations	23,705	20,660	5,669	2,563
	Countries	90		18	
	Waves	4		3	

Source: Constructed by the authors based on Gallup Surveys 2005-2013

Table 5: Selective Effects of Using Population Weighted Averages When There Is Significant Country Differences in Population Size and Value of Variables

	Population weighted average	difference
Global Poverty (population below $1/day)		
Poverty rate	18%	+17%
- excluding China	21%	
Population exiting poverty 1981-2004 (millions)	-501 million	1253%
- excluding China	+4 million	
Female labor force participation rate		
GCC	13.8%	188%
- excluding Saudi Arabia	26.0%	
Real per capita GDP annual rate of growth		
Arab oil importers 2000-10	3.3%	-12%
- excluding Egypt	2.9%	
Arab oil importers 2010-11	0.8%	263%
- excluding Egypt	2.9%	

Source: Ferreira and Ravallion (2008) for poverty; ILO/UNDP (2013) for the participation rate; World Bank (2014) for the GDP growth rate

Table 6: Step 1 Regression of Log (Total Household Income): All 22 Arab Countries, All Respondents, All Waves

All 22 Arab Countries, All Respondents and All Waves													
Step 1: Dependent Variable: log(total household income)													
Explanatory Variables: Household/ country/ wave controls and characteristics of all respondents													
N	155167	104007	104007	101252	101252	101052	101052	100770	100770	96961	96961	13823	13823
Adj R2	0.5479	0.5652	0.5668	0.5688	0.5695	0.6020	0.6026	0.6028	0.6035	0.6002	0.6008	0.6440	0.6445
	1	**2**	**3**	**4**	**5**	**6a**	**6b**	**7a**	**7b**	**8a**	**8b**	**9a**	**9b**
Controls													
hhadults	0.0436	0.0439	0.0439	0.0432	0.0426	0.0438	0.0012	0.0421	0.0427	0.0437	0.0441	0.0518	0.0524
children	***-0.0001***	***0.0007***	***0.0003***	0.0040	0.0043	0.0074	0.0078	0.0075	0.0079	0.0078	0.0082	0.0075	0.0076
expat	-0.2293	-0.2106	-0.2131	-0.2282	-0.2294	-0.2686	-0.2755	-0.2690	-0.2760	-0.2277	-0.2339	-0.4419	-0.4501
domtransfer		-0.2079	-0.2019	-0.1952	-0.1924	-0.1510	-0.1506	-0.1460	-0.1455	-0.1379	-0.1376	***-0.0088***	***-0.0068***
fortransfer		0.1927	0.1903	0.1814	0.1841	0.1771	0.1785	0.1797	0.1811	0.1879	0.1889	0.2251	0.2265
domandfortransfer		0.1956	0.2001	0.2028	0.2052	0.1929	0.1942	0.1973	0.1987	0.2038	0.2050	0.3494	0.3509
rural				-0.3085	-0.3090	-0.2368	-0.2385	-0.2365	-0.2382	-0.2297	-0.2311	-0.2098	-0.2108
village				-0.1946	-0.1951	-0.1505	-0.1510	-0.1510	-0.1515	-0.1468	-0.1472	-0.1674	-0.1679
Individual Characteristics													
female					-0.0629	-0.0192	-0.0199	***-0.0060***	***-0.0066***	0.0355	0.0321	0.0687	0.0657
eduyear						0.0490		0.0485		0.0464		0.0460	
edu9_15							0.3476		0.3433		0.3329		0.3297
edu16plus							0.6792		0.6726		0.6444		0.6233
age						0.0064	0.0051	0.0071	0.0059	0.0024	***0.0016***	0.0061	***0.0055***
age2						-0.000065	-0.000054	-0.000060	-0.000049	***0.0000***	***0.0000***	***0.0000***	***0.0000***
married								-0.0232	-0.0246	-0.0342	-0.0353	-0.0394	-0.0385
separated								***-0.0153***	***-0.0172***	***-0.0358***	***-0.0375***	***-0.1107***	***-0.1134***
divorced								-0.1112	-0.1110	-0.1187	-0.1179	-0.1254	-0.1244
widowed								-0.1870	-0.1896	-0.1976	-0.1997	-0.2090	-0.2117
respworking										0.1308	0.1229		
unemployed										-0.1978	-0.2031	*omitted*	*omitted*
ptvoluntary										***-0.0113***	***-0.0090***	0.1698	0.167701
ptinvoluntary										-0.1383	-0.1354	*omitted*	*omitted*
ftgov												0.1829	0.1808
ftprivate												0.0663	0.0658
ftself												0.1664	0.1664
Controls													
country + day of the week	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
waves			yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Number of Countries	22	22	22	22	22	22	22	22	22	22	22	18	18
Number of Waves			13	13	13	13	13	13	13	13	13	3	3

Notes: a. All coefficients significant at 5% level except those in italics and bold. b. The missing waves in columns 3, 4, 5, 6a, 6b, 7a, 7b, 8a and 8b are 1, 2, 3, 3.1, 3.2, 3.3 3.4, 4, 4.1, 4.3, 5.1, and 6. c. Columns 9a and 9b are based on the 4.2, 5 and 5.2 waves. b. The missing countries in columns 9a and 9b are Bahrain, Morocco, Oman and Qatar. d. The reference group for expat is national, for rural and village is city and suburb, for marital status is single and partners, for the transfers is notransfer, for edu9_15 and edu16plus is edu0_8, and for the employment group is nonactive.

Table 7a: Step 2 Regression of Log (Adjust Household Income) Arab Countries, National Men of Working Age, Various Specifications (See Appendix Table A2a)

N	31378	31179	30347	29674	29603	24108	24108
Adj R2	0.6012	0.6389	0.6372	0.6346	0.6354	0.6239	0.6256
edualgeria	0.0476	0.0477	0.0467	0.0466	0.0457	0.0449	0.0442
edubahrain	0.0689	0.0689	0.0761	0.0767	0.0766	0.0785	0.0778
educomoros	0.0503	0.0503	0.0480	0.0470	0.0469	0.0466	0.0471
edudjibouti	0.0968	0.0967	0.0935	0.0923	0.0927	0.0928	0.0910
eduegypt	0.0527	0.0528	0.0508	0.0518	0.0518	0.0506	0.0499
eduiraq	0.0237	0.0238	0.0219	0.0233	0.0238	0.0270	0.0263
edujordan	0.0613	0.0614	0.0611	0.0623	0.0626	0.0573	0.0571
edukuwait	0.0299	0.0296	0.0298	0.0291	0.0299	0.0254	0.0247
edulebanon	0.0698	0.0698	0.0680	0.0679	0.0666	0.0706	0.0700
edulibya	0.0400	0.0400	0.0388	0.0386	0.0390	0.0530	0.0544
edumauritania	0.0557	0.0557	0.0533	0.0539	0.0539	0.0523	0.0515
edumorocco	0.1075	0.1073	0.1031	0.1043	0.1036	0.0979	0.0973
eduoman	0.0940	0.0945	0.0900	0.0893	0.0888	0.0896	0.0877
edupalestine	0.0454	0.0454	0.0451	0.0460	0.0461	0.0441	0.0430
eduqatar	0.0345	0.0352	0.0342	0.0499	0.0506	0.0492	0.0463
edusaudiarabia	0.0220	0.0203	0.0212	0.0246	0.0249	0.0222	0.0214
edusomalia	0.0790	0.0792	0.0730	0.0717	0.0719	0.0659	0.0653
edusudan	0.0651	0.0648	0.0633	0.0629	0.0629	0.0614	0.0601
edusyria	***0.0004***	***0.0007***	***0.0008***	***0.0005***	***-0.0007***	***0.0079***	***0.0078***
edutunisia	0.0515	0.0514	0.0498	0.0507	0.0504	0.0493	0.0493
eduuae	0.0224	0.0223	0.0223	0.0237	0.0238	0.0321	0.0320
eduyemen	0.0523	0.0524	0.0500	0.0509	0.0516	0.0519	0.0504

Note: All coefficients significant at 5% level except those in italics and bold

Table 7b: Step 2 Regression of Log (Adjust Household Income) Arab Countries, National Men of Working Age, Various Specifications

N	12580	12518	12239	12121	12088	9744	9744
Adj R2	0.6628	0.6621	0.6600	0.6604	0.6627	0.6547	0.6560
edualgeria	0.0597	0.0595	0.0592	0.0594	0.0586	0.0552	0.0544
edubahrain	0.0675	0.0668	0.0764	0.0767	0.0746	0.0698	0.0672
educomoros	0.0695	0.0703	0.0654	0.0645	0.0630	0.0655	0.0653
edudjibouti	0.1130	0.1131	0.1078	0.1108	0.1106	0.1092	0.1086
eduegypt	0.0762	0.0763	0.0725	0.0716	0.0699	0.0684	0.0663
eduiraq	0.0263	0.0267	0.0242	0.0257	0.0250	0.0318	0.0313
edujordan	0.0724	0.0724	0.0717	0.0739	0.0713	0.0711	0.0704
edukuwait	0.0402	0.0410	0.0397	0.0379	0.0386	***0.0311***	***0.0309***
edulebanon	0.0701	0.0701	0.0690	0.0698	0.0691	0.0722	0.0715
edulibya	0.0667	0.0668	0.0662	0.0658	0.0653	0.0648	0.0654
edumauritania	0.0615	0.0616	0.0602	0.0600	0.0588	0.0505	0.0488
edumorocco	0.1233	0.1235	0.1214	0.1219	0.1199	0.1260	0.1253
eduoman	0.0643	0.0638	0.0634	0.0626	0.0624	0.0493	0.0453
edupalestine	0.0705	0.0704	0.0696	0.0722	0.0698	0.0691	0.0671
eduqatar	0.0558	0.0574	0.0569	0.0568	0.0553	0.0550	0.0548
edusaudiarabia	0.0297	0.0310	0.0294	***0.0252***	***0.0238***	***0.0150***	***0.0142***
edusomalia	0.0765	0.0767	0.0700	0.0681	0.0669	0.0594	0.0590
edusudan	0.0780	0.0789	0.0778	0.0777	0.0763	0.0735	0.0723
edusyria	***0.0021***	***0.0015***	***0.0015***	***0.0020***	***0.0009***	***0.0049***	***0.0049***
edutunisia	0.0562	0.0563	0.0543	0.0547	0.0532	0.0530	0.0526
eduuae	0.0450	0.0444	0.0446	0.0451	0.0442	0.0488	0.0486
eduyemen	0.0657	0.0671	0.0584	0.0582	0.0575	0.0606	0.0595

Note: All coefficients significant at 5% level except those in italics and bold. The results are based on specifications that range from parsimonious ones (first column) to ones with additional variables.
Source: Appendix Tables A2a and A2b.

Table 8: Rates of Return Ranking by Country and Arab Sub-Region

Country Rankings				Subregional Rankings			
Men		Women		Men		Women	
Syria	***1%***	Syria	***0%***	Saudi	2%	Saudi	1%
Saudi	2%	**Saudi**	***1%***	Kuwait	2%	Kuwait	*3%*
Kuwait	2%	**Kuwait**	***3%***	UAE	3%	Oman	5%
Iraq	3%	Iraq	3%	Qatar	5%	UAE	5%
UAE	3%	**Oman**	5%	Bahrain	8%	Qatar	*5%*
Palestine	4%	**UAE**	5%	Oman	9%	Bahrain	7%
Algerai	4%	Mauritania	5%	**GCC**	**4.8%**	**GCC**	**4.4%**
Qatar	5%	Tunisia	5%				
Comoros	5%	Algeria	5%	Syria	***1%***	Syria	***0%***
Tunisia	5%	**Qatar**	5%	Iraq	3%	Iraq	3%
Egypt	5%	Somalia	6%	Palestine	4%	Yemen	6%
Yemen	5%	Yemen	6%	Yemen	5%	Palestine	7%
Mauritania	5%	Comoros	7%	Jordan	6%	Jordan	7%
Libya	5%	Libya	7%	Lebanon	7%	Lebanon	7%
Jordan	6%	Egypt	7%	**Middle East**	**4.2%**	**Middle East**	**5.1%**
Sudan	6%	Palestine	7%				
Somalia	7%	**Bahrain**	7%	Algerai	4%	Tunisia	5%
Lebanon	7%	Jordan	7%	Tunisia	5%	Algeria	5%
Bahrain	8%	Lebanon	7%	Egypt	5%	Libya	7%
Oman	9%	Sudan	7%	Libya	5%	Egypt	7%
Djibouti	9%	Djibouti	11%	Morocco	10%	Morocco	13%
Morocco	10%	Morocco	13%	**North Africa**	**5.9%**	**North Africa**	**7.3%**
Average	**5.2%**	**Average**	**5.8%**				
				Comoros	5%	Mauritania	5%
				Mauritania	5%	Somalia	6%
				Sudan	6%	Comoros	7%
				Somalia	7%	Sudan	7%
				Djibouti	9%	Djibouti	11%
				OTH	**6.3%**	**OTH**	**7.1%**

Source: Appendix Table A2 last column.

Table 9: Public Sector Employment Impact on Income

Men		Women	
govworker_algeria	-36.2%	govworker_comoros	-18.5%
govworker_morocco	-26.5%	govworker_algeria	-18.2%
govworker_syria	-13.5%	govworker_yemen	-11.3%
govworker_jordan	-13.2%	govworker_libya	-2.8%
govworker_libya	-6.9%	govworker_jordan	-1.7%
govworker_lebanon	-4.9%	govworker_somalia	-1.0%
govworker_kuwait	-3.1%	govworker_saudi	2.4%
govworker_comoros	-0.8%	govworker_sudan	2.5%
govworker_sudan	0.2%	govworker_tunisia	4.8%
govworker_egypt	0.4%	govworker_uae	7.4%
govworker_iraq	0.6%	govworker_kuwait	8.3%
govworker_somalia	3.3%	govworker_palestine	10.6%
govworker_bahrain	7.0%	govworker_lebanon	11.6%
govworker_mauritania	8.3%	govworker_syria	13.9%
govworker_uae	8.5%	govworker_mauritania	14.6%
govworker_tunisia	11.2%	govworker_iraq	14.7%
govworker_palestine	13.8%	govworker_bahrain	15.1%
govworker_saudi	14.8%	govworker_morocco	15.3%
govworker_yemen	23.9%	govworker_egypt	16.9%
govworker_djibouti	24.1%	govworker_djibouti	46.0%
govworker_oman	n.a	govworker_oman	n.a.
govworker_qatar	n.a	govworker_qatar	n.a.
Country Average	**0.6%**	**Country Average**	**6.5%**

Source Appendix Table A3

Table 10: Impact of an Additional Year of Education on Incomes by Sector of Employment (Compared To Non-Workers)

Sector	Non-Arab countries		Arab countries	
	Men	Women	Men	Women
Public sector	0.357	0.259	0.146	0.111
Private - employee	0.234	0.214	0.094	(0.078)
Private - self employed	0.160	0.080	0.187	0.074
n	23,705	20,660	5,669	2,563
number of countries	90		18	

Note: Statistically insignificant estimates in parenthesis
Source: Authors' estimates based on Gallup Surveys

Table 11: Regional Comparison of RORE as Reported by Montenegro and Patrinos and Estimated Using Gallup Data for the Same Countries

		Male		Female	
Region	**N**	**Gallup**	**MnP**	**Gallup**	**MnP**
EAP	8	6.8	8.9	7.1	10.7
ECA	18	4.8	7.0	5.1	9.2
LAC	19	6.4	8.8	6.8	10.5
SAS	6	4.9	7.0	6.4	10.2
SSA	29	7.2	11.2	7.3	14.8
MENA	9	5.5	6.5	6.6	11.1
Average	89	5.9	8.2	6.5	11.1

Source: Gallup: Authors' estimates; MnP as reported in Montenegro and Patrinos (2014)

Table 12: Average Rates of Rates of Return to Education over Time

	Returns to Schooling	Average Years of Schooling	Number of Surveys
1980-1985	13.3	6.6	12
1986-1990	12.7	8.1	23
1991-1995	11.0	8.0	58
1996-2000	10.1	8.8	109
2001-2005	9.9	10.1	228
2006-2010	9.6	10.9	238

Source: Montenegro and Patrinos (2014)

Table 13: Percentage of Executives Reporting Inadequately Educated Workforce

OECD		**Arab**	
Switzerland	14.1	Oman	21.8
Austria	13.9	Saudi Arabia	16.9
Germany	12.6	UAE	16.4
Turkey	11.9	Qatar	15.1
Canada	9.9	Bahrain	8.8
UK	7.9	Kuwait	7.1
Sweden	7.4	**GCC average**	**14.4**
USA	6.8		
Norway	6.7	Libya	9.7
Average	**6.2**	Yemen	8.1
China	5.2	Algeria	8.1
Australia	5.1	**Other oil-producers**	**8.6**
Denmark	3.4		
Spain	3.4	Morocco	11.6
France	3.1	Jordan	8.5
Portugal	2.8	Egypt	5.3
Finland	2.4	Tunisia*	5.1
Greece	0.8	Lebanon	2.6
Japan	0.6	**Non-oil**	**6.6**
Japan	0.6		
Italy	0.4	**All Arab States**	**10.4**

Notes: * indicates data for 2010-2011
Source: World Economic Forum's Global Competitive Index Report (2012-2013)

Appendix Tables

Appendix Table A1a: Step 1 Regression of Log (Total Household Income) 142 Non-Arab Countries, All Respondents, All Waves

N	631887	502635	502635	493325	493325	489338	489338	485566	485566	470109	470109	48881	48881
Adj R2	0.5652	0.5564	0.5577	0.5814	0.5830	0.6238	0.6246	0.6282	0.6290	0.6366	0.6370	0.7335	0.7338
	1	**2**	**3**	**4**	**5**	**6a**	**6b**	**7a**	**7b**	**8a**	**8b**	**9a**	**9b**
Controls													
hhadults	0.0911	0.0929	0.0939	0.0955	0.0941	0.0872	0.0879	0.0816	0.0822	0.0839	0.0844	0.0794	0.0799
children	-0.0082	-0.0088	-0.0085	-0.0021	***-0.0012***	***-0.0012***	-0.0017	-0.0048	-0.0052	-0.0046	-0.0049	-0.0083	-0.0088
expat	***-0.0052***	-0.0278	-0.0288	-0.0717	-0.0698	-0.0670	-0.0717	-0.0692	-0.0736	-0.0668	-0.0705	-0.0513	-0.0552
domtransfer		-0.0718	-0.0801	-0.0795	-0.0764	-0.0755	-0.0755	-0.0670	-0.0670	-0.0603	-0.0604	***-0.0085***	***-0.0085***
fortransfer		0.2663	0.2668	0.2467	0.2493	0.2212	0.2228	0.2261	0.2276	0.2300	0.2311	0.2765	0.2792
domandfortransfer		0.2985	0.2986	0.2676	0.2711	0.2312	0.2324	0.2386	0.2398	0.2424	0.2433	0.3810	0.3829
rural				-0.4995	-0.5020	-0.3715	-0.3708	-0.3812	-0.3804	-0.3789	-0.3782	-0.3632	-0.3624
village				-0.2875	-0.2885	-0.2082	-0.2059	-0.2131	-0.2108	-0.2094	-0.2074	-0.1984	-0.1967
Individual Characteristics													
female					-0.1054	-0.0762	-0.0780	-0.0633	-0.0649	-0.0286	-0.0310	-0.0482	-0.0494
eduyear						0.0590		0.0588		0.0569		0.0572	
edu9_15							0.4064		0.4064		0.4015		0.4123
edu916plus							0.8135		0.8094		0.7767		0.7540
age						0.0164	0.0156	0.0083	0.0077	0.0020	0.0017	0.0092	0.0093
age2						-0.000210	-0.000205	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
married								0.1494	0.1479	0.1365	0.1354	0.1166	***0.1157***
separated								-0.0734	-0.0732	-0.0830	-0.0825	***-0.0598***	-0.0597
divorced								-0.1651	-0.1637	-0.1762	-0.1746	-0.1834	-0.1830
widowed								-0.0886	-0.0904	-0.0971	-0.0984	-0.1438	-0.1455
respworking										0.1779	0.1727		
unemployed										-0.2073	-0.2065	*omitted*	*omitted*
ptvoluntary										-0.1217	-0.1208	***-0.1583***	***-0.1795***
ptinvoluntary										-0.2272	-0.2253	***-0.2721***	***-0.2929***
ftgov												***0.0573***	***0.0329***
ftprivate												***-0.0171***	***-0.0366***
ftself												***-0.1393***	***-0.1602***
Controls													
country + day of the week	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
waves			yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Number of Countries	139	137	137	137	137	137	137	137	137	137	137	90	90
Number of Waves			14	14	14	14	14	14	14	12	12	4	4

Notes: a. All coefficients significant at 5% level except those in italics and bold. b. The missing waves in columns 3, 4 and 5 are 1, 2, 3, 3.1, 3.2, 3.3 3.4, 4.1, 4.3, 6.1 and 6.4. c. The missing countries in column 1 are Cuba, Namibia and Puerto Rico. The additional missing countries in columns 2, 3, 4, 5, 6a, 6b, 7a, 7b, 8a and 8b are Belize and Guyana. d. The reference group for expat is national, for rural and village is city and suburb, for marital status is single and partners, for the transfers is notransfer, for edu9_15 and edu16plus is edu0_8, and for the employment group is nonactive.

Appendix Table A1b: Step 1 Regression of Log (Total Household Income) Global Arab and Non-Arab Countries (164), All Respondents, All Waves

N	787054	606642	606642	594577	594577	590390	590390	586336	586336	567070	567070	62704	62704
Adj R2	0.5615	0.5568	0.5581	0.5782	0.5695	0.6192	0.6200	0.6229	0.6237	0.6298	0.6303	0.7151	0.7154
	1	**2**	**3**	**4**	**5**	**6a**	**6b**	**7a**	**7b**	**8a**	**8b**	**9a**	**9b**
Controls													
hhadults	0.0777	0.0806	0.0814	0.0824	0.0813	0.0768	0.0775	0.0737	0.0743	0.0757	0.0762	0.0735	0.0740
children	-0.0048	-0.0056	-0.0054	***0.0005***	0.0013	0.0014	***0.0011***	-0.0021	-0.0024	-0.0019	-0.0021	***-0.0019***	***-0.0022***
expat	-0.0714	-0.0762	-0.0776	-0.1111	-0.1104	-0.1226	-0.1286	-0.1257	-0.1314	-0.1111	-0.1159	-0.1866	-0.1923
domtransfer		-0.0923	-0.0985	-0.0967	-0.0937	-0.0851	-0.0852	-0.0768	-0.0769	-0.0698	-0.0699	***-0.0077***	***-0.0075***
fortransfer		0.2534	0.2533	0.2347	0.2375	0.2146	0.2161	0.2197	0.2211	0.2244	0.2254	0.2637	0.2661
domandfortransfer		0.2756	0.2772	0.2548	0.2581	0.2252	0.2264	0.2330	0.2343	0.2374	0.2384	0.3729	0.3746
rural				-0.4722	-0.4743	-0.3546	-0.3543	-0.3627	-0.3622	-0.3596	-0.3591	-0.3448	-0.3442
village				-0.2716	-0.2725	-0.1991	-0.1973	-0.2030	-0.2012	-0.1990	-0.1974	-0.1920	-0.1905
Individual Characteristics													
female					-0.0983	-0.0666	-0.0682	-0.0537	-0.0552	-0.0181	-0.0206	-0.0267	***-0.0283***
eduyear						0.0569		0.0567		0.0548		0.0536	
edu9_15							0.3934		0.3932		0.3872		0.3836
edu16plus							0.7871		0.7827		0.7512		0.7130
age						0.0160	0.0151	0.0087	0.0078	0.0028	0.0023	0.0095	0.0094
age2						-0.000203	-0.000197	-0.000125	-0.000119	-0.000057	-0.0001	-0.0001	-0.0001
married								0.1254	0.1238	0.1134	0.1121	0.0867	***0.0860***
separated								-0.0857	-0.0855	-0.0954	-0.0949	-0.0770	***-0.0768***
divorced								-0.1632	-0.1621	-0.1733	-0.1720	-0.1836	-0.1830
widowed								-0.1083	-0.1104	-0.1167	-0.1183	-0.1690	-0.1709
respworking										0.1672	0.1614		
unemployed										-0.2086	-0.2092	*omitted*	*omitted*
ptvoluntary										-0.1088	-0.1076	***-0.0897***	***-0.1129***
ptinvoluntary										-0.2164	-0.2143	***-0.2093***	***-0.2317***
ftgov												***0.0895***	***0.0639***
ftprivate												***0.0075***	***-0.0140***
ftself												***-0.0654***	***-0.0880***
Controls													
country + day of the week	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
waves			yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Number of Countries	161	159	159	159	159	159	159	159	159	159	159	108	108
Number of Waves			17	17	17	17	17	17	17	15	15	5	5

Notes: a. All coefficients significant at 5% level except those in italics and bold. b. The missing waves in columns 3, 4, 5, 6a, 6b, 7a and 7b are 1, 2, 3, 3.1, 3.2, 3.3 3.4 and 4.3. c. The missing waves in columns 8a and 8b are 1, 2, 3, 3.1, 3.2, 3.3 3.4, 4.1, 4.3 and 6.4. d. The missing countries in column 1 are Cuba, Namibia and Puerto Rico. The additional missing countries in columns 2, 3, 4, 5, 6a, 6b, 7a, 7b, 8a and 8b are Belize and Guyana. e. The reference group for expat is national, for rural and village is city and suburb, for marital status is single and partners, for the transfers is notransfer, for edu9_15 and edu16plus is edu0_8, and for the employment group is nonactive.

Appendix Table A2a: Step 2 Regression of Log (Adjusted Household Income) Arab Countries, National Men of Working Age

N	31378	31179	30347	29674	29603	24108	24108
Adj R2	0.6012	0.6389	0.6372	0.6346	0.6354	0.6239	0.6256
Number of Countries	22	22	22	22	22	22	22
Number of Waves	14	14	14	14	14	13	13
Controls							
hhadults				0.0387	0.0351	0.0371	0.0374
children		***0.0005***	***0.0036***	***0.0007***	***0.0034***	***0.0019***	***0.0019***
domtransfer						-0.0772	-0.0703
fortransfer						0.1856	0.1917
domandfortransfer						0.1634	0.1656
rural			-0.1764	-0.1829	-0.1796	-0.1886	-0.1852
village			-0.1244	-0.1309	-0.1291	-0.1318	-0.1304
Individual Characteristics							
married					-0.0774	-0.0639	-0.0667
separated					***0.0349***	***0.0422***	***0.0383***
divorced					***-0.0277***	***0.0072***	***0.0103***
widowed					***-0.0152***	***-0.0457***	***-0.0520***
ptvoluntary							-0.0509
ptinvoluntary							-0.1397
age	0.0039	0.0039	0.0038	0.0040	0.0056	0.0052	0.0050
edualgeria	0.0476	0.0477	0.0467	0.0466	0.0457	0.0449	0.0442
edubahrain	0.0689	0.0689	0.0761	0.0767	0.0766	0.0785	0.0778
educomoros	0.0503	0.0503	0.0480	0.0470	0.0469	0.0466	0.0471
edudjibouti	0.0968	0.0967	0.0935	0.0923	0.0927	0.0928	0.0910
eduegypt	0.0527	0.0528	0.0508	0.0518	0.0518	0.0506	0.0499
eduiraq	0.0237	0.0238	0.0219	0.0233	0.0238	0.0270	0.0263
edujordan	0.0613	0.0614	0.0611	0.0623	0.0626	0.0573	0.0571
edukuwait	0.0299	0.0296	0.0298	0.0291	0.0299	0.0254	0.0247
edulebanon	0.0698	0.0698	0.0680	0.0679	0.0666	0.0706	0.0700
edulibya	0.0400	0.0400	0.0388	0.0386	0.0390	0.0530	0.0544
edumauritania	0.0557	0.0557	0.0533	0.0539	0.0539	0.0523	0.0515
edumorocco	0.1075	0.1073	0.1031	0.1043	0.1036	0.0979	0.0973
eduoman	0.0940	0.0945	0.0900	0.0893	0.0888	0.0896	0.0877
edupalestine	0.0454	0.0454	0.0451	0.0460	0.0461	0.0441	0.0430
eduqatar	0.0345	0.0352	0.0342	0.0499	0.0506	0.0492	0.0463
edusaudiarabia	0.0220	0.0203	0.0212	0.0246	0.0249	0.0222	0.0214
edusomalia	0.0790	0.0792	0.0730	0.0717	0.0719	0.0659	0.0653
edusudan	0.0651	0.0648	0.0633	0.0629	0.0629	0.0614	0.0601
edusyria	***0.0004***	***0.0007***	***0.0008***	***0.0005***	***-0.0007***	***0.0079***	***0.0078***
edutunisia	0.0515	0.0514	0.0498	0.0507	0.0504	0.0493	0.0493
eduuae	0.0224	0.0223	0.0223	0.0237	0.0238	0.0321	0.0320
eduyemen	0.0523	0.0524	0.0500	0.0509	0.0516	0.0519	0.0504

Note: All coefficients significant at 5% level except those in italics and bold

Appendix Table A2b: Step 2 Regression of Log (Adjusted Household Income) Arab Countries, National Men of Working Age

N	12580	12518	12239	12121	12088	9744	9744
Adj R2	0.6628	0.6621	0.6600	0.6604	0.6627	0.6547	0.6560
Number of Countries	22	22	22	22	22	22	22
Number of Waves	14	14	14	14	14	13	13
Controls							
hhadults				0.0372	0.0375	0.0392	0.0396
children		0.0095	0.0116	0.0108	0.0076	***0.0069***	***0.0078***
domtransfer						***-0.0328***	***-0.0280***
fortransfer						0.1995	0.2049
domandfortransfer						0.2263	0.2352
rural			-0.1944	-0.1947	-0.1966	-0.1938	-0.1957
village			-0.1545	-0.1554	-0.1559	-0.1588	-0.1574
Individual Characteristics							
married					***0.0279***	0.0375	0.0382
separated					-0.1538	-0.1624	-0.1520
divorced					-0.1671	-0.1536	-0.1540
widowed					-0.1682	-0.1519	-0.1509
ptvoluntary							-0.0466
ptinvoluntary							-0.1332
age	0.0032	0.0033	0.0033	0.0037	0.0044	0.0037	0.0036
edualgeria	0.0597	0.0595	0.0592	0.0594	0.0586	0.0552	0.0544
edubahrain	0.0675	0.0668	0.0764	0.0767	0.0746	0.0698	0.0672
educomoros	0.0695	0.0703	0.0654	0.0645	0.0630	0.0655	0.0653
edudjibouti	0.1130	0.1131	0.1078	0.1108	0.1106	0.1092	0.1086
eduegypt	0.0762	0.0763	0.0725	0.0716	0.0699	0.0684	0.0663
eduiraq	0.0263	0.0267	0.0242	0.0257	0.0250	0.0318	0.0313
edujordan	0.0724	0.0724	0.0717	0.0739	0.0713	0.0711	0.0704
edukuwait	0.0402	0.0410	0.0397	0.0379	0.0386	***0.0311***	***0.0309***
edulebanon	0.0701	0.0701	0.0690	0.0698	0.0691	0.0722	0.0715
edulibya	0.0667	0.0668	0.0662	0.0658	0.0653	0.0648	0.0654
edumauritania	0.0615	0.0616	0.0602	0.0600	0.0588	0.0505	0.0488
edumorocco	0.1233	0.1235	0.1214	0.1219	0.1199	0.1260	0.1253
eduoman	0.0643	0.0638	0.0634	0.0626	0.0624	0.0493	0.0453
edupalestine	0.0705	0.0704	0.0696	0.0722	0.0698	0.0691	0.0671
eduqatar	0.0558	0.0574	0.0569	0.0568	0.0553	0.0550	0.0548
edusaudiarabia	0.0297	0.0310	0.0294	***0.0252***	***0.0238***	***0.0150***	***0.0142***
edusomalia	0.0765	0.0767	0.0700	0.0681	0.0669	0.0594	0.0590
edusudan	0.0780	0.0789	0.0778	0.0777	0.0763	0.0735	0.0723
edusyria	***0.0021***	***0.0015***	***0.0015***	***0.0020***	***0.0009***	***0.0049***	***0.0049***
edutunisia	0.0562	0.0563	0.0543	0.0547	0.0532	0.0530	0.0526
eduuae	0.0450	0.0444	0.0446	0.0451	0.0442	0.0488	0.0486
eduyemen	0.0657	0.0671	0.0584	0.0582	0.0575	0.0606	0.0595

Note: All coefficients significant at 5% level except those in italics and bold

Appendix Table A3: Step 3: Estimates of the Public Sector Effects, Arab Countries (Nationals only, less than 65 Years Old)

N	17220	6052	6052	10261	7559	2813	2813	4589	10818	10818	4785	4785
Adj R2	0.6491	0.6327	0.6357	0.6381	0.6864	0.6898	0.6922	0.6865	0.6559	0.6571	0.7014	0.7029
	Men				**Women**				**Men**		**Women**	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Controls												
otherHHadult	0.0434	0.0474	0.0488	0.0469	0.0434	0.0524	0.0519	0.0464	0.0502	0.0505	0.0476	0.0474
children	***0.0025***	***-0.0031***	***-0.0035***	***0.0046***	0.0108	***0.0094***	***0.0091***	0.0185	***0.0037***	***0.0034***	0.0176	0.0182
domtransfer	-0.0565	***0.0543***	***0.0553***		***-0.0347***	***0.0029***	***0.0034***					
fortransfer	0.1887	0.2495	0.2489		0.1761	0.2456	0.2475					
domandfortransfer	0.1757	0.3275	0.3302		0.2141	0.3362	0.3317					
rural	-0.1573	-0.1683	-0.1690	-0.1581	-0.1471	-0.1349	-0.1240	-0.1472	-0.1583	-0.1569	-0.1475	-0.1471
village	-0.1091	-0.1331	-0.1326	-0.1164	-0.1561	-0.1964	-0.1967	-0.1953	-0.1143	-0.1154	-0.1970	-0.1951
Individual Characteristics												
age	0.0043	0.0034	0.0033	0.0039	0.0033	0.0023	***0.0023***	0.0036	0.0040	0.0040	0.0036	0.0035
eduyears	0.0491	0.0459	0.0448	0.0453	0.0520	0.0468	0.0473	0.0505	0.0463	0.0460	0.0513	0.0506
part_time		-0.1004	-0.0934	-0.1058		-0.0783	-0.0849	-0.1091		-0.0991		-0.1049
govworker		***0.0096***				0.0771						
govworker_algeria			-0.2928	-0.3640			***-0.1402***	-0.1832	-0.3474	-0.3617	-0.1815	-0.1817
govworker_bahrain									***0.0799***	***0.0699***	0.1534	0.1509
govworker_comoros			***-0.1161***	***-0.0014***			***-0.0937***	-0.1851	***-0.0012***	***-0.0080***	-0.1744	-0.1854
govworker_djibouti			0.2357	0.2390			0.4688	0.4607	0.2595	0.2405	0.4611	0.4605
govworker_egypt			***-0.0463***	***0.0051***			***0.2161***	***0.1684***	***0.0082***	***0.0039***	0.1851	***0.1687***
govworker_iraq			***0.0091***	***0.0057***			***0.1093***	***0.1457***	***0.0130***	***0.0063***	***0.1577***	***0.1467***
govworker_jordan			***-0.1149***	-0.1336			***-0.1141***	***-0.0166***	-0.1271	-0.1320	***-0.0008***	***-0.0165***
govworker_kuwait			***-0.0465***	***-0.0316***			***0.0605***	***0.0840***	***-0.0230***	***-0.0308***	***0.1022***	***0.0834***
govworker_lebanon			***-0.0112***	***-0.0488***			***0.2878***	***0.1171***	***-0.0456***	***-0.0492***	***0.0883***	***0.1164***
govworker_libya			-0.3733	***-0.0694***			***-0.1408***	***-0.0265***	***-0.0694***	***-0.0686***	***-0.0363***	***-0.0275***
govworker_mauritania			***0.0664***	0.0854			***0.1225***	0.1459	0.0891	0.0835	0.1544	0.1462
govworker_morocco				-0.2620				***0.1531***	-0.2662	-0.2650	***0.1545***	***0.1532***
govworker_oman												
govworker_palestine			***0.1332***	0.1379			***0.0197***	***0.1051***	0.1405	0.1379	***0.1172***	***0.1059***
govworker_qatar												
govworker_saudi			***0.0309***	0.1488			***0.1288***	***0.0248***	0.1474	0.1481	***0.0219***	***0.0239***
govworker_somalia			***0.0045***	***0.0341***			***-0.0237***	***-0.0105***	***0.0537***	***0.0329***	***0.0081***	***-0.0102***
govworker_sudan			***-0.0018***	***0.0030***			***-0.0683***	***0.0244***	***0.0146***	***0.0021***	***0.0538***	***0.0255***
govworker_syria			***-0.0684***	-0.1353			***0.1087***	***0.1391***	***-0.1270***	-0.1348	***0.1349***	***0.1394***
govworker_tunisia			***0.1212***	***0.1140***			***0.0517***	***0.0488***	***0.0965***	***0.1124***	***0.0161***	***0.0477***
govworker_uae			***-0.0968***	***0.0840***			***0.0730***	***0.0756***	***0.0909***	***0.0848***	***0.0673***	***0.0739***
govworker_yemen			0.3216	0.2377			***-0.0026***	***-0.1137***	0.2508	0.2389	***-0.0858***	***-0.1128***
Average Govworker			-0.0136	0.0026			0.0591	0.0609	0.0119	0.0056	0.0699	0.0654
Number of Countries	22	18	18	19	22	18	18	19	20	20	20	20
Number of Waves	5	2	2	3	5	2	2	3	3	3	3	3

Notes: (1) Columns 9 to 12 include Bahrain for which information was issing for other variables included in columns 1 to 8. (2) All Coefficients are significant at the 10% level except those in italics and bold

Annex: The Gallup World Poll Survey

Gallup Worldwide Research continually surveys residents in more than 150 countries, representing more than 98% of the world's adult population, using randomly selected, nationally representative samples. Gallup typically surveys 1,000 individuals in each country, using a standard set of core questions that has been translated into the major languages of the respective country. In some regions, supplemental questions are asked in addition to the core questions.

Major core questions are those on income, education and employment. In addition to personal characteristics questions, other core questions include, but are not limited to, questions on law and order, food and shelter, institutions and infrastructure (community and national institutions, youth development, and corruption), good jobs, wellbeing (career, financial, physical, experiential and social wellbeing, civic engagement, life evaluation, and experience), and community attachment (diversity, optimism, and religiosity.)

In the Arab region, up until the spring 2012 wave (wave 7.1), interviews were conducted face-to-face and took approximately one hour to be completed. In most of the Arab countries, two waves were conducted each year with the fieldwork of each generally completed in two to four weeks.

All of the 22 Arab countries are covered in the Gallup World Poll Surveys between the years 2005 and 2012. However, not all of them are covered in all the twenty-five waves (or all the years). The 22 Arab countries are typically included in seven or more waves except for Oman (two waves), Djibouti (five waves), Libya (four waves) and Qatar (six waves).

In the Arab region, respondents are not necessarily nationals. However, any non-nationals interviewed are of Arab nationalities. Therefore, there is no representation of non-Arab expatriates.

The number of survey questions can vary between countries and also between waves for the same country. All in all, the data includes responses from 1,240,956 individuals in all twenty-five waves and all the 164 countries. The countries included and the response rate to individual questions can vary depending on the number of waves the country is part of the survey, as well as answers like "do not know", "refuse" or simply omissions or wrong categorizations. For example, information on the respondent's age and gender is practically complete (99.36%) while some variables of interest in the context of the current paper are largely missing. For example, information on whether the respondent is working and, if so, working for the government is available only in 150,809 cases

Explanation of Variables:

1. **Income: Continuous Variable:** The Survey includes information on total annual household income before taxes as reported by the respondent (who can be of any age more than or equal to 15 years and may or may not be working). Income includes wages and salaries, remittances from family members living elsewhere and all other sources. It is converted to international dollars at 2009 purchasing power parity[36]. Respondents report either the level of household income or the income brackets which the income falls in. The latter is then converted to a corresponding level using the midpoint of each bracket.

[36] The conversion uses the Individual Consumption Expenditure by Household PPP ration from table 1 of the World Bank Global Purchasing Power Parities and Real Expenditures 2005 International Comparison Program (ICP-iceh) report. The ICP-iceh 2005 PPP values are adjusted for inflation relative to the United States for years 2006, 2007, and 2008 to arrive at the 2009 PPP. Household income values in local currency are divided by the ICP-iceh PPP ratio to obtain ID. For those countries not covered by the World Bank ICP, GDP-based PPPs from the CIA World Factbook are used.

2. **Employment Status: Categorical Variable:** Respondents are asked whether they work and, if so, in which category of employment. The categories are as follows:
   (1) *employed full time for an employer* if the respondent is employed by an employer and works for his or her employer for at least 30 hours per week;
   (2) *employed full time for self* if the respondent is self-employed and works for at least 30 hours per week;
   (3) *employed part time, do not want full time* if the respondent works either for an employer of for self but does not want to work more than 30 hours per week;
   (4) *employed part time, want to work full time* if the respondent works either for an employer of for self for no more than 30 hours per week but wants to work for longer hours per week;
   (5) *unemployed* if the respondent was not employed for the past seven days but has been actively looking for a job in the last four weeks and is able to begin work; and
   (6) *out of the workforce* if the respondent does not belong to any of the above categories (this implies s/he may be unwilling to work, full-time student, retired, disabled, homemaker and so on).

3. **Work for the Government:** In addition to employment status, the respondent indicated whether s/he works for the government.

4. **Education Level:** The education level of the respondent is reported in the following categories:
   (1) *no formal education to 8 years of education;*
   (2) *9 to 15 years of education;*
   (3) *completed 4 or more years tertiary (bachelor's degree or higher) education (16 years of education or more).*

   On the basis of this categorization, education was recoded as one variable whose values were derived by assuming that the average number of years in the respective categories were 4, 12, and 17.

5. **Adult Residents in Household:** Number of adults (age 15+) in the household.

6. **Children:** Number of children (below age 15) in the household.

7. **Gender:** Whether the respondent is male or female.

8. **Urban/Rural:** Whether the respondent lives in a rural or an urban area.

9. **Transfers:** Whether the household receives money or goods from:
   (1) from someone living in same country,
   (2) from someone living in another country,
   (3) from someone living in the same and other in another country, or
   (4) it does not receive any money or goods.

10. **Marital Status:** Whether the respondent is:
    (1) single/ never been married,
    (2) married,

(3) separated,
(4) divorced,
(5) widowed,
(6) domestic partner.

11. **National:** Whether the respondent is a national or a non-national of country he was living in at the time of the survey.

12. **Wave:** This refers to the time each of the twenty-five surveys used in the analysis was conducted. The first survey was conducted in 2005 and the last one in the data set we use was conducted in 2012

13. **Age:** The age of the respondent.

14. **Date:** The day the interview was conducted.

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