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The Effect of Social Capital on Individuals' Economic Outcomes in the MENA Region

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Abstract

Social networks and social media mobilizing them have been highlighted in relation to the Arab Spring events of 2011. Social capital is also an important factor in MENA region economies, begetting business opportunities in imperfectly connected markets subject to red tape barriers, facilitating trust in the absence of formal enforcement mechanisms, and enabling the matching of workers and employers. However, '*wasta'* also leads to inequality of opportunities for disenfranchised firms and workers. Our study sheds light on the role of social capital by imputing MENA workers' social capital and assessing its impact on workers' economic outcomes. Using extensive individual-level data from the World Values Surveys pooled across 14 countries and years 1999–2014, we impute social capital stochastically by Bayesian clustering, based on workers' club memberships, volunteering, trust, sense of belonging, and perception of own sociability. We then describe the distribution of MENA-region workers' social capital, including intertemporal trends in 6 countries. Least-squares and ordered probit regressions link workers' type of social capital, instrumented, to their economic outcomes.

We find that a cluster of workers with a sense of belonging with respect to personal and social relationships have a higher probability of attaining employment and higher incomes. As expected, being literate and more educated enables individuals to join the highest income groups and reduces their probability of falling into the middle or lower income groups. Income differentials based on education are stark – a certain level of education appears to guarantee workers a certain level of income. Positive subjective perceptions about one's social class and health status are also associated positively with workers' economic activity level and earnings. Workers in private nonprofit organizations tend to end up in the lowest income group. We do not

find gender gaps in economic outcomes, which warrants further investigation.

Keywords: Social capital, Bayesian clustering, ordered probit, Arab region, MENA, World Values Survey.
JEL Codes: J15, J24, Z13, C38, C11.

1. Introduction

The concept of social capital and its relevance to individuals' and communities' wellbeing has traditionally been investigated in Sociology. In the past decade, social capital has entered the domain of Economics, where there is growing recognition that factors beside the accumulation of hard skills and physical capital affect individuals' economic performance and satisfaction in life. Social capital is a multidimensional attribute of each individual and their community that interacts with individuals' human and physical capital to produce various real lifetime outcomes. Social capital includes individuals' soft skills such as trust in public and market institutions, sociability in particular social contexts, and size and tightness of individuals' social networks. Individuals' norms and values they attribute to their possessions and outcomes affect their incentives to invest, as well as their life satisfaction. Hence, social capital has multiple roles in individuals' pursuit of lifetime goals, and in the functioning of communities and societies.

In the MENA region, the role of people's social networks and social media mobilizing them has been highlighted in relation to the dynamics of Arab Spring events of 2011. Social capital is also an important factor in MENA region economies, begetting business opportunities in imperfectly connected markets subject to red tape barriers, facilitating trust in the absence of formal enforcement mechanisms, and enabling the matching of workers and employers. However, '*wasta'* also leads to inequality of opportunities for disenfranchised firms and workers. These facts raise several questions: To what extent is the effect of social capital systematic, in bringing about economy-wide benefits at the same time as it leaves some socio-economic groups behind? What is the nature and distribution of social capital in MENA-region countries? How do the levels of social capital and between-group gaps in them get formed, and how does social capital interact with economic and political factors?

A critical problem is that social capital is an elusive concept that is unobservable and must be

estimated indirectly. This has not been attempted in the MENA region. To this day, little is known systematically about MENA citizens' stock of social capital, its composition, distribution across various socio-economic groups, as well as differences in the distribution across countries and over time. To the best of our knowledge, ours is the first study estimating the distribution of the degrees and types of social capital among the MENA-region population, and linking it to workers' labor market outcomes. As a methodological innovation, we impute workers' social capital stochastically by Bayesian clustering, based on workers' membership in organizations, volunteering, trust in society or peers, reliance on personal relationships as sources of information, confidence in public institutions, sense of belonging, and perception of own sociability.

We describe the distribution of social capital across MENA-region workers and across demographic groups, including intertemporal trends in 6 countries. We then use ordered probit models to investigate links between workers' type of social capital and their economic outcomes. The analysis relies on pooled 1999–2014 rounds of the World Values Surveys (WVSs) for 14 countries – Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Palestine, Qatar, Tunisia, Turkey and Yemen – adding up to 18,000 observations for the newest wave of WVSs, and 40,000 observations across all waves.

The rest of the study is organized as follows. The next section reviews the available evidence of the role of social capital in MENA-region economies, with particular focus on labor markets. Section 3 describes in detail our estimation approach, and section 4 introduces our data. Section 5 presents our main results, and finally section 6 concludes with the main take-home messages, their policy implications, and directions for future research.

2. Literature Review

Since the pioneering work of Jane Jacobs (1961), various definitions of SC have been proposed in sociology (Glaeser 2001; Lesser 2009), and SC has been linked to diverse socio-economic phenomena and outcomes. At a societal level, increases in measures of trust are associated with higher economic growth rates (Knack and Keefer 1997), greater judicial efficiency and lower government corruption (LaPorta *et al.* 1997). At a community level, high trust communities were found to exhibit more resilience to a variety of community crises

(Helliwell *et al.* 2017). At an individual level, SC was found to promote well-being and health (Poortinga 2006). Different individuals accumulate different amounts and forms of social capital, and collect different economic and non-economic benefits from their investments (Astone et al. 1999). Individuals' sociability and social networking affect their labor-market, financial and other lifetime outcomes, their welfare, as well as outcomes of their offspring (Hofferth et al. 1998) and societal outcomes (DiPasquale and Glaeser 1999).

Literature on social capital and social inclusion in the MENA region is largely missing, with a few notable exceptions. Haron (2013) studied the incidence of social exclusion (described as a person's lack of access to rights and services they are entitled to in their society) in Israel, and found that the groups at risk of social exclusion are the less educated, the young, Israeli Muslims, women, and those with poor health. Clustering all individuals into three groups – the most endowed, the 'middle class,' and the least endowed – she found the greatest gap to occur between the middle class and the least endowed, suggesting that social exclusion can be deep. Mehchy and Kabbani (2013) studied residents' empowerment (imputed using individuals' access to information, social inclusion and participation, and local organizational capacity) across 24 Syrian villages, and again found that having low education, being a youth or female, or lacking land ownership are associated with lower degrees of empowerment. These studies suggest that in the MENA region citizens' social capital interacts in important ways with their social and economic functioning. The relationship between workers' social capital and their economic outcomes, including wealth, career path and earnings, is a presently understudied but vital research theme.

3. Methodology

3.1 Social capital imputation by Bayesian non-hierarchical clustering

Since social capital is unobservable, we use a set of observable behavioral, attitudinal and perceptional indicators to obtain a limited number of summary measures of social capital. Indicators for social capital in WVS data include people's membership in organizations, volunteering, trust in society or peers, reliance on personal relationships as sources of information, confidence in public institutions, sense of belonging, and perception of own sociability. Methodological literature proposes several data-dimension reduction techniques to

identifying the structure of the data – including (dis)similarities and joint variation among the available indicators – and aggregating them (Fodor 2002). In the social capital literature, several alternative methods have been promulgated, including using single indicators (DiPasquale and Glaeser 1999; Glaeser et al. 2002); linear combinations of indicators (Shideler and Kraybill 2009); and exploratory principal-component or factor analysis (Sabatini 2006, 2009; Gannon and Roberts 2014; Alvarez and Romani 2017; Hlasny and Lee 2017; Saukani and Ismail 2018).

Our study proposes a novel probability-based approach to imputing social capital. We use Bayesian clustering to group observations with common properties, and then describe the representative properties in each cluster. Bayesian clustering takes a stochastic view of the formation of social capital across individuals as a function of the joint distribution of contributing variables, which is assumed to be a finite mixture of multivariate normal distributions. The analysis estimates posterior distributions of observations as a function of fitted parameters for each cluster, fitted proportions of the different clusters, and cluster-membership probabilities for all observations. The index of social capital is obtained stochastically from these estimated posterior distributions. The strength of this approach relative to conventional deterministic imputation – including parametric finite mixture models, and principal component analysis – is that it allows for uncertainty in classifying each individual, and is expected to yield predictions that are more robust to outlying values. The predictions also come with estimates of the associated posterior uncertainty (Franzen 2008; Muller et al. 2009).

We employ Franzen's (2006) non-hierarchical Bayesian clustering based on a Gaussian mixture model and a Gibbs sampler.[1] We consider *n* independent and multivariate observations $\mathbf{x}=(x_1, x_2, \dots, x_n)$ from the C multivariate Gaussian mixture model of

$$f(y_i|\theta) = \sum_{c=1}^{C} \omega_c f_c(y_i|\mu_c, \Sigma_c) \quad i = 1, \dots, n$$

where C is a number of clusters given and $\theta = (\mu, \Sigma, \Omega, V)$ in which μ is a mean vector of size K, Σ is a K×K variance-covariance matrix, and $\Omega = (\omega_1, \omega_2, \dots, \omega_C)$ is a vector with classification probabilities for the C clusters with $0 < \omega_c < 1$. Note that $f_c(y_i|\mu_c, \Sigma_c)$ is multivariate Gaussian

[1] In contrast, hierarchical clustering is less efficient, but has certain nicety properties, including that it is more informative and structured, and users do not have to select the number of clusters beforehand. The non-hierarchical technique compensates for these features by including tools to determine the optimal number of clusters (AIC, BIC, or the elbow method) and get the informative structure from the *proper* prior distributions of the variables of interest.

with a mean μ_c and variance $\sum_c$ with probability ω_c for $c = 1, \dots, C$, and a classification vector $V = (v_1, v_2, \dots, v_C)$ in which $v_i = c$ means that observation x_i is in cluster c.

According to Lavine and West's (1992) conjugate priors for (μ, Σ, Ω) of the Gaussian mixture model, the posterior distributions are:

$$\Sigma_c \sim W^{-1}(m_c, \varphi_c)$$

$$\mu_c|\Sigma_c \sim N_M(\zeta_c, \frac{\Sigma_c}{\tau_c})$$

$$\Omega \sim D(\alpha_1, \dots, \alpha_C)$$

where W^{-1} is the inverse Wishart distribution, all (μ_c, Σ_c) are assumed to be independent over clusters, and D is the Dirichlet distribution with α_c being the mean of the prior distribution of Ω. The likelihood function is

$$L(\mu, \Sigma, \Omega \mid y) = \prod_{i=1}^{n} \sum_{c=1}^{C} \omega_c f_c(y_i|\mu_c, \Sigma_c)$$

and the joint prior distribution $g(\theta)$ yields the joint posterior distribution

$$\Pi(\theta| y) \propto \prod_{i=1}^{n} f(y_i|\theta) g(\theta)$$

The posterior distributions for (μ, Σ, Ω) are:

$$\Sigma_c|y, V \sim W^{-1}(n_c + m_c, \varphi_c + \lambda_c + \frac{n_c \tau_c}{n_c + \tau_c} (\overline{y_c} - \zeta_c)(\overline{y_c} - \zeta_c)')$$

$$\mu_c|y, \Sigma_c, V \sim N_M(\overline{\zeta_c}, \frac{\Sigma_c}{\tau_c + n_c})$$

$$\Omega| V \sim D\left(\alpha_1 + \sum_{i=1}^{n} I(v_i = 1), \dots, \alpha_C + \sum_{i=1}^{n} I(v_i = C)\right)$$

where n_c is the number of observations in cluster c and $\overline{\zeta_c} = (\tau_c \zeta_c + n_c \overline{y_c})/(n_c + \tau_c)$. The posterior probability t_{ic} for x_c to be in cluster c is, by the Bayes theorem:

$$\mathrm{t_{ic}}|\mu_c, \Sigma_c, \Omega = \frac{\omega_c f(y_i|\mu_c, \Sigma_c)}{\sum_{c=1}^{C} \omega_c f(y_i|\mu_c, \Sigma_c)} \quad i = 1, \dots, n$$

The Gibbs sampler, a popular Markov chain Monte Carlo algorithm, is iterated as follows:

1. $\Sigma_c^{(t)}|y, V^{(t-1)} \quad c = 1, \dots, C$ are simulated.

2. $\mu_c^{(t)}|y, \Sigma_c^{(t)}, V^{(t-1)} \quad c = 1, \dots, C$ are simulated.

3. $\Omega|V^{(t-1)}$ is simulated.

4. $V^{(t)}|\mu^{(t)}, \Sigma^{(t)}, \Omega^{(t)}$ is simulated.

Note that μ_c is generated by Σ_c, which implies that the algorithm is Data Augmentation, which has certain convergence advantages.

3.2 Regression model

Obtaining the optimal number of clusters, we first label each cluster using the typically observed properties of member observations. We then assess the link between the social capital cluster workers belong to, and their economic outcomes. As our main dependent variables, we use two economic outcome variables: categorical employment status ranging from active (full-time), through part-time, to seeking work, and to inactive/discouraged; and the income decile one belongs to. We test whether the indicators for any social capital cluster from the Bayesian clustering analysis have a positive effect on these economic outcomes.

Four model specifications are evaluated: 1) Model of workers' subjective perceptions of themselves; 2) Socioeconomic variables model; 3) Model of the nature of one's economic activity; and 4) Fully specified model controlling for demographics, country of residence, etc. (The models are described in table A1 in the appendix.) The first model controls for the subjective perceptions of one's social class, and satisfaction with their family income and their health status. These perceptions may not represent one's true socioeconomic and health status. If one's subjective perceptions are related positively to one's motivation or skills – indeed health is a component of human capital – we should find a positive association between the perceptions and one's labor market outcome.

The second model controls for a set of socioeconomic factors with bearing on one's employment status. The third model controls for the nature of tasks in one's employment – cognitive vs. manual, creative vs. routine, and independent vs. dependent – and for the employment sector – public institution, private business, private non-profit organization, or self-employed. Cognitive, creative, and independent nature of tasks are thought to be predictors of more active employment types, because they are associated more with public sector jobs than with private sector jobs compared to manual, routine and dependent tasks. A set of control variables are used, namely age, sex, literacy of the respondent, marital status (married, divorced/separate/widowed, or single/never-married), and family savings in the past year.

We hypothesize that membership in a highly socially associated cluster has a positive effect on the status of economic activity and earnings. Since both economic outcomes are ordinal categorical variables, we use ordered probit regressions and estimate the marginal effects of the social-capital cluster indicators and other controls.

4. Data

The study relies on 25 MENA-region national surveys from waves 4 (1999–2004), 5 (2005–2008) and 6 (2010–2014) of the WVS database[2]: Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Palestine, Qatar, Tunisia, Turkey and Yemen. For Algeria, Iraq, Jordan, Morocco, Turkey and Egypt, 2–3 survey waves are used. For each survey, 1,000–3,400 adult respondents are available, amounting to nearly 18,000 observations for the most recent (6^{th}) WVS wave in the 14 countries, and 40,000 observations among waves 4–6. Definitions and descriptive statistics for the associated components of social capital for clustering and explanatory and control variables for the regression models are summarized in tables A2–A3 in the appendix. Missing values in the components of social capital are imputed using the information on individuals' age, sex and education, or typical values of the population in the respective country and year.

[2] WVS Database, waves 4–6, http://www.worldvaluessurvey.org/WVSContents.jsp (accessed 23 April 2019).

5. Results

5.1 Bayesian clustering on individual's social capital

To perform Bayesian clustering, we need to first select the number of clusters. There are several methods to find it, for example minimizing the Bayesian Information Criterion (BIC). Unfortunately, the variance-covariance matrix of social capital components may not have a full rank because most indicators exhibit little variability and high correlation, which leads to extremely high log likelihood values and to BIC values that are difficult to compare across models. One alternative is to use a modified version of an elbow method based on the within-cluster sums of point-to-centroid distances, instead of the sum of squared errors in the original elbow method. We identify the optimal number of clusters just before the point where diminishing returns to scale begins – in our data five clusters. Table 1 shows the detailed results of clustering when five clusters are selected. (Table A2 in the appendix shows the within-cluster sums of point-to-centroid distances when 4–8 clusters are selected. Table A3 shows the descriptive statistics for each cluster, for the five cluster case.) Looking at the densities of the five clusters, the effective optimal number of clusters appears to be three, since no individuals are classified to belong to cluster 2 and cluster 4. Classification of individuals into clusters is implemented by the rule of maximum probability of an individual across all clusters.[3]

Since most social-capital indicators are on the scale from 0 to 2, let us call 1 as the intermediate level, 0 the lowest, and 2 the highest. Among cluster 1 members, there are no variables with values over 1 but four variables (trust_tv, trust_gov, conf_env, and conf_women) with values over 0.5. Hence, cluster 1 comprises individuals involved in social activities, with some degree of trust in public institutions. This cluster can be used as the baseline for other clusters. Clusters 2 and 4 do not have any observations. Among cluster 3 members, there are seven variables (trust_fam, info_friend, trust_nbd, trust_per, myself_loc, myself_cit, and person_do) with values over 1. These features indicate a high degree of belonging with respect to private and social relationships. Cluster 5 members have six variables (trust_fam, conf_chari, trust_nbd, trust_pers, myself_loc, and myself_cit) with values over 1 – most of them indicating high trust in their community – but appear to have little personal interaction. The histograms for

[3] For example, if the probability of being in clusters 1–5 is (0.4, 0.0, 0.5, 0.0, 0.1), the agent is classified to be in cluster 3.

social capital clusters by countries and demographic groups are found in the appendix.

Table 1. Social capital clusters descriptive statistics: 5 clusters case

Cluster #. Label	Typical properties (full definition in table A1)	Members by survey round	Mean score \ probability	Within-cluster sum of point-to-centroid distances
1. Not much involved in social activities or trust	Variables whose values over 0.5 -trust in tv -trust in gov -conf in env -conf in women	14452	0.117 \ 0.402	17,808.2
2. No observation		0	0.386 \ 0.000	20,754.97
3. Sense of belonging with respect to relationship	Variables whose values over 1 -trust in fam -info from friends -trust in nbd -trust in person -myself loc -myself cit -person do	16346	0.642 \ 0.454	71,758.82
4. No observation		0	0.403 \ 0.000	71,166.82
5. Trust in community	Variables whose values over 1 -trust in fam -conf in charity -trust in nbd -trust in person -myself loc -myself cit	5181	0.454 \ 0.144	59,191.43

Source: Own analysis of 1999-2014 WVS data.

5.2 Regressions of individuals' employment status

With the individuals' type of social engagement identified, we use it in regressions of individuals' economic outcomes: activity level of one's employment status, or the ranking of earnings. In the regressions of individuals' activity level, four alternative sets of explanatory variables are used as described in section 3.2. Table 2 summarizes the marginal effects of the effective social capital clusters on individuals' activity level. Since no agents belong to cluster 2 and 4, those variables are omitted. Cluster 1 is omitted as a baseline for the categorical variable and the fifth cluster is omitted due to collinearity among dummy variables unintentionally induced by the fact that our regression model has a large set of dummy variables. This problem would be handled in the next revision of our analysis.

Interestingly, members in the cluster of those with a high degree of belonging with respect to

private and social relationships exhibit a more active employment status, significant across all models. The effect is the strongest in the socioeconomic model: membership in cluster 3 is associated with a 30.1% higher probability of having an active employment status. This is a policy-relevant finding, since individuals' latent sense of belonging in relationships serves to boost their prospects of attaining full-time employment. This effect may work through their labor-supply decisions, or through employers' demand for the labor of socially-connected workers.

The fully-specified model shows an even stronger effect, increasing probability of active employment status by 48.8%. Controlling for both the subjective perceptions and relatively objective socioeconomic indicators thus further accentuates the association between workers' social relationships and the degree of their economic activity. On the other hand, controlling for the nature of one's tasks on the job reduces the estimated marginal effect of one's social relationships on the degree of their economic activity. This suggests that the degree of economic activity and the nature of the corresponding tasks are simultaneously determined by workers' social connectedness. Controlling for the nature of one's tasks serves to partial out the indirect effect of social capital on economic activity through the choice of the nature of job tasks.

Table 2. Marginal effects for employment status with respect to social capital clusters summary

No. Cluster	Regression model	Employment status	Cluster1	Clutser2	Cluster3	Cluster4	Cluster5
5	Subjective perception About One's status	Active	Baseline	Omitted	0.058** (0.024)	Omitted	Omitted
		Inactive	Baseline	Omitted	-0.061** (0.026)	Omitted	Omitted
	Socio-economic	Active	Baseline	Omitted	0.301** (0.136)	Omitted	Omitted
		Inactive	Baseline	Omitted	-0.183** (0.083)	Omitted	Omitted
	One's task nature	Active	Baseline	Omitted	0.028 (0.037)	Omitted	Omitted
		Inactive	Baseline	Omitted	-0.006 (0.008)	Omitted	Omitted
	All combined	Active	Baseline	Omitted	0.488** (0.216)	Omitted	Omitted
		Inactive	Baseline	Omitted	-0.108** (0.048)	Omitted	Omitted

Notes: Standard errors in parentheses; significant at * 0.10, ** 0.05, *** 0.01 level.

Table A4 in the appendix shows the marginal effects of all explanatory variables. The positive subjective perception of one's social class and health status are revealed to be associated positively with an active employment status (2.4% and 1.6% respectively) and negatively with an inactive status (-2.5% and -1.8% respectively). In the socio-economic model, employment in public institutions is shown to be the strongest predictor of active status among all types of employment (60.2%). Interestingly, age when workers completed their education is not significant across all models while education level itself is. This may imply that the labor market values one's skills attained through higher education but not the work experience since graduation. The nature of one's task is shown to matter to a small degree: the more cognitive, creative, and independent the tasks are, the somewhat higher probability of the worker holding an active employment status (0–1%).

Male workers are more likely to be economically active across all models. Interestingly, age does not seem to have either a positive or a negative effect on holding an active job status, suggesting high lifetime persistence and low mobility in workers' economic status. Marital status does not appear to affect one's economic activity level, something worth investigating more in the future particularly in relation to women. Family savings are associated weakly positively with the active employment status (1–2%).

5.3 Regressions of individuals' income rank

Next we estimate the second set of regressions where the dependent variable is the individuals' income rank. Table 3 summarizes the marginal effects of social capital clusters for three representative income-rank steps: the lowest (1st decile), middle (5th) and the highest (10th). Our central finding is that the magnitude of marginal effects of social capital is not as high in absolute value as in the previous section: -0.4% (subjective perception model), 2.7% (socio-economic model), 1.3% (one's task nature model), and 6.7% (fully-specified model), respectively. Except for the insignificant estimate in the subjective perception model, the more cognitive, creative, and independent the nature of one's tasks are, the higher one's income rank is predicted to be. Income mobility appears lower and less sensitive to one's socio-economic

variables, and job tasks than the prospect of attaining an active employment status.

The less cognitive, creative, and independent nature one's task has, the lower one's income rank would be. The largest magnitudes are introduced in all-combined model: 6.7% for highest, -7.9% for middle, and -1.5% for lowest income rank, respectively. Other than the all-combined model, the socio-economic model shows the largest magnitudes of 2.7% for highest and -7.2% for lowest. But we still have the consistent result with previous section that sense of belonging in relationship is positively associated with higher probability of lying in the higher income rank and vice versa. (Table A5 shows the marginal effects of all explanatory variables, other than social capital clusters, on workers' income rank.)

Table 3. Marginal effects for income rank with respect to social capital clusters summary

No. Cluster	Regression models	Income rank	Cluster1	Clutser2	Cluster3	Cluster4	Cluster5
5	Subjective perception About One's status	Highest (10)	Baseline	Omitted	-0.004 (0.028)	Omitted	-0.008 (0.028)
		Middle (5)	Baseline	Omitted	0.002 (0.018)	Omitted	0.005 (0.018)
		Lowest (1)	Baseline	Omitted	0.014 (0.101)	Omitted	0.030 (0.101)
	Socio-economic	Highest (10)	Baseline	Omitted	0.027** (0.013)	Omitted	Omitted
		Middle (5)	Baseline	Omitted	.	Omitted	Omitted
		Lowest (1)	Baseline	Omitted	-0.072** (0.034)	Omitted	Omitted
	One's task nature	Highest (10)	Baseline	Omitted	0.013*** (0.013)	Omitted	Omitted
		Middle (5)	Baseline	Omitted	-0.011*** (0.003)	Omitted	Omitted
		Lowest (1)	Baseline	Omitted	-0.040*** (0.010)	Omitted	Omitted
	All combined	Highest (10)	Baseline	Omitted	0.067*** (0.028)	Omitted	Omitted
		Middle (5)	Baseline	Omitted	-0.079*** (0.033)	Omitted	Omitted
		Lowest (1)	Baseline	Omitted	-0.150*** (0.061)	Omitted	Omitted

Notes: Standard errors in parentheses; significant at * 0.10, ** 0.05, *** 0.01 level.

In the socio-economic model, working in a private non-profit organization decreases the probability of attaining the highest income rank, but increases the probability of being in the fifth

or lower deciles. There is no job type that is clearly associated with the highest income rank. In the fifth and lower deciles, on the other hand, working for private non-profit organizations (including private schools, hospitals or other welfare-services providers) increases the probability of ending up in those deciles. Educational level is associated positively with the highest income rank and negatively with the middle or lower ranks.

Surprisingly, being male is associated negatively with one's income. Men are estimated to have a lower probability of being in the highest income rank, and higher probability to be in the middle and lower ranks. This result should be investigated further, but one possible interpretation is self-selection: while most men must work to provide for their families, women work only if their wage-offer exceeds the value of their labor at home or unpaid contribution to their family enterprise. Literacy is again revealed to be an important factor for attaining higher income ranks. On the other hand, marital status is not a significant predictor of one's income rank, calling for further inquiry.

6. Discussion

Our results highlight various correlates of workers' positive economic outcomes. First, the cluster of workers with a heightened sense of belonging with respect to personal and social relationships have a consistently and significantly higher propensity to attain an active employment status and a higher income rank. The importance of having a sense of belonging as a motivation for achievement has been studied in various fields: children's better experiences in school (Gore, 2005), mental health care (Hagerty et al, 1992), and improved self-efficacy during studies (Freeman et al, 2007, Strayhorn, 2012). The results in this study support these prior findings in the case of MENA-region workers and their employment outcomes.

A sense of belonging in relationship and positive subjective perceptions may indicate the possibility having an agent hope for the future or continuity for one's life and it seems to make individuals work hard with their economic outcomes revealed high. Acknowledging that the benefit of having ones a sense of belonging in relationship works for individuals' economic outcome and possibly leads to the entire society, a set of programs to boost a sense of belonging in relationship would be a good alternative as a public policy. Another implication of this study

is the importance of literacy to one's job attainment and earnings. Literacy is widely accepted as a key component of human capital and recipe for economic growth (Coulombe et al, 2004).

Positive subjective perceptions about one's social class and health status are also associated with a higher probability of getting an active employment status. Education increases the propensity of workers' getting an active employment status and higher income rank. As one's education increases, their propensity of attaining the middle or lower rank of incomes falls. The marked difference in marginal effects of education across income quantiles may imply that a certain level of education guarantees an agent a certain level of income.

The results in this paper show that workers in private nonprofit organizations have a high propensity of being in low income groups. To the extent that national authorities may wish to support nonprofit organizations, these organizations or their workers may need public support to recruit quality staff. In tackling inequality and poverty, the authorities may also look at nonprofit organizations in their targeting of vulnerable groups.

Our findings regarding gender-, and marital-status effects warrant further investigation. Men are found to be more likely to achieve an active employment status, but less likely to get in the highest income ranks. This is not due to sample size differences in the WVS. Men and women active in labor markets are equally represented in the WVS, and their sampling weights do not appear to be biased against either group. One possible explanation is the self-selection of women into entering the formal labor market based on their wage offers.

To improve on the existing results, we aim to undertake several extensions. One, using instrumental variables for workers' social capital, we hope to address the potential endogeneity of social capital in the regressions of economic outcomes. Two, we will consider alternative ways to finding the optimal number and composition of social-capital clusters of individuals. This should help to reduce the number of omitted clusters. We are also exploring developing a better way to assign individuals to specific clusters beside the maximum probability rule, to possibly allow individuals to appear in multiple clusters.

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Appendix

Table A1. Regression models summary

Dependent variable	Explanatory variables (other than social capital clusters)	Control variables

1. Employment status (inactive to active, 5 steps) 2. Income rank (1st to 10th step, 10 steps)	**Model 1** Subjective perception about one's class model · Social class (subjective) 5: Upper class 4: Upper middle class 3: Lower middle class 2: Working class 1: Lower class · Satisfaction with financial situation of household 1: Dissatisfied 2: 2 3: 3 4: 4 5: 5 6: 6 7: 7 8: 8 9: 9 10: Satisfied ·State of health (subjective) 5: Very good 4: Good 3: Fair 2: Poor 1: Very poor	**Model 2** Socio-economic model · size of town (0-25,000) · employment type -Public institution -Private business -Private non-profit organization -Self-employed · Do you live with your parents? 1: Yes 0: No · What age did you complete your education? · Highest educational level attained 1: inadequately completed elementary education 2: completed elementary education 3: incomplete secondary school/elementary education and basic vocational qualification 4: complete secondary school/secondary, intermediate vocational qualification	**Model 3** Nature of one's task model · employment type -Public institution -Private business -Private non-profit organization -Self-employed · Nature of tasks: manual vs. Cognitive 1: Mostly manual tasks (…) 10: Mostly non-manual tasks · Nature of tasks: Creative vs. routine 1: Mostly routine tasks (…) 10: Mostly non-routine tasks · Nature of tasks: independence 1: No independence at all (…) 10: Complete	**Model 4** All combined model	· Age · Sex · Was the respondent literate? 1: Yes 0: No · Family savings during past year 4: Save money 3: Just get by 2: Spent some savings and borrowed money 1: Spent savings and borrowed money (except for model 2) · Marital status1 1: married 0: not married · Marital status2 1: divorced, separate, or widowed 0: otherwise · Marital status3 1: single or never-married 0: otherwise

		5: incomplete secondary/secondary, intermediate general qualification 6: complete secondary/Full secondary, maturity level certificate 7: some university without degree/higher education 8: university with degree/higher education · Family savings during past year 4: Save money 3: Just get by 2: Spent some savings and borrowed money 1: Spent savings and borrowed money	independence		

Table A2. Within-cluster sums of point-to-centroid distances report

No. Clusters	4	5	6	7	8
Within-cluster sums of point-to-centroid distances	71966.37 59745.6 51388.45 71248.21	17808.2 20754.97 71758.82 71166.82 59191.43	27795.35 50394.11 27141.76 43323.65 62148.97 28031.43	54452.25 41482.4 20243.96 17030.45 24897.11 17710.24 51161.48	51003.97 9553.005 41529.14 15218.76 16817.96 54390.97 24907.1 7585.672
Sum	254,348.6	240,680.2	238,835.3	226,977.9	221,006.6
Difference	.	13,668.7	1,845.0	1,185,737.0	5,971.3

Table A3. Indicators used in clustering analysis

Variable name (in code)	Full definition, obs. if <35,979 (units)	Obs	Avg. (st.dev.)[i]	Min–max
Act_religion	Active level in religion (0: lowest, 2: highest)	35979	0.079 (0.353)	0-2
Act_sport	Active level in sport or recreation (0: lowest, 2: highest)	35979	0.098 (.390)	0-2
Act_art_music_edu	Active level in art, music, and education (0: lowest, 2: highest)	35979	0.068 (0.327)	0-2
Act_lunion	Active level in labor union	35979	0.044	0-2

	(0: lowest, 2: highest)		(0.261)	
Act_ppart	Active level in political party (0: lowest, 2: highest)	35979	0.043 (0.254)	0-2
Act_env	Active level in environmental organization (0: lowest, 2: highest)	35979	0.045 (0.263)	0-2
Act_prof	Active level in professional organization (0: lowest, 2: highest)	35979	0.074 (0.335)	0-2
Act_human	Active level in humanitarian organization (0: lowest, 2: highest)	35979	0.084 (0.367)	0-2
Act_etc	Active level in any other organization (0: lowest, 2: highest)	35979	0.023 (0.190)	0-2
Trust_fam	How much do you trust your family? (0: lowest, 2: highest)	35979	1.121 (0.968)	0-2
Trust_tv	How much do you trust television? (0: lowest, 2: highest)	35979	0.689 (0.748)	0-2
Trust_gov	How much do you trust the government? (0: lowest, 2: highest)	35979	0.690 (0.791)	0-2
Trust_pparty	How much do you trust the political parties? (0: lowest, 2: highest)	35979	0.229 (0.517)	0-2
Trust_mjcomp	How much do you trust major companies? (0: lowest, 2: highest)	35979	0.510 (0.689)	0-2
Trust_nbd	How much do you trust your neighborhood? (0: lowest, 2: highest)	35979	0.698 (0.796)	0-2
Trust_personal_ppl	How much do you trust people you know personally? (0: lowest, 2: highest)	35979	0.687 (0.793)	0-2
Trust_first_meet	How much do you trust people you meet for the first time? (0: lowest, 2: highest)	35979	0.167 (0.422)	0-2
Trust_ppl _diff_religion	How much do you trust people of another religion? (0: lowest, 2: highest)	35979	0.222 (0.473)	0-2
Trust_ppl _diff_nationality	How much do you trust in people of other nationalities? (0: lowest, 2: highest)	35979	0.203 (0.462)	0-2
Conf_env _prtc_mvmnt	Confidence level in the environmental protection movement (0: lowest, 2: highest)	35979	0.622 (0.747)	0-2
Conf_women_mvmnt	Confidence level in the women's movement (0: lowest, 2: highest)	35979	0.584 (0.733)	0-2
Conf_justice _sys_courts	Confidence level in justice systems/courts (0: lowest, 2: highest)	35979	0.490 (0.755)	0-2
Conf_UN	Confidence level in the United Nations (0: lowest, 2: highest)	35979	0.358 (0.626)	0-2
Conf_charity_org	Confidence level in charitable or humanitarian organizations (0: lowest, 2: highest)	35979	0.534 (0.754)	0-2
Conf_banks	Confidence level in banks (0: lowest, 2: highest)	35979	0.303 (0.612)	0-2
Conf_univ	Confidence level in universities (0: lowest, 2: highest)	35979	0.352 (0.648)	0-2
Info_friends	Information source: talk with friends or colleagues (0: lowest frequently, 2: highest frequently)	35979	0.701 (0.954)	0-2
Myself_citizen_cntry	I see myself as a citizen of the country. (0: lowest, 2: highest)	35979	0.942 (0.903)	0-2
Myself_loc_comm	I see myself as a member of my local community. (0: lowest, 2: highest)	35979	0.856 (0.869)	0-2
Myself_sociable	I see myself as someone who is outgoing, sociable (0: lowest, 2: highest)	35979	0.364 (0.678)	0-2
Person_do_good	Schwartz: It is important to this person to do	35979	0.645	0-2

_for_society	something for the good of society. (0: lowest, 2: highest)	(0.877)

Data: World Value Survey.

Fig A1. Distribution of social capital clusters by country

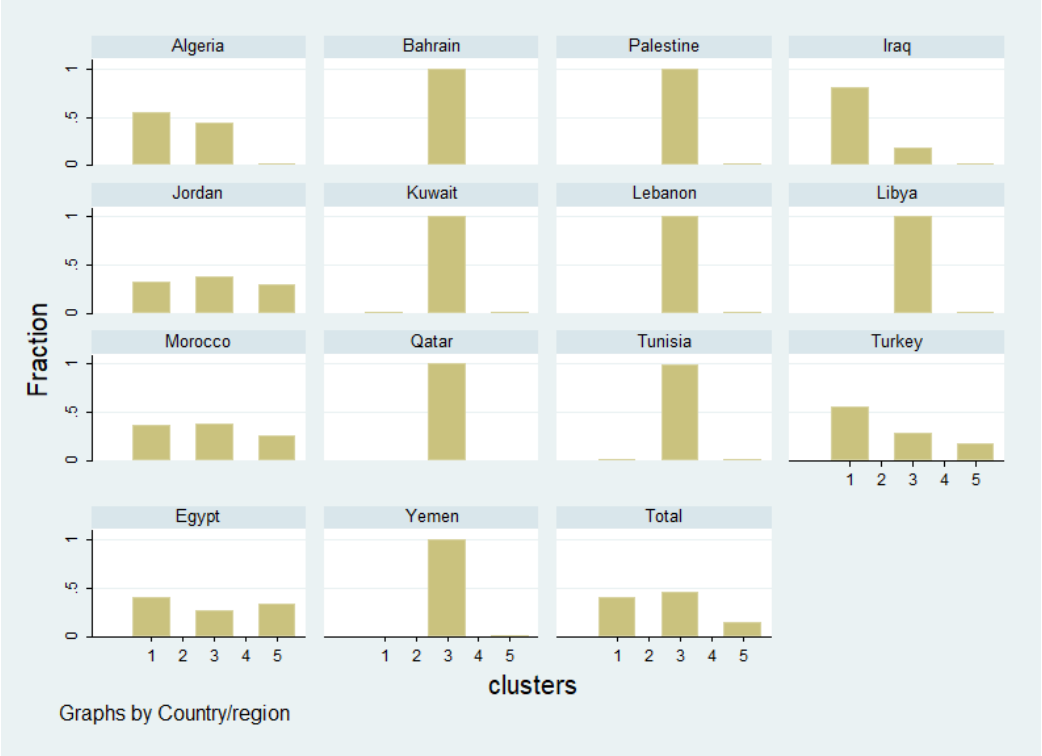
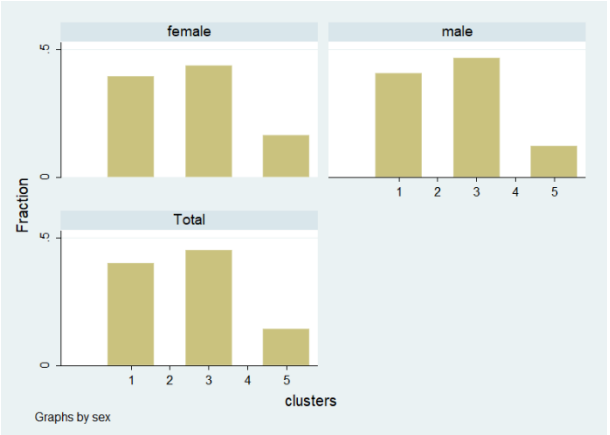


Fig A2. Distribution of social capital clusters by demographic group

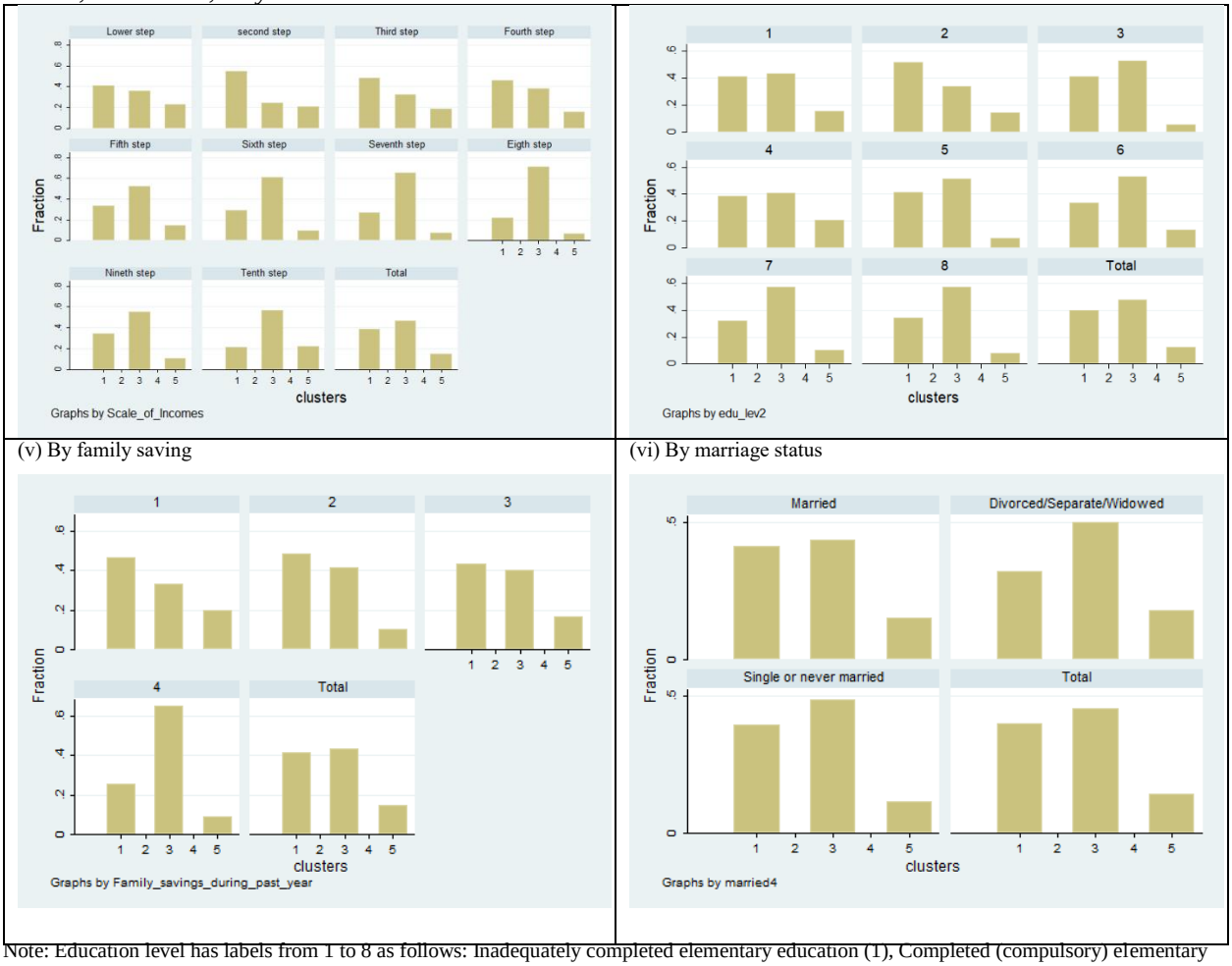
(i) By age

(ii) By sex



(iii) By income rank

(iv) By education level



(v) By family saving

(vi) By marriage status

Note: Education level has labels from 1 to 8 as follows: Inadequately completed elementary education (1), Completed (compulsory) elementary education (2), Incomplete secondary school: technical/vocational type/(Compulsory) elementary education and basic vocational qualification (3), Complete secondary school: technical/vocational type/Secondary, intermediate vocational qualification (4), Incomplete secondary: university-preparatory type/Secondary, intermediate general qualification (5), Complete secondary: university-preparatory type/Full secondary, maturity level certificate (6), Some university without degree/Higher education - lower-level tertiary certificate (7), and University with degree/Higher education - upper-level tertiary certificate (8).

And Family saving has labels from 1 to 4 as follows: Spent savings and borrowed money (1), Spent some savings and borrowed money (2), Just get by (3), and Save money (4).

Table A4. Definition of variables used in regressions (explanatory and control variables)

Variable name	Definition, Obs. if <35,979 (Units)	Obs	Avg. (St.Dev.)[i]	Min–Max
Explanatory variables				
Soc_class_subj	Social class (subjective) (5: Upper class – 1: Lower class)	35043	2.743 (0.991)	1-5
Satis_hhfinance	Satisfaction with financial situation of household (10: Satisfied – 1: Dissatisfied)	35794	5.503 (2.605)	1-10
Health_subj	State of health (subjective) (5: very good – 1: very poor)	35829	3.902 (0.872)	1-5
Townsize2	Size of town (1000 – 25,000)	18876	93906.92	1000-

			(172425.8)	500000
Emp_public	Employment type: public institution (1: yes, 0: no)	35979	0.135 (0.342)	0-1
Emp_private_biz	Employment type: private business (1: yes, 0: no)	35979	0.173 (0.378)	0-1
Emp_private_nonprofit	Employment type: private non-profit organization (1: yes, 0: no)	35979	0.015 (0.120)	0-1
Emp_self	Employment type: self-employed (1: yes, 0: no)	35979	0 (0)	0-0
Liv_w_parents	Do you live with your parents? (1: yes, 0: no)	35726	0.350 (0.477)	0-1
Age_edu_cplt	What age did you complete your education?	25479	18.226 (6.141)	1-99
Edu_lev	Highest educational level attained (8: some university without degree/higher education 1: inadequately completed elementary education)	29788	4.517 (2.384)	1-8
Fam_saving	Family savings during past year (4: Save money – 1: Spent savings and borrowed money)	34264	2.812 (0.872)	1-4
Nat_task1_cognitive	Nature of tasks: manual vs. cognitive (10: Mostly non-manual tasks – 1: Mostly manual tasks)	12800	4.888 (3.160)	1-10
Nat_task2_routine	Nature of tasks: creative vs. routine (10: Mostly non-routine tasks – 1: Mostly routine tasks)	12777	4.563 (2.919)	1-10
Nat_task3_ind	Nature of tasks: independence (10: Complete independence – 1: No independence at all)	12777	6.218 (2.897)	1-10
Control variables				
Age	Age	35917	37.740 (14.196)	16-99
Sex	Female=0, Male=1	35946	0.498 (0.500)	0-1
Fam_saving	Family savings during past year (4: Save money – 1: Spent savings and borrowed money)	34264	2.812 (0.872)	1-4
Married1	Married=1, otherwise=0	35979	0.654 (0.476)	0-1
Married2	Divorced/separate/widowed=1, otherwise=0	35979	0.074 (0.262)	0-1
Married3	Single or never-married=1, otherwise=0	35979	0.271 (0.445)	0-1

Table A3. Descriptive statistics in each cluster

variables	Full definition, obs. if <35,979 (units)	No. Clusters		
		1	3	5
	Obs	14452	16346	5181
Act_religion	Active level in religion (0: lowest, 2:	0	0.168	0.020

	highest)	(0)	(0.499)	(0.185)
Act_sport	Active level in sport or recreation (0: lowest, 2: highest)	0 (0)	0.202 (0.540)0.	0.044 (0.273)
Act_art_music_edu	Active level in art, music, and education (0: lowest, 2: highest)	0 (0)	0.142 (0.461)	0.022 (0.196)
Act_lunion	Active level in labor union (0: lowest, 2: highest)	0 (0)	0.092 (0.373)	0.014 (0.151)
Act_ppart	Active level in political party (0: lowest, 2: highest)	0 (0)	0.086 (0.355)	0.024 (0.197)
Act_env	Active level in environmental organization (0: lowest, 2: highest)	0 (0)	0.095 (0.377)	0.009 (0.126)
Act_prof	Active level in professional organization (0: lowest, 2: highest)	0 (0)	0.151 (0.466)	0.038 (0.237)
Act_human	Active level in humanitarian organization (0: lowest, 2: highest)	0 (0)	0.178 (0.518)	0.023 (0.194)
Act_etc	Active level in any other organization (0: lowest, 2: highest)	0 (0)	0.048 (0.269)	0.010 (0.132)
Trust_fam	How much do you trust your family? (0: lowest, 2: highest)	0.000 (0.029)	1.850 (0.429)	1.946 (0.237)
Trust_tv	How much do you trust television? (0: lowest, 2: highest)	0.718 (0.750)	0.611 (0.740)	0.855 (0.733)
Trust_gov	How much do you trust the government? (0: lowest, 2: highest)	0.773 (0.786)	0.655 (0.785)	0.572 (0.799)
Trust_pparty	How much do you trust the political parties? (0: lowest, 2: highest)	0.274 (0.550)	0.191 (0.480)	0.227 (0.522)
Trust_mjcomp	How much do you trust major companies? (0: lowest, 2: highest)	0.368 (0.613)	0.612 (0.731)	0.585 (0.680)
Trust_nbd	How much do you trust your neighborhood? (0: lowest, 2: highest)	0.000 (0.019)	1.134 (0.723)	1.269 (0.682)
Trust_personal_ppl	How much do you trust people you know personally? (0: lowest, 2: highest)	0.000 (0.020)	1.141 (0.729)	1.172 (0.701)
Trust_first_meet	How much do you trust people you meet for the first time? (0: lowest, 2: highest)	0 (0)	0.290 (0.529)	0.246 (0.470)
Trust_ppl _diff_religion	How much do you trust people of another religion? (0: lowest, 2: highest)	0.000 (0.008)	0.382 (0.577)	0.334 (0.525)

Trust_ppl _diff_nationality	How much do you trust in people of other nationalities? (0: lowest, 2: highest)	0.000 (0.008)	0.372 (0.578)	0.240 (0.470)
Conf_env _prtc_mvmnt	Confidence level in the environmental protection movement (0: lowest, 2: highest)	0.587 (0.766)	0.637 (0.739)	0.703 (0.711)
Conf_women_mvmnt	Confidence level in the women's movement (0: lowest, 2: highest)	0.545 (0.742)	0.577 (0.720)	0.716 (0.735)
Conf_justice _sys_courts	Confidence level in justice systems/courts (0: lowest, 2: highest)	0.000 (0.012)	0.872 (0.818)	0.652 (0.834)
Conf_UN	Confidence level in the United Nations (0: lowest, 2: highest)	0.369 (0.635)	0.329 (0.609)	0.422 (0.647)
Conf_charity_org	Confidence level in charitable or humanitarian organizations (0: lowest, 2: highest)	0 (0)	0.829 (0.789)	1.095 (0.775)
Conf_banks	Confidence level in banks (0: lowest, 2: highest)	0.000 (0.008)	0.661 (0.762)	0.016 (0.160)
Conf_univ	Confidence level in universities (0: lowest, 2: highest)	0.000 (0.008)	0.768 (0.773)	0.020 (0.183)
Info_friends	Information source: talk with friends or colleagues (0: lowest frequently, 2: highest frequently)	0 (0)	1.544 (0.839)	0.001 (0.039)
Myself_citizen_cntry	I see myself as a citizen of the country. (0: lowest, 2: highest)	0.000 (0.025)	1.546 (0.622)	1.670 (0.539)
Myself_loc_comm	I see myself as a member of my local community. (0: lowest, 2: highest)	0.000 (0.020)	1.404 (0.668)	1.511 (0.641)
Myself_sociable	I see myself as someone who is outgoing, sociable (0: lowest, 2: highest)	0 (0)	0.801 (0.812)	0.002 (0.059)
Person_do_good _for_society	Schwartz: It is important to this person to do something for the good of society. (0: lowest, 2: highest)	0 (0)	1.420 (0.770)	0.002 (0.059)

Table A4. Marginal effects for employment status summary

Category	Variables	Note	J=5			
			Regression models			
			Subjective perception	Socio-economic	One's task nature	All combined

			about one's status			
Employment status=active						
Sc clusters	Cluster1	Not much involved in social activities or trust	Baseline	Baseline	Baseline	Baseline
	Cluster2	No observations	Omitted	Omitted	Omitted	Omitted
	Cluster3	Sense of belonging with respect to relationship	0.058** (0.024)	0.301** (0.136)	0.028 (0.037)	0.488** (0.216)
	Cluster4	No observations	Omitted	Omitted	Omitted	Omitted
	Cluster5	Trust in society	Omitted	Omitted	Omitted	Omitted
Explanatory variables	Soc_class_subj	Social class (subjective) (5: Upper class – 1: Lower class)	0.024*** (0.003)			0.003 (0.008)
	Satis_ hhfinance	Satisfaction with financial situation of household (10: Satisfied – 1: Dissatisfied)	-0.000 (0.001)			-0.03 (0.008)
	Health_ subj	State of health (subjective) (5: very good – 1: very poor)	0.016*** (0.004)			0.020** (0.008)
	Townsize2	Size of town (1000 – 25,000)		0.000 (0.000)		0.000 (0.000)
	Emp_ public	Employment type: public institution (1: yes, 0: no)		0.602*** (0.011)	0.529*** (0.018)	0.590*** (0.027)
	Emp_private_biz	Employment type: private business (1: yes, 0: no)		0.477*** (0.012)	0.348*** (0.018)	0.400*** (0.027)
	Emp_private_non_profit	Employment type: private non-profit organization (1: yes, 0: no)		0.413*** (0.021)	0.309*** (0.028)	0.344*** (0.038)
	Emp_self	Employment type: self-employed (1: yes, 0: no)		omitted	omitted	omitted
	Liv_w _parents	Do you live with your parents? (1: yes, 0: no)		0.021** (0.010)		-0.005 (0.017)
	Age_edu_cplt	What age did you complete your education?		0.001 (0.001)		-0.001 (0.002)
	Edu_lev	Highest educational level attained (8: some university without degree/higher education 1: inadequately completed elementary education)		0.015*** (0.002)		0.018*** (0.004)
	Fam_ saving	Family savings during past year (4: Save money – 1: Spent savings and borrowed money)		0.004 (0.004)		
	Nat_task1_cognitive	Nature of tasks: manual vs. cognitive (10: Mostly non-manual tasks – 1: Mostly manual tasks)			0.013*** (0.002)	0.008*** (0.002)
	Nat_task2_routine	Nature of tasks: creative vs. routine (10: Mostly non-routine tasks – 1: Mostly routine tasks)			0.006*** (0.002)	0.004* (0.002)

	Nat_task3_ind	Nature of tasks: independence (10: Complete independence – 1: No independence at all)			0.005*** (0.002)	0.005** (0.002)
Control variables (individual)	Age	Age	-0.000 (0.000)	-0.000 (0.000)	-0.001 (0.000)	0.000 (0.000)
	Sex	Female=0, Male=1	0.339*** (0.005)	0.206*** (0.007)	0.150*** (0.010)	0.181*** (0.014)
	Lit	Family savings during past year (4: Save money – 1: Spent savings and borrowed money)	0.152*** (0.003)	0.016 (0.025)	0.058*** (0.018)	-0.001 (0.053)
	Fam_ saving	Family savings during past year (4: Save money – 1: Spent savings and borrowed money)	0.015*** (0.003)		0.015*** (0.006)	0.018** (0.008)
	Married1	Married=1, otherwise=0	0.168 (0.179)	0.328 (0.235)	0.162 (0.254)	0.397 (0.358)
	Married2	Divorced/separate/widowed=1, otherwise=0	0.149 (0.179)	0.318 (0.236)	0.140 (0.255)	0.368 (0.359)
	Married3	Single or never-married=1, otherwise=0	0.184 (0.179)	0.358 (0.235)	0.168 (0.255)	0.403 (0.358)
Control variables (country)	Algeria		Baseline	Baseline	Baseline	Baseline
	Bahrain		0.014 (0.015)	-0.008 (0.015)	-0.133*** (0.024)	-0.130*** (0.027)
	Palestine		-0.034** (0.017)		0.005 (0.031)	
	Iraq		-0.068*** (0.014)	-0.033** (0.016)	-0.006 (0.027)	-0.020 (0.031)
	Jordan		-0.065*** (0.015)	-0.013 (0.016)	0.170 (0.030)	0.152*** (0.033)
	Kuwait		0.145*** (0.018)		0.180 (0.030)	
	Lebanon		0.089*** (0.016)	0.103*** (0.016)	0.013 (0.025)	0.076** (0.029)
	Libya		0.009 (0.014)	-0.033** (0.015)	-0.106*** (0.024)	-0.118*** (0.028)
	Morocco		0.309*** (0.018)		0.321*** (0.025)	
	Qatar		0.034** (0.016)			
	Tunisia			0.008 (0.015)	0.003 (0.026)	0.007 (0.029)
	Turkey		-0.004 (0.014)		0.132*** (0.026)	
	Egypt		-0.065*** (0.014)		-0.126 (0.027)	
	Yemen		-0.054*** (0.015)	-0.019 (0.017)	-0.021 (0.029)	0.002 (0.034)
Employment status=inactive (active lev 0)						
Sc clusters	Cluster1	Not much involved in social activities or trust	Baseline	Baseline	Baseline	Baseline
	Cluster2	No observations	Omitted	Omitted	Omitted	omitted
	Cluster3	Sense of belonging with respect to relationship	-0.061** (0.026)	-0.183** (0.083)	-0.006 (0.008)	-0.108** (0.048)
	Cluster4	No observations	Omitted	Omitted	Omitted	Omitted
	Cluster5	Trust in society	Omitted	Omitted	Omitted	Omitted
Explanatory variables	Soc_class_subj	Social class (subjective) (5: Upper class – 1: Lower class)	-0.025*** (0.003)			-0.001 (0.002)
	Satis_ hhfinance	Satisfaction with financial situation of household	0.000 (0.001)			0.001 (0.001)

		(10: Satisfied – 1: Dissatisfied)				
	Health_ subj	State of health (subjective) (5: very good – 1: very poor)	-0.018*** (0.004)			-0.005** (0.002)
	Townsize2	Size of town (1000 – 25,000)		-0.000 (0.000)		-0.000 (0.000)
	Emp_ public	Employment type: public institution (1: yes, 0: no)		-0.367*** (0.005)	-0.117*** (0.007)	-0.131*** (0.009)
	Emp_private_biz	Employment type: private business (1: yes, 0: no)		-0.291*** (0.004)	-0.077*** (0.005)	-0.089*** (0.007)
	Emp_private_non_profit	Employment type: private non-profit organization (1: yes, 0: no)		-0.251*** (0.011)	-0.069*** (0.007)	-0.076*** (0.009)
	Emp_self	Employment type: self-employed (1: yes, 0: no)				
	Liv_w _parents	Do you live with your parents? (1: yes, 0: no)		-0.013** (0.006)		0.001 (0.004)
	Age_edu_cplt	What age did you complete your education?		-0.001 (0.001)		0.000 (0.000)
	Edu_lev	Highest educational level attained (8: some university without degree/higher education 1: inadequately completed elementary education)		-0.009*** (0.001)		-0.004*** (0.001)
	Fam_ saving	Family savings during past year (4: Save money – 1: Spent savings and borrowed money)		-0.003 (0.002)		
	Nat_task1_cognitive	Nature of tasks: manual vs. cognitive (10: Mostly non-manual tasks – 1: Mostly manual tasks)			-0.003*** (0.000)	-0.002*** (0.001)
	Nat_task2_routine	Nature of tasks: creative vs. routine (10: Mostly non-routine tasks – 1: Mostly routine tasks)			-0.001*** (0.000)	-0.001* (0.001)
	Nat_task3_ind	Nature of tasks: independence (10: Complete independence – 1: No independence at all)			-0.001*** (0.000)	-0.001** (0.001)
Control variables (individual)	Age	Age	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
	Sex	Female=0, Male=1	-0.359*** (0.005)	-0.125*** (0.005)	-0.033*** (0.003)	-0.040*** (0.004)
	Lit	Literate=1, otherwise=0	-0.161*** (0.004)	-0.001 (0.015)	-0.013*** (0.004)	0.000 (0.012)
	Fam_saving	Family savings during past year (4: Save money – 1: Spent savings and borrowed money)	-0.016*** (0.004)		-0.003**s* (0.001)	-0.004** (0.002)
	Married1	Married=1, otherwise=0	-0.178 (0.190)	-0.200 (0.143)	-0.036 (0.056)	-0.089 (0.080)
	Married2	Divorced/separate/widowed=1, otherwise=0	-0.158 (0.190)	-0.193 (0.144)	-0.031 (0.057)	-0.082 (0.080)
	Married3	Single or never-married=1, otherwise=0	-0.195 (0.190)	-0.218 (0.143)	-0.037 (0.057)	-0.089 (0.080)
Control	Algeria		Baseline	Baseline	Baseline	Baseline

variables (country)	Bahrain		-0.015 (0.017)	0.005 (0.009)	0.048*** (0.008)	0.0348*** (0.007)
	Palestine		0.039** (0.020)		-0.001 (0.008)	
	Iraq		0.083*** (0.017)	0.021** (0.010)	0.002 (0.007)	0.004 (0.007)
	Jordan		0.079*** (0.018)	0.008 (0.010)	-0.033*** (0.006)	-0.022*** (0.005)
	Kuwait		-0.133*** (0.017)		-0.013** (0.007)	
	Lebanon		-0.088*** (0.016)	-0.065*** (0.010)	-0.003 (0.007)	-0.013** (0.005)
	Libya		-0.010 (0.016)	0.021** (0.010)	0.036*** (0.008)	0.036*** (0.007)
	Morocco		-0.234*** (0.014)		-0.048*** (0.006)	
	Qatar		-0.036** (0.017)			
	Tunisia		No obs	-0.005 (0.010)	-0.001 (0.007)	-0.001 (0.006)
	Turkey		0.004 (0.016)		-0.030*** (0.006)	
	Egypt		0.079*** (0.016)		0.003 (0.007)	
	Yemen		0.064*** (.018)	0.012 (0.011)	0.006 (0.008)	-0.000 (0.007)
Ordered probit results						
		Number of obs	10803	5676	6965	3704
		LR chi(2)(23)	5228.51	5592.75	1572.65	1009.70
		Prob>chi2	0.0000	0.0000	0.000	0.000
		Pseudo R2	0.1606	0.3188	0.085	0.1014
		Cut1	2.178	3.966	0.590	3.028
		Cut2	2.547	4.846	1.087	3.585
		Cut3	3.067	5.687	2.052	4.596
		Cut4	3.571	6.317	2.717	5.235

Table A5. Marginal effects for income rank summary

Category	Variables	Note	J=5			
			Reg models			
			Subjective perception about one's status	Socio-economic	One's task nature	All combined
Incomerank=10 (tenth step, highest)						
Sc clusters	Cluster1	Not much involved in social activities or trust	Baseline	Baseline	Baseline	Baseline
	Cluster2	No observations	Omitted	Omitted	Omitted	Omitted
	Cluster3	Sense of belonging with respect to relationship	-0.004 (0.028)	0.027** (0.013)	0.013*** (0.013)	0.067*** (0.028)
	Cluster4	No observations	Omitted	Omitted	Omitted	Omitted
	Cluster5	Trust in society	-0.008 (0.028)	Omitted	Omitted	Omitted
Explanatory variables	Soc_class_subj	Social class (subjective) (5: Upper class – 1: Lower class)	0.017*** (0.001)			0.018*** (0.002)

	Satis_ hhfinance	Satisfaction with financial situation of household (10: Satisfied – 1: Dissatisfied)	0.003*** (0.001)			0.004*** (0.000)
	Health_ subj	State of health (subjective) (5: very good – 1: very poor)	0.001** (0.000)			0.001 (0.001)
	Townsize2	Size of town (1000 – 25,000)		0.000 (0.000)		-0.000 (0.000)
	Emp_ public	Employment type: public institution (1: yes, 0: no)		0.000 (0.001)	0.002 (0.002)	-0.002 (0.002)
	Emp_private_biz	Employment type: private business (1: yes, 0: no)		0.001 (0.001)	0.001 (0.001)	-0.001 (0.002)
	Emp_private_non_profit	Employment type: private non-profit organization (1: yes, 0: no)		-0.007** (0.003)	-0.006*** (0.002)	-0.008** (0.03)
	Emp_self	Employment type: self-employed (1: yes, 0: no)		Omitted	Omitted	Omitted
	Liv_w _parents	Do you live with your parents? (1: yes, 0: no)		0.001 (0.001)		0.002 (0.002)
	Age_edu_cplt	What age did you complete your education?		0.000 (0.000)		-0.000 (0.000)
	Edu_lev	Highest educational level attained (8: some university without degree/higher education 1: inadequately completed elementary education)		0.003*** (0.000)		0.002*** (0.000)
	Fam _saving	Family savings during past year (4: Save money – 1: Spent savings and borrowed money)		0.014*** (0.001)		
	Nat_task1_cognitive	Nature of tasks: manual vs. cognitive (10: Mostly non-manual tasks – 1: Mostly manual tasks)			0.002*** (0.000)	0.000** (0.000)
	Nat_task2_routine	Nature of tasks: creative vs. routine (10: Mostly non-routine tasks – 1: Mostly routine tasks)			0.001*** (0.000)	0.001*** (0.000)
	Nat_task3_ind	Nature of tasks: independence (10: Complete independence – 1: No independence at all)			0.001*** (0.000)	0.001*** (0.000)
Control variables (individual)	Age	Age	-0.000 (0.000)	-0.000 (0.000)	-0.000*** (0.000)	-0.000 (0.000)
	Sex	Female=0, Male=1	-0.002*** (0.001)	-0.004*** (0.001)	-0.004*** (0.001)	-0.002* (0.001)
	Lit	Literate=1, otherwise=0	0.005*** (0.001)	0.006* (0.003)	0.011*** (0.002)	0.009** (0.004)
	Fam _saving	Family savings during past year (4: Save money – 1: Spent savings and borrowed money)	0.005*** (0.000)		0.011*** (0.001)	0.006*** (0.001)
	Married1	Married=1, otherwise=0	0.028	0.242	0.010	0.204

			(0.021)	(4.008)	(0.026)	(4.175)
	Married2	Divorced/separate/widowed=1, otherwise=0	0.027 (0.021)	0.235 (4.008)	0.007 (0.026)	0.202 (4.175)
	Married3	Single or never-married=1, otherwise=0	0.0295 (0.021)	0.245 (4.008)	0.013 (0.026)	0.207 (4.175)
Control variables (country)	Algeria		Baseline	Baseline	Baseline	Baseline
	Bahrain		0.013*** (0.002)	0.027*** (0.003)	0.012*** (0.002)	0.012*** (0.003)
	Palestine		0.005*** (0.001)	.	.	.
	Iraq		0.012*** (0.001)	0.012*** (0.002)	0.011*** (0.002)	0.013*** (0.003)
	Jordan		0.014*** (0.002)	0.008*** (0.002)	0.005*** (0.002)	0.013*** (0.003)
	Kuwait		0.004*** (0.001)	.	0.014*** (0.002)	0.013*** (0.003)
	Lebanon		0.014*** (0.002)	0.024*** (0.003)	0.014*** (0.002)	0.019*** (0.003)
	Libya		0.000 (0.001)	0.007*** (0.001)	0.001 (0.001)	0.006*** (0.002)
	Morocco		0.002** (0.001)	.	-0.003** (0.001)	.
	Qatar		.	.	.	.
	Tunisia		0.004*** (0.001)	0.001 (0.001)	0.001 (0.001)	0.006*** (0.002)
	Turkey		0.014*** (0.001)	.	0.022*** (0.003)	.
	Egypt		0.003*** (0.001)	.	-0.002 (0.001)	.
	Yemen		-0.001 (0.001)	-0.004*** (0.001)	-0.005*** (0.001)	-0.004*** (0.002)
Income rank=5 (fifth step)						
Sc clusters	Cluster1	Not much involved in social activities or trust	Baseline	.	Baseline	Baseline
	Cluster2	No observations	Omitted	.	Omitted	Omitted
	Cluster3	Sense of belonging with respect to relationship	0.002 (0.018)	.	-0.011*** (0.003)	-0.079*** (0.033)
	Cluster4	No observations	Omitted	.	Omitted	Omitted
	Cluster5	Trust in society	0.005 (0.018)	.	Omitted	Omitted
Explanatory variables	Soc_class_subj	Social class (subjective) (5: Upper class – 1: Lower class)	-0.011*** (0.001)			-0.021*** (0.001)
	Satis_ hhfinance	Satisfaction with financial situation of household (10: Satisfied – 1: Dissatisfied)	-0.002*** (0.000)			-0.005*** (0.000)
	Health_ subj	State of health (subjective) (5: very good – 1: very poor)	-0.000** (0.000)			-0.001 (0.001)
	Townsize2	Size of town (1000 – 25,000)		.		0.000 (0.000)
	Emp_ public	Employment type: public institution (1: yes, 0: no)		.	-0.001 (0.001)	0.002 (0.003)
	Emp_private_biz	Employment type: private business (1: yes, 0: no)		.	-0.001 (0.001)	0.001 (0.003)
	Emp_private_non_profit	Employment type: private non-profit organization		.	0.005*** (0.002)	0.009** (0.004)

		(1: yes, 0: no)				
	Emp_self	Employment type: self-employed (1: yes, 0: no)		.	Omitted	Omitted
	Liv_w_ parents	Do you live with your parents? (1: yes, 0: no)		.		-0.002 (0.002)
	Age_edu_cplt	What age did you complete your education?		.		0.000 (0.000)
	Edu_lev	Highest educational level attained (8: some university without degree/higher education 1: inadequately completed elementary education)		.		-0.002*** (0.000)
	Fam_ saving	Family savings during past year (4: Save money – 1: Spent savings and borrowed money)		.		
	Nat_task1_cognitive	Nature of tasks: manual vs. cognitive (10: Mostly non-manual tasks – 1: Mostly manual tasks)				-0.001** (0.000)
	Nat_task2_routine	Nature of tasks: creative vs. routine (10: Mostly non-routine tasks – 1: Mostly routine tasks)				-0.002*** (0.000)
	Nat_task3_ind	Nature of tasks: independence (10: Complete independence – 1: No independence at all)				-0.002*** (0.000)
Control variables (individual)	Age	Age	0.000** (0.000)	.	0.000** (0.000)	0.000 (0.000)
	Sex	Female=0, Male=1	0.001*** (0.000)	.	0.003*** (0.001)	0.002* (0.002)
	Lit	Family savings during past year (4: Save money – 1: Spent savings and borrowed money)	-0.003*** (0.001)	.	-0.009*** (0.001)	-0.010** (0.005)
	Fam_ saving	Family savings during past year (4: Save money – 1: Spent savings and borrowed money)	-0.003*** (0.000)		-0.009*** (0.001)	-0.007*** (0.001)
	Married1	Married=1, otherwise=0	-0.018 (0.014)	.	-0.009 (0.022)	-0.238 (4.882)
	Married2	Divorced/separate/widowed=1, otherwise=0	-0.017 (0.014)	.	-0.006 (0.022)	-0.237 (4.882)
	Married3	Single or never-married=1, otherwise=0	-0.019 (0.014)	.	-0.011 (0.022)	-0.242 (4.882)
Control variables (country)	Algeria		Baseline	.	Baseline	Baseline
	Bahrain		-0.007*** (0.002)	.	-0.013*** (0.003)	-0.014*** (0.003)
	Palestine		-0.000 (0.001)	.	-0.003* (0.002)	.
	Iraq		-0.006*** (0.001)	.	-0.011*** (0.003)	-0.016*** (0.004)
	Jordan		-0.008*** (0.001)	.	-0.004** (0.002)	-0.015*** (0.003)
	Kuwait		0.000 (0.001)	.	-0.148*** (0.003)	.

	Lebanon		-0.008*** (0.002)	.	-0.016*** (0.003)	-0.023*** (0.004)
	Libya		0.000 (0.001)	.	-0.000 (0.000)	0.001 (0.001)
	Morocco		0.001* (0.001)	.	-0.003** (0.002)	.
	Qatar			.		
	Tunisia		0.000 (0.001)	.	-0.000 (0.000)	-0.007*** (0.002)
	Turkey		-0.009*** (0.001)	.	-0.027*** (0.003)	.
	Egypt		0.001 (0.001)	.	-0.001 (0.001)	.
	Yemen		-0.002 (0.001)	.	-0.016*** (0.004)	0.001 (0.001)
Income rank=1 (first step, lowest)						
Sc clusters	Cluster1	Not much involved in social activities or trust	Baseline	Baseline	Baseline	Baseline
	Cluster2	No observations	Omitted	Omitted	Omitted	Omitted
	Cluster3	Sense of belonging with respect to relationship	0.014 (0.101)	-0.072** (0.034)	-0.040*** (0.010)	-0.150*** (0.061)
	Cluster4	No observations	Omitted	Omitted	Omitted	Omitted
	Cluster5	Trust in society	0.030 (0.101)	Omitted	Omitted	Omitted
Explanatory variables	Soc_class_subj	Social class (subjective) (5: Upper class – 1: Lower class)	-0.062*** (0.002)			-0.040*** (0.002)
	Satis_ hhfinance	Satisfaction with financial situation of household (10: Satisfied – 1: Dissatisfied)	-0.013*** (0.000)			-0.001*** (0.001)
	Health_ subj	State of health (subjective) (5: very good – 1: very poor)	-0.003** (0.001)			-0.002 (0.002)
	Townsize2	Size of town (1000 – 25,000)		-0.000 (0.000)		0.000 (0.000)
	Emp_ public	Employment type: public institution (1: yes, 0: no)		-0.000 (0.004)	-0.005 (0.005)	0.003 (0.005)
	Emp_private_biz	Employment type: private business (1: yes, 0: no)		-0.002 (0.003)	-0.002 (0.005)	0.002 (0.005)
	Emp_private_non_profit	Employment type: private non-profit organization (1: yes, 0: no)		0.018** (0.008)	0.019*** (0.007)	0.018** (0.008)
	Emp_self	Employment type: self-employed (1: yes, 0: no)		Omitted	Omitted	Omitted
	Liv_w_ parents	Do you live with your parents? (1: yes, 0: no)		-0.002 (0.004)		-0.003 (0.004)
	Age_edu_cplt	What age did you complete your education?		-0.000 (0.000)		0.000 (0.000)
	Edu_lev	Highest educational level attained (8: some university without degree/higher education 1: inadequately completed elementary education)		-0.008*** (0.001)		-0.004*** (0.001)

	Fam_ saving	Family savings during past year (4: Save money – 1: Spent savings and borrowed money)		-0.036*** (0.002)		
	Nat_task1_cognitive	Nature of tasks: manual vs. cognitive (10: Mostly non-manual tasks – 1: Mostly manual tasks)			-0.005*** (0.000)	-0.001** (0.000)
	Nat_task2_routine	Nature of tasks: creative vs. routine (10: Mostly non-routine tasks – 1: Mostly routine tasks)			-0.005*** (0.001)	-0.003*** (0.001)
	Nat_task3_ind	Nature of tasks: independence (10: Complete independence – 1: No independence at all)			-0.005*** (0.000)	-0.003*** (0.001)
Control variables (individual)	Age	Age	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	0.000 (0.000)
	Sex	Female=0, Male=1	0.006*** (0.002)	0.010*** (0.003)	0.012*** (0.003)	0.004* (0.003)
	Lit	Family savings during past year (4: Save money – 1: Spent savings and borrowed money)	-0.017*** (0.003)	-0.015* (0.008)	-0.034*** (0.005)	-0.020** (0.010)
	Fam_ saving	Family savings during past year (4: Save money – 1: Spent savings and borrowed money)	-0.018*** (0.001)		-0.034*** (0.002)	-0.013*** (0.002)
	Married1	Married=1, otherwise=0	-0.101 (0.077)	-0.642 (10.637)	-0.033 (0.081)	-0.454 (9.304)
	Married2	Divorced/separate/widowed=1, otherwise=0	-0.096 (0.077)	-0.625 (10.637)	-0.021 (0.081)	-0.451 (9.304)
	Married3	Single or never-married=1, otherwise=0	-0.107 (0.077)	-0.649 (10.637)	-0.040 (0.081)	-0.462 (9.304)
Control variables (country)	Algeria		Baseline	Baseline	Baseline	Baseline
	Bahrain		-0.051*** (0.005)	-0.063*** (0.006)	-0.039*** (0.007)	-0.029*** (0.006)
	Palestine		-0.031*** (0.006)	.	-0.022*** (0.009)	.
	Iraq		-0.049*** (0.005)	-0.045*** (0.006)	-0.037*** (0.007)	-0.031*** (0.007)
	Jordan		-0.053*** (0.005)	-0.036*** (0.006)	-0.024*** (0.008)	-0.031*** (0.007)
	Kuwait		-0.026*** (0.006)	.	-0.042*** (0.007)	.
	Lebanon		-0.053*** (0.005)	-0.059*** (0.006)	-0.043*** (0.007)	-0.037*** (0.006)
	Libya		-0.000 (0.006)	-0.032*** (0.006)	-0.006 (0.008)	0.013* (0.007)
	Morocco		-0.014** (0.007)	.	0.025*** (0.010)	.
	Qatar			.	.	.
	Tunisia		-0.027*** (0.006)	-0.009 (0.007)	-0.007 (0.008)	-0.019*** (0.007)
	Turkey		-0.054*** (0.005)	.	-0.051*** (0.007)	.
	Egypt		-0.021*** (0.006)	.	0.012 (0.009)	.
	Yemen		0.011 (0.07)	0.042*** (0.011)	0.068*** (0.013)	0.025*** (0.010)
Ordered probit results						
		Number of obs	12774	6762	7814	4153

LR chi(2)(23)	7450.65	1462.87	2245.60	2127.12
Prob>chi2	0.0000	0.000	0.000	0.000
Pseudo R2	0.1376	0.051	0.068	0.122
Cut1	2.587	6.930	0.873	9.163
Cut2	3.033	7.344	1.250	9.603
Cut3	3.599	7.774	1.723	10.144
Cut4	4.122	8.159	2.171	10.631
Cut5	4.851	8.767	2.803	11.354
Cut6	5.453	9.302	3.322	111.997
Cut7	6.149	9.909	3.934	12.710
Cut8	6.921	10.574	4.611	13.500
Cut9	7.495	11.038	5.124	13.871

(Note: the results of socio-economic model for income rank=5 (fifth step) are not estimated due to variance matrix being nonsymmetric or highly singular.)