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HOUSEHOLD ASSET WEALTH AND FEMALE LABOR SUPPLY IN MENA

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Abstract

Female labor force participation rates in the Middle East and North Africa are low compared to other world regions. This study contributes to the literature explaining this phenomenon in Egypt, Jordan and Tunisia by referring to women's unearned incomes, whether in the form of household wealth, the presence of male earners in the household, or expected wages in the labor market. We estimate probability models of women's labor force participation, accounting for wealth indices based on households' productive and non-productive assets. Recognizing the role of wealth, estimation is repeated by household wealth quintile. We find that the higher the wealth index of a woman's household, the less likely the woman is to participate in the labor force. This result holds even when the presence of a male wage worker in the household is accounted for, and when own expected wages are included. Regional degree of wealth inequality has bearing on women's labor force participation, but the results differ between Egypt, on the one hand, and Jordan and Tunisia, on the other hand. Overall, the magnitudes of the substitution and income effects of wages on women's labor force participation vary by country and survey wave, and particularly between women in different wealth quintiles.

JEL Classifications: J22, J70, D31, D63, N35

Keywords: Female employment, labor force participation, asset-based wealth, wealth inequality, MENA.

ملخص

تعتبر معدلات مشاركة الإناث في القوى العاملة في منطقة الشرق الأوسط وشمال أفريقيا منخفضة مقارنة بمناطق أخرى من العالم. تساهم هذه الدراسة في الأدبيات التي تشرح هذه الظاهرة في مصر والأردن وتونس من خلال الإشارة إلى عدم حصول المرأة على دخل تكتسبه سواء في شكل ثروة عائلية أو في حالة وجود ذكور في الأسرة يكتسبون العيش أو في أي شكل من الأجور المتوقعة في سوق العمل. ونقوم بتقدير نماذج محتملة لمشاركة المرأة في القوى العاملة، إذ نحسب مؤشرات الثروة على أساس الأصول الإنتاجية وغير الإنتاجية للأسر المعيشية متمثلة في مؤشرات الثروة على أساس الأصول المنتجة وغير المنتجة لدى الأسر. وبالتعرف على دور الثروة، نكرر تقديرنا له بخمس ثروة الأسرة المعيشة. ونجد أنه كلما ارتفع مؤشر الثروة لدى أسرة المرأة، قل احتمال مشاركة المرأة في القوى العاملة. وتنطبق هذه النتيجة أيضا في حالة عمل أحد أفراد الأسرة الذكور بأجر، وكذلك عند إدراج الأجور الذاتية المتوقعة. وتؤثر درجة التفاوت في الثروة من منطقة إلى أخرى على مشاركة المرأة في القوى العاملة، لكن النتائج تختلف بين مصر من ناحية، والأردن وتونس من ناحية أخرى. وعموما، فإن مدى تأثير بدائل الحصول على أجر أو على دخول من الأجر على مشاركة المرأة في القوى العاملة يختلف بحسب البلد وموجة المسح، ولا سيما بين النساء في مختلف شرائح الثروة.

1. Introduction and Related Literature

Female labor force participation (FLFP) rates in the Middle East and North Africa (MENA) region are the lowest in the world (Table A.1 in the appendix). This is despite the fact that females in the region have almost closed the gap between them and their male counterparts in terms of education (see Table A.2). The particular cultural and social norms of the region undoubtedly play a role in this low FLFP, but other factors, such as the wealth gap might also be responsible. Ross (2008, 2012) argued, for example, that oil wealth is one important factor behind low female labor force participation and low gender equality in the region. Can this notion be extended to other types of wealth, or is it particular to oil exporting countries?

In the standard labor supply model, women are likely to raise their supply of labor in the market as the wage rate they expect to earn rises. This is the well-known substitution effect. However, an increase in unearned income, such as the income of a spouse or income from household assets, would reduce the desire to work and result in the backward bending supply curve. In this paper, we investigate the importance of wealth in determining women's labor supply using detailed data on household wealth.

At the aggregate level, inequality of wealth across households has long been recognized as potentially impairing economic growth and producing market failures (Birdsall and Londono 1997; Bardhan et al. 1999). At the micro level, access to, control over, and ownership of assets are prime components of wellbeing and are thought to have strong bearing on individuals' economic decisions (Sherraden 1991 ; Carter and Barrett 2006). Welfare, the ultimate aim of individuals' economic endeavors, is a multidimensional concept that involves more than just current expenditures or income. In the words of Nobel Laureate Amartya Sen, "We generally have excellent reasons for wanting more income or wealth. This is not because income and wealth are desirable for their own sake, but because, typically, they are admirable general-purpose means for having more freedom to lead the kind of lives we have reason to value." (Sen 1999). In Sen's view, we should care about these "capabilities" (income, wealth) not for their own sake, but for what they allow us to enjoy in terms of "functionings" – or the freedom to choose. In principle, these capabilities are not only monetary measures of welfare but should include multidimensional indicators of well-being since all of a households' capabilities are important in determining its freedom to choose (Ward 2014). These multidimensional indicators include households' ownership of productive and non-productive assets. Consider for example a rural household's ownership of a cow that they can use on the farm, at home to produce dairy products as well as to eventually sell (or directly consume) its meat. An urban household's ownership of a motorcycle can facilitate its members' travel requirements to work and school, and maybe even serve as a delivery vehicle for their small business. Clearly, households' command of such assets can alter their functionings and hence their wellbeing, and should be incorporated into measures of welfare.

Reliable data on financial wealth is difficult to come by in the region, either because the surveys do not ask about it or respondents are reluctant to answer such questions. This leaves researchers with the task of trying to come up with ways to infer the households' wealth based on other indicators such as ownership of various classes of assets. In this paper we rely on an index of household assets using information on the household's ownership of productive and nonproductive assets to gauge the impact of wealth on various labor market outcomes for women. In further research we also anticipate constructing measures of female empowerment to study the effect of household asset wealth on them.

Filmer and Pritchett (2001) were the first to calculate a measure of household wealth based on Principal Component Analysis (PCA) of household assets and found that the asset index is a good proxy for a household's long-run economic wellbeing. They tested their method by using data from countries where both asset and expenditure information was available in the same survey and found that the classification of households was similar based on the two methods. They used their asset index to study the impact of wealth on children's school enrollment in India.

McKenzie (2005) went a step further and used a similarly calculated asset index to estimate inequality in Mexico, and to study the impact of this inequality on state-level school enrollment for boys. He found that after controlling for household income and demographics, school attendance of boys is lower for Mexican states with higher wealth inequality. Ward (2014) constructed several different types of wealth indices for China based on household assets and found that wealth inequality was actually declining in China overtime, unlike income inequality.

Research on the relationship between wealth and other socioeconomic indicators for the MENA region is scant. A few earlier studies have used an index of wealth to estimate poverty, economic and job mobility and transitions in and out of poverty. Osman et.al (2006) used a wealth index to develop a poverty targeting methodology in the absence of complete data on income and expenditure. Assaad et al. (2009) used a wealth index and panel labor market data to study job transitions in Egypt between 1998 and 2006. AlAzzawi (2010) used a wealth index to measure multidimensional poverty and to examine transitions in and out of poverty by wealth quintile. Angeli (2009) used wealth quintiles to examine outcomes such as maternal and child health and female fertility using Demographic and Health Surveys, but did not examine the impacts on labor market outcomes such as labor force participation.

El Enbaby (2012) assessed inequality of opportunity in wealth in Egypt in 2006 by constructing a wealth index from household assets using the ELMPS and used it to examine the inequality of opportunity. She found that the share of inequality of opportunity ranges between 20% and 45% of total inequality in wealth, depending on the measure of inequality used. El Enbaby and Galal (2015) used ELMPS (1998-2012) to perform similar analysis using both wages and an asset based wealth index. They found that circumstances account fora relatively small portion of inequality of opportunity in both wages and wealth, but that the portion that is due to circumstances (as opposed to effort) is three times as high for the wealth index.

El Hamidi (2004) investigated the impact of wealth on female labor supply in Egypt, using data from 1998 only. She found that women in the poorest income groups were likely to increase their hours of work the most when faced with a wage cut. This result was true at all other wealth quintiles as well, but to a smaller degree, suggesting a negative labor supply elasticity.

As far as we know this is the only study that investigates the repercussions of wealth inequality based on productive and non-productive household assets for women's labor market outcomes. The analysis is performed for three MENA countries: Egypt, Jordan and Tunisia, over a period of time characterized by far reaching economic, social and political changes.

In what follows we outline the methods for constructing an index of household wealth, and estimating the role of wealth in women's labor market participation decisions. Section 3 describes the available survey data. Finally, section 4 presents the main results, and section 5 summarizes the results and concludes.

2. Methods

Constructing the Wealth Index

Following Filmer and Pritchett (2001) and McKenzie (2005), we develop a one-dimensional index of wealth based on households' all available productive and non-productive assets, livestock, farm equipment and capitalization of firms owned by households. The wealth index w is obtained from the first component in the principal component analysis (PCA) of households' observable ownership of all assets. This first component can be expressed as the weighted sum of households' assets x_p (numbering P assets, $p \in P$), where x is a potentially non-integer stock of each asset. Asset ownership is standardized by the mean and standard deviation across households, and the weight a_p on each standardized unit of asset p is selected to maximize sample variance of the index subject to $\Sigma_p a_p^2=1$:

$$w = \sum_p a_p \, {(x_p - \overline{x_p})}\big/{stdev(x_p)} \tag{1}$$

Household level subscripts are omitted here for clarity of presentation. The PCA method assigns the highest weights to assets that vary most across households, thus informing on maximum discrimination in asset ownership between households, and allowing for heavy tails of the wealth distribution. By accounting for non-productive as well as productive assets, we expand on the coverage typically used in studies of household assets, and we alleviate biases due to systematic differences between urban and rural households. As a by-product, our method allows us to comment on errors introduced in wealth indices when only domestic non-productive assets are accounted for, when household wealth, consumption or expenditure is normalized by household size, or when information in wealth indices is further reduced by reporting of only categorical indices such as wealth quintiles.

With the first principal component identified, we can compute the portion of the total variance in the observed variables that it accounts for, and the loadings of individual assets in it. Regression scores from the first principal component are used as the wealth index for each household.

One concern with the use of principal-component loadings for various household assets is that the same loadings are applied to all households regardless of differentials in regional costs or typical quality, and all units of the same asset type (households' first and second car).[1] Individual assets may contribute systematically differently to the true wealth of, say, urban and rural, or rich and poor households.[2]

For these reasons, principal component analyses are sometimes performed separately for urban and rural households, or wealth quantiles are identified separately among urban and rural households (but on the same nationwide wealth index) (Rutstein 2008). To evaluate how serious the urban–rural inconsistency is in our data, we pursue the first method to estimate a separate wealth index for each group. We then extrapolate the factor loadings of assets among each group to the other group, and observe the resulting changes in the wealth distribution in each group, depending on whether the urban-only, rural-only or nationwide sets of asset loadings are used.

By design, the estimated index is distributed around zero with unit variance, but may not be distributed symmetrically, depending on the distribution of the stocks of all included assets. To

[1] These are restrictive assumptions, but without external information on systematic differences in values there may be no superior alternatives. The extent of the problem cannot be reliably tested. The problem is different from the issue of spatial cost differentials, and cannot be solved using spatial price indexes, because these are not disaggregated by commodity, do not apply to durables purchased in prior years etc.

[2] Size of dwelling is valued very differently across regions. Gas stove, flushing toilet and other appliances may have different installation and maintenance costs in urban and rural areas, and their production year and quality may vary systematically between urban and rural areas. Assets such as motorcycle may be associated with higher economic status in rural households (i.e., positive factor loading in a rural sample), but lower economic status in urban households (negative factor loading in an urban sample).

facilitate interpretation vis-à-vis real-world distribution of wealth, the index is transformed to be bounded between 0 and 100:

$$\tilde{w} = 100 \times {(w - \min w)}\Big/{(\max w - \min w)} \tag{2}$$

This index measures the relative position of any household, in terms of wealth, in the range between the poorest and the wealthiest households in the population. This transformation keeps relative distances between all scores unchanged, and does not affect the delineation of wealth quantiles. Setting the minimum to 0, implicitly assuming that the lowest true value of wealth in the sample is zero, also facilitates limited comparison of the distributions of wealth, income and consumption, and allows us to compute selected inequality measures, such as the Gini coefficient, aggregate wealth shares, or percentile ratios. In fact, the assumption of the zero-minimum wealth appears plausible given that our analysis considers gross non-depreciated assets and does not account for household debt or future liabilities, and given the high degree of poverty gaps in the MENA region.[3]

Unfortunately, differences in wealth scores across households with different profiles of asset ownership are not amenable to cardinal interpretation. This is because asset loadings derived in PCA do not reflect precisely the real market values of individual asset types, and treat all units of each asset type as having the same value. Nevertheless, the shape of the wealth distribution can be informative of the degree of wealth concentration or polarization within a country. The wealth index can also preserve the correct ranking of households on the wealth scale, and can facilitate their classification into the correct wealth quantile groups.

Women's Labor Supply and Wealth

The standard labor supply model suggests that individuals experience a trade-off between consumption and leisure, both of which are desirable goods. In this model, an increase in the wage rate raises the opportunity cost of leisure and hence induces the individual to raise their supply of labor. At the same time, as the individual's or household's income increases, they can afford to have more leisure, and thus reduce their supply of labor. The balance of these two forces, known as the substitution and income effects, depends on the person's current work status in the labor market. For someone who already has positive labor supply, the net result of the income and substitution effects is ambiguous and needs to be estimated econometrically. For someone who is not working, however, only the substitution effect exists, raising the attractiveness of work as income goes up. Conversely, an increase in unearned income, such as the income of a spouse or income from household assets, would reduce the desire to work, on the extensive margin (participation) as well as the intensive margin (hours worked).

We investigate the extent to which participation of women in the labor market is affected by negative income and wealth effects, positive own wage effects, as well as other family and individual characteristics. We use data on all women aged 15 to 64 who are not currently students. We begin by estimating the probability of participating in the labor force (whether employed or not):

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[3] For example, the lowest-wealth household in the 1998 Egyptian survey owns 25% of capital in a co-owned firm worth 1000-4999LE, and owns a 2-room dwelling of 30m^2 with mud floor, brick and mud walls, wooden roof, water from a well, toilet connected to an indoor tank, and kerosene cooker. It has no other reported assets. The lowest-wealth household in the 2006 Egyptian survey rents a 3-room dwelling of 40m^2 with a wooden roof, brick and mud walls, mud floor, electricity lighting, water tap connected to public network, toilet connected to an indoor tank. The household owns a black-and-white TV, landline phone, small person-pulled cart, selected livestock, but no other assets. Using the transformation in equation 2, these households are modelled as having zero wealth.

$$p_{it} = F\ (\alpha_{rt} + \beta_t Z_{it}) \tag{3}$$

where F is the standard normal cumulative distribution function. p_{it} is a binary variable for being in the labor force during the reference period. α_{rt} are regional fixed effects that control for region-level determinants of participation such as sectoral structure. Z_{it} include other explanatory variables that might affect LFP such as age, age squared, education, marital status, region of residence as well as variables that control for children under 6 and children 7-14, the presence of male wage earners, the total income of male wage earners in the household, and finally our variable of interest, the wealth index.

Next, we rerun this regression after removing the wealth index from the regression as an explanatory variable. Given the way the index is constructed, it allows very little variation between households and this might be problematic for the interpretation. Instead, we run the regression at different quintiles of the wealth distribution for each country/year to determine if there are significant differences in the determinants of labor force participation based on household wealth.

Female Labor Force Participation and Asset Wealth, Conditional on Expected Wage

A key determinant of a woman's desire to work is undoubtedly the wage she expects to earn in the labor market. To generate a complete understanding of the impact of household asset wealth on FLFP, we need to estimate our model after incorporating the wage the woman expects to earn in the labor market as a key explanatory variable. To this end, we estimate the probability of being employed, and the number of hours of employment, conditional on the wage that the woman expects to earn in the labor market, as well as other explanatory and control variables as above, using the following specification:

$$p_{it} = F\ (\alpha_{rt} + \beta_t \widehat{w}_{it} + \gamma_t Z_{it}) \tag{4}$$

where p_{it} is the dependent variable of interest and $\widehat{w}_{it}$ is the expected wage that a female worker expects to make once employed. All other variables are as above.

Actual wages are only observed for those who are employed. We obtain estimates of the expected wage using a standard wage equation estimated after correcting for selection bias, using a standard Heckman Selection Model. Real hourly earnings are regressed on age, age squared, experience, experience squared, education, marital status and region of residence, controlling for self-selection into the sample:

$$\ln w_{it} = \alpha_t + \gamma_t Z_{it} + \ \delta t \lambda_{it} + u_{it} \tag{5}$$

$\lambda_{it}$is the selection term from the Heckman two-step estimator for the probability of being selected into wage employment. The selection equation is the same as equation 4, except that we do not include predicted wage, which is replaced by variables that control for children under 6 and children 7-14, for the presence of another female aged 12 to 64 who can take care of children, and for the presence of a male wage earner in the household, all of which are likely to affect the woman's decision to participate in wage employment regardless of the wage offer:

$$p_{it} = F\ (\alpha_{rt} + \beta_t H_{it} + \gamma_t Z_{it}) \tag{6}$$

Here H_{it} is a vector of variables that includes the controls for children under 6 and children 7-14, for the presence of another female aged 12 to 64 who can take care of children, and for the presence of a male wage earner in the household. The wage model is thus identified on the variables in Z, except for age, education and marital status which appear in both equations 5 and 6.

3. Data

The analysis relies on data from several waves of panel surveys for three MENA countries: Egypt Labor Market Panel Surveys (LMPS) 1998, 2006 and 2012; Jordan LMPS 2010; and Tunisia LMPS 2014, that were obtained from Economic Research Forum's Open Access Micro Data Initiative. To put the surveys in perspective of recent events in the MENA region, the Jordanian survey was administered during January–April 2010, less than a year before protests erupted in Amman in January 2011 over economic conditions in the country and government incompetence. Those protests came on the heels of a revolution in Tunisia in December 2010 that led to a change of government and ushered in democratic changes. In the following months Arab Spring uprisings swept through several MENA region countries. In Egypt, popular revolution started only days after the ousting of the Tunisian president and the events in Jordan. The Egyptian president was also ousted in February 2011, and the secular regime was replaced by an Islamist government led by the Muslim Brotherhood in June 2012. Continued popular protests over both economic and political concerns led to the ousting of the elected president in June 2013, and a new government came to power through a coup d'état. The 2012 Egyptian LMPS was conducted amidst this domestic and region wide flux and uncertainty, during March–June 2012. Tunisian survey was conducted between February and November 2014, a period of political stabilization and pluralist rule after the enactment of a new consensus national constitution.

Labor market panel surveys are suitable for our endeavor as they contain vast information on households' productive as well as non-productive assets, business and farm ownership, and household members' circumstances and outcomes, harmonized across survey waves.

All surveys used here were conducted subject to a multi-stage sampling design stratified at the level of administrative regions. All surveys provide sampling weights, and their samples are nationally representative. Individual waves of Egyptian LMPS are harmonized among themselves, facilitating intertemporal comparison of statistics, and enabling us to follow the evolution of asset ownership and economic conditions over time (Assaad and Krafft 2013; El Enbaby and Galal 2015).

Household assets accounted for here include both private and "public" goods, capturing household-members' individual consumption as well as consumption shared by all household members. Total household wealth rather than wealth per capita is used, for various reasons. One, identity of purchasers, owners and users of assets is not reported in household surveys. Asset holdings are typically surveyed in household modules rather than individual modules of questionnaires. Two, many durables have public-good nature in that they bestow benefits on multiple household members, their use by one member does not diminish the stock available to other household members, and the exact distribution of the benefits is not easy to allocate to individual members. Three, it is unclear what adult-equivalence scale should be used for asset ownership, particularly since there are various classes of assets.

Asset ownership can be categorized into three groups: housing capital (real estate type and size, materials, infrastructure, access to utilities), physical non-productive capital (household durables, appliances), and physical productive capital (transportation, two-way communication, commercial and agricultural capital, livestock, land) (McKenzie 2005; Ward 2014). The value of physical productive capital is adjusted for the household's co-ownership share of this capital, and if the value is in monetary units (i.e., firm ownership), for inflation. Monetary values are converted to year-2012 dollars using currency conversion factors and US GDP-deflator inflation.[4] We study all assets jointly rather than utilize the above classification, because the three indexes would not be related cardinally, and because there are too few asset types in each category to perform PCA successfully.

Table A3 in the Appendix reports the lists of assets included with their range of values in each wave of the Egyptian LMPS, as well as their loadings in the PCA. Tables A4 shows the equivalent statistics for the Jordanian and Tunisian LMPS. These tables make it clear that asset ownership is partially harmonized across waves of the Egyptian surveys, but much less so across countries, particularly for types of housing, construction materials, and commercial and agricultural assets. As a result, we can only infer the degree of relative inequality of wealth within countries. Levels of wealth across countries are not directly comparable.

Several types of capital are notably missing from our analysis, for lack of consistent data. One, household debt and other present or future liabilities (e.g., taxes due) are omitted since these are not available in the surveys. We also do not consider the accumulation of durable non-physical capital, such as social networks, education or other skills (Echevin 2013). Value of households' financial assets (including savings, pension, insurance etc.) is omitted because surveys do not cover them, or too few households report them. Our asset index can thus be thought of as measuring gross physical wealth, or assets that are convertible to cash within several years.

Another problem in the available survey data is missing observations. If a household fails to respond to a single query about the ownership of a single asset, the entire household would be dropped from the PCA. Possible solutions include dropping such households, dropping assets suffering from high item nonresponse, or imputing values of the missing items using information about the households or on the typical rate of ownership of that asset in the population. The first two approaches would exclude valuable information from the calculation of the wealth index in the population. To take advantage of the greatest possible number of household observations and asset types surveyed, we impute missing values: 1) in the case of surveys with multiple waves (ELMPS), using households' ownership of the same asset in adjacent survey waves; and 2) in the absence of ownership information from adjacent waves, using sampling-weights adjusted mean ownership rate across survey households in the same survey wave.

Beside asset ownership, the panel surveys contain information on households' demographics, current income and consumption and various labor-market outcomes. Cross-sectional population weights are used to obtain nationally-representative and cross-survey comparable results. Table 1 shows summary statistics for the samples used in this study by country and year. The sample statistics differ by country and year but we can point out a few important stylized facts. Women in the sample are largely married (64-78%), they have under 5 years of labor market experience on average, and the highest rate of experience prevailed in Egypt in 2006. Most women are at secondary education or below, and Egypt has been witnessing a steady increase in the education attainment of women in the labor force. The mean number of children under six per woman ranges from 0.31 in Tunisia to 0.70 in Jordan, while the mean number of children between 7 and 14 ranges between 0.4 in Tunisia and 0.85 in Jordan. 40 to 65% have at least one male wage earner in their household and about one-half have another female in the house aged 12-64 who might be able to take care of children. In Egypt in 1998, the majority of the sample resided in either Urban Upper Egypt or Cairo; in 2006 and 2012 the majority resided in Urban and Rural Upper Egypt. In Jordan,

[4] Conversion rates are as follows: 1998 Eg. pound: 1.087; 2006 Eg. pound: 1.138; 2012 Eg. pound: 1.795; 2010 Jord. dinar: 0.292; 2014 Tun. dinar: 0.612. (World Bank 2015a,b).

the majority resided in the Middle region while in Tunisia, the majority resided in the Northern and Central Eastern regions.

4. Results

Female Labor Force Participation and Household Wealth

Table 2 presents the results of estimating the probability of labor force participation as in equation 3. We start by showing the results with the asset index included as one of the explanatory variables. The coefficient on assets is negative and highly significant for all countries and rounds. This suggests that all else equal, the higher the wealth index of a household, the less likely that women in that household would participate in the labor force. This result holds even when the presence of a male wage worker in the household is accounted for. This suggests that household asset wealth has an impact on women's decision to enter the labor market, over and above the impact of a spouse's income. The coefficient on the male wage worker indicator variable is also of interest. In Egypt in 2006 and 2012 it is negative and significant implying that women who had a male worker in the household were less likely to participate in the labor market due to a substitution effect. In Jordan and Tunisia, however, the opposite is true. Complementarity is found between male and female work in these two countries. This finding will be further examined in the next section to determine whether the effect differs by wealth quintile.

In a different specification (not shown to save on space), we included the log total male monthly income as an explanatory variable. When this was included with the indicator variable for the presence of a male worker in the household, however, both were insignificant. When log total male monthly income was included without the indicator variable for the presence of a male worker in the household, its coefficients were all negative and significant, but the sample sizes were reduced dramatically since not all male workers have wage income. Additionally, the coefficient in the wealth index remained negative and significant for all years and countries. We have chosen not to report results accounting for the log male monthly income since using it reduces the sample size significantly and does not affect the coefficients on any of the other variables of interest.

Several other notable results were identified. Being married is associated highly negatively with LFP. As expected, LFP is more likely the more highly educated the woman is. Having children under the age of 6 reduced LFP, while having children 7 to 14 has a positive impact in Egypt. Having another female in the household to take care of young children may facilitate women's LFP. The coefficient on this variable is positive and significant for Egypt and Tunisia.

Controls for the region of residence suggest that in Egypt, living in Alexandria or the Suez Canal cities was associated negatively with LFP (in 1998 only), compared to the omitted reference category, Greater Cairo. Living in Upper Egypt or Lower Egypt (Rural and Urban) was associated with a higher female LFP rate compared to the Greater Cairo reference region in all years. In Jordan, women who lived in Jordan-South were more likely to participate in the labor force compared to the reference, Jordan Middle, while in Tunisia, living in the North West, Center East or South West was associated with a higher female LFP rate compared to the North, while living in the Center West is associated with lower LFP.

Tables 3 to 7 show the results of estimating the LFP model by wealth quintile. Results are largely similar to those discussed above about Table 2. The main coefficient of interest is that on the control for a male wage worker. The sign of the coefficient switches from negative at low wealth levels for all surveys and years, to positive and significant at higher wealth quintiles, starting in either the third, fourth or fifth quintile, depending on country and year. These results support the U-curve feminization hypothesis suggesting that women's labor force participation at first declines and then increases as the economy grows and develops (Goldin 1994, Mammen and Paxson 2000). Analogous arguments can be made with regard to household wealth.

At low levels of wealth, the combination of the negative income effect and the social stigma against work outside the home result in lower female labor force participation. In the lower wealth quintiles we would expect men's education levels and hence their income to be higher than women's. This leads to a combination of fewer and less lucrative job opportunities for women compared to men, and higher male income that reduces the woman's need for work given the existence of this unearned income. Thus, the negative income effect (due to unearned income), dominates the positive substitution effect (from female wages) especially given the social stigma of work at these low levels of wealth and social status. At higher levels of wealth, however, women are likely to be much better educated, informed and connected and hence their job and income prospects from their own work will be higher. Jobs that require a higher level of education such as civil servants, teachers, doctors or engineers are deemed "respectable" and hence much more acceptable socially. We thus see that at higher wealth quintiles the positive substitution effect dominates the negative income effect, and women's labor force participation is associated positively with male work.

Estimating the Elasticity of Expected Wages on LFP and Work Hours

This analysis would not be complete without examining the impact of wealth on FLFP after accounting for own expected wages as explained above. We first impute the expected wage using a standard wage equation estimated after correcting for self-selection bias. The results of the Heckman Maximum Likelihood wage and participation equations are presented in Table A5 in the appendix. These results are fairly typical and will not be discussed further here.

Table 8 presents results of the structural equation for labor force participation (equation 4 above) with the estimated expected wage as an explanatory variable. For all countries the marginal effect of the predicted own wage has a positive and significant effect. This clearly indicates that the higher the earning potential, the higher the labor market participation of women. For Egypt this effect rose between 1998 and 2006 and then fell between 2006 and 2012. This might be explained by the eventual increase in women's attachment to the labor market and hence reduction in the impact of wages per se. (See also Klasen and Pieters 2013, for a similar finding for India.)

The effect of unearned income as represented by our wealth index is still negative and significant, indicating the rise in the income effect as wealth increases. The coefficient on having a male worker in the household, however, has a positive and significant coefficient. This is unexpected but can be explained by also including the male monthly income in the regressions (not shown to save on space). When we include the latter variable, its coefficients are always negative and significant, once again in line with the unearned income impact on participation as hypothesized earlier (the sample size does fall considerably though when this variable is included). Thus, it seems that unearned income in the form of either wealth or male income do indeed have a negative impact on participation, while having a male wage worker in the household has a positive impact. A plausible explanation for the latter result could be that having an employed male household member makes employment outside the house more acceptable from a social perspective and also allows for network effects that make it easier for women to find better employment.

Tables 9 through 13 report the results of the same structural equation for labor force participation estimated by quintile for each survey wave. The results are largely similar to those in Table 8, most notably that the elasticity of own wage is always positive and highly significant at all wealth quintiles for all countries and years. For Egypt 1998 and 2006, and Jordan 2010, the coefficient on having a male worker in the household is positive and significant only in the higher quintiles. This supports the hypothesis described above of male workers in the household providing networking support to help women find gainful employment. The same is true for Tunisia across all quintiles. For Egypt 2012 the situation is different though: at the lowest quintiles having a male worker is associated with lower female labor force participation. This suggests that more recently the negative income effect in Egypt has become stronger. Additionally, the weaker networking ability especially among males at the lowest wealth quintiles may have reduced their ability to help their female family members with finding good employment. The events of the Arab Spring have generally been associated with lower female participation as good jobs have become scarcer in the economy due to the continued economic challenges facing Egypt.

We further estimate a structural-form equation of hours worked to examine the impact of own wage and unearned income and wealth on hours. Results are presented in Table 14. The elasticity of hours of work to own wage is negative and significant for Egypt, positive and significant for Jordan and not significant in Tunisia. This implies that in Egypt the income effect is stronger than the substitution effect: as wages go up, women prefer to work fewer hours. In Jordan, on the other hand, the substitution effect is stronger, with women raising their hours of work in response to higher wages. There is no significant effect for Tunisia. The impact of having a male worker in the household and the wealth index are both much smaller and only significant in 1998, and in 2012, respectively. Both have a positive estimated effect.

Results from analogous quintile regressions do not show significant differences across wealth quintiles. These results are largely similar to those reported in Table 14 for each survey wave, and are therefore omitted to save on space.

Wealth Inequality and Female Labor Force Participation

An important issue related to the impact of wealth on females' desire to participate in the labor market is the impact of overall economic inequality on their participation. We can expect that rising wealth inequality in the society will discourage women from engaging in paid employment. To examine this hypothesis, we compute a measure of wealth inequality using our constructed wealth indices. Recall that these wealth indices are constructed such that they have zero mean across all households. Measures of inequality, such as the Gini coefficient and Atkinson, Theil and Generalized entropy indices, involve division by the mean, and hence will not be defined for the sample as a whole. We follow McKenzie (2005) in constructing a relative measure of asset inequality. Let σ_c be the sample standard deviation of the first principal component score from the constructed wealth index for community C. Let λ be the eigenvalue corresponding to the first principal component, as well as the variance of the principal component scores over the whole sample. Let us define a measure of relative inequality, I_c, as the standard deviation of the first principal component in a given community of interest relative to the standard deviation in the sample as a whole.

$$I_c=\frac{\sigma_c}{\sqrt{\lambda}} \tag{7}$$

I_c will be greater than one if community c displays more inequality within it than does the survey population as a whole. McKenzie (2005) showed that I_c satisfies many of the commonly accepted desirable properties of an inequality measure. For our purposes, I_c is calculated for each country at the governorate level. Table A4 in the appendix reports the values of this inequality measure by governorate and year.

Our final results are presented in Table 15, reporting on probit regressions of female labor force participation accounting for the effect of wealth inequality, I_c. The coefficient on the inequality of wealth measure is only significant for Egypt 1998 and 2012. In 1998 it is negative indicating that governorates with higher inequality had lower female labor force participation, as we hypothesized above. In 2012, however, the opposite is true. The positive coefficient might be a sign that in governorates with higher inequality, workers with the right connections, education level and social status (wealth) were more likely to participate in the labor market if they felt they were going to be rewarded adequately. For the remainder of the survey waves the coefficient is also negative but insignificant. This preliminary analysis requires further study, especially given the difference in results across years. In follow-up research we explore additional measures of wealth inequality and we also incorporate measures of inequality in income and consumption to examine whether these alternative measures of welfare inequality have a significant relation to female labor force participation.

5. Summary and Conclusion

Female Labor Force Participation Rates in the MENA region are extremely low by world standards, despite a steady increase in women's educational attainment in the region to almost match that of their male counterparts. In the standard labor supply model, women are likely to raise their supply of labor in the market as the wage rate they expect to earn rises. This is the well-known substitution effect. However, an increase in unearned income, such as the income of a spouse or the level of household wealth, would reduce the desire to work (income effect) and result in the backward bending supply curve. In this paper we investigated the effect wealth and wealth inequality on women's labor supply in three MENA countries.

We first constructed an index of wealth based on household ownership of productive and non-productive assets, using Principal Component Analysis. We then investigated the extent to which participation of women in the labor market is affected by negative income and wealth effects, positive own wage effects, as well as other family and individual characteristics. We found that the higher the wealth index of a household, the less likely that women in that household would participate in the labor force. This result holds even when the presence of a male wage worker in the household is accounted for and also when own expected wage is included as an explanatory variable. Performing the analysis by wealth quintile we found that at low levels of wealth, the negative income effect dominates, resulting in lower female labor force participation when a male wage worker is present, and that this result is reversed at the highest quintiles. Finally, we investigated the relationship between wealth inequalities within countries and FLFP. We found that the regional degree of wealth inequality has bearing on women's labor force participation, but the results differ between countries and over time.

The results in this paper suggest that wealth, as measured by ownership of household assets does indeed have a significant impact on women's participation in the labor market. This impact is robust to including own expected wage and the presence of a male wage worker in the household. These results lend support to the extension of Ross' s hypothesis (Ross 2008, 2012), that MENA's extremely low FLFP rates is closely related to its wealth, to other types of wealth, not just oil wealth**.**

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Table 1: Sample Statistics for working age females (15-64) who are not students, by round and country

Variable	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
	EGYPT 1998					EGYPT 2006					EGYPT 2012				
Hourly Wage	1,012	1.71	3.02	0.13	79.12	1,548	2.66	3.37	0.06	83.33	1,762	6.42	8.39	0.41	230.77
Age	6,307	36.54	12.94	15	64	10,503	35.38	13.21	15	64	13,440	35.7	12.83	15	64
Age squared	6,307	15.03	10.02	2.25	40.96	10,503	14.26	10.26	2.25	40.96	13,440	14.4	10.17	2.25	40.96
Experience	6,307	3.88	8.74	0	55.00	10,503	5.40	10.67	0.00	58.00	13,440	4.84	10.27	0	56
Experience squared	6,307	0.91	2.82	0	30.25	10,503	1.43	3.84	0.00	33.64	13,440	1.29	3.68	0	31.36
Married	6,307	0.68	0.46	0	1	10,503	0.71	0.45	0	1	13,440	0.78	0.42	0	1
Divorced	6,307	0.02	0.13	0	1	10,503	0.02	0.13	0	1	13,440	0.02	0.14	0	1
Widowed	6,307	0.10	0.30	0	1	10,503	0.09	0.28	0	1	13,440	0.08	0.27	0	1
Read & Write	6,307	0.08	0.27	0	1	10,503	0.04	0.21	0	1	13,440	0.03	0.17	0	1
Basic	6,307	0.14	0.34	0	1	10,503	0.13	0.33	0	1	13,440	0.14	0.35	0	1
Secondary	6,307	0.21	0.41	0	1	10,503	0.28	0.45	0	1	13,440	0.31	0.46	0	1
Post Secondary	6,307	0.05	0.21	0	1	10,503	0.04	0.20	0	1	13,440	0.03	0.17	0	1
Univ & above	6,307	0.09	0.28	0	1	10,503	0.12	0.33	0	1	13,440	0.15	0.35	0	1
Num Children <6	6,307	0.48	0.79	0	4	10,503	0.50	0.78	0	4	13,440	0.59	0.83	0	5
Num Children 7-14	6,307	0.79	1.02	0	5	10,503	0.53	0.86	0	6	13,440	0.49	0.81	0	5
Female 12-64 present	6,307	0.66	0.47	0	1	10,503	0.56	0.50	0	1	13,440	0.44	0.50	0	1
Male Wage Earner	6,307	0.65	0.48	0	1	10,503	0.61	0.49	0	1	13,440	0.63	0.48	0	1
Log monthly male income	4,165	5.5	0.7	2	8.1	6,509	5.8	0.7	1.5	9.2	8,598	5.7	0.7	1.4	9.2
Asset Wealth Index	6,307	36.78	15.15	0	100	10,503	41.85	10.17	0	100	13,440	32.7	9.96	0	100
GCairo	6,307	0.19	0.39	0	1	10,503	0.15	0.36	0	1	13,440	0.12	0.32	0	1
Alex_Suez	6,307	0.12	0.33	0	1	10,503	0.11	0.31	0	1	13,440	0.09	0.28	0	1
ULEgypt	6,307	0.16	0.37	0	1	10,503	0.13	0.34	0	1	13,440	0.11	0.32	0	1
UUEgypt	6,307	0.20	0.40	0	1	10,503	0.25	0.43	0	1	13,440	0.27	0.45	0	1
RLEgypt	6,307	0.17	0.38	0	1	10,503	0.15	0.35	0	1	13,440	0.14	0.34	0	1
RUEgypt	6,307	0.15	0.36	0	1	10,503	0.21	0.41	0	1	13,440	0.28	0.45	0	1

Variable	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
	JORDAN 2010					TUNISIA 2014				
Hourly Wage	900	2.90	7.37	0.04	120.00	376	3.13	6.35	0.10	104
Age	6,061	35.95	11.95	15	64	4,966	39.85	13.05	15	64
Age squared	6,061	14.35	9.39	2.25	40.96	4,966	17.58	10.65	2.25	40.96
Experience	6,061	3.89	8.52	0	54	4,966	3.46	8.64	0	58
Experience squared	6,061	0.88	2.69	0	29.16	4,966	0.87	2.94	0	33.64
Married	6,061	0.70	0.46	0	1	4,966	0.64	0.48	0	1
Divorced	6,061	0.02	0.14	0	1	4,966	0.01	0.12	0	1
Widowed	6,061	0.05	0.22	0	1	4,966	0.04	0.20	0	1
Read & Write	6,061	0.11	0.31	0	1	4,966	0.14	0.34	0	1
Basic	6,061	0.35	0.48	0	1	4,966	0.26	0.44	0	1
Secondary	6,061	0.16	0.37	0	1	4,966	0.07	0.25	0	1
Post Secondary	6,061	0.13	0.33	0	1	4,966	0.03	0.18	0	1
Univ & above	6,061	0.14	0.35	0	1	4,966	0.04	0.20	0	1
Num Children under 6	6,061	0.70	0.95	0	5	4,966	0.31	0.65	0	4
Num Children 7-14	6,061	0.85	1.13	0	7	4,966	0.40	0.74	0	4
Female 12-64 present	6,061	0.57	0.50	0	1	4,966	0.55	0.50	0	1
Male Wage Earner	6,061	0.64	0.48	0	1	4,966	0.40	0.49	0	1
Log monthly male income	3,922	6.42	0.77	1.8	12.04	1,345	6.19	0.704	0.1	8.21
Asset Wealth Index	6,061	38.74	12.86	0	100	4,966	33.24	14.75	0.00	100
Jord_Middle	6,061	0.51	0.50	0	1					
Jord_North	6,061	0.33	0.47	0	1					
Jord_South	6,061	0.16	0.36	0	1					
Tun_North						4,966	0.30	0.46	0	1
Tun_CE						4,966	0.23	0.42	0	1
Tun_NW						4,966	0.14	0.35	0	1
Tun_CW						4,966	0.18	0.38	0	1
Tun_SE						4,966	0.10	0.31	0	1
Tun_SW						4,966	0.05	0.22	0	1

Table 2: Probit Regressions for Labor Force Participation

VARIABLES	(1) Egypt 1998	(2) Egypt 2006	(3) Egypt 2012	(4) Jordan 2010	(5) Tunisia 2014
Age	0.119***	0.137***	0.115***	0.139***	0.063***
	(0.012)	(0.008)	(0.008)	(0.015)	(0.012)
Age squared	-0.144***	-0.160***	-0.133***	-0.187***	-0.082***
	(0.015)	(0.010)	(0.010)	(0.020)	(0.014)
Married	-0.899***	-0.691***	-0.410***	-0.979***	-0.289***
	(0.071)	(0.048)	(0.047)	(0.071)	(0.066)
Divorced	-0.152	-0.260**	-0.114	-0.074	0.181
	(0.147)	(0.107)	(0.092)	(0.137)	(0.167)
Widowed	-0.708***	-0.562***	-0.293***	-0.740***	0.079
	(0.104)	(0.072)	(0.069)	(0.138)	(0.121)
Read&Write	-0.027	-0.204***	0.073	-0.020	0.175***
	(0.093)	(0.079)	(0.084)	(0.115)	(0.067)
Basic	0.224***	-0.073	0.061	0.020	0.528***
	(0.073)	(0.053)	(0.048)	(0.099)	(0.057)
Secondary	1.616***	0.878***	0.849***	0.366***	0.949***
	(0.062)	(0.041)	(0.039)	(0.105)	(0.086)
Post Secondary	2.065***	1.214***	1.143***	1.153***	1.566***
	(0.096)	(0.073)	(0.072)	(0.103)	(0.117)
Univ & above	2.285***	1.589***	1.695***	1.892***	1.946***
	(0.087)	(0.056)	(0.050)	(0.109)	(0.116)
Number of children under 6	-0.043	-0.088***	-0.059***	-0.064**	-0.143***
	(0.029)	(0.021)	(0.018)	(0.029)	(0.041)
Number of children 7 to 14	0.045**	0.058***	0.004	0.001	-0.052*
	(0.021)	(0.017)	(0.017)	(0.021)	(0.031)
Another female aged 12 to 64 present	0.002	0.154***	0.062**	-0.016	0.214***
	(0.047)	(0.034)	(0.030)	(0.057)	(0.049)
Male wage worker present	-0.053	-0.072**	-0.103***	0.161***	0.119***
	(0.043)	(0.029)	(0.026)	(0.047)	(0.044)
Asset wealth index	**-0.012*** **	**-0.015*** **	**-0.019*** **	**-0.004** **	**-0.011*** **
	(0.002)	**(0.002)**	**(0.002)**	**(0.002)**	**(0.002)**
Jord_North				0.053	
				(0.049)	
Jord_South				0.456***	
				(0.059)	
Tun_NW					0.353***
					(0.072)
Tun_CE					0.210***
					(0.058)
Tun_CW					-0.200***

					(0.074)
Tun_SE					-0.042
					(0.077)
Tun_SW					0.226**
					(0.096)
Alex_Suez	-0.193***	0.011	0.050		
	(0.075)	(0.057)	(0.057)		
ULEgypt	0.199***	0.174***	0.258***		
	(0.068)	(0.053)	(0.053)		
UUEgypt	0.146**	0.253***	0.154***		
	(0.069)	(0.053)	(0.053)		
RLEgypt	0.128*	0.117**	0.294***		
	(0.072)	(0.051)	(0.049)		
RUEgypt	-0.059	0.500***	0.001		
	(0.084)	(0.056)	(0.056)		
Constant	-2.522***	-2.638***	-2.569***	-3.101***	-1.789***
	(0.217)	(0.162)	(0.159)	(0.271)	(0.230)
Observations	6,307	10,503	13,440	6,061	4,966

Dependent variable: binary variable if the woman is in the labor force over the previous three months according to market definition (search not required); Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3 Probit Regressions for Labor Force Participation, by wealth quintile, Egypt 1998

Quintile VARIABLES	(1)	(2)	(3)	(4)	(5)
Age	0.102***	0.126***	0.103***	0.144***	0.167***
	(0.022)	(0.028)	(0.035)	(0.037)	(0.028)
Age squared	-0.134***	-0.164***	-0.123***	-0.167***	-0.188***
	(0.029)	(0.037)	(0.046)	(0.048)	(0.034)
Married	-0.684***	-0.785***	-1.012***	-1.092***	-1.318***
	(0.126)	(0.155)	(0.191)	(0.208)	(0.166)
Divorced	-0.018	0.022	-0.148	-0.121	-0.549
	(0.257)	(0.292)	(0.448)	(0.491)	(0.346)
Widowed	-0.501***	-0.573**	-0.750**	-1.000***	-0.961***
	(0.189)	(0.237)	(0.297)	(0.303)	(0.227)
Read&Write	0.086	-0.063	-0.527	-0.031	0.165
	(0.156)	(0.199)	(0.329)	(0.247)	(0.273)
Basic	0.155	0.131	0.307*	0.109	0.501**
	(0.147)	(0.152)	(0.181)	(0.201)	(0.211)
Secondary	1.598***	1.497***	1.754***	1.770***	1.852***
	(0.128)	(0.135)	(0.170)	(0.167)	(0.185)
PostSecondary	1.921***	2.119***	2.035***	2.366***	2.245***
	(0.483)	(0.288)	(0.267)	(0.231)	(0.207)
Univabove	2.094***	2.864***	2.803***	2.166***	2.477***
	(0.439)	(0.546)	(0.334)	(0.207)	(0.189)
Number of children under 6	0.004	-0.001	0.046	-0.127	-0.115
	(0.049)	(0.063)	(0.082)	(0.081)	(0.072)
Number of children 7 to 14	0.022	0.065	0.214***	0.040	0.001
	(0.037)	(0.046)	(0.065)	(0.062)	(0.050)
Another female aged 12to 64 present	-0.141	0.032	0.003	-0.068	0.086
	(0.096)	(0.114)	(0.140)	(0.131)	(0.089)
Male wage worker present	-0.376***	-0.311***	-0.049	0.156	0.383***
	(0.081)	(0.107)	(0.125)	(0.114)	(0.085)
Alex_Suez	0.085	-0.340	-0.420**	0.085	-0.196*
	(0.484)	(0.226)	(0.201)	(0.164)	(0.111)
ULEgypt	0.369	0.052	0.137	0.489***	0.149
	(0.380)	(0.191)	(0.168)	(0.148)	(0.122)
UUEgypt	0.384	-0.053	0.079	0.193	0.313***
	(0.357)	(0.201)	(0.191)	(0.177)	(0.111)
RLEgypt	0.545	-0.103	-0.001	-0.020	0.003
	(0.352)	(0.186)	(0.187)	(0.200)	(0.196)
RUEgypt	0.257	-0.270	-0.216	0.157	-0.005
	(0.351)	(0.215)	(0.276)	(0.285)	(0.268)
Constant	-2.472***	-2.560***	-2.818***	-3.770***	-4.495***
	(0.485)	(0.502)	(0.612)	(0.644)	(0.523)
Observations	1,747	1,168	933	970	1,489

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 4 Probit Regressions for Labor Force Participation, by wealth quintile, Egypt 2006

Quintiles VARIABLES	(1)	(2)	(3)	(4)	(5)
Age	0.092***	0.100***	0.184***	0.171***	0.229***
	(0.014)	(0.018)	(0.021)	(0.023)	(0.026)
Age squared	-0.113***	-0.116***	-0.219***	-0.191***	-0.263***
	(0.018)	(0.024)	(0.028)	(0.029)	(0.032)
Married	-0.222***	-0.636***	-1.089***	-1.165***	-1.184***
	(0.082)	(0.106)	(0.122)	(0.130)	(0.148)
Divorced	-0.407**	0.179	-0.500**	-0.364	-0.398
	(0.198)	(0.226)	(0.254)	(0.274)	(0.352)
Widowed	-0.202	-0.539***	-0.760***	-0.953***	-0.731***
	(0.124)	(0.159)	(0.176)	(0.199)	(0.218)
Read&Write	-0.305**	-0.168	0.136	-0.289	0.118
	(0.129)	(0.166)	(0.176)	(0.249)	(0.329)
Basic	-0.111	-0.065	0.296**	-0.076	-0.014
	(0.090)	(0.112)	(0.123)	(0.164)	(0.219)
Secondary	0.504***	0.856***	1.099***	1.240***	1.558***
	(0.074)	(0.086)	(0.105)	(0.129)	(0.173)
PostSecondary	0.474	1.365***	1.389***	1.394***	1.802***
	(0.346)	(0.187)	(0.172)	(0.163)	(0.199)
Univabove	1.185***	1.472***	1.720***	1.852***	2.135***
	(0.283)	(0.157)	(0.134)	(0.143)	(0.176)
Number of children under 6	0.019	-0.111**	-0.128**	-0.154***	-0.184***
	(0.035)	(0.048)	(0.050)	(0.057)	(0.063)
Number of children 7 to 14	0.034	0.098**	0.046	-0.004	-0.040
	(0.027)	(0.039)	(0.045)	(0.051)	(0.051)
Another female aged 12to 64 present	0.145**	0.094	0.108	0.167*	0.060
	(0.061)	(0.075)	(0.085)	(0.090)	(0.087)
Male wage worker present	-0.279***	-0.118*	-0.114	0.211***	0.348***
	(0.052)	(0.065)	(0.071)	(0.079)	(0.077)
Alex_Suez	0.849*	-0.184	-0.060	-0.118	0.316***
	(0.503)	(0.198)	(0.131)	(0.108)	(0.101)
ULEgypt	0.549	0.106	0.261**	0.334***	0.224*
	(0.450)	(0.159)	(0.110)	(0.103)	(0.115)
UUEgypt	0.835*	0.168	0.275**	0.116	0.340***
	(0.430)	(0.155)	(0.129)	(0.121)	(0.099)
RLEgypt	0.539	0.076	0.370***	0.269**	0.407**
	(0.428)	(0.139)	(0.110)	(0.124)	(0.172)
RUEgypt	0.987**	0.309**	0.523***	0.208	0.700***
	(0.427)	(0.147)	(0.142)	(0.187)	(0.202)
Constant	-2.742***	-2.526***	-4.090***	-4.184***	-5.659***
	(0.482)	(0.338)	(0.378)	(0.418)	(0.488)
Observations	2,830	2,254	2,057	1,724	1,638

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 5 Probit Regressions for Labor Force Participation, by wealth quintile, Egypt 2012

Quintiles VARIABLES	(1)	(2)	(3)	(4)	(5)
Age	0.088***	0.096***	0.132***	0.107***	0.160***
	(0.015)	(0.020)	(0.021)	(0.020)	(0.017)
Age squared	-0.111***	-0.114***	-0.163***	-0.124***	-0.176***
	(0.019)	(0.025)	(0.028)	(0.026)	(0.022)
Married	0.178*	-0.117	-0.492***	-0.871***	-0.974***
	(0.094)	(0.121)	(0.133)	(0.120)	(0.096)
Divorced	0.058	0.275	0.110	-0.631**	-0.430**
	(0.197)	(0.247)	(0.219)	(0.251)	(0.170)
Widowed	0.176	0.066	-0.139	-0.752***	-0.702***
	(0.136)	(0.169)	(0.187)	(0.184)	(0.142)
Read&Write	0.239	-0.072	0.165	0.100	0.249
	(0.152)	(0.202)	(0.180)	(0.211)	(0.266)
Basic	0.122	0.001	0.024	-0.002	0.456***
	(0.089)	(0.110)	(0.122)	(0.125)	(0.154)
Secondary	0.451***	0.743***	0.863***	0.962***	1.361***
	(0.079)	(0.088)	(0.095)	(0.099)	(0.127)
PostSecondary	0.183	1.171***	1.189***	1.272***	1.541***
	(0.343)	(0.234)	(0.195)	(0.165)	(0.150)
Univabove	1.507***	1.456***	1.745***	1.792***	1.991***
	(0.217)	(0.161)	(0.135)	(0.116)	(0.128)
Number of children under 6	-0.012	-0.044	-0.006	-0.045	-0.153***
	(0.038)	(0.045)	(0.047)	(0.041)	(0.038)
Number of children 7 to 14	0.037	0.006	-0.007	-0.003	-0.083**
	(0.031)	(0.043)	(0.046)	(0.039)	(0.038)
Another female aged 12to 64 present	0.184***	-0.022	0.028	0.046	-0.096
	(0.060)	(0.076)	(0.082)	(0.077)	(0.061)
Male wage worker present	-0.322***	-0.172**	-0.072	-0.060	0.167***
	(0.054)	(0.070)	(0.074)	(0.064)	(0.051)
Alex_Suez	0.244	-0.035	0.037	0.038	0.091
	(0.524)	(0.348)	(0.242)	(0.130)	(0.071)
ULEgypt	0.136	0.291	0.260	0.285**	0.445***
	(0.406)	(0.272)	(0.199)	(0.115)	(0.073)
UUEgypt	0.064	-0.100	-0.137	0.153	0.428***
	(0.356)	(0.248)	(0.201)	(0.126)	(0.073)
RLEgypt	-0.057	0.078	0.270	0.536***	0.584***
	(0.351)	(0.237)	(0.186)	(0.109)	(0.081)
RUEgypt	-0.166	-0.298	-0.234	0.155	0.140
	(0.349)	(0.238)	(0.195)	(0.139)	(0.156)
Constant	-2.414***	-2.713***	-3.340***	-2.924***	-4.451***
	(0.447)	(0.424)	(0.414)	(0.351)	(0.331)
Observations	2,830	2,277	2,169	2,666	3,498

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 6 Probit Regressions for Labor Force Participation, by wealth quintile, Jordan 2010

Quintiles VARIABLES	(1)	(2)	(3)	(4)	(5)
Age	0.067**	0.197***	0.148***	0.223***	0.148***
	(0.027)	(0.039)	(0.036)	(0.039)	(0.042)
Age squared	-0.059*	-0.288***	-0.213***	-0.302***	-0.196***
	(0.035)	(0.057)	(0.050)	(0.053)	(0.054)
Married	-1.070***	-0.863***	-0.680***	-0.972***	-1.406***
	(0.160)	(0.162)	(0.155)	(0.160)	(0.194)
Divorced	-0.961***	0.206	0.377	0.496	-0.210
	(0.323)	(0.275)	(0.318)	(0.355)	(0.496)
Widowed	-1.042***	-0.403	-0.591*	-0.997***	-0.933**
	(0.267)	(0.321)	(0.314)	(0.351)	(0.410)
Read&Write	0.165	0.467*	-0.724**	-0.022	3.273
	(0.174)	(0.266)	(0.333)	(0.379)	(119.651)
Basic	0.138	0.077	-0.261	0.407	3.564
	(0.166)	(0.252)	(0.250)	(0.311)	(119.650)
Secondary	0.507***	0.599**	-0.008	0.522	4.075
	(0.195)	(0.260)	(0.259)	(0.320)	(119.650)
PostSecondary	1.109***	1.417***	0.879***	1.441***	4.663
	(0.205)	(0.258)	(0.253)	(0.310)	(119.650)
Univabove	1.849***	1.923***	1.396***	2.273***	5.658
	(0.263)	(0.275)	(0.259)	(0.317)	(119.650)
Number of children under 6	-0.015	-0.158**	0.038	-0.190***	0.014
	(0.066)	(0.064)	(0.059)	(0.071)	(0.085)
Number of children 7 to 14	0.123***	-0.060	-0.135***	-0.027	0.099
	(0.044)	(0.049)	(0.046)	(0.050)	(0.063)
Another female aged 12to 64 present	-0.127	-0.106	0.250*	-0.036	0.061
	(0.128)	(0.132)	(0.130)	(0.125)	(0.146)
Male wage worker present	0.114	-0.010	-0.026	0.288***	0.500***
	(0.107)	(0.110)	(0.104)	(0.107)	(0.118)
Jord_North	-0.079	0.274**	0.010	-0.035	0.130
	(0.109)	(0.109)	(0.107)	(0.113)	(0.131)
Jord_South	0.054	0.590***	0.600***	0.536***	0.791***
	(0.141)	(0.130)	(0.117)	(0.135)	(0.209)
Constant	-2.311***	-4.083***	-3.128***	-4.866***	-7.305
	(0.515)	(0.670)	(0.614)	(0.746)	(119.652)
Observations	1,202	1,374	1,331	1,197	957

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 7 Probit Regressions for Labor Force Participation, by wealth quintile, Tunisia 2014

VARIABLES	(1)	(2)	(3)	(4)	(5)
Age	0.039**	0.051**	0.068**	0.108***	0.096**
	(0.019)	(0.024)	(0.031)	(0.035)	(0.041)
Age squared	-0.051**	-0.067**	-0.091**	-0.148***	-0.120**
	(0.023)	(0.030)	(0.039)	(0.043)	(0.050)
Married	-0.006	-0.375***	-0.507***	-0.462**	-0.536***
	(0.118)	(0.135)	(0.164)	(0.181)	(0.196)
Divorced	-0.858*	0.631**	0.366	0.005	0.162
	(0.502)	(0.306)	(0.369)	(0.433)	(0.580)
Widowed	0.459**	0.010	-0.736*	-0.166	0.140
	(0.198)	(0.244)	(0.398)	(0.344)	(0.417)
Read&Write	0.248**	0.264**	0.175	0.037	0.178
	(0.117)	(0.130)	(0.178)	(0.193)	(0.278)
Basic	0.403***	0.530***	0.710***	0.413***	0.867***
	(0.105)	(0.120)	(0.145)	(0.155)	(0.201)
Secondary	0.832***	1.257***	0.745***	0.859***	1.263***
	(0.218)	(0.213)	(0.204)	(0.202)	(0.217)
PostSecondary	1.404***	1.529***	1.695***	1.591***	1.641***
	(0.358)	(0.290)	(0.306)	(0.257)	(0.244)
Univabove	1.203***	2.705***	2.457***	2.075***	1.825***
	(0.320)	(0.516)	(0.362)	(0.256)	(0.233)
Number of children under 6	-0.130*	-0.182**	-0.210**	-0.170	0.025
	(0.072)	(0.081)	(0.107)	(0.105)	(0.127)
Number of children 7 to 14	-0.091*	0.082	-0.006	-0.111	-0.169*
	(0.051)	(0.069)	(0.078)	(0.099)	(0.092)
Another female aged 12to 64 present	0.235***	0.238**	0.070	0.362***	0.092
	(0.084)	(0.102)	(0.130)	(0.136)	(0.140)
Male wage worker present	-0.076	0.101	0.248**	0.239**	0.251**
	(0.081)	(0.094)	(0.113)	(0.117)	(0.125)
Tun_NW	0.285**	0.367***	0.095	0.600**	0.477
	(0.134)	(0.138)	(0.219)	(0.284)	(0.343)
Tun_CE	0.071	0.240**	0.225*	0.513***	0.061
	(0.143)	(0.117)	(0.135)	(0.143)	(0.150)
Tun_CW	-0.263*	-0.454**	0.066	0.251	-0.032
	(0.134)	(0.187)	(0.219)	(0.245)	(0.297)
Tun_SE	-0.058	-0.057	-0.103	-0.060	-0.084
	(0.180)	(0.143)	(0.184)	(0.176)	(0.258)
Tun_SW	0.412*	0.188	-0.040	0.269	0.372
	(0.217)	(0.188)	(0.234)	(0.252)	(0.252)
Constant	-1.598***	-1.872***	-2.211***	-3.031***	-3.063***
	(0.396)	(0.471)	(0.591)	(0.652)	(0.762)
Observations	1,614	1,115	820	778	639

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 8 Probit Regressions of Labor Force Participation, with expected wage, Marginal Effects

	(1)	(2)	(3)	(4)	(5)
VARIABLES	**EG98**	**EG06**	**EG12**	**JO10**	**TU14**
Expected ln wage	0.749***	1.043***	0.886***	0.661***	1.711***
	(0.025)	(0.021)	(0.017)	(0.027)	(0.070)
Male wage worker present	0.081***	0.076***	-0.033***	0.028***	0.180***
	(0.012)	(0.010)	(0.008)	(0.009)	(0.015)
Asset Wealth Index	-0.003***	-0.004***	-0.004***	-0.001***	-0.003***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)
Age	0.035***	0.024***	0.050***	0.084***	-0.077***
	(0.003)	(0.003)	(0.002)	(0.004)	(0.005)
Age squared	-0.066***	-0.064***	-0.081***	-0.124***	0.070***
	(0.004)	(0.004)	(0.003)	(0.005)	(0.006)
Read & Write	-0.012	0.279***	-0.135***	-0.007	0.018
	(0.026)	(0.029)	(0.027)	(0.023)	(0.021)
Basic	-0.128***	-0.211***	-0.378***	-0.047**	-0.015
	(0.021)	(0.019)	(0.017)	(0.019)	(0.019)
Secondary	0.062***	-0.161***	-0.251***	-0.136***	-0.629***
	(0.018)	(0.016)	(0.014)	(0.022)	(0.044)
PostSecondary	-0.022	-0.228***	-0.258***	-0.207***	-1.428***
	(0.028)	(0.026)	(0.023)	(0.025)	(0.082)
Univabove	-0.157***	-0.366***	-0.390***	-0.334***	-1.590***
	(0.030)	(0.023)	(0.021)	(0.032)	(0.091)
Married	-0.341***	-0.413***	-0.272***	-0.242***	-0.311***
	(0.016)	(0.014)	(0.011)	(0.014)	(0.020)
Number of children under 6	-0.031***	-0.110***	-0.018***	-0.013**	-0.081***
	(0.007)	(0.007)	(0.005)	(0.005)	(0.012)
Number of children 7 to 14	0.018***	0.013**	-0.002	-0.001	-0.043***
	(0.006)	(0.006)	(0.005)	(0.004)	(0.009)
Another female aged 12to 64 present	-0.009	0.057***	0.023**	0.020*	0.221***
	(0.013)	(0.012)	(0.009)	(0.011)	(0.016)
Alex_Suez	0.157***	0.150***	0.092***		
	(0.021)	(0.020)	(0.017)		
ULEgypt	0.201***	0.389***	0.378***		
	(0.019)	(0.019)	(0.017)		
UUEgypt	0.227***	0.218***	0.309***		
	(0.020)	(0.018)	(0.017)		
RLEgypt	0.235***	0.343***	0.380***		
	(0.020)	(0.018)	(0.016)		
RUEgypt	0.154***	0.330***	0.206***		
	(0.023)	(0.020)	(0.017)		
Jord_North				0.101***	
				(0.010)	
Jord_South				0.001	
				(0.011)	

Tun_NW					0.925***
					(0.040)
Tun_CE					0.299***
					(0.020)
Tun_CW					0.080***
					(0.023)
Tun_SE					0.209***
					(0.025)
Tun_SW					0.215***
					(0.031)
Observations	6,307	10,503	13,440	6,061	4,966

Standard errors in parentheses,
*** p<0.01, ** p<0.05, * p<0.1

Table 9 Probit Regressions of Labor Force Participation, with expected wage, by Quintile Egypt 1998

Quintile VARIABLES	(1)	(2)	(3)	(4)	(5)
Expected ln wage	3.688***	3.881***	3.574***	3.018***	3.336***
	(0.203)	(0.283)	(0.332)	(0.265)	(0.213)
Male wage worker present	0.097	0.148	0.419***	0.414***	0.771***
	(0.100)	(0.130)	(0.149)	(0.128)	(0.101)
Age	0.158***	0.210***	0.117***	0.116***	0.105***
	(0.027)	(0.037)	(0.042)	(0.041)	(0.030)
Age squared	-0.283***	-0.371***	-0.247***	-0.230***	-0.248***
	(0.039)	(0.054)	(0.060)	(0.056)	(0.040)
Read & Write	-0.006	0.023	-0.593	-0.052	0.076
	(0.182)	(0.232)	(0.418)	(0.280)	(0.377)
Basic	-0.445***	-0.789***	-0.596**	-0.797***	-0.371
	(0.165)	(0.191)	(0.236)	(0.250)	(0.291)
Secondary	0.593***	0.217	0.438*	0.129	-0.018
	(0.146)	(0.174)	(0.224)	(0.224)	(0.260)
PostSecondary	0.068	-0.001	-0.261	0.103	-0.432
	(0.525)	(0.346)	(0.358)	(0.308)	(0.295)
Univabove	-0.431	-0.185	-0.099	-0.805**	-0.929***
	(0.480)	(0.622)	(0.446)	(0.334)	(0.306)
Married	-1.394***	-1.519***	-1.599***	-1.376***	-1.712***
	(0.126)	(0.158)	(0.200)	(0.184)	(0.147)
Number of children under 6	-0.081	-0.098	-0.148	-0.160*	-0.222***
	(0.059)	(0.073)	(0.092)	(0.086)	(0.079)
Number of children 7 to 14	0.125***	0.112**	0.316***	0.056	0.052
	(0.044)	(0.055)	(0.076)	(0.068)	(0.057)
Another female aged 12 to 64 present	-0.237**	0.163	-0.133	0.084	-0.067
	(0.117)	(0.136)	(0.169)	(0.146)	(0.106)
Alex_Suez	0.940	0.676**	0.361	0.916***	0.720***
	(0.580)	(0.278)	(0.238)	(0.198)	(0.142)
ULEgypt	1.073**	0.764***	0.708***	1.023***	0.843***
	(0.454)	(0.235)	(0.199)	(0.170)	(0.147)
UUEgypt	1.232***	0.863***	0.940***	0.985***	1.113***
	(0.430)	(0.251)	(0.239)	(0.212)	(0.141)
RLEgypt	1.325***	0.909***	0.878***	0.890***	0.956***
	(0.422)	(0.233)	(0.225)	(0.233)	(0.232)
RUEgypt	0.992**	0.601**	0.680**	0.757**	0.642**
	(0.422)	(0.262)	(0.317)	(0.315)	(0.307)
Constant	-0.060	-0.372	0.627	-0.012	0.779
	(0.589)	(0.603)	(0.744)	(0.732)	(0.624)
Observations	1,747	1,168	933	970	1,489

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 10 Probit Regressions of Labor Force Participation, with expected wage, by Quintile Egypt 2006

Quintile **VARIABLES**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Expected ln wage	4.288***	3.788***	3.860***	3.596***	3.775***
	(0.143)	(0.168)	(0.199)	(0.202)	(0.218)
Male wage worker present	0.069	0.259***	0.121	0.476***	0.638***
	(0.069)	(0.080)	(0.083)	(0.093)	(0.091)
Age	0.039**	0.039*	0.080***	0.076***	0.106***
	(0.018)	(0.023)	(0.026)	(0.027)	(0.029)
Age squared	-0.171***	-0.145***	-0.228***	-0.225***	-0.287***
	(0.025)	(0.032)	(0.036)	(0.035)	(0.036)
Read & Write	1.302***	1.052***	0.940***	0.868**	1.067**
	(0.180)	(0.213)	(0.226)	(0.359)	(0.450)
Basic	-0.603***	-0.629***	-0.844***	-1.038***	-1.284***
	(0.114)	(0.138)	(0.169)	(0.227)	(0.327)
Secondary	-0.498***	-0.268**	-0.777***	-0.746***	-0.801***
	(0.091)	(0.109)	(0.152)	(0.185)	(0.269)
PostSecondary	-1.204***	-0.430*	-1.023***	-0.952***	-0.961***
	(0.390)	(0.238)	(0.227)	(0.226)	(0.302)
Univabove	-1.345***	-0.975***	-1.376***	-1.445***	-1.619***
	(0.320)	(0.199)	(0.214)	(0.238)	(0.306)
Married	-1.254***	-1.351***	-1.613***	-1.618***	-1.774***
	(0.093)	(0.108)	(0.122)	(0.134)	(0.143)
Number of children under 6	-0.377***	-0.422***	-0.434***	-0.438***	-0.448***
	(0.047)	(0.058)	(0.059)	(0.066)	(0.072)
Number of children 7 to 14	0.029	0.065	0.186***	0.029	0.024
	(0.035)	(0.048)	(0.054)	(0.062)	(0.061)
Another female aged 12 to 64 present	0.164**	0.294***	0.154	0.303***	0.067
	(0.083)	(0.094)	(0.103)	(0.112)	(0.104)
Alex_Suez	1.711**	0.338	0.321**	0.414***	0.806***
	(0.681)	(0.237)	(0.152)	(0.127)	(0.122)
ULEgypt	2.187***	1.181***	1.346***	1.407***	1.300***
	(0.625)	(0.197)	(0.140)	(0.136)	(0.150)
UUEgypt	1.507**	0.419**	0.708***	0.721***	0.966***
	(0.599)	(0.187)	(0.155)	(0.143)	(0.122)
RLEgypt	1.900***	0.940***	1.307***	1.206***	1.615***
	(0.598)	(0.171)	(0.138)	(0.158)	(0.226)
RUEgypt	2.025***	0.747***	0.964***	0.684***	1.548***
	(0.596)	(0.177)	(0.168)	(0.237)	(0.234)
Constant	2.190***	2.286***	2.266***	1.953***	1.749***
	(0.672)	(0.442)	(0.514)	(0.560)	(0.664)
Observations	2,830	2,254	2,057	1,724	1,638

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 11 Probit Regressions of Labor Force Participation, with expected wage, by Quintile Egypt 2012

Quintile	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
VARIABLES					
Expected ln wage	4.580***	3.379***	3.061***	2.838***	3.485***
	(0.151)	(0.163)	(0.171)	(0.149)	(0.133)
Male wage worker present	-0.270***	-0.246***	-0.104	-0.133*	0.060
	(0.073)	(0.081)	(0.082)	(0.069)	(0.058)
Age	0.194***	0.162***	0.194***	0.156***	0.245***
	(0.020)	(0.023)	(0.025)	(0.022)	(0.019)
Age squared	-0.314***	-0.251***	-0.306***	-0.264***	-0.395***
	(0.027)	(0.031)	(0.034)	(0.031)	(0.026)
Read & Write	-0.531**	-0.519**	-0.336	-0.338	-0.787**
	(0.207)	(0.249)	(0.211)	(0.238)	(0.360)
Basic	-1.589***	-1.409***	-1.247***	-1.402***	-1.460***
	(0.126)	(0.146)	(0.156)	(0.164)	(0.204)
Secondary	-1.462***	-0.750***	-0.638***	-0.658***	-1.184***
	(0.113)	(0.119)	(0.132)	(0.136)	(0.180)
PostSecondary	-1.942***	-0.597**	-0.555**	-0.581***	-1.326***
	(0.372)	(0.274)	(0.231)	(0.201)	(0.206)
Univabove	-2.179***	-1.402***	-0.977***	-0.920***	-1.920***
	(0.273)	(0.216)	(0.205)	(0.185)	(0.209)
Married	-0.869***	-0.804***	-1.059***	-1.112***	-1.426***
	(0.096)	(0.108)	(0.119)	(0.109)	(0.088)
Number of children under 6	0.005	-0.054	-0.034	-0.060	-0.167***
	(0.050)	(0.051)	(0.052)	(0.043)	(0.042)
Number of children 7 to 14	-0.028	0.060	0.008	0.014	-0.081*
	(0.042)	(0.050)	(0.052)	(0.043)	(0.044)
Another female aged 12 to 64 present	0.264***	0.058	0.019	0.115	0.025
	(0.083)	(0.089)	(0.093)	(0.085)	(0.069)
Alex_Suez	0.870	0.040	0.184	0.189	0.424***
	(0.710)	(0.417)	(0.280)	(0.145)	(0.083)
ULEgypt	1.487***	1.368***	1.385***	1.155***	1.535***
	(0.567)	(0.339)	(0.241)	(0.136)	(0.095)
UUEgypt	1.751***	0.863***	0.871***	0.899***	1.367***
	(0.498)	(0.307)	(0.241)	(0.144)	(0.093)
RLEgypt	1.860***	0.993***	1.339***	1.301***	1.670***
	(0.493)	(0.295)	(0.226)	(0.128)	(0.102)
RUEgypt	1.342***	0.397	0.524**	0.655***	0.799***
	(0.490)	(0.295)	(0.231)	(0.155)	(0.174)
Constant	-1.432**	-1.203**	-1.958***	-1.194***	-1.995***
	(0.607)	(0.494)	(0.467)	(0.393)	(0.381)
Observations	2,830	2,277	2,169	2,666	3,498

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 12 Probit Regressions of Labor Force Participation, with expected wage, by Quintile Jordan 2010

Quintile	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
VARIABLES					
Expected ln wage	4.215***	4.215***	3.876***	4.028***	4.317***
	(0.331)	(0.331)	(0.345)	(0.339)	(0.353)
Male wage worker present	0.145	0.145	0.014	-0.072	0.283**
	(0.118)	(0.118)	(0.121)	(0.114)	(0.121)
Age	0.415***	0.415***	0.584***	0.526***	0.628***
	(0.041)	(0.041)	(0.057)	(0.051)	(0.053)
Age squared	-0.576***	-0.576***	-0.863***	-0.779***	-0.929***
	(0.056)	(0.056)	(0.085)	(0.075)	(0.077)
Read & Write	0.230	0.230	0.478	-0.791**	0.101
	(0.206)	(0.206)	(0.304)	(0.401)	(0.492)
Basic	0.004	0.004	-0.095	-0.592**	0.143
	(0.192)	(0.192)	(0.273)	(0.285)	(0.404)
Secondary	-0.501**	-0.501**	-0.476	-1.247***	-0.848**
	(0.234)	(0.234)	(0.296)	(0.312)	(0.425)
PostSecondary	-1.088***	-1.088***	-0.792**	-1.591***	-1.236***
	(0.283)	(0.283)	(0.334)	(0.354)	(0.445)
Univabove	-1.768***	-1.768***	-1.667***	-2.624***	-2.119***
	(0.394)	(0.394)	(0.421)	(0.444)	(0.521)
Married	-1.191***	-1.191***	-1.343***	-1.194***	-1.509***
	(0.157)	(0.157)	(0.173)	(0.167)	(0.177)
Number of children under 6	-0.072	-0.072	-0.229***	0.063	-0.182**
	(0.070)	(0.070)	(0.072)	(0.065)	(0.077)
Number of children 7 to 14	0.126***	0.126***	-0.034	-0.146***	0.002
	(0.049)	(0.049)	(0.054)	(0.050)	(0.056)
Another female aged 12 to 64 present	-0.006	-0.006	-0.000	0.552***	0.077
	(0.142)	(0.142)	(0.147)	(0.150)	(0.145)
Jord_North	0.568***	0.568***	0.804***	0.594***	0.513***
	(0.134)	(0.134)	(0.131)	(0.127)	(0.135)
Jord_South	-0.377**	-0.377**	0.159	0.161	-0.004
	(0.158)	(0.158)	(0.145)	(0.130)	(0.153)
Constant	-9.657***	-9.657***	-11.506***	-10.384***	-12.429***
	(0.810)	(0.810)	(1.020)	(0.927)	(1.036)
Observations	1,202	1,202	1,374	1,331	1,197

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 13 Probit Regressions of Labor Force Participation, with expected wage, by Quintile Tunisia 2014

Quintile **VARIABLES**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Expected ln wage	7.536***	6.234***	4.758***	5.317***	5.894***
	(0.446)	(0.524)	(0.597)	(0.643)	(0.645)
Male wage worker present	0.604***	0.676***	0.653***	0.636***	0.687***
	(0.096)	(0.112)	(0.129)	(0.133)	(0.143)
Age	-0.367***	-0.296***	-0.196***	-0.187***	-0.251***
	(0.031)	(0.039)	(0.046)	(0.049)	(0.057)
Age squared	0.351***	0.281***	0.166***	0.136**	0.213***
	(0.034)	(0.043)	(0.052)	(0.055)	(0.064)
Read & Write	0.044	0.289**	0.155	-0.238	0.018
	(0.132)	(0.138)	(0.183)	(0.217)	(0.308)
Basic	-0.227*	-0.012	0.218	-0.140	0.244
	(0.119)	(0.137)	(0.164)	(0.177)	(0.224)
Secondary	-2.857***	-1.813***	-1.716***	-1.997***	-2.096***
	(0.310)	(0.341)	(0.376)	(0.404)	(0.434)
PostSecondary	-6.852***	-5.190***	-3.509***	-4.156***	-5.077***
	(0.616)	(0.639)	(0.721)	(0.739)	(0.773)
Univabove	-8.086***	-4.842***	-3.510***	-4.694***	-5.726***
	(0.635)	(0.824)	(0.829)	(0.853)	(0.854)
Married	-1.192***	-1.203***	-1.028***	-1.019***	-1.220***
	(0.130)	(0.142)	(0.172)	(0.182)	(0.201)
Number of children under 6	-0.277***	-0.336***	-0.394***	-0.256**	-0.152
	(0.079)	(0.085)	(0.114)	(0.110)	(0.136)
Number of children 7 to 14	-0.194***	0.004	-0.099	-0.265**	-0.290***
	(0.057)	(0.072)	(0.082)	(0.110)	(0.103)
Another female aged 12 to 64 present	0.937***	0.890***	0.559***	0.883***	0.539***
	(0.104)	(0.124)	(0.146)	(0.159)	(0.160)
Tun_NW	3.815***	3.535***	2.457***	3.152***	3.323***
	(0.257)	(0.307)	(0.377)	(0.435)	(0.491)
Tun_CE	1.141***	1.109***	0.916***	1.184***	0.861***
	(0.170)	(0.145)	(0.165)	(0.172)	(0.182)
Tun_CW	0.312**	0.015	0.506**	0.721***	0.550*
	(0.152)	(0.201)	(0.234)	(0.266)	(0.314)
Tun_SE	0.912***	0.778***	0.526**	0.561***	0.538*
	(0.200)	(0.165)	(0.206)	(0.199)	(0.282)
Tun_SW	0.800***	0.809***	0.479*	0.723**	0.946***
	(0.251)	(0.212)	(0.250)	(0.282)	(0.297)
Constant	3.269***	2.204***	0.982	0.682	1.677*
	(0.509)	(0.598)	(0.729)	(0.790)	(0.931)
Observations	1,614	1,115	820	778	639

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 14 OLS Regressions of Log Annual Hours, with expected wage, Marginal Effects

VARIABLES	(1) EG98	(2) EG06	(3) EG12	(4) JO10	(5) TU14
Expected ln wage	-0.132*	-0.158***	-0.106*	0.314***	0.097
	(0.074)	(0.048)	(0.059)	(0.118)	(0.203)
Male wage worker present	0.065**	-0.025	0.026	0.001	-0.062
	(0.032)	(0.019)	(0.022)	(0.030)	(0.046)
Asset Wealth Index	-0.001	0.002	0.003**	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Age	0.004	0.012**	0.009	0.026**	-0.022
	(0.009)	(0.006)	(0.007)	(0.013)	(0.018)
Age squared	0.001	-0.008	-0.010	-0.048***	0.018
	(0.011)	(0.007)	(0.009)	(0.018)	(0.020)
Read & Write	-0.055	-0.004	0.183**	-0.268***	0.051
	(0.092)	(0.059)	(0.078)	(0.095)	(0.072)
Basic	0.102	0.056	0.024	-0.013	0.081
	(0.069)	(0.039)	(0.052)	(0.083)	(0.063)
Secondary	0.117**	0.175***	0.154***	-0.044	0.043
	(0.055)	(0.032)	(0.045)	(0.092)	(0.126)
PostSecondary	0.126*	0.232***	0.203***	-0.129	0.001
	(0.072)	(0.048)	(0.066)	(0.102)	(0.233)
Univabove	0.104	0.196***	0.153**	-0.312**	-0.189
	(0.079)	(0.046)	(0.063)	(0.135)	(0.255)
Married	-0.109**	-0.111***	-0.047	-0.165***	-0.103*
	(0.042)	(0.026)	(0.030)	(0.046)	(0.061)
Number of children under 6	0.011	-0.008	-0.048***	-0.036*	0.007
	(0.021)	(0.014)	(0.016)	(0.020)	(0.040)
Number of children 7 to 14	-0.022	0.008	-0.011	-0.013	0.049
	(0.015)	(0.010)	(0.014)	(0.014)	(0.031)
Another female aged 12 to 64 present	-0.054*	-0.017	0.003	-0.035	0.015
	(0.031)	(0.020)	(0.023)	(0.037)	(0.050)
Alex_Suez	-0.079	-0.044	-0.032		
	(0.050)	(0.036)	(0.043)		
ULEgypt	-0.083*	-0.117***	-0.042		
	(0.045)	(0.036)	(0.044)		
UUEgypt	-0.111**	-0.174***	-0.050		
	(0.045)	(0.032)	(0.042)		
RLEgypt	-0.195***	-0.177***	-0.153***		
	(0.053)	(0.035)	(0.042)		
RUEgypt	-0.222***	-0.323***	-0.101**		
	(0.064)	(0.037)	(0.046)		
Jord_North				0.018	
				(0.034)	
Jord_South				-0.062	
				(0.041)	
Tun_NW					-0.154
					(0.120)
Tun_CE					-0.119**
					(0.060)
Tun_CW					-0.533***

					(0.092)
Tun_SE					-0.335***
					(0.086)
Tun_SW					-0.496***
					(0.083)
Observations	1,278	2,633	2,638	996	733

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 15 Probit Regressions of Labor Force Participation, and the Effect of Asset Inequality

VARIABLES	(1)	(3)	(4)	(5)	(6)
Expected ln wage	3.235***	3.730***	3.399***	3.834***	6.064***
	(0.103)	(0.075)	(0.065)	(0.152)	(0.240)
Male wage worker present	0.349***	0.274***	-0.135***	0.162***	0.640***
	(0.051)	(0.036)	(0.031)	(0.052)	(0.052)
Asset Wealth Index	-0.013***	-0.014***	-0.013***	-0.006***	-0.011***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Wealth Inequality	-0.851***	-0.179	1.447***	-0.136	-0.125
	(0.286)	(0.136)	(0.144)	(0.220)	(0.207)
Age	0.153***	0.085***	0.194***	0.489***	-0.273***
	(0.014)	(0.010)	(0.009)	(0.021)	(0.018)
Age squared	-0.287***	-0.230***	-0.314***	-0.718***	0.249***
	(0.020)	(0.013)	(0.013)	(0.030)	(0.020)
Read & Write	-0.054	0.996***	-0.501***	-0.040	0.064
	(0.111)	(0.104)	(0.104)	(0.135)	(0.073)
Basic	-0.547***	-0.754***	-1.428***	-0.274**	-0.054
	(0.089)	(0.068)	(0.065)	(0.112)	(0.066)
Secondary	0.278***	-0.573***	-0.950***	-0.788***	-2.231***
	(0.079)	(0.055)	(0.055)	(0.127)	(0.154)
PostSecondary	-0.100	-0.811***	-0.966***	-1.199***	-5.066***
	(0.123)	(0.093)	(0.090)	(0.146)	(0.287)
Univabove	-0.674***	-1.306***	-1.481***	-1.935***	-5.642***
	(0.130)	(0.084)	(0.080)	(0.190)	(0.320)
Married	-1.474***	-1.476***	-1.057***	-1.405***	-1.100***
	(0.067)	(0.050)	(0.045)	(0.075)	(0.069)
Number of children under 6	-0.134***	-0.395***	-0.074***	-0.073**	-0.288***
	(0.032)	(0.025)	(0.021)	(0.032)	(0.043)
Number of children 7 to 14	0.079***	0.046**	-0.010	-0.006	-0.153***
	(0.024)	(0.021)	(0.020)	(0.023)	(0.034)
Another female aged 12 to 64 present	-0.039	0.205***	0.086**	0.117*	0.784***
	(0.056)	(0.042)	(0.036)	(0.064)	(0.058)
Alex_Suez	0.585***	0.508***	0.561***		
	(0.096)	(0.073)	(0.071)		
ULEgypt	0.948***	1.384***	1.527***		
	(0.086)	(0.070)	(0.067)		
UUEgypt	1.176***	0.815***	1.027***		
	(0.107)	(0.071)	(0.067)		
RLEgypt	1.094***	1.220***	1.528***		
	(0.091)	(0.066)	(0.062)		
RUEgypt	0.853***	1.214***	0.661***		
	(0.118)	(0.075)	(0.069)		
Jord_North				0.573***	
				(0.062)	
Jord_South				-0.013	
				(0.075)	
Tun_NW					3.263***
					(0.140)

Tun_CE					1.058***
					(0.071)
Tun_CW					0.291***
					(0.082)
Tun_SE					0.713***
					(0.098)
Tun_SW					0.761***
					(0.109)
Constant	0.842***	2.463***	-2.390***	-9.586***	2.454***
	(0.318)	(0.237)	(0.224)	(0.445)	(0.352)
Observations	6,307	10,503	13,440	6,061	4,966

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix

Table A.1 Female Labor Force Participation Rates for ages 15-64

	1995	2000	2005	2010	2011	2012	2013	2014
East Asia & Pacific	67.7	61.1	54.7	50.3	50.7	50.8	50.8	50.7
Egypt, Arab Rep.	**19.5**	**18.9**	**22.2**	**19.9**	**20.0**	**20.0**	**20.0**	**20.0**
Europe & Central Asia	40.7	36.1	32.5	33.1	33.0	32.3	32.4	32.4
Jordan	**8.6**	**8.5**	**9.3**	**11.0**	**10.2**	**9.9**	**10.2**	**10.5**
Latin America & the Caribbean	42.1	42.4	43.8	42.6	42.5	42.8	42.8	42.9
Middle East & North Africa	**17.1**	**16.9**	**17.7**	**15.2**	**15.4**	**15.5**	**15.6**	**15.7**
South Asia	30.7	28.2	29.7	23.8	23.1	22.5	22.5	22.5
Sub-Saharan Africa	49.6	50.4	51.2	50.9	51.0	50.9	51.0	51.0
Tunisia	**26.9**	**24.9**	**21.8**	**20.0**	**20.1**	**20.3**	**20.4**	**20.6**
World	47.8	44.1	42.5	39.3	39.1	38.9	38.9	38.9

Source: World Development Indicators

Table A.2 Female Secondary School Enrollment Rate

	1995	2000	2005	2010	2011	2012	2013	2014
East Asia & Pacific	46.7	57.4	64.0	79.4	82.5	84.8	87.4	86.7
Egypt, Arab Rep.	**67.6**	**77.7**	**..**	**70.5**	**81.2**	**83.0**	**84.8**	**85.9**
Europe & Central Asia	83.7	86.6	85.7	89.5	91.2	92.2	97.3	98.0
Jordan	**..**	**88.1**	**92.4**	**91.1**	**89.1**	**86.4**	**..**	**..**
Latin America & the Caribbean	81.6	88.2	90.3	93.5	92.8	92.8	96.7	97.2
Middle East & North Africa	**55.0**	**63.5**	**67.9**	**71.1**	**74.8**	**75.8**	**73.3**	**74.1**
South Asia	33.4	36.4	45.4	56.5	59.4	62.1	64.0	64.4
Sub-Saharan Africa	21.7	23.4	28.6	36.4	37.4	38.4	39.0	39.5
Tunisia	**54.2**	**76.0**	**88.3**	**93.4**	**94.2**	**..**	**..**	**..**
World	53.5	57.4	62.1	69.7	71.3	72.6	74.5	74.5

Source: World Development Indicators

Table A.3 Asset summary statistics and PCA loadings: Egyptian Labor Market Panel Surveys

Asset	Description (units)	1998 mean (range)	Loading	2006 mean (range)	Loading	2012 mean (range)	Loading
house	own (0/1)	0.661 (0–1)	-0.149	0.629 (0–1)	-0.131	0.504 (0–1)	-0.128
house1	paying off (0/1)	0.053 (0–1)	0.081	0.049 (0–1)	0.094		
house2	rent (0/1)	0.232 (0–1)	0.136	0.211 (0–1)	0.123	0.198 (0–1)	0.117
house3	fringe ben/free (0/1)	0.054 (0–1)	-0.022	0.111 (0–1)	-0.024	0.204 (0–1)	-0.010
housetyp	apt. (count)					0.722 (0–2)	0.214
housetyp1	villa (0/1)					0.052 (0–1)	-0.017
housetyp2	village house (0/1)					0.171 (0–1)	-0.186
housetyp3	rooms (0/1)					0.040 (0–1)	-0.088
floor	mud (0/1)	0.220 (0–1)	-0.225	0.147 (0–1)	-0.211	0.101 (0–1)	-0.162
floor1	brick/stone (0/1)	0.027 (0–1)	-0.022	0.015 (0–1)	-0.022	0.011 (0–1)	-0.030
floor2	tile/cement (0/1)	0.746 (0–1)	0.224	0.823 (0–1)	0.190	0.619 (0–1)	-0.036
roof	straw/mud (0/1)	0.051 (0–1)	-0.102	0.035 (0–1)	-0.101	0.030 (0–1)	-0.056
roof1	wood (0/1)	0.244 (0–1)	-0.197	0.163 (0–1)	-0.185	0.113 (0–1)	-0.156
roof2	iron tile (0/1)	0.012 (0–1)	-0.008	0.012 (0–1)	-0.017	0.006 (0–1)	-0.020
roof3	concrete (0/1)	0.692 (0–1)	0.236	0.785 (0–1)	0.221	0.840 (0–1)	0.179
wall	brick/concrete (0/1)	0.695 (0–1)	0.133	0.840 (0–1)	0.144	0.825 (0–1)	0.058
wall1	brick & mud (0/1)	0.084 (0–1)	-0.133	0.050 (0–1)	-0.113	0.041 (0–1)	-0.100
wall2	reinf. concrete (0/1)	0.124 (0–1)	0.049	0.052 (0–1)	0.014	0.108 (0–1)	0.034
wall3	mud/brick (0/1)	0.094 (0–1)	-0.136	0.057 (0–1)	-0.133	0.025 (0–1)	-0.077
rooms	(count)	3.82 (1–20)	0.055	3.766 (1–16)	0.049	3.514 (1–14)	0.071
dwelarea	dwelling (sq.m.)	95 (2–1700)	0.017	91 (3–1200)	0.020	84 (6–400)	0.047
light source	el./generator (0/1)	0.979 (0–1)	0.086	0.993 (0–1)	0.056	0.996 (0–1)	0.024
toilet	indoor, netwk (0/1)	0.549 (0–1)	0.209	0.600 (0–1)	0.204	0.660 (0–1)	0.206
toilet1	indoor tank (0/1)	0.374 (0–1)	-0.171	0.346 (0–1)	-0.170	0.298 (0–1)	-0.173
toilet2	shared, netwk (0/1)	0.021 (0–1)	-0.017	0.015 (0–1)	-0.024	0.020 (0–1)	-0.056
toilet3	shared, tank (0/1)	0.044 (0–1)	-0.060	0.033 (0–1)	-0.072	0.019 (0–1)	-0.068
water	indoor tap (0/1)	0.874 (0–1)	0.170	0.960 (0–1)	0.121	0.939 (0–1)	0.108
water1	well (0/1)	0.078 (0–1)	-0.125	0.026 (0–1)	-0.097	0.015 (0–1)	-0.056
water2	outside tap (0/1)	0.044 (0–1)	-0.105	0.007 (0–1)	-0.047	0.030 (0–1)	-0.089
telephone	(count)	0.311 (0–1)	0.211	0.574 (0–1)	0.188		
internet	connect. (count)					0.044 (0–6)	0.130
int_dsl	DSL connect. (0/1)					0.072 (0–1)	0.138
int_usb	USB connect. (0/1)					0.022 (0–1)	0.055
keros. cook	(count)	0.671 (0–6)	-0.134	0.290 (0–4)	-0.113	0.196 (0–4)	-0.136
cookr	fuel cooker (count)	0.712 (0–2)	0.200	0.882 (0–4)	0.135	0.852 (0–10)	0.130
heater	(count)	0.062 (0–4)	0.123	0.049 (0–3)	0.129	0.053 (0–4)	0.093
AC	(count)	0.037 (0–6)	0.094	0.052 (0–3)	0.150	0.101 (0–5)	0.161
bike	(count)	0.199 (0–5)	0.048	0.157 (0–4)	0.008	0.080 (0–5)	0.012
B/W TV	(count)	0.403 (0–2)	-0.107	0.203 (0–2)	-0.147	0.035 (0–3)	-0.051
cam	(count)	0.108 (0–4)	0.145	0.072 (0–6)	0.137	0.029 (0–4)	0.093
cell	(count)			0.343 (0–6)	0.210	1.822 (0–10)	0.139
color TV	(count)	0.563 (0–3)	0.241	0.775 (0–4)	0.224	0.959 (0–3)	0.131
comp	desktop (count)			0.094 (0–3)	0.169	0.270 (0–4)	0.185
comp1	laptop (count)					0.062 (0–6)	0.135
dishwasher	(count)	0.015 (0–1)	0.064	0.016 (0–2)	0.094	0.019 (0–2)	0.068
fan	electric (count)	0.88 (0–10)	0.185	1.22 (0–10)	0.122	1.628 (0–9)	0.096
freezer	(count)	0.043 (0–2)	0.111	0.047 (0–2)	0.137	0.083 (0–2)	0.136
mp3	mp3 or iPod (count)					0.020 (0–4)	0.076
iron	(count)	0.648 (0–6)	0.221	0.708 (0–4)	0.199	0.693 (0–3)	0.176
motorcycle	(count)	0.017 (0–1)	0.022	0.017 (0–1)	0.011	0.058 (0–1)	-0.001

microwave	(count)	0.014 (0–2)	0.032	0.020 (0–2)	0.088	0.064 (0–3)	0.129
oven	(count)					0.319 (0–7)	-0.050
radio	(count)	0.82 (0–10)	0.141	0.764 (0–7)	0.137	0.341 (0–4)	0.106
refrg	(count)	0.683 (0–4)	0.237	0.860 (0–5)	0.191	0.95 (0–10)	0.111
sat	(count)			0.181 (0–3)	0.167	0.862 (0–8)	0.115
sat1	(count)					0.009 (0–3)	0.033
sew	(count)	0.163 (0–3)	0.120	0.073 (0–3)	0.087	0.053 (0–7)	0.048
video	(count)	0.118 (0–2)	0.163	0.092 (0–2)	0.169	0.025 (0–2)	0.093
wat. heater	(count)	0.318 (0–4)	0.236	0.414 (0–10)	0.233	0.500 (0–4)	0.225
washer	semiauto (count)	0.861 (0–5)	0.191	0.953 (0–4)	0.120	0.696 (0–4)	-0.128
washer1	auto (count)					0.316 (0–2)	0.216
car	(count)	0.063 (0–2)	0.133	0.063 (0–3)	0.162	0.070 (0–4)	0.150
taxi	(count)	0.009 (0–2)	0.015	0.007 (0–2)	0.013	0.007 (0–2)	0.018
truck	(count)	0.009 (0–8)	0.021	0.008 (0–3)	0.019	0.010 (0–2)	0.015
tuctuc	(count)			0.001 (0–1)	0.003		
tuctuc1	(count)					0.007 (0–2)	0.005
land	own (0/1)					0.148 (0–1)	-0.166
non-ag. proj.	(count)					0.196 (0–4)	0.052
agric. proj.	(0/1)					0.166 (0–1)	-0.175
farm	(count)					0.161 (0–2)	-0.165
mill	(count)			0.001 (0–2)	-0.006		
ownfirm	(2012LE)	7.2k (0–166k)	0.009	4.4k (0–142k)	0.068	2.7k (0–75k)	0.074
ownfirm1	(0/1)					0.108 (0–1)	0.005
ownfirm2	(0/1)					0.094 (0–1)	0.082
cart	animal (count)			0.049 (0–5)	-0.067	0.033 (0–3)	-0.107
cart1	human-dr. (count)			0.025 (0–5)	-0.038	0.014 (0–5)	-0.069
insecticide	(count)			0.003 (0–4)	-0.020	0.002 (0–2)	-0.032
insecticide1	(count)			0.004 (0–1.9)	-0.024	0.003 (0–1)	-0.031
livest. feed	(count)			0.001 (0–4)	-0.006	0.000 (0–1)	0.000
livestock	cow (count)			0.376 (0–1500)	-0.004	0.104 (0–45)	-0.094
livestock1	buffalo (count)			0.169 (0–50)	-0.060	0.091 (0–45)	-0.083
livestock2	goat (count)			0.128 (0–55)	-0.052	0.087 (0–25)	-0.072
livestock3	sheep (count)			0.094 (0–40)	-0.033	0.063 (0–25)	-0.049
livestock4	camel (count)			0.004 (0–50)	-0.010	0.001 (0–2)	-0.020
livestock5	donkey (count)			0.153 (0–20)	-0.102	0.086 (0–4)	-0.153
livestock6	horse (count)			0.016 (0–25)	-0.010	0.004 (0–2)	-0.033
livestock7	chicken (count)			9.967 (0–2200)	-0.040		
livestock8	pigeon (count)			0.946 (0–200)	-0.035		
livestock9	rabbit (count)			0.223 (0–300)	-0.014		
livestock10	duck (count)			2.402 (0–256)	-0.078		
livestock11	goose (count)			0.777 (0–100)	-0.064		
livestock12	turkey (count)			0.095 (0–15)	-0.023		
livestock13	others (count)			0.005 (0–10)	-0.004		
beehive	(count)			0.013 (0–12)	-0.027	0.001 (0–18)	-0.005
plow	(count)			0.004 (0–7)	-0.010	0.002 (0–1)	-0.027
plow1	(count)			0.006 (0–7)	-0.024	0.004 (0–1)	-0.042
poultry bat.	(count)			0.001 (0–1)	0.006	0.002 (0–5)	-0.007
sprinkler	(count)			0.005 (0–13)	-0.007	0.003 (0–2)	-0.035
thresher	(count)			0.004 (0–5)	-0.012	0.004 (0–2)	-0.035
thresher1	(count)			0.002 (0–1.9)	-0.027	0.001 (0–2)	-0.021
tractor big	(count)			0.005 (0–2)	-0.005	0.006 (0–2)	-0.041
tractor sml.	(count)			0.004 (0–1.5)	-0.019	0.002 (0–1)	-0.026
water pump	(count)			0.034 (0–5)	-0.052	0.021 (0–3)	-0.083

wat. pump1	(count)	0.006 (0–5)	-0.026	0.008 (0–1)	-0.054
wat. pump2	(count)	0.010 (0–1.9)	-0.042		
winnower	(count)	0.001 (0–1.9)	-0.001	0.002 (0–1)	-0.024

Note: Households weighted using sampling weights. Monetary units corrected for CPI inflation and converted to 2012LE (International Monetary Fund, International Financial Statistics). N_{98} = 4,816; N_{06} = 8,351; N_{12} = 12,060.
First principal component unrotated loadings, normalized to have sum of squared loadings = 1.

Table A.4 Asset summary statistics and PCA loadings: Jordan & Tunisia LMPS

Asset	Description (units)	Jordan 2010 mean (range)	Loading	Description (units)	Tunisia 2014 mean (range)	Loading
house	apt own (0/1)	0.447 (0–1)	0.108	tradition. house (0/1)	0.139 (0–1)	-0.067
house1	house own (0/1)	0.218 (0–1)	-0.060	core house (0/1)	0.083 (0–1)	-0.119
house2	rent (0/1)	0.226 (0–1)	-0.013	court yard (0/1)	0.127 (0–1)	-0.131
house3	fringe benefit/free (0/1)	0.034 (0–1)	-0.056	town house (0/1)	0.266 (0–1)	0.036
house4				duplex/villa (0/1)	0.215 (0–1)	0.092
house5				villa floor (0/1)	0.103 (0–1)	0.087
house6				apt (0/1)	0.054 (0–1)	0.094
house7				own (0/1)	0.856 (0–1)	-0.014
house8				rent (0/1)	0.099 (0–1)	0.036
floor	cement (0/1)	0.066 (0–1)	-0.096	cement (0/1)	0.352 (0–1)	-0.181
floor1				tile/ceramic (0/1)	0.642 (0–1)	0.184
roof	concrete/cement (0/1)	0.992 (0–1)	0.031	concrete (0/1)	0.923 (0–1)	0.083
roof1				steel/zinc (0/1)	0.037 (0–1)	-0.068
wall	concrete/cement (0/1)	0.113 (0–1)	-0.022	brick/stone (0/1)	0.659 (0–1)	-0.085
wall1	cement/bricks (0/1)	0.621 (0–1)	-0.125	concrete (0/1)	0.328 (0–1)	0.088
rooms				(count)	3.014 (0–8)	0.181
dwelarea	dwelling (sq.m.)	129 (20–960)	0.178	dwelling (sq.m.)	145 (1–2k)	0.091
light source	network (0/1)	0.998 (0–1)	0.010	el. bill (0/1)	0.922 (0–1)	0.077
light1				el., no bill (0/1)	0.074 (0–1)	-0.071
toilet	toilet & bath (0/1)	0.588 (0–1)	-0.183	toilet (0/1)	0.412 (0–1)	-0.218
toilet1	2 toilets & bath (0/1)	0.374 (0–1)	0.210	toilet & bath (0/1)	0.529 (0–1)	0.179
toilet2	network (0/1)	0.644 (0–1)	0.098	2 toilets & bath (0/1)	0.045 (0–1)	0.112
toilet3				sewage netwk (0/1)	0.579 (0–1)	0.193
toilet4				septic tank (0/1)	0.376 (0–1)	-0.164
water	pipe, filter (0/1)	0.209 (0–1)	0.142	indoor tap (0/1)	0.810 (0–1)	0.179
water1	pipe (0/1)	0.411 (0–1)	-0.164	outdoor tap (0/1)	0.073 (0–1)	-0.056
water2	tank (0/1)	0.012 (0–1)	-0.046	private well (0/1)	0.043 (0–1)	-0.087
water3	well/spring (0/1)	0.062 (0–1)	-0.003	public well (0/1)	0.051 (0–1)	-0.121
water4	piped (0/1)	0.982 (0–1)	0.053			
telephone	(count)	0.245 (0–3)	0.175	(count)	0.163 (0–6)	0.155
internet	connect. (count)	0.156 (0–2)	0.192	connect. (count)	0.132 (0–4)	0.200
cookr	fuel cooker (count)	0.369 (0–3)	-0.165	gas network (0/1)	0.176 (0–1)	0.174
cookheat1				gas cylinder (0/1)	0.815 (0–1)	-0.164
heating	central (count)	1.579 (0–8)	-0.059			
heat1	gas (0/1)	0.449 (0–1)	0.144			
heat2	kerosene (0/1)	0.334 (0–1)	0.047			
heat3	el. (0/1)	0.071 (0–1)	-0.055			
heat4	diesel, wood, coal (0/1)	0.062 (0–1)	-0.005			
heater, space	(count)	0.049 (0–1)	0.175	(count)	0.042 (0–1)	0.120
AC	(count)	0.192 (0–6)	0.163	(count)	0.245 (0–21)	0.170
bike				(count)	0.076 (0–5)	0.064
bookcase				(count)	0.063 (0–2)	0.119
B/W TV	(count)	0.015 (0–2)	-0.022			
camera	(count)	0.089 (0–3)	0.132	(count)	0.071 (0–5)	0.099
cell	(count)	2.357 (0–9)	0.160	(count)	1.974 (0–8)	0.149
color TV	(count)	1.155 (0–6)	0.182	(count)	1.028 (0–6)	0.144
computer	desktop (count)	0.417 (0–4)	0.186	desktop (count)	0.104 (0–5)	0.141
computer1	laptop (count)	0.149 (0–4)	0.180	laptop (count)	0.200 (0–5)	0.187
dishwasher	(count)	0.007 (0–1)	0.062	(count)	0.010 (0–1)	0.066
fan	electric (count)	1.255 (0–7)	0.103	electric fan (count)	0.194 (0–11)	0.044
fax	(count)	0.009 (0–1)	0.079			

freezer	(count)	0.083 (0–2)	0.134	(count)	0.037 (0–2)	0.084
hair dryer	(count)	0.528 (0–4)	0.191			
iron	(count)	0.845 (0–4)	0.167			
motorcycle				(count)	0.126 (0–3)	0.020
microwave	(count)	0.363 (0–2)	0.213	(count)	0.147 (0–1)	0.168
oven	(count)	0.706 (0–2)	0.183			
radio	(count)	0.303 (0–3)	0.118	(count)	0.370 (0–2)	0.105
refrig.	(count)	0.973 (0–3)	0.110	(count)	0.979 (0–16)	0.069
sat	(count)	1.055 (0–6)	0.170	(count)	0.905 (0–4)	0.104
sew	(count)	0.082 (0–2)	0.040	(count)	0.029 (0–2)	0.057
stove				(count)	0.697 (0–2)	0.184
player	(count)	0.026 (0–2)	0.026	(count)	0.149 (0–2)	0.133
space heater	(count)	0.117 (0–2)	0.115			
vacuum	(count)	0.619 (0–3)	0.209			
video	(count)	0.230 (0–9)	0.150			
water heater	(count)	0.617 (0–3)	0.160	(count)	0.469 (0–2)	0.233
washer	semiauto (count)	0.955 (0–3)	0.111	semiauto (count)	0.521 (0–1)	0.049
washer1	auto (count)			auto (count)	0.163 (0–2)	0.206
other equip.	(0/1)	0.000 (0–1)	0.002	(0/1)	0.003 (0–4)	-0.005
car	(count)	0.510 (0–6)	0.198	(count)	0.198 (0–3)	0.207
motorcycle				(count)	0.126 (0–3)	0.020
truck				(count)	0.024 (0–1)	0.007
land				own (0/1)	0.570 (0–1k)	-0.005
ownfirm	(2010JOD)	2,173 (0–75k)	0.078	(2014TND)	1,120 (0–75k)	0.038
cart				donkey cart (count)	0.012 (0–1)	-0.031
cart1				small cart (count)	0.019 (0–2)	-0.025
insecticide				motor (count)	0.003 (0–1)	0.008
insecticide1				hand-powered (count)	0.004 (0–1)	-0.013
livestk machn.				(count)	0.001 (0–2)	0.005
livestock	cow (count)	0.014 (0–20)	-0.023	cow (count)	0.149 (0–30)	-0.034
livestock1	goat (count)	0.084 (0–150)	-0.018	chicken (count)	1.645 (1–60)	-0.082
livestock2	sheep (count)	0.090 (0–300)	-0.016	goat (count)	1.130 (1–50)	-0.049
livestock3				sheep (count)	1.810 (1–100)	-0.082
livestock4				camel (count)	1.012 (1–25)	-0.016
livestock5	donkey (count)	0.008 (0–1)	-0.047	donkey (count)	1.003 (1–10)	-0.013
livestock6	horse (count)	0.009 (0–2)	-0.046	horse (count)	1.002 (1–7)	-0.009
livestock7	chicken (count)	0.496 (0–5k)	-0.001			
livestock8	pigeon (count)	0.023 (0–100)	-0.008			
livestock9	rabbit (count)	0.010 (0–9)	-0.037			
livestock10	duck (count)	0.008 (0–1)	-0.046			
livestock11	beehive (count)	0.008 (0–1)	-0.047			
livestock13	other (count)	0.008 (0–1)	-0.047	other (count)	1.026 (1–50)	0.006
beehive	(count)	0.003 (0–10)	-0.003	(count)	0.003 (0–8)	-0.006
plow	(count)	0.001 (0–2)	-0.015	(count)	0.006 (0–2)	0.009
plow1				(count)	0.007 (0–2)	-0.022
poultry batter				(count)	0.002 (0–8)	-0.006
sprinkler	(count)	0.001 (0–1)	-0.002			
thresher				motor (count)	0.002 (0–3)	0.008
thresher1				hand-powered (count)	0.001 (0–1)	-0.011
tractor big	(count)	0.002 (0–2)	-0.008	(count)	0.008 (0–2)	0.025
tractor small	(count)	0.001 (0–1)	0.008	(count)	0.005 (0–2)	0.000
water pump	(count)	0.004 (0–3)	0.146			
water pump1	(count)	0.001 (0–2)	-0.003			

water filter	(count)	0.212 (0–2)	0.147			
water pump	(count)	0.270 (0–3)	-0.002			
agricul equip	(0/1)	0.009 (0–1)	0.005			
agriland	(0/1)	0.113 (0–1)	0.043			
agriland1	(0/1)	0.002 (0–1)	-0.007			
drip irrigation	(count)	0.003 (0–3)	0.011	(count)	0.005 (0–5)	0.007
spraymachine	(count)	0.001 (0–2)	0.003			
spraymachine1	(count)	0.002 (0–2)	0.003			

Note: Households weighted using sampling weights. N_{JO} = 5,102; N_{TU} = 4,521.
First principal component unrotated loadings, normalized to have sum of squared loadings = 1.

Table A5 Heckman Selection Model

VARIABLES	Egypt 1998 Ln Hourly wage	Egypt 1998 Participation	Egypt 2006 Ln Hourly wage	Egypt 2006 Participation	Egypt 2012 Ln Hourly wage	Egypt 2012 Participation	Jordan 2010 Ln Hourly wage	Jordan 2010 Participation	Tunisia 2014 Ln Hourly wage	Tunisia 2014 Participation
age	0.046***	0.181***	0.104***	0.194***	-0.035*	0.195***	-0.104***	0.223***	0.111***	0.086***
	(0.017)	(0.015)	(0.014)	(0.011)	(0.021)	(0.011)	(0.031)	(0.018)	(0.025)	(0.017)
agesq	-0.039*	-0.208***	-0.103***	-0.221***	0.054**	-0.213***	0.140***	-0.293***	-0.128***	-0.111***
	(0.022)	(0.019)	(0.018)	(0.015)	(0.026)	(0.014)	(0.042)	(0.024)	(0.033)	(0.022)
expr	0.044***		0.046***		0.048***		0.039***		0.023**	
	(0.007)		(0.007)		(0.007)		(0.011)		(0.011)	
exprsq	-0.053***		-0.056***		-0.075***		-0.070**		-0.043	
	(0.019)		(0.018)		(0.019)		(0.034)		(0.036)	
ReadWrite	0.086	0.127	-0.034	0.483***	0.148	0.383***	0.002	-0.014	0.259*	0.354***
	(0.143)	(0.127)	(0.125)	(0.109)	(0.172)	(0.122)	(0.180)	(0.133)	(0.141)	(0.095)
Basic	0.424***	0.526***	0.469***	0.565***	0.427***	0.480***	0.011	0.065	0.483***	0.571***
	(0.102)	(0.091)	(0.093)	(0.077)	(0.110)	(0.071)	(0.152)	(0.112)	(0.132)	(0.079)
Secondary	0.961***	1.655***	1.153***	1.579***	0.497***	1.257***	0.220	0.250**	1.016***	0.725***
	(0.109)	(0.071)	(0.084)	(0.058)	(0.132)	(0.052)	(0.158)	(0.118)	(0.162)	(0.109)
PostSecondary	1.318***	2.182***	1.395***	1.873***	0.580***	1.611***	0.464***	1.005***	1.635***	0.774***
	(0.133)	(0.096)	(0.102)	(0.081)	(0.166)	(0.082)	(0.168)	(0.111)	(0.193)	(0.137)
Univabove	1.607***	2.340***	1.769***	2.174***	0.881***	2.110***	0.870***	1.557***	2.133***	1.276***
	(0.132)	(0.080)	(0.099)	(0.063)	(0.187)	(0.055)	(0.192)	(0.111)	(0.182)	(0.118)
married	0.020	-0.597***	-0.088**	-0.634***	0.185***	-0.426***	0.160**	-0.819***	-0.182*	-0.432***
	(0.049)	(0.062)	(0.044)	(0.047)	(0.050)	(0.044)	(0.077)	(0.068)	(0.102)	(0.077)
Alex_Suez	-0.192***		-0.140***		-0.051					
	(0.053)		(0.046)		(0.057)					
ULEgypt	-0.141***		-0.259***		-0.260***					
	(0.048)		(0.045)		(0.054)					
UUEgypt	-0.187***		-0.145***		-0.218***					
	(0.046)		(0.043)		(0.052)					
RLEgypt	-0.222***		-0.253***		-0.260***					
	(0.057)		(0.045)		(0.051)					
RUEgypt	-0.169**		-0.235***		-0.155**					
	(0.081)		(0.065)		(0.066)					
nchildu6		-0.054*		-0.160***		-0.115***		-0.030		-0.027
		(0.033)		(0.026)		(0.025)		(0.032)		(0.047)

nchild7_14		0.075***		0.029		-0.084***		-0.025		-0.017
		(0.024)		(0.020)		(0.023)		(0.023)		(0.038)
fem_12_64_present		-0.087*		0.017		-0.012		-0.111*		0.123**
		(0.050)		(0.037)		(0.038)		(0.059)		(0.060)
male_wage_worker		0.296***		0.172***		0.218***		0.213***		0.121**
		(0.049)		(0.035)		(0.036)		(0.051)		(0.053)
Jord_North							-0.099*			
							(0.053)			
Jord_South							0.162***			
							(0.061)			
Tun_NW									-0.489***	
									(0.115)	
Tun_CE									-0.168**	
									(0.078)	
Tun_CW									-0.078	
									(0.132)	
Tun_SE									-0.102	
									(0.137)	
Tun_SW									-0.098	
									(0.162)	
Constant	-3.002***	-5.407***	-4.418***	-5.650***	-0.284	-5.907***	2.058***	-5.051***	-3.478***	-3.232***
	(0.382)	(0.274)	(0.299)	(0.203)	(0.606)	(0.211)	(0.651)	(0.330)	(0.546)	(0.316)
Observations	6,296	6,296	10,494	10,494	13,440	13,440	6,061	6,061	4,792	4,792
Lambda	0.448		0.595		0.00469		-0.0171		0.858	
	(0.0572)		(0.0412)		(0.104)		(0.111)		(0.111)	

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table A6 Values of Ic, Measure of Relative Inequality by Governorate/Country and Year

Governorate	1998	2006	2010	2012	2014
Jordan-Amman			1.101984		
Jordan-Balqa			0.970299		
Jordan-Zarqa			0.786809		
Jordan-Madaba			0.802907		
Jordan-Irbid			0.888976		
Jordan-Mafraq			0.729908		
Jordan-Jarash			0.974466		
Jordan-Ajloun			0.838644		
Jordan-Karak			0.829688		
Jordan-Tafileh			0.727827		
Jordan-Ma'an			0.782564		
Jordan-Aqaba			0.863863		
Tunisia-Tunis					0.754083
Tunisia-Ariana					1.12228
Tunisia-Ben Arous					0.931871
Tunisia-Manouba					0.561213
Tunisia-Nabeul					1.010863
Tunisia-Zaghouan					1.04656
Tunisia-Bizerte					0.851737
Tunisia-Beja					0.793836
Tunisia-Jendouba					0.739279
Tunisia-Le Kef					0.862419
Tunisia-Siliana					0.733546
Tunisia-Sousse					0.768094
Tunisia-Monastir					0.684459
Tunisia-Mahdia					0.821229
Tunisia-Sfax					0.945747
Tunisia-Kairouan					1.029382
Tunisia-Kasserine					0.942083
Tunisia-Sidi Bouzide					0.792957
Tunisia-Gabes					0.670023
Tunisia-Mednine					0.718795
Tunisia-Tataouine					0.509387
Tunisia-Gafsa					0.948685
Tunisia-Tozeur					0.894748
Tunisia-Kebili					0.823904
Egypt-Cairo	0.662511	0.73496		0.804733	
Egypt-Alex.	0.569326	0.55933		0.554317	
Egypt-Port-Said	0.458193	0.722531		0.755869	
Egypt-Suez	0.492619	0.586757		0.563909	

Egypt-Damietta	0.676324	0.503443	0.550669
Egypt-Dakahlia	0.727256	0.631787	0.595558
Egypt-Sharkia	0.8037	0.878116	0.874804
Egypt-Kalyoubia	0.738629	0.647879	0.757529
Egypt-Kafr-Elsheikh	0.752977	0.749546	0.763368
Egypt-Gharbia	0.879	0.783016	0.781578
Egypt-Menoufia	0.85495	0.897796	0.851809
Egypt-Behera	0.847671	0.604525	0.784816
Egypt-Ismailia	0.834593	0.931748	0.969299
Egypt-Giza	0.879298	1.12235	0.810458
Egypt-Beni-Suef	0.861177	0.925301	0.995152
Egypt-Fayoum	0.864465	0.883689	0.964874
Egypt-Menia	0.934393	1.031968	0.996028
Egypt-Asyout	0.908084	0.884944	0.915413
Egypt-Suhag	0.991122	0.92347	0.809655
Egypt-Qena	0.799667	0.91034	0.793739
1Egypt-Aswan	1.125267	1.213508	0.981293
Egypt-Luxur	0.687497	1.211128	1.048246