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DETERMINANTS OF UNEMPLOYMENT DURATION

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Abstract

This study uses a set of dates on unemployment, employment, mobility, marriage, and birth, from the 2006 and 2012 rounds of the Egyptian Labor Market Panel Survey, to construct a cross-section of first-unemployment spells, and to measure selected individual-specific attributes (age, residency, cohort, and marital status) at the time of the spell. After conducting a 2006-2012 comparison of Kaplan-Meier estimates of the probability of staying unemployed, along several characteristics, the 2012 data is employed to estimate a discrete hazard regression model to quantify the effect of these characteristics on the duration of unemployment, after controlling for gender, educational level, as well as father's education and occupation. It is found that unemployment duration was longer among women and persons with secondary and higher education. Individuals who entered the labor market as adolescents experienced longer spells, in comparison to older youth. Father's education and unemployment duration were negatively associated for men, but were unrelated among women. Men whose fathers had no or unskilled jobs exited unemployment faster, with no recorded effect of father's occupation on the likelihood of leaving unemployment among women. Regional variations in duration were more pronounced for women than for men. Marriage was associated with longer spells of unemployment, maybe due to stronger support from (rather than to) immediate family (spouse and children). The duration of unemployment increased over time for entrants of the same age. The baseline hazard was flat for women, and hump-shaped for men, suggesting a time dependent duration for the latter group.

JEL Classification: J64, C41

Keywords: Unemployment, duration analysis, Egypt

ملخص

تستخدم هذه الدراسة مجموعة من تواريخ في الفترة من 2006 إلى 2012 عن البطالة، والعمالة، والتنقل، والزواج، والولادة، من المسح التتبعي لسوق العمل في مصر، لبناء المقطع العرضي من فترات البطالة لأول مرة وقياس الفرد الذي تحدده سمات معينة - (العمر والإقامة، فوج، والحالة الاجتماعية) في هذه الفترات. بعد إجراء المقارنة 2006-2012 باستخدام تقديرات كابلان-ماير من احتمال بقاء العاطلين عن العمل، إلى جانب العديد من الصفات، يعمل فيها بيانات عام 2012 إلى تقدير نموذج خطر الانحدار المنفصل لقياس تأثير هذه الخصائص على مدة البطالة، بعد السيطرة للمساواة بين الجنسين، والمستوى التعليمي، وكذلك مستوى تعليم الأب والوظيفة. تبين أن مدة البطالة كانت أطول بين النساء والأشخاص ذوي التعليم الثانوي والعالي. أيضا الأفراد الذين دخلوا سوق العمل في سن المراهقة من ذوي الخبرة كانت فترات البطالة أطول لديهم، بالمقارنة بالشباب الأكبر سنا. نجد أن مدة التعليم والبطالة للأب ارتبطت سلبيا بالنسبة للرجال، ولكن لا يوجد علاقة بينها وبين مدة البطالة لدى النساء. أيضا الرجال الذين لم يملك آباءهم وظائف أو مهارات نجد أنهم خرجوا من البطالة بشكل أسرع، مع عدم وجود تأثير مسجل لوظيفة الأب على احتمال ترك البطالة. كانت الاختلافات الإقليمية في مدة أكثر وضوحا بالنسبة للنساء عنها من الرجال. وارتبط الزواج مع فترات أطول من البطالة، وربما يرجع ذلك إلى دعم أقوى من (بدلا من) الأسرة المباشرة (الزوجة والأطفال). زادت مدة البطالة على مر الزمن للوافدين من نفس الفئة العمرية. يظهر الخطر الأساسي على شكل مستوى بيانها بالنسبة للمرأة، وعلى شكل أكثر حدة للرجال، مما يشير إلى المدة التي تعتمد على الوقت للمجموعة الأخيرة.

1. Introduction

Unemployment and job creation are arguably the primary challenges to economic and social policies in Egypt. For many years, the demand for labor has not kept up with an increasingly educated and primarily young workforce, even during years of high output growth. The focus of this paper is the duration dimension of unemployment. Using data from the 2006 and 2012 rounds of the Egypt Labor Market Panel Survey (ELMPS), I examine the pattern of transition from unemployment to employment along several individual and environmental characteristics. I use a set of dates on unemployment, employment, mobility, marriage, and birth, to construct a cross-section of unemployment spells, and to measure selected individual attributes (age, region of residency, cohort, and marital status) at the time of the spell. Using a discrete hazard model of duration, I estimate the effect of these attributes on the probability of exiting unemployment to work, controlling also for pre-determined factors, such as gender and education, as well as father's education and occupation, as proxies for initial socio-economic status.

According to ELMPS data, the market definition of economic activity, and the standard, job search-based definition of unemployment, the estimated unemployment rate in Egypt in 2012 was 8.7 percent. The female rate (23.7 percent) was almost six times higher than the male rate (4.2 percent). In addition, at 10.0 percent, urban unemployment was higher than the 7.7 percent recorded in rural areas. Unemployment in Egypt is primarily a problem affecting youth. About two thirds of the unemployed in 2012 belonged to the age group 15-29. And peak unemployment occurred among the 20- to 29-year-olds, with recorded rates of 8.6 percent for men and 43.8 percent for women. Another salient feature of Egyptian unemployment is that it rises with educational attainment. In 2012, individuals without a high school diploma experienced unemployment rates that were less than 4 percent, whereas those who completed high-school or tertiary education registered considerably higher rates - in the 10-13 percent range. Assaad and Krafft (2015) present a detailed study of the evolution of employment and unemployment in Egypt from 1988 to 2012.

These major dimensions of unemployment prevalence are also expected to influence unemployment duration. In 2012, the median duration of current unemployment was 36 months, and the median for women was almost double that of men. Therefore, the analysis is carried out for men and women separately. Furthermore, by examining the determinants of the first spell of unemployment (or employment), the study focuses on the duration pattern for Egyptian youth (15-29 years), who constitute more than 96 percent of the sample under study. The results for men are likely to be more reliable. In 2012, the female participation rate stood at 23 percent, compared to 80 percent for men, strongly suggesting that the female data and regressions are more likely than the male ones to suffer from self-selection bias, and therefore to not represent the population of all (working and non-working) women. It is also difficult to distinguish, in the case of women, between unemployment, discouraged unemployment, and non-participation.

2. Exploratory Analysis of Duration Data

In both the 2006 and 2012 rounds of ELMPS, individuals who were identified as currently unemployed reported the starting date (year and month) of the most recent unemployment spell. In addition, in 2012, household members who ever worked before reported the dates of up to four consecutive employment, unemployment, or non-employment statuses, starting with either the date of the first status after completing school or the date of the first job lasting more than six months if it preceded the school completion date. The 2006 round collected similar duration data, but differed in this regard from the 2012 round in two main respects. The reported history of the 2006 participants covered up to three statuses. And while the 2012 respondents were solicited to provide the year and month of each status (almost half of them nevertheless provided the dates in years only), their 2006 counterparts were only asked to report the year of

the event. I used this information to construct a sample of current and past unemployment spells. The surveys do not provide unemployment information on any individual who never worked, if he/she quit the labor force following an unsuccessful job search. That is, unemployment is only identified for persons who ever worked, and for those who are currently unemployed. In addition, I assumed that individuals who did not experience unemployment found their first job after a short, one-month stint of unemployment. Therefore, the parametric (regression) and non-parametric (Kaplan-Meier) estimates I provide are conditional on having experienced an unemployment spell. The next section of this paper provides more details on how the 2012 sample of spells was identified, and a similar procedure was applied to the 2006 set, with one additional adjustment: I converted the spells constructed from the 2006 survey from annual to monthly series, in order to present, in the current section, a comparative 2006-2012 non-parametric analysis. Therefore, by construction, the 2006 duration records are less precise and less smooth than the 2012 ones. In the next section of the paper, I use the 2012 data to estimate a semi-parametric discrete hazard model of unemployment duration.

Table 1 reports unemployment duration statistics by gender, for individuals who were “currently unemployed” in 2006 and 2012. The reported percentiles are unlikely to efficiently summarize the unemployment problem, because these statistics do not account for individuals who never experienced unemployment, and do not use information on those who were formerly unemployed at the time of the survey. In addition, the data are right-censored in that observed duration cannot exceed the time in which it is measured. Nevertheless, if the resulting biases are not highly sensitive to time-dependent labor market conditions, the changes between 2006 and 2012 should carry useful information. The data show that the overall median duration of unemployment almost doubled during this period, from 24 months to 44 months, and the 75th percentile increased by 60 percent to 96 months. While the median for men went up moderately, from 17.5 to 20 months, the female median soared from 36 to 69 months. A similar gender-based pattern of change occurred at the 75th percentile, with 129 months for women and 45 months for men in 2012. Judged by both the level of and change in duration, the unemployment status was typically more severe for women than for men, and was more so in 2012. The increase in current unemployment duration (shown in Table 1) between 2006 and 2012 was common to urban and rural women (from a common duration of 36 months in 2006 to 57 and 69 months, respectively), as well as to rural men (12 to 21 months). On the other hand, urban men experienced a small drop in the median duration, from 24 to 20 months.

In Table 2, the duration figures are Kaplan-Meier estimates that do not account for individuals who secured work within one month of entering the labor market (i.e., by construction, overwhelmingly those who moved directly to employment, without reporting an unemployment spell). The data show that the typical female spell was considerably longer in both 2006 and 2012. Also, there was no change in duration between 2006 and 2012 at the lower end of the distribution (25th percentile), for both men and women. The median and 75th percentile durations increased slightly for women, and the 75th percentile decreased substantially for men. However, it is important to recall that the frequency of the 2006 data is annual, making the 2006-2012 comparisons not very accurate. At 36 months, the overall 2012 median indicates that unemployment in Egypt is mainly a long-term structural problem. In the remainder of this section, I examine a series of Kaplan-Meier survival charts, each of which traces out, by an individual-specific characteristic, the survival rate, or the probability of remaining unemployed beyond time (month) t . The survival function is equal to 1 at $t = 0$, and decreases toward zero as t goes to infinity. The following charts (Figures 1-3) use data on individuals who were 15 to 29 years old, when they joined the labor market between 1970 and 2012. In addition, I excluded any unemployment duration in excess of 180 months (15 years). It is important to stress that the data cover the currently unemployed, the previously

unemployed (if they ever worked), and individuals who moved straight into employment, as reported in each survey year.

Figure 1 shows the probability of remaining unemployed as a function of elapsed time (months) of unemployment by gender in 2006 and 2012. The step-shaped function for 2006 reflects the monthly representation of annual data. Among men, both the incidence and the probability of continued unemployment was noticeably higher in 2012 than in 2006, during the first 24 months of unemployment. The differences narrowed considerably afterwards. As for women, the 2012 probability of staying unemployed was consistently higher than its 2006 level, even after 120 months of unemployment. The survival function of men in either year was steeper than that of women, indicating that men exit unemployment more rapidly. And the gender gap in both years was obvious and persistent. In 2012, the probability of remaining unemployed, after two years of unemployment, was 16 percent for men and 35 percent for women. After four years, the 2012 male probability dropped to 6 percent, whereas the female probability stayed relatively high, at 28 percent. According to the graph, one in ten women remains "permanently" unemployed. The Cox test rejected the null hypothesis that the survivor functions of men and women in each year were the same (p -value < 0.01), as well as the null hypothesis that the functions were the same in 2006 and 2012 for each gender (p -value: 0.04 for women and 0.01 for men).

Figure 2 explores the link between unemployment duration and educational attainment for males and females. The latter was classified into three categories: pre-secondary education, secondary (mostly technical) education, and higher (mostly university) education. Among men with secondary and higher education, the survival curves remained stable between 2006 and 2012. In addition, there were no significant differences among the three education groups in 2012, with respect to the evolution of the probability of exiting unemployment. A Cox test did not reject the null hypothesis of equal survivor functions in 2012. In other words, education does not appear to have an important effect on male duration in this bivariate context. However, there was an upward shift from 2006 to 2012 in the survival function of men with pre-secondary education, pointing to worsening labor market conditions for this group. Their probability of remaining unemployed after a year increased from 7 percent in 2006 to 24 percent in 2012.

The situation was different for women, for whom education seemed to have a strong level effect on duration. The p -value of the Cox test was below 0.01, thus rejecting the assumption of equal female survival functions by education. In 2012, after 4 years in unemployment, the probability of remaining unemployed was 26 percent for women with higher education, 38 percent for those with secondary education, and 9 percent for those with pre-secondary education. The latter probability was lower (2 percent) in 2006, showing deteriorating employment odds in 2012, as it was the case for men of the same (pre-secondary education) group. The patterns of survival for the other two female groups were more or less stable between 2006 and 2012. Furthermore, there was no major difference in how the rate of quitting unemployment evolved over time between secondary and higher-education women.

The age of the unemployed on entry did not matter much for men in 2006, or after roughly 36 months of unemployment in 2012 (Figure 3). However, 15-19-year-old men in 2012 experienced lower incidence and shorter duration upon entering the labor market. Their initial probability of continued unemployment was 21 percent, which was considerably lower than the 33 percent estimate for both the 20-24 and 25-29-year-olds. Age played a more pronounced role among women in both 2006 and 2012. The younger the age group, the longer the female unemployment duration. And the gaps persisted as unemployment duration prolonged. After 3 years, the youngest (15-19) group of female entrants had a 38 percent survival rate, the middle (20-24) group had a 29 percent rate, and the oldest (25-29) group had a 21 percent rate.

Furthermore, there is some evidence that more recent female cohorts experience longer unemployment duration. Without controlling for other variables, the cohort factor might reflect indirect age or attrition effects. However, there appears to be an independent decade-of-entry influence. Women who experienced unemployment in 2000-2012 had considerably higher survival rates (38 percent at 48 months) and hence experienced longer spells of unemployment, compared to women who joined the market in the 1990s (22 percent survival rate at 48 months), the 1980s (16 percent at the 48 month mark), and the 1970s (8 percent at the same mark). Such patterns may well reflect possible differences between durations computed from contemporaneous data (for the most recent decade), and those derived from retrospective data (for the earlier decades). However, the effect may not be entirely due to measurement disparities, given that they had a much smaller effect on the survival functions of men from different cohorts in 2012. In general, the observed increase in unemployment durations may also reflect a weakening ability of demand for labor services to absorb a gradually aging youth bulge.

The analysis has been so far exploratory, relying on two or three-way relationships among potential subject-specific determinants of unemployment duration. I now turn to regression methods, to simultaneously account for these and other determinants, in order to assess their relative contributions in explaining the length of unemployment spells.

3. A Discrete Hazard Model of Unemployment Duration

In this section, I use data from the 2012 survey to estimate a regression model of the probability of exiting unemployment. In addition to identifying the currently unemployed, the 2012 survey allows for the classification of each reported historical status of individuals who ever worked into one of three categories: Employed (E), unemployed (U), or out of the labor force (O). I use the resulting sequences (EEEE, EEEU, ...) to identify the starting date of the first unemployment-status spell, as well as the starting date of the following non-unemployment status, which is used as the ending date of the first unemployment spell. Most individuals reported one or two statuses, and no one reported more than two U statuses (160 individuals reported two periods of unemployment). Also, all empty or missing statuses occur at the right end of the sequence, after the current status, and therefore do not break the reported timeline. The starting and ending dates are used to calculate unemployment duration in months and years. The monthly metric allows treating duration as a continuous variable. However, a large number of respondents reported the years but not the months. One option was to replace the missing months with the middle month of the year (June). The alternative was to employ the annual duration measure, treating it as a discrete variable. I placed the duration data into eight groups. Group 1 includes unemployment durations of up to one year; group 2 contains cases of duration lasting between 13 and 24 months inclusive, etc. The last group aggregates all durations of eight years or more. In addition, I assumed that those who did not experience unemployment (had sequences of E and O only) obtained their first job after a brief (one-month long) period of unemployment, or within the first year according to the annually-grouped data.

Also, I dropped a limited number of cases (180) in which the individual transited from U to O. Another group of individuals (442 cases) qualified to answering twos sections of the 2012 questionnaire, for they were currently unemployed, and they worked before. However, only 333 of them actually provided unemployment dates for both sections (there were too many date discrepancies for the same individuals). After restricting the sample to individuals who were between 15 and 64 years of age at the time of their first unemployment or employment spell, the observations included 1,055 individuals who were currently unemployed and who never worked before, 2,001 individuals who worked before and who experienced past unemployment, as well as 10,236 individuals who reported E but not U statuses, for a total of 13,292 observations. Unlike those who reported on current unemployment, individuals who documented past unemployment were not asked to provide information about their job search

behavior. Therefore, to be consistent, the currently unemployed were identified using the broad definition of unemployment that does not require search. The mean values of the variables used in the regression study, both for the entire sample and for those who were unemployed, can be found in Kherfi (2014). By only considering the first instance of unemployment or employment, the study focuses on the duration patterns of Egyptian youth. More than 96 percent of the final sample reported an entry age of 29 years or less. The grouped duration data are presented in Table 3.

The next step involved using the dates on unemployment, employment, mobility, marriage, and birth, to measure at the time of the first spell (i.e., date of entry) selected potential determinants of unemployment duration. These factors include both individual-specific variables (age and marital status at entry, gender, and education), as well as environmental ones (region of residency, urban-rural designation, father's education, father's occupation, and year of entry). The survey provides dates of any long-term residential moves, which I used along with E or U dates, to adjust the region of residency and urban-rural variables from their current values to their values at the time of labor market entry, under the assumption that the regional and urban designations have remained stable over time.

The age at entry is the difference between the start year of the first E or U spell and the year of birth. Ages at entry and marriage were compared to determine marital status at the start of the spell. Other covariates, such as sex and father's occupation when the subject of study was 15 years of age, are predetermined. In addition, it is safe to assume that parents' education is in steady state when the individual enters the labor market. The same can be said of the own education variable, because its current values apply to the currently unemployed, and are likely to correctly measure the time-dependent educational attainment of those who report past spells, since the survey questions ask about post-studies status (few cases of returning to education after the first main job were reported).

In addition, I introduce a series of dummy variables, one for each year, as a non-parametric representation of time dependent duration (Jenkins 2005). Under such representation, it is possible that the probability of finding work decreases as the duration of unemployment rises because of human capital depreciation or reduced search effort due to discouragement. Given that the dependent variable is categorical, I reorganized the data following Jenkins (2005) in order to estimate a discrete hazard model, using the PGMHAZ8 procedure (Jenkins 2004). Assaad, Binzel, and Gadallah (2010) and Tansil and Tasci (2010) adopt a similar approach. The hazard rate for person i in duration interval j is (Jenkins, 2004):

$$h_j(X_{ij}) = 1 - \exp\{-\exp(X_{ij}'\beta + D_j)\}$$

X represents the vector of regressors, and β is the vector of parameters to be estimated. D_j is the coefficient to be estimated of a binary variable, set to 1 at interval j and zero otherwise.

D_j is a non-parametric representation of the baseline function (the hazard at $X = 0$). I estimated the model with and without a disturbance term that accounts for unobserved heterogeneity. Most of the coefficient estimates were unaffected by the heterogeneity assumption, but few (three) coefficients were unstable and displayed unreasonable (very large) values under this assumption. Therefore, I report the results without unobserved heterogeneity.

4. Regression Results

Table 4 presents the estimated model of the transition from unemployment to employment. The estimates are derived for the entire sample and by gender. The reported figures are the exponentiated coefficients, which represent the ratio of the hazards for a change in each independent variable from 0 to 1, holding the other regressors constant. All the regressors are

binary variables. If the hazard ratio is below one, the corresponding regressor lengthens the period of unemployment. If the ratio is above one, the effect of the regressor is to shorten the period of unemployment. For example, if the exponentiated coefficient (i.e., ratio) associated with being a female is 0.5, women will be half as likely as men to find a job in any given period.

In Table 5, I report the marginal effects of selected variables. The marginal effect, which is derived from the pooled regression estimates, shows how changing the value of one regressor from 0 to 1 alters the evolution of duration over time (periods 1 to 8), holding the other variables at their base (mostly zero) values. The reference (base) case represents an unmarried, male entrant from rural Lower Egypt, who was 20-24 years old at entry, who entered in 2005-2012 with an intermediate degree in education, and whose uneducated father was a semi-skilled blue-collar worker when the individual was 15 years old. For a particular set of values for the covariates, I calculate the probability of exiting unemployment in each year (the hazard rate, h_j), as well as the survival rate (or the probability of remaining unemployed beyond t), $S(t) = \sum_{j=1}^t (1 - h_j)$ (Jenkins, no date). The duration of unemployment at time j is then $-1/\ln(S(t))$ (Cleves *et al.*, 2010). The marginal effects reflect the proportional hazards assumption of the model, under which the impact of a unit change in a variable is multiplicative with respect to the hazard rate.

The regression results from the pooled sample point to a highly significant gender effect: women on average experience a longer unemployment duration. Being a female decreases the hazard, or the probability of finding a job, by 45 percent. In a traditional society, women are more likely to be financially dependent on intra-household support. Therefore, they tend to have higher reservation wages and consequently exert lower job search effort. Alternatively, because of labor market discrimination, women are less likely than men to receive job offers. Changing the gender of the reference person from male to female lengthens the unemployment spell by 82 percent (an increase of about 8 months, from 0.80 to 1.46 years in year 1).

Being married at the start of the spell has an impact on both men and women. Overall, being unmarried reduces the likelihood of remaining unemployed by 25 percent. The duration of unemployment increases by 0.2 years (1.01-0.8) or 2.4 months in year 1, when the reference case changes from a never-married man to an ever-married man. Although the pressure of marriage and family is expected to reduce the time to employment, married individuals perhaps are more likely to receive support from spouse or children.

The rise in one's education attainment significantly reduces the probability of finding a job, and raises the duration of unemployment in both the male and female samples. The estimated hazard ratios are all below one, the ratio of the reference group of no-diploma holders. Although the ratios generally decrease in value with the rise in education, the main effect occurs during the transition from no education to low levels of educational attainment. The hazard rate decreases to 84 percent and 68 percent for men with below intermediate degrees and intermediate degrees, respectively. After the initial large increase in duration at these educational levels, the duration continues to increase further but moderately with more education. A similar pattern is observed for females. The drop in the hazard ratio is initially large, to 55 percent for women with below intermediate education, and then to 24 percent for intermediate diploma holders. Afterwards, the hazard rate remains stable in the 23-26 range for higher levels of education. Furthermore, the effect of higher education in prolonging unemployment is considerably larger among women. For instance, the hazard rate for men who hold a university degree is 0.58, whereas the rate of their counterparts in the female sample is 0.26, compared to a ratio of 1 for the non-educated. These findings suggest that individuals, particularly women, wait longer in anticipation for better jobs, the more educated they are. For

the reference person, the unemployment spell increases by 11 percent to 0.89 years when his educational attainment rises from intermediate to university.

The estimates of the age-group indicator variables point to a positive association between the age at first entry and the probability of leaving unemployment. According to the combined sample results, the hazard ratio rises by 29 percent and 78 percent for youth in the age groups 20-24 and 25-29, respectively, in comparison to those who are in the age group 15-19. This positive effect holds irrespective of gender, although it is stronger among women. In duration terms, the reference male, who is 20-24 years old, experiences a 20-percent decrease in the period of unemployment (from about 1 to 0.8 years in the first year).

The estimated model identifies regional variations that interact with gender. The length of female unemployment is no different in Alexandria and Suez Canal regions than it is in Cairo. However, women experience considerably longer spells of unemployment in the rest of Egypt, irrespective of their urban-rural residency, with longer spells in Lower Egypt than in Upper Egypt. In the male sample, unemployment is significantly but moderately longer in Alexandria, Suez Canal region, and urban Lower Egypt than in the Greater Cairo region, with no important variations recorded for the other regions. The predicted probability of exiting unemployment decreases if residency changes from Cairo to urban Lower Egypt, which corresponds to a 17 percent increase in the duration of unemployment (from 0.66 years in year 1). Urban to rural comparisons do not show important male differences in Upper Egypt, but men endure longer spells in urban areas of Lower Egypt. As for women, there is no urban dimension to the length of unemployment in Lower Egypt. However, they remain unemployed longer in the urban areas of Upper Egypt in comparison to its rural areas. These results partially capture the effect of time-invariant (persistent) differences in local labor market conditions across Egypt's main regions and its rural-urban divide.

The period-of-entry dummy variables suggest that unemployment duration is increasing in recent times. Conditional upon age at entry, men who joined the labor market more recently, between 2005 and 2012, appear to have waited longer for the first job, compared to earlier cohorts. Among men, earlier periods of entry (before 2005) have hazard rates that are not substantially different from each other. In contrast, the increase in women's unemployment duration seems to have started earlier, during the 1990-1999 period. Furthermore, the decline in their predicted hazard is substantially larger. The hazard rate for males who entered in 2005-2012 (0.73) is 75 percent higher than its level for same-period female entrants. These results may not only point to changing economic and employment conditions, but also reflect supply-side (demographic) factors, as well as possible recall errors arising from the retrospective nature of the more distant unemployment spell data.

With respect to the education of one's father, a moderate impact on men's duration was detected. The hazard ratio dropped 14 percent (30 percent) for men whose fathers had a below-intermediate (intermediate) diploma, compared to persons whose fathers were formally uneducated. The hazard rate did not change further with higher levels of father's education. Father's education had no influence on the duration of female unemployment. As for father's occupation, again no female impact is detected. Men whose fathers had no or unskilled occupations were more likely, by 10-15 percent, to remain unemployed. Those whose fathers had semi-skilled or skilled occupations were not different from each other. The findings related to father's education and "early" occupation support the proposition that, by having better social networks, high socioeconomic status households are likely to shorten the transition to employment, even though these households are also capable of supporting longer job search durations. Men whose fathers rank very low socioeconomically are more likely to be unemployed and, at the same time, are less likely to afford being so.

It is interesting to note that the female hazard ratio does not vary over time, thus refuting the proposition that the ratio at any point in time depends on the amount of time that has already elapsed. However, such proposition holds for men. The male probability of finding a job rises gradually from year 2 to year 4. Afterwards, it drops gradually returning almost to its year-2 level in year 7. The male pattern suggests that, after the first year, waiting for a better job may not be a bad strategy, particularly if the individual is receiving family support. However, starting in year 4, the impact of deteriorating human capital dominates, and the probability of remaining unemployed rises. The time evolution of the gender-specific baseline hazard ratios is depicted in the working paper version of this study (Kherfi 2014).

Under the alternative assumption that the probability of exiting unemployment does not change over time ($h_1 = h_2 = \dots h_8 = h$), which is equivalent to setting all the time dummies to zero, one can obtain the Nth percentile duration of unemployment, $\ln(p)/\ln(1-h)$, where p is the desired percentile. For example, the median duration (τ) satisfies $S(\tau) = 0.5$. Assuming a constant hazard, $\tau = \ln(0.5)/\ln(1-h)$ (Jenkins, no date). The first data row in Table 6 shows the estimated length of unemployment at the 25th, 50th, and 75th percentiles of unemployment duration, if the sample were to represent the characteristics of the reference person. The following rows in the table display how the length varies if one characteristic is changed, holding the other ones constant. According to the table, 25 percent of men who represent the reference person remain in unemployment for at least 1.1 years, whereas 25 percent find a job within 0.23 years. The median duration is 0.56 years (about 7 months). As for the duration of otherwise identical women, those at the top 25 percent experience at least 2.1 years of unemployment, with a median spell of 1 year. The table also reveals that the percentile durations are longer among university graduates (in comparison to intermediate diploma holders), among those who are married, and among the 15- to 19-year-olds (relative to the 20-24 olds). On the other hand, people in Cairo, an urban zone, experience a minor decrease in the duration of unemployment (of one month for the median case), relative to those who live in rural Lower Egypt.

5. Conclusion

This paper examines the determinants of the probability of transition from unemployment to work using data from the last two rounds of ELMPS (2006 and 2012). Kaplan-Meier estimates of continuing unemployment are produced and compared by gender, survey year, and other individual characteristics. A discrete hazard model is estimated to quantify, by gender, the effects of individual and environmental attributes, on the duration of the first spell of unemployment. The probability of longer unemployment is found to be considerably higher among women, indicating discriminatorily unfavorable labor market conditions, or higher female reservation wages. After accounting for other factors, educational attainment and unemployment duration were found to be positively related, but the main effect occurred at low levels of education. Marriage is associated with longer unemployment spells among men and women, perhaps reflecting a higher likelihood of receiving support due to the presence of spouse or children. Furthermore, after correcting for educational attainment, youths who entered at ages 20-24 find jobs more rapidly, compared to those who are younger.

Other things being equal, unemployment duration does vary by region, with particularly longer duration among women in Lower Egypt. The regional variation in men's duration is limited in size and is only significant in some urban centers. Conditional upon age at entry, individuals who joined the labor market between 2005 and 2012 appear to have waited longer for the first job, in comparison to earlier cohorts. The cohort effects may reflect worsening demand conditions, changing labor supply, or information recall problems. Furthermore, there was a positive impact of father's education on male unemployment spells. And individuals whose fathers occupied no or unskilled jobs experienced slightly longer unemployment compared to

those with fathers in semi-skilled blue collar occupations. Fathers who held semi-skilled or skilled jobs had no effect on their sons' unemployment duration. These socioeconomic proxies (father's education and occupation) do not generate any apparent effects on the duration of women's unemployment. Finally, the baseline hazard was flat for women, suggesting spell duration that are independent of elapsed time of unemployment. For men, however, the hazard rates follows an inverted U pattern, implying that initially the probability of exiting unemployment increases with unemployment duration, perhaps due to the search for a more suitable job. However, the probability of finding a job subsequently decreases the longer the spell, likely due to stigma and skill deterioration effects.

The results complement the job market outlook that recorded unemployment rates depict. Overall unemployment remained roughly unchanged between 2006 and 2012 (from 8.5 to 8.7 percent), but increased considerably for women, from 18 to over 23 percent. The rate for men decreased during the same period by about one point, to 4.2 percent. The duration of male and female unemployment spells reveal a similar pattern. The median duration for men was stable between 2006 and 2012, and the large increase in the overall duration was mainly driven by considerably longer first-unemployment experience for women. The rising burden of unemployment during the period of study fell essentially on women in both frequency and duration terms. An overall median unemployment spell of 2 years for those who experience unemployment points to long-term structural problems, as opposed to search- or business-cycle related sources. While public employment was severely curbed over the past decade, formal private sector jobs growth was not high enough to absorb the surplus of an increasingly educated workforce. Men, particularly those with low levels of education or socioeconomic status, appear to have relied instead on the informal sector for livelihood. On the other hand, more educated individuals seem to have chosen to wait longer for a formal-sector job. This is particularly true for women, who are more likely to view the informal sector as a socially unattractive alternative.

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Figure 1: Probability of Survival in Unemployment by Gender and Months of Unemployment, Age at Entry: 15-29, Year of Entry: 1970-2012, 2006/2012 Estimates

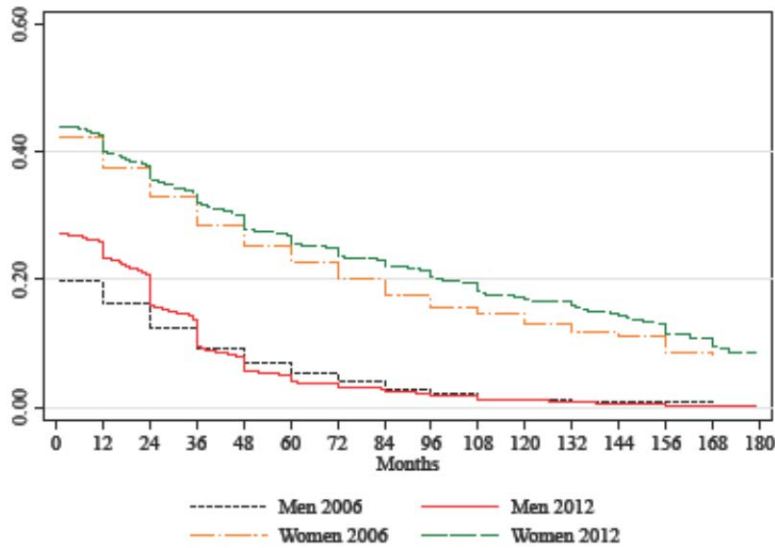


Figure 2: Probability of Survival in Unemployment by Gender, Education, and Months of Unemployment, Age at Entry: 15-29, Year of Entry: 1970-2012, 2006/2012 Estimates

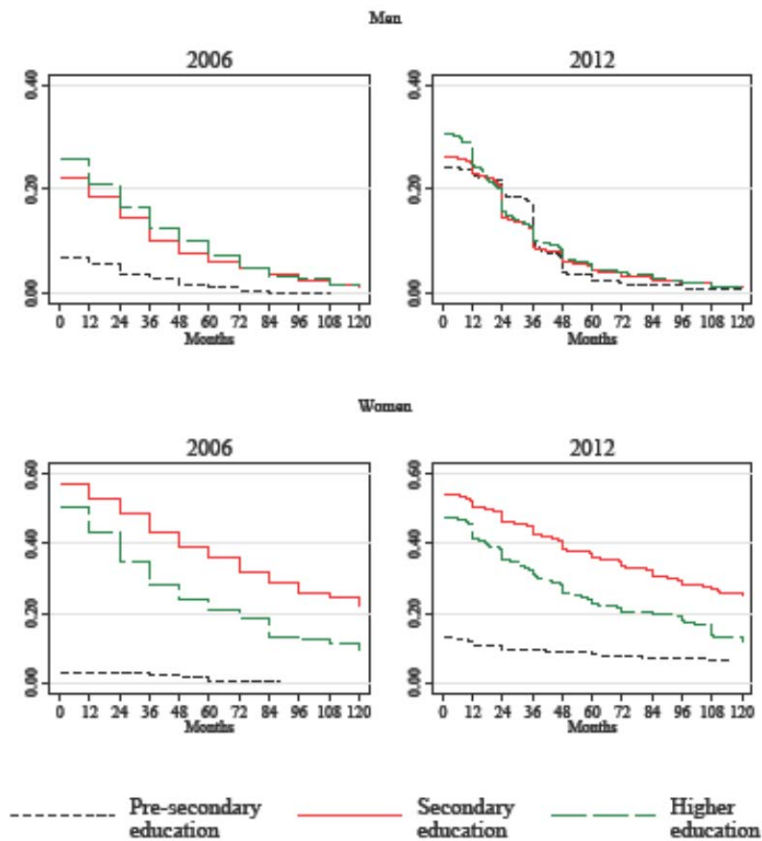


Figure 3: Probability of Survival In Unemployment by Gender, Age of Entry, and Months of Unemployment, Age at Entry: 15-29, Year of Entry: 1970-2012, 2006/2012 Estimates

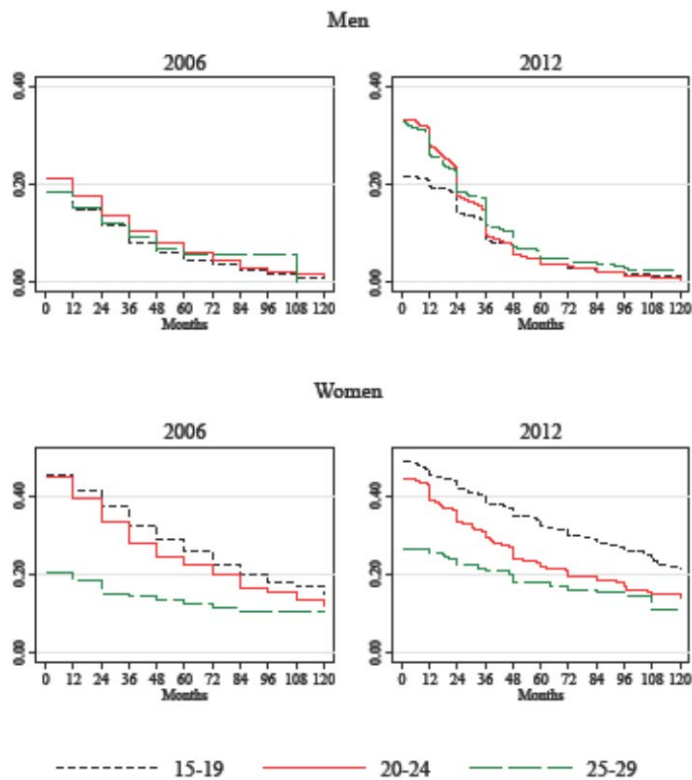


Table 1: The Duration of Current Unemployment (in months), Ages 15-64: 2006 and 2012

Gender	Mean	25th percentile	Median	75th percentile
ELMPS 2006				
Men	26.2	6.0	17.5	36.0
Women	53.0	12.0	36.0	72.0
Total	41.7	12.0	24.0	60.0
ELMPS 2012				
Men	33.7	9.0	20.0	45.0
Women	82.8	26.0	69.0	129.0
Total	64.4	14.0	44.0	96.0

Source: Author's calculations from ELMPS 2006 and ELMPS 2012.

Table 2: Duration of First Spell of Unemployment (in months)-Kaplan Meier Estimates *

Percentile	Men			Women			Total		
	25%	50%	75%	25%	50%	75%	25%	75%	
ELMPS 2006	24	36	72	36	72	156	24	48	108
ELMPS 2012	24	36	48	36	86	162	24	36	93

* Conditional on having experienced unemployment, and taking right censoring into account. 15-29 year olds at the time of the spell. Year of spell: 1970 or higher. Persons who secured work within one month of entering the labor market are excluded.

Source: Author's calculations from ELMPS 2012.

Table 3: Duration of Unemployment, Grouped Data

Duration in years (X)	All*	Unemployed**
	%	%
$X \leq 1$	73.3	2.4
$1 < X \leq 2$	5.5	20.1
$2 < X \leq 3$	5.7	20.9
$3 < X \leq 4$	4.3	15.8
$4 < X \leq 5$	2.6	9.3
$5 < X \leq 6$	1.9	6.9
$6 < X \leq 7$	1.2	4.4
$X > 7$	5.5	20.2
Count	13119	3588

Notes: * $X \leq 1$ for no-unemployment-spell workers. ** Median duration: 36 months.

Source: Author's calculations from ELMPS 2012.

Table 4: Proportional Hazard Model of Unemployment Duration: Discrete Grouped Duration of First Spell

	All		Men		Women	
Woman	0.551 ^{***}	0.016				
Single	1.254 ^{***}	0.054	1.439 ^{***}	0.109	1.206 ^{***}	0.070
Age at entry (15-19)						
20-24	1.289 ^{***}	0.044	1.167 ^{***}	0.045	1.473 ^{***}	0.098
25-29	1.785 ^{***}	0.107	1.556 ^{***}	0.112	2.475 ^{***}	0.254
30 or higher	2.724 ^{***}	0.207	1.573 ^{***}	0.230	3.359 ^{***}	0.328
Own education (no diploma)						
Below intermediate	0.693 ^{***}	0.039	0.844 ^{***}	0.050	0.546 ^{***}	0.065
Intermediate	0.484 ^{***}	0.023	0.677 ^{***}	0.035	0.237 ^{***}	0.019
Above intermediate	0.443 ^{***}	0.031	0.628 ^{***}	0.050	0.229 ^{***}	0.030
University	0.434 ^{***}	0.024	0.576 ^{***}	0.037	0.259 ^{***}	0.026
Father's education (no diploma)						
Below intermediate	0.894 ^{***}	0.034	0.864 ^{***}	0.037	0.918	0.067
Intermediate	0.798 ^{***}	0.039	0.732 ^{***}	0.043	0.987	0.080
Above intermediate	0.755 ^{***}	0.070	0.664 ^{***}	0.071	0.970	0.170
University	0.836 ^{***}	0.053	0.737 ^{***}	0.056	0.986	0.106
Father's occupation †						
(semi-skilled blue collar)						
No job	0.916	0.063	0.879 [*]	0.064	0.799	0.134
Elementary	0.928 [*]	0.038	0.893 ^{**}	0.042	0.972	0.076
Semi-skilled white-collar	1.013	0.049	0.987	0.056	0.997	0.087
Skilled	1.055	0.039	1.032	0.044	1.044	0.072
Year of entry (prior to 1980)						
1980-1989	0.923	0.045	0.906 [*]	0.048	0.917	0.085
1990-1999	0.891 ^{***}	0.040	0.949	0.046	0.714 ^{***}	0.065
2000-2004	0.773 ^{***}	0.036	0.906 [*]	0.048	0.480 ^{***}	0.045
2005-2012	0.633 ^{***}	0.029	0.728 ^{***}	0.037	0.418 ^{***}	0.037
Region (Cairo)						
Alex, Suez Canal	0.854 ^{***}	0.043	0.853 ^{***}	0.051	0.998	0.084
Urban Lower Egypt	0.737 ^{***}	0.035	0.873 ^{**}	0.049	0.527 ^{***}	0.045
Urban Upper Egypt	0.855 ^{***}	0.039	0.958	0.051	0.699 ^{***}	0.057
Rural Lower Egypt	0.821 ^{***}	0.035	0.993	0.050	0.556 ^{***}	0.043
Rural Upper Egypt	0.966	0.047	1.043	0.058	0.766 ^{***}	0.071
Time dependence	included		included		included	
Count (person-years)	25644		14565		11079	
Count (persons)	13119		9065		4054	

Notes: Exponentiated coefficients; Standard errors in second column. ^{*} $p < 0.10$, ^{**} $p < 0.05$, ^{***} $p < 0.01$.

† When the individual was 15 years of age.

Source: Author's calculations from ELMPS 2012.

Table 5: The Expected Remaining Duration of Unemployment at Year j

Year	1	2	3	4	5	6	7	8
Reference*	0.80	0.70	0.58	0.49	0.44	0.41	0.39	0.29
Woman	1.46	1.28	1.06	0.89	0.80	0.74	0.70	0.53
University	0.89	0.79	0.65	0.55	0.49	0.45	0.43	0.33
Age: 15-19	1.03	0.91	0.75	0.64	0.57	0.52	0.50	0.38
Cairo	0.66	0.58	0.48	0.40	0.36	0.33	0.32	0.24
Married	1.01	0.88	0.73	0.62	0.55	0.51	0.48	0.37

Notes: *Male, unmarried, 20-24 years, labor market entry: 2005-12, intermediate education, rural Lower Egypt, uneducated semi-skilled blue collar father.

Source: Author's calculations from ELMPS 2012.

Table 6: Predicted Duration of Unemployment By Percentile (in Years) Assuming No Time Dependency

	25th percentile	50th percentile	75th percentile
Reference	0.23	0.56	1.11
Woman	0.42	1.01	2.08
University education	0.26	0.62	1.24
Age: 15-19	0.30	0.72	1.43
Cairo	0.19	0.46	0.91
Married	0.29	0.70	1.39

Source: Author's calculations from ELMPS 2012.