

Employment's Role in Enabling and Constraining Marriage in the Middle East and North Africa

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Abstract

This paper investigates the role of employment in enabling and constraining marriage for young men and women in Egypt, Jordan, and Tunisia. Survival analysis methods for age at marriage are applied to comparable labor market panel surveys from Egypt (2012), Jordan (2010), and Tunisia (2014), which include detailed labor market histories. For men, employment and especially high-quality employment are associated with more rapid transitions to marriage. For women, past, but not contemporaneous employment statuses are associated with more rapid transitions to marriage. After addressing endogeneity using residual-inclusion methods for the case of public sector employment (a type of high-quality employment), we find that such employment significantly accelerates marriage for men in Egypt and women in Egypt and Tunisia. The potential of high-quality employment to accelerate marriage may make queuing in unemployment, seeking high-quality employment, a worthwhile strategy.

Keywords: Economics of marriage; labor markets; Middle East and North Africa

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1. Introduction

The link between economic factors and marriage behavior has long been a concern in demography and studies of the life course (Baizán et al. 2002; Blossfeld et al. 2005; Juárez & Gayet 2014; Oppenheimer 1988, 2003; Oppenheimer et al. 1997). To understand marriage outcomes, scholars have used a “marriage market” framework, with search and matching among potential spouses in a setting characterized by incomplete information on spousal quality (Adachi, 2003; Becker, 1973, 1974; Grossbard-Shechelman, 1995). Besides signaling future earning potential, employment can affect the timing of marriage by allowing individuals to contribute to the costs of marriage.

In this paper, we examine the relationship between work and marriage in the Middle East and North Africa (MENA), specifically in Egypt, Jordan, and Tunisia. Given the region’s dominant male breadwinner, female homemaker model, young men must signal their economic readiness for marriage (Hoodfar 1997). Recent declines in the ability to acquire high-quality employment, especially employment in the public sector, have severely tested young men’s ability to signal their economic readiness, making the transition to adulthood more protracted and uncertain (Assaad et al. 2010; Assaad & Krafft 2015a, 2015b; Salehi-Isfahani & Egel 2010; Salem 2016a). This phenomenon of prolonged transitions to adulthood has been termed “waithood” (Dhillon et al. 2009; Kuhn 2012; Singerman 2007). Waithood has induced anxieties among youth and their families, and social and political concerns. The lack of decent employment for increasingly educated youth and the resulting protracted transition to adulthood are considered an important trigger for the Arab Spring revolutions (Arampatzi et al. 2018; Campante & Chor 2012; Devarajan & Ianchovichina 2018).

To date, there is limited rigorous empirical evidence on how employment shapes the transition to marriage in MENA. We therefore investigate two key research questions: (1) how different labor market statuses affect marriage timing and (2) whether queuing (waiting in

unemployment for a good job) pays off as a strategy to accelerate marriage. The paper highlights how the links between the labor market and the marriage market differ by sex, due to gender roles that mandate employment as a pre-requisite to marriage for men, but not women.

This paper makes three contributions to understanding the link between work and marriage. First, it addresses the potential endogeneity of employment (specifically for public sector employment). Second, it explores the marriage timing tradeoffs between making a slower transition to employment in the hopes of getting higher-quality employment versus making a quicker transition into lower-quality employment. Third, it investigates the relative roles of signaling (indicating future standards of living) versus resource accumulation (saving towards marriage costs) effects of employment on marriage timing. It thus contributes a number of insights about the interplay between labor market behavior and the marriage market.

2. Context

MENA countries, more so than other regions, have maintained the archetypal structure of the transition to adulthood. In MENA, marriage is the sole socially acceptable route to adult roles, including independent living, sexual relations, and childbearing (El Feki 2013; Hoodfar 1997; Singerman & Ibrahim 2003). Although Egypt, Jordan, and Tunisia have much in common in terms of the centrality of marriage to the transition to adulthood, they have variation in key aspects of their economic context, as well as different patterns of age at marriage. Comparing these countries can illustrate common relationships between work and marriage that span contexts with similar, archetypal transitions, as well as how these relationships can be context dependent. These countries were selected due to the availability of data on work and marriage. They do not represent all countries in the region, but do represent different sub-regions across MENA, including the Arab west (Maghreb) and east (Mashreq). These three countries do not necessarily represent the Gulf states, which have higher incomes and different labor markets, although similar norms around marriage.

Table 1 compares key features of the three countries, starting with the percentage of men and women married by (before) various ages. Marriage is almost universal for men and women in Egypt and for men in Jordan. A substantial fraction of men in Tunisia (14%) and women in Jordan (14%) and Tunisia (18%) do not marry by age 50. The median age at marriage is similar in Egypt and Jordan, 27 for men and 21-22 for women, but higher in Tunisia, 33 for men and 27 for women.

Education has expanded rapidly in the MENA region. The average years of schooling increased substantially in all three countries, comparing the cohorts born in 1950-1954 to 1980-1984, but the increase was more pronounced among women. Despite rising educational attainment, female labor force participation (employment plus unemployment as a percentage of the working age population) is still very low. Female participation rates are 17% in Jordan, 23% in Egypt, and 25% in Tunisia (Table 1), compared to a world average of 49% (ILO 2017).

Historically, educated graduates were guaranteed employment in high-quality jobs in the public sector (Assaad 2014a; Devarajan & Ianchovichina 2018). As education expanded this model became unsustainable. There was limited growth of high-quality employment (i.e. formal employment, with social insurance and/or a contract) in the private sector, which primarily provided low-quality, informal employment (Assaad, AlSharawy, et al. 2019; Assaad, Krafft, et al. 2019; World Bank 2013, 2014).

Rising educational attainment and deteriorating labor market opportunities led to some of the highest youth unemployment rates in the world. Male and female youth unemployment rates are very similar in Tunisia (34-37%), where unemployment durations are long (Assaad & Krafft 2016), but in Egypt the female rate (50%) is approximately five times the male rate (10%). Jordan falls between these two extremes (20% male, 43% female). These differences can be understood by thinking of unemployment as a strategic queuing behavior, where youth remain unemployed in hopes of obtaining public sector or private formal employment, which offer better

wages and benefits as well as greater social prestige (Assaad, 1997; Assaad, 2014a; Barsoum, 2015; Groh, McKenzie, Shammout, & Vishwanath, 2014). Young people strongly prefer public sector employment, followed by private formal sector employment, due to the better working conditions, pay, and benefits associated with such jobs (Barsoum 2015b, 2015a). In Egypt, young men are less likely to end up in formal employment than in Jordan or Tunisia (Table 1). The scarcity of formal employment for Egyptian men makes queuing a less appealing option for them. In Jordan and Tunisia, where the chances of obtaining formal employment are higher, men would be more willing to queue for these positions, raising their unemployment rates.

The work women undertake in all three countries is limited to activities that are considered appropriate for women in a conservative social setting. Public sector employment is the most reconcilable with other gender roles, while informal employment is considered inappropriate (Assaad & El-Hamidi 2009; Assaad et al. 2014; Assaad & Krafft 2015c). For women, employment is not a pre-requisite for adulthood, but marriage is. As a result, their fallback position is to remain unemployed queueing for public sector employment or to leave the labor force altogether.

The challenging conditions of the school-to-work transition have contributed to public anxiety around the ability of young people to marry in a timely fashion (Salehi-Isfahani 2013; Salem 2014, 2015, 2016b; Singerman 2007). Economic factors are related to the delay in marriage on two fronts. First, the transition to work, with substantial unemployment or informal employment is an obstacle, as employment is (for men) a prerequisite to marriage. Second, even once working, accumulating the substantial resources required for marriage may further delay marriage (Singerman 2007).

The costs of marriage can be high, particularly in contexts, such as Egypt and Tunisia (but not Jordan), where home ownership is the norm (Assaad, Krafft, & Rolando 2017). If a groom in Egypt were to cover the full initial costs of marriage, it would take eight years of wages

(Assaad & Krafft 2015a), compared to five years in Jordan (Assaad, Krafft, & Rolando 2017). Men bear the largest share of the costs of marriage (Salem 2015; Singerman 2007), which may particularly delay their marriages and contribute to persistent spousal age gaps (Assaad & Krafft 2015a). The groom's family, as well as the bride and her family, also contribute towards marriage costs, with prescribed purchases, such as the groom's side securing housing and the bride's side the kitchen appliances (Amin & Al-Bassusi 2004; Yount & Agree 2004). Thus, employment not only signals future standards of living (signaling), but is also necessary to purchase the assets required to marry (resource accumulation).

3. Conceptual Framework

This paper draws on two key strands of theoretical literature on transitions to adulthood. First, the global life course literature provides a framework for understanding transitions into adult roles and how transitions vary by gender and background (Lloyd 2005; Mortimer & Shanahan 2003; Sommers 2012). Second, the economics of marriage literature frames marriage market behavior, including features such as assortative mating, uncertainty and information problems, and game theoretic behaviors (Assaad & Krafft 2015b, 2015a; Becker 1973, 1974; Bergstrom & Bagnoli 1993; Smith 2006).

Across both developed and developing country contexts, the transition to adulthood has been evolving in response to changing economic, social, and demographic forces. The archetypal transition to adulthood proceeds through education, employment, residential independence, marriage, and child bearing (Juárez & Gayet 2014). Increasing time spent in school and increasingly insecure employment opportunities prolong transitions (Arnett et al. 2011; Blossfeld et al. 2005; Dhillon & Yousef 2009; Sommers 2012).

Marriage (or union formation), which is often linked with independent living, is a key stage in the transition. There is substantial heterogeneity across countries in how age at marriage

has shifted over time (Amato et al. 2008; Billari & Wilson 2001; Mensch 2005). This heterogeneity may be in part because marriage depends on the preceding transitions, in particular the school-to-work transition. Transitions to adulthood are gendered, in that men and women have distinct patterns for age at marriage around the globe, often linked with the speed and quality of transitions into employment (Baizán et al. 2002; Calvès 2016; Goldin 2006; Gutierrez-Domenech 2008; Jampaklay 2006; Juárez & Gayet 2014; Kalmijn 2011; Oppenheimer 2003; Oppenheimer et al. 1997).

A key framework linking employment to marriage timing is the idea of a marriage market in which individuals search and match over the set of potential spouses (Adachi 2003; Becker 1973, 1974; Grossbard-Shechman 1995). There are challenges with incomplete information about spousal quality, so matches occur based on expected quality (Bergstrom & Bagnoli 1993). In this uncertain assortative mating process, timing of marriage (for men) is delayed until they enter stable careers (Oppenheimer 1988). Increases in employment instability can lead to reductions in marriage rates, as demonstrated in the U.S. (Oppenheimer 2003; Oppenheimer et al. 1997) and Europe (Gutierrez-Domenech 2008; Kalmijn 2011). There are fewer studies connecting the timing of marriage to employment in the developing world (Antoine et al. 1995; Calvès 2016; Jampaklay 2006).

Because MENA marriages are the outcome of extensive negotiations across two families rather than simply the result of individual choices, it is useful to supplement the traditional search theoretic framework with a bargaining framework (Assaad & Krafft 2015b). The bride side's bargaining power is greatest up front, due to the unequal rights accorded to wives within marriage in countries that follow Sharia law as the basis for their family law (Assaad & Krafft 2015b). Gender equity within marriage varies by country, with Tunisia being relatively more equitable (Assaad, Ghazouani, et al. 2018; Yount & Agree 2004). Divorce is uncommon and particularly damaging to women (El Feki 2013; Hoodfar 1997). Marriage is therefore a high-

stakes endeavor, and the bride's side tries to secure up front as much certainty about the spouse and future living conditions as possible (Assaad & Krafft 2015b). This theoretical frame points to a dual role for (higher quality) employment in the marriage market. First, employment (and the *future* standard of living it implies, which we refer to as signaling) makes individuals more desirable marriage partners. Second, their employment (and the *current* associated earnings) make it possible to more rapidly secure the pre-requisite conditions (e.g. housing) for marriage, which we refer to as resource accumulation.

In MENA, evidence on employment and marriage is available primarily for the case of Egypt (Amin & Al-Bassusi 2004; Assaad et al. 2010; Assaad & Krafft 2015a; Salem 2016a), with a single study on Jordan (Gebel & Heyne 2016), and one on Iran (Salehi-Isfahani & Egel 2010). None of the studies address the potential endogeneity of employment in predicting age at marriage. There is the potential for a variety of sources—and directions—of endogeneity in the marriage and employment relationship. For example, individuals who have greater expectations for their standards of living at marriage may seek employment to help secure those standards. Those who have greater expectations may require more time to acquire resources prior to marriage, such that high expectations delay marriage. In this example, while employment accelerates marriage, the unobserved aspirations for living standards at marriage decelerate marriage, thus attenuating the estimated effect of employment on accelerating marriage. A similar argument can be made for higher-quality employment. Alternatively, it may be that individuals who have a marital prospect at hand (e.g. are engaged) seek employment sooner in order to accelerate marriage, such that this reverse causality overstates employment's effect on accelerating marriage. Women may also quit employment in anticipation of marriage. Since both directions of bias are possible, we empirically test the direction of the bias.

For men, previous studies of MENA countries find a clear association between employment (quality) and accelerated marriages (Assaad et al. 2010; Assaad & Krafft 2015a;

Gebel & Heyne 2016; Salehi-Isfahani & Egel 2010). For women, the employment-marriage timing nexus is more ambiguous. In Egypt, there is no relationship between employment, generally, and women's age at marriage (Assaad & Krafft 2015a; Salem 2016a). Some studies find that higher quality employment accelerates women's marriage (Assaad & Krafft 2015a), while others find no relationship (Salem 2016a). Working prior to marriage may be a strategy for generating the savings needed to cover the bride's side marriage costs (Amin & Al-Bassusi 2004; Sieverding 2012). In Iran and Jordan, women's employment is associated with later marriages (Gebel & Heyne 2016; Salehi-Isfahani & Egel 2010), which may be a case of reverse causality, wherein women who lack marriage prospects work for a time.

Building on this literature, we advance four hypotheses, which we test separately for each county and by sex.

H1: Employment accelerates marriage

Employment signals spousal (future) value and aids resource accumulation. We expect that effects will be stronger for men than for women given the male breadwinner, female homemaker norm in the region.

H2: Higher-quality employment (public sector or private formal) accelerates marriage relative to lower-quality employment.

Higher-quality employment may signal a more desirable marriage partner or yield higher earnings, thus securing the material conditions for marriage. We expect that this will be true for both men and women, but that, for women, only public sector employment (which is more reconcilable with marriage) will have unique effects, whereas for men private formal employment will also accelerate marriage, as it achieves similar income and job security/pension outcomes as public sector employment.

H3: The signaling of future standards of living implied by employment will be a stronger driver of marriage timing for men than the resource accumulation effects of employment, which will be stronger for women.

Marriage timing theory (Oppenheimer 1988) highlights both the signaling and resource accumulation channels of how employment affects the timing of marriage. For men, as breadwinners, signaling is likely to matter more, whereas for women, resource accumulation will matter more, since many leave employment at or before marriage. Resource accumulation will be particularly important in contexts with higher up-front marriage costs (i.e. Egypt and Tunisia).

H4: Queuing or searching for employment while unemployed, if it pays off in higher-quality employment (i.e. public sector employment), can be an effective strategy for accelerating marriage compared to accepting low-quality employment right away (i.e. private informal employment).

This hypothesis is based on the potential for strategic behavior (queuing or extended job search) in the face of employment uncertainty in the labor market in an attempt to maximize spousal quality. We expect this tradeoff to be particularly relevant for men, as women who are unemployed or do not work will face less of a penalty on the marriage market.

4. Methods

Survival analysis methods are used to model age at marriage and its relationship with employment. These methods take into account the fact that many individuals are not yet married (i.e. are right-censored on their age at marriage). Because age at marriage is recorded in years, we take a discrete-time approach. Marrying at a particular age, t , can be denoted as T_t . We characterize marriage with the discrete-time hazard function, h_{it} (Jenkins 1995):

$$h_{it} = \Pr(T_t | T_t \geq t) \quad (1)$$

Survival analysis methods can include time-varying (such as whether or not an individual is employed) as well as time invariant characteristics (such as birth region). To incorporate time-varying covariates, the data are structured such that an observation is a unique combination of an individual and a year of age (e.g. age nineteen) ending with the age at which an individual marries for the first time, or his/her current age, if still unmarried.³

Denoting the covariates as X_{it} , we estimate the complementary log-log model, a discrete-time proportional hazards model, as (Jenkins 1995):

$$\log(-\log(1 - h_{it})) = \theta(t) + \beta X_{it} \quad (2)$$

The term $\theta(t)$ is a series of dummies for the years of age (baseline hazard).⁴ The estimated coefficients, β , when transformed as $\exp(\beta)$ can be interpreted as hazard ratios, describing the relationship between a one-unit increase in a covariate and the hazard of getting married. The investigation of the tradeoffs in remaining unemployed to search for high-quality (specifically public sector) employment relies on the parameters of the complementary log-log model to create simulations of different trajectories across unemployment and different types of employment.

Endogeneity is likely to be a problem in estimating the effect of employment. We therefore need instruments for employment to account for potential endogeneity. We focus our endogeneity-corrected estimates on the impact of public sector employment on marriage timing, not only because public sector employment is highly valued by youth (Barsoum 2015a; Boughzala 2018) but also because an instrument is available for public sector employment,

³ We focus on marriage, rather than engagement, since stages of the engagement process happen at different spacings, making these intermediate stages less comparable (Gebel & Heyne 2014). Engagements are commonly broken and are not the same durable transition to adulthood as marriage (Hoodfar 1997). Additionally, the couples' living conditions are negotiated during the engagement process, and thus marriage timing depends in part on employment during engagement. We also test lagged employment status, which could be interpreted as employment status when engaged.

⁴ Because the hazards are very low at young and old ages, the dummies for 15-18 are combined, and ages 35+ are combined, but no observations are dropped.

namely the proportion of adults that are in public sector employment in the local (governorate and urban/rural) labor market each year.

For the instrument to be valid, it must be exogenous and unrelated to marriage timing except through public sector employment, after accounting for other variables (exclusion restriction). We would not expect public sector employment opportunities to affect marriage timing except through an individuals' own public sector employment. Public sector employment opportunities are centrally allocated through the budget process, which is a strong argument in favor of their exogeneity (Assaad 1997). Previous research has demonstrated that, at least in Egypt, local public sector employment is not significantly related to other local social or economic conditions such as GDP per capita or adult literacy (Krafft 2016). Even if the level of local public sector employment were correlated with other local conditions, the change in this level, which is the basis of our identification strategy, is unlikely to be.

We include governorate of birth and urban/rural dummies and their interactions as controls to capture any time-invariant aspects of localities. We use the information on the governorate of birth rather than that of current residence to avoid any possible endogeneity associated with the decision to migrate.⁵ Further, we control for time trends with year fixed effects. Thus, we are identifying off of variation across locations in the change in local public sector employment opportunities. We also include lagged (one year prior) local public sector employment opportunities, to be able to account for both stock and flow dynamics in the labor market. Our instrument – the share of the local adult population with public sector employment – has substantial variation over time and across locations, which is critical for identification (Krafft 2016).

⁵ We tested dropping individuals who moved from their place of birth from our sample, and results were substantively similar except for women in Tunisia, for whom the result lost significance (possibly due to reduced sample size) but had the same direction.

A challenge in applying instrumental variables methods is that both our endogenous regressor (public sector employment) and outcome of interest (age at marriage) are inherently non-linear. Using a non-linear first stage in two-stage least squares estimation is not recommended (Angrist & Pischke 2009). One solution is a three-stage procedure with a two-part first stage (Adams et al. 2009; Angrist & Pischke 2009; Wooldridge 2002). A non-linear model (we use a probit) is used to estimate the endogenous time-varying binary outcome of interest, D_{it} (own public sector employment), as a function of covariates X_{it} and instruments Z_{it} (local public sector employment). The predicted probability of own public sector employment, namely \hat{D}_{it} , can then be used as an instrument in an ordinary least squares (OLS) linear probability model for D_{it} with covariates X_{it} , which generates the predicted probability \hat{p}_{it} . If our outcome of interest were linear, we could then run OLS on that outcome with \hat{p}_{it} and X_{it} as covariates, essentially two-stage least squares, but for the instruments being \hat{D}_{it} .

An additional complication arises from the fact that our outcome of interest is a duration, age at marriage. When the outcome is inherently non-linear, then using a control function approach, also referred to as two-stage residual inclusion (2SRI), is recommended (Terza, Basu, et al. 2008; Wooldridge 2015). Simulations have shown 2SRI performs better than alternatives when outcomes are non-linear, including in survival analysis settings (Carlin & Solid 2014; Terza, Basu, et al. 2008; Terza, Bradford, et al. 2008). Instead of the predicted probability \hat{p}_{it} , the original outcome D_{it} is included along with the residual from the preceding stage, namely $D_{it} - \hat{p}_{it}$. Thus, the approach we take combines the methods of three-stage instrumental variables, using the predicted values of our endogenous dummy of interest as instruments in the intermediate stage, and two-stage residual inclusion. We therefore refer to it as “three stage residual inclusion” (3SRI) (Krafft 2016). Using this method, the statistical significance of the residual

embodies a test of the hypothesized endogeneity of public sector employment. Bootstrapped standard errors clustered at the primary sampling unit (PSU) level are used.

5. Data

The study uses data from the Egypt Labor Market Panel Survey (ELMPS) 2012, the Jordan Labor Market Panel Survey (JLMPS) 2010 and Tunisia Labor Market Panel Survey (TLMPS) 2014 (OAMDI 2013, 2016, 2018).⁶ The data include detailed labor market histories as well as information on the timing of first marriages. We use the labor market history data to estimate employment opportunities in a cell defined by governorate and urban/rural location and year.⁷ Governorates are the first level of administrative geography; there are 22 governorates in our sample in Egypt, 12 in Jordan, and 24 in Tunisia. Our sample consists of individuals 15-59 at the time of each survey.⁸ This sample totals 24,432 individuals in Egypt, 12,330 individuals in Jordan, and 4,714 individuals in Tunisia.

Controls are included for a variety of individual characteristics that theory indicates are likely to affect the timing of marriage (Assaad & Krafft 2015a, 2015b). Individuals' time-varying labor market statuses are characterized as: (1) public sector employment (2) private sector formal wage work, with either a contract or social insurance coverage (3) private informal wage work (4) non-wage work (i.e. being self-employed, an employer, or an unpaid family worker) (5) unemployment or (6) out of the labor force (OLF).⁹

⁶ For more information see Assaad and Krafft (2013), Assaad (2014b), and Assaad et al. (2016). Data are publicly available from ERF at www.erfdataportal.com.

⁷ We restrict our data to the 30 years preceding each survey. The Jordanian data do not distinguish between urban/rural areas of birth in the residential history data.

⁸ Because employment histories are only available starting at age 15, we start our analysis of marriage timing from age 15, excluding those (very few) individuals married prior to that age. Missing data also limits the size of the sample, particularly in Tunisia.

⁹ In the labor market history data we can only capture market work, which is likely to underestimate work, particularly for women (Donahoe 1999; Langsten & Salem 2008). However, comparisons of labor market history and contemporaneous data show reasonably good data consistency, particularly for more persistent statuses, such as public sector work (Assaad, Krafft, et al. 2018).

Education is included as a time-varying covariate for whether an individual is currently enrolled in school, along with various completed levels (illiterate (the reference), read and write, basic education, secondary education, or university education). Mother's and father's education are included categorically as time-invariant characteristics. Father's employment status and occupation when the individual was 15 (time-invariant) are included as important measures of socio-economic status. Since few mothers worked, we control for mother working (or not) when the individual was 15 (time-invariant) rather than her type of work. We include the (time-invariant) number of brothers and sisters ever born, to account for any resource competition. Time trends are captured with a series of time-varying five-year-period dummies (e.g. the year being 2000-2004). Region (of birth, time-invariant) is incorporated, along with urban/rural location at birth (in combination with region in Egypt (as is typical)).

In the 3SRI models, public sector employment versus all other statuses is examined. For 3SRI estimation, the categorical regions are further broken down to be on the level (typically governorate and urban/rural¹⁰) at which the instrument was estimated, and controls are included for each time-varying year (rather than in five-year categories as before) to further ensure the instrument is valid, after accounting for the control variables.

6. Results

6.1 Correlates of Marriage Timing

In this section we explore how employment is associated with age of marriage. Table 2 presents the discrete time proportional hazards models, showing hazard ratios. Hazards greater than one indicate an individual is more likely to marry at each age compared to the reference (baseline hazard) individual; hazards less than one indicate an individual is less likely to marry. For instance, in Egypt, the hazard ratio for males for public sector employment is 1.368; public

¹⁰ In Tunisia, because of small sample sizes, a number of neighboring governorates are combined.

sector employment is associated with a 37% higher hazard of marrying at each age, compared to the omitted category of private informal wage work. Men in Jordan and Tunisia also have a significantly higher hazard of marrying at each age if they have public sector employment. Private formal wage employment significantly increases the hazard of marriage for men in Egypt by 19%, but not in Jordan or Tunisia (where the hazard ratio is similar to Egypt, but insignificant). The relative rarity of private formal work in Egypt (see Table 1), may mean it has a stronger signaling effect on the marriage market. Non-wage work is not significantly different from private informal work for men, but being unemployed and especially out of the labor force significantly reduces the hazard of marrying for men. Overall, for men, in terms of associations, there is evidence that employment accelerates marriage (H1) and employment quality matters for marriage timing (H2).

For women, compared to the “default” of being out of the labor force, women in public sector wage work are significantly more likely to marry at each age in Egypt (by 12%), Tunisia (by 70%), and Jordan (8%, insignificant). For women, compared to being out of the labor force, all non-public types of work are associated with either an insignificant or a significant and lower hazard of marriage. This may be because women only undertake these forms of work when they need to help pay for marriage or when they have limited marriage prospects available. Thus, for women, the results in terms of employment being associated with accelerating marriage (H1), are mixed, in part because the results confirm that the quality of employment matters (H2).

We tested an additional model that pooled men and women and then included interactions between sex and all covariates. We found that there were significant differences in the relationship between covariates and marriage timing by sex in all countries, both overall and when specifically looking at the differences in the relationship between employment and marriage. While for men, being unemployed or OLF was associated with delayed marriage it was

not so for women. Relative to informal employment, other types of employment were associated with faster marriage to a greater extent for women than men.

The hazard ratios of other covariates are as expected. For example, those in school tend to have a significantly lower hazard of marrying. Some parental characteristics are associated with a higher hazard of marriage, for example, having a mother who worked, potentially due to an additional family member with income accelerating saving for marriage. Yet other parental characteristics are associated with delays in marriage, for example having a mother with higher education, likely because educated mothers typically denote a higher socio-economic status and higher expectations for adult living. In all three countries even after controlling for other characteristics, there are strong cohort trends, displaying a rise and fall in the age at marriage for Egypt, along with rising but potentially stabilizing ages at marriage in Jordan and Tunisia.

6.2 Dynamics of Employment and Marriage Timing

In Table 3 we include both concurrent labor market status and lagged status (one year prior), to investigate whether signaling or resource accumulation drives the employment-marriage timing relationships we see (H3). We interpret current labor market status, controlling for lagged status, as the effect of signaling the future or social value of a labor market status. We interpret lagged labor market status, controlling for current status, as the ability to accumulate resources towards marriage. Since labor market statuses are highly persistent, multi-collinearity will inflate the standard errors. In Egypt and Jordan, the concurrent effect of higher-quality employment (i.e. in the public sector) is associated with earlier marriage for men. Having previously been employed does not show much quality differentiation. However, being unemployed or out of the labor force both currently and in the past reduce the hazard of marriage (the latter likely due to an inability to accumulate resources). In Tunisia, for men, results are insignificant, likely related to smaller sample size and multi-collinearity.

For women, current work, especially informal wage work, is related to a lower hazard of marriage, but previously being employed enables marriage. This result demonstrates distinct signaling (current employment, which may even be a negative signal) versus resource accumulation effects (savings from past work accelerating marriage) for women (H3). This result also suggests reverse causality for women; women may work while seeking partners and accumulating resources, and then quit in advance of marrying.

6.3 Determinants of Marriage Timing Accounting for the Potential Endogeneity of Employment

A major concern with considering the impact of employment on marriage timing is the potential endogeneity of employment. We therefore estimate our 3SRI models, with the local share of public sector employment among the adult population and its lag (one year prior) as instruments. We show the probit marginal effects from the first stage of the 3SRI models in Table 4. A percentage point increase in local public sector employment increases an individual's probability of public sector employment 1.6 to 12.0 percentage points (p.p.). The effects of the lagged local public sector variable tend to be negative,¹¹ smaller in magnitude, and usually significant. Table 5 presents the statistics from testing the first stage. The instrument is strong, with p-values for the chi-square statistic less than 0.01, except for women in Jordan (p=0.248). The F-tests in the second stage are all large (the smallest F-statistic, for females in Jordan, is 53) and all have p-values less than 0.001.

For the 3SRI model, we present first a series of models ("restricted sample") that compare public sector employment, as a dummy, to all other statuses, restricted to the same sample as is used for the 3SRI models (see Table 6). For men, the hazard ratios are higher than in

¹¹ The negative is because, if after accounting for contemporaneous local public sector employment opportunities, last period's local public sector employment was higher, this means the location is shedding public sector employment, and thus unlikely to hire a young person.

the model presented in Table 2, since being unemployed and out of the labor force, which delay marriage, as well as other employment statuses are aggregated in the reference group. For women, the hazard ratios are generally similar to those in Table 2, since not working does not have the same delaying effect on marriage as it does for men. These “restricted sample” models are the non-IV counterparts of the 3SRI model in Table 6.

After instrumenting, for men in Egypt, public sector employment significantly accelerates marriage (hazard ratio of 10.702).¹² The residual is less than one and also significant, indicating that the men who obtain public sector employment would, for unobservable reasons, otherwise marry later. The residual is essentially a test of endogeneity; public sector employment for men in Egypt is endogenous to marriage. Individuals who have higher aspirations for marriage may both seek public sector work and marry later, attenuating the estimated effect for public sector work when endogeneity is not accounted for. In Tunisia, the hazard ratio for public sector work is greater than one (2.171) and the residual less than one. Although neither is statistically significant, the results suggest a similar pattern to Egypt.

For men and women in Jordan, the hazard ratio for public sector work and the residual are insignificant. These results suggest public sector work does not aid marriage in Jordan (H2) nor is it endogenous. Since marriage costs are lower in Jordan and public sector employment more widely available across backgrounds (Assaad, Krafft, & Rolando 2017; Assaad & Salemi 2019), such work may have both less of a resource accumulation effect and less of a spousal quality signaling effect than in the other two contexts.

¹² The larger size of the effects in the 3SRI model may be due to the fact that local average treatment effects (LATE), the effects for compliers, could be larger than the average treatment effects (ATE) for the sample as a whole (Angrist et al. 1996). In this case, and consistent with the monotonicity assumption, we expect that there will be compliers (individuals who would not have worked in the public sector otherwise induced to do so by increases in local public sector employment opportunities), but no defiers (there will not be any individuals who would have otherwise worked in the public sector who do *not* do so as a result of greater local opportunities).

For women in Egypt (8.235) and Tunisia (7.091), the hazard ratio on public sector work is greater than one and is substantially larger in the 3SRI models than the uncorrected models. The residual is less than one, suggesting the unobservable characteristics, potentially aspirations for living conditions or spousal quality, that predispose women towards public sector work lead them to delay marriage. Such work may also make women more attractive on the marriage market, since women in Egypt and Tunisia are less likely to leave work at marriage when employed in the public sector (Assaad, Krafft, & Selwaness 2017).

6.4 Does Queuing for Public Sector Employment Pay Off in the Marriage Market?

In this section we explore whether queuing for public sector employment by remaining unemployed longer pays off in the marriage market. Specifically, we use our models to simulate the median age at marriage for youth depending on how long they spend in unemployment and if they obtain public sector employment.¹³ We use the predicted probabilities from the various models as the hazards to simulate a survival function and determine the median age at marriage.

In the uncorrected model, if the individual queues but does not obtain public sector employment and at some point “gives up,” we assume that a man gets private informal wage employment and a woman remains out of the labor force, as these are the fallback positions for men and women. If they entered different labor market statuses, that would change the tradeoffs. For the 3SRI model public sector employment is compared to not obtaining such employment (including both working and non-working statuses). The 3SRI model residual is set to zero (the mean). The profiles we simulate spend between zero and six years unemployed, the latter being

¹³ The simulations are run for a secondary graduate, in school until age 18, with secondary-educated parents, whose father was a self-employed professional, whose mother did not work, located in Cairo for Egypt, Amman for Jordan, and Tunis for Tunisia. She or he has two brothers and two sisters and was born 35 years before the survey round. These characteristics create a baseline hazard from our models, over which we vary employment statuses. Different characteristics would lead to different ages at marriage but the same general structure of tradeoffs. For example, if we simulate a man born in rural Lower Egypt, instead of Greater Cairo, since the hazard ratio of rural Lower Egypt is greater than one (see Table 2), marriages will be systematically a year earlier for all profiles than shown in Fig. 1. A similar result of shifted ages pertains with other characteristics; they will be systematically shifted, with the direction depending on their hazard ratios.

on the high end of queuing, but not uncommon in Tunisia (Assaad & Krafft 2016), before they may or may not succeed in attaining public sector employment. The results using the uncorrected models are presented in Fig. 1, while the results using the 3SRI model are presented in Fig. 2. In Fig. 3 we show the results for the same sample and comparison as in the 3SRI model, but without instrumenting (based on the “restricted sample” model in Table 6).

First, we examine immediately getting public sector employment versus getting informal employment (for men) or leaving the labor force (for women), after zero years unemployed (the first set of columns in each panel of Fig. 1). Men who immediately get public sector employment marry at a median age of 29 in Egypt and Tunisia and 28 in Jordan. Immediately entering informal employment raises the median age of marriage to 31 in Egypt and Tunisia and 29 in Jordan. Men can spend up to six years unemployed and still marry at the same age or earlier than those who immediately transition to informal wage employment, so long as the queuing ends in public sector employment. For women, obtaining public sector employment immediately or after one to three years of unemployment (varying across countries) accelerates marriage. From a perspective of accelerating the transition to adulthood, queuing multiple years for public sector employment is a viable strategy (confirms H4), especially for men, so long as queuing actually results in public sector employment, which is by no means guaranteed. However, these results are without endogeneity corrections.

Results from the endogeneity-corrected 3SRI models in Fig. 2 and Fig. 3 (without the 3SRI correction) compare public sector employment to everything else, which likely exaggerates the effect of public sector employment. Fig. 2 shows queuing accelerates marriage for men and women in Egypt and Tunisia, even if they spend up to four years (women) or six years (men) without public sector employment but eventually obtain such employment. In Jordan, where the 3SRI estimates were insignificant and near one, there are no differences. In Fig. 3, a similar pattern pertains, but differences in age at marriage are less than in the 3SRI models for Egypt and

Tunisia. Thus, the endogeneity corrected estimates suggest that, except in Jordan, queuing for public sector employment, even for as long as six years, may be a viable strategy for accelerating marriage so long as there is some assurance of obtaining such employment after queuing.

7. Discussion and Conclusions

7.1 Discussion

Marriage in MENA is a critical stage in the life course marking the completion of a young person's transition to adulthood. There has been considerable public anxiety about the delays in marriage that young people experienced in recent years. These delays can be partly attributed to the growing difficulty of young men to signal their economic readiness for marriage. Comparing our results across countries identifies commonalities in the marriage-employment relationship, as well as differences across contexts.

Our findings for Egypt confirm previous research suggesting (higher-quality) employment is associated with accelerated marriage for young men (H1 and H2) (Assaad et al. 2010; Gebel & Heyne 2016; Salehi-Isfahani & Egel 2010; Salem 2016a). Public sector employment significantly accelerates marriage in Egypt and this effect is increased after correcting for endogeneity. A similar finding pertains for Jordan and Tunisia when there is no correction for endogeneity, but the effect of public sector employment becomes insignificant after instrumenting. However, the insignificant residuals indicate that the results that treat employment as exogenous may be valid. These results correcting for endogeneity are an important contribution to the literature, particularly in demonstrating a new approach for non-linear modeling.

Although we could not correct for endogeneity for other labor market statuses, there are interesting differences across countries. In Egypt, but not Jordan or Tunisia, private formal wage employment is associated with a higher hazard of marriage for men than informal employment. This may be because private formal employment in Egypt remains a relatively elite status, unlike

in Jordan or Tunisia. Thus, while there are similar effects of employment on accelerating marriage for men, the effect of employment type depends on the local signaling power of employment statuses.

Previous research in Jordan and Iran found that women who worked were slower to marry (Gebel & Heyne 2016; Salehi-Isfahani & Egel 2010), while in Egypt there was no relationship (Salem 2016a). For women, our results suggest that employment is endogenous to marriage timing. Women who work may have higher expectations for married life or work while waiting for a potential spouse. Once endogeneity is taken into account, we find that public sector employment substantially increases the hazard of marriage for women in Egypt and Tunisia, but not in Jordan (where instruments are underpowered and the results including lags suggest reverse causality). Marriage markets may place a premium on women's public sector work, which is much more likely to continue after marriage than private sector work (Assaad, Krafft, & Selwaness 2017). Working in the public sector may also be an arena to meet men. Further research is necessary to disentangle these varying interpretations.

Results show important distinctions between the signaling versus resource accumulation impacts of work (H3). In Egypt and Jordan, women currently in private sector informal wage work transition to marriage at slower rates. However, previously working in informal wage employment accelerates marriage. These results suggest that rather than enhancing women's value in the marriage market, informal wage employment allows women to marry earlier by helping them to save for marriage. Once they marry, women tend to quit such work (Assaad, Krafft, & Selwaness 2017), explaining the negative association between the current status and the timing of marriage.

The segmented labor market structure in MENA, with superior and preferred, but limited, public and private formal employment is a driver of high youth unemployment rates (Assaad 1997, 2014a). Young people queue in unemployment attempting to obtain preferred, high-

quality, formal employment, rather than accept readily available informal employment. Previous work had not explored the role of the marriage market in these queuing dynamics; we examined whether it was worthwhile from a marriage timing perspective to remain unemployed longer if such queuing increases the probability of obtaining public sector employment. We find that queuing in unemployment for a number of years is a viable strategy to accelerate marriage if it yields public sector employment (H4)—a possible, but not certain, proposition. Marriage market payoffs to queuing may be contributing to persistent high youth unemployment rates. This dynamic interplay between the marriage and labor markets merits further research.

7.2 Limitations

Although our research is an important advance in addressing endogeneity, the endogeneity-corrected results are only as good as the instrument. We identify the effect of public sector employment on the timing of marriage off of variation over time and place in the share of public sector employment in the adult population. While we control for time-invariant geographic differences and overall time trends, this approach assumes that variation over time in the local share of employment in the public sector is exogenous and only affects marriage timing through individuals' public sector employment. While decisions to, for example, hire additional teachers in a location are unlikely to be related to marriage timing trends, this assumption is not testable. The resulting estimates of hazard ratios tend to be large, which may be because a local average treatment effect (on those whose behavior is shifted by the instrument) is being estimated rather than an average treatment effect.

7.3 Implications for Policy and Future Research

The links between employment and marriage have considerable implications for the future trajectory of the transition to adulthood in MENA. Struggles to create good jobs in the face of rising education and aspirations will continue to constrain economic readiness for marriage, particularly for men, for whom employment is a pre-requisite to marriage. Policies that

encourage the creation of higher-quality employment, such as improving the business environment, may help youth transition to work and marriage (Krafft & Assaad 2015).

However, given labor market trends, how can we explain the reversal in the rise of the age at marriage in Egypt and the slowdown of the rise in Tunisia in recent years? The reversal in Egypt has been linked to housing policy that increased rental housing availability (Assaad & Krafft 2015a; Assaad, Krafft, & Rolando 2017; Assaad & Ramadan 2008). The lower costs of marriage in Jordan (Assaad, Krafft, & Rolando 2017) may be one of the reasons the employment effects there were smaller. Policies that help lower marriage costs, such as housing finance or rental market reforms, may further facilitate transitions to adulthood and reduce the problem of “waithood” (Salehi-Isfahani & Dhillon 2008).

It could also be that the increasing scarcity of public sector employment is causing expectations about what it takes to be economically ready for marriage to change. As public sector employment retreats, women may increasingly engage in private informal wage employment to save for marriage, but then leave work in anticipation of marriage (Assaad, Krafft, & Selwaness 2017). Marriage markets may ultimately update expectations to adjust to the changing economic situations of young men. This complex interaction between changing expectations in the marriage market and the objective economic situation of young people makes the prognosis of future trends highly uncertain and an important area for future research.

Ethics and Consent

The authors report no ethical issues.

Conflict of Interest

The authors declare no conflicts of interest.

Authors' Contributions

Both authors contributed to the study concept and design. Data harmonization, preparation, and analyses were performed by Caroline Krafft. The first draft of the manuscript was written by Caroline Krafft. Both authors contributed to subsequent versions of the manuscript. Both authors read and approved the final manuscript.

Data Availability

Data are publicly available from ERF at www.erfdataportal.com.

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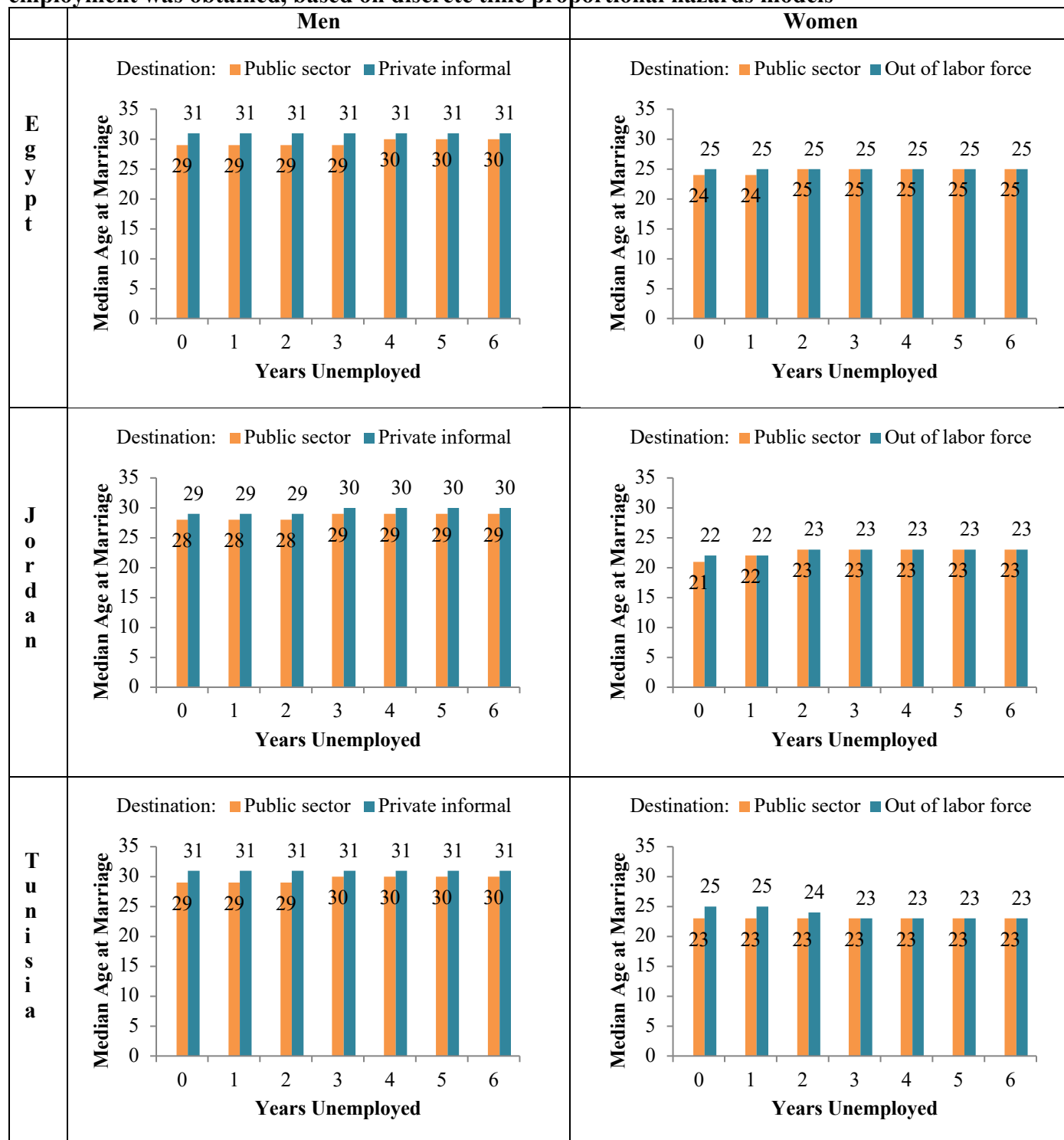
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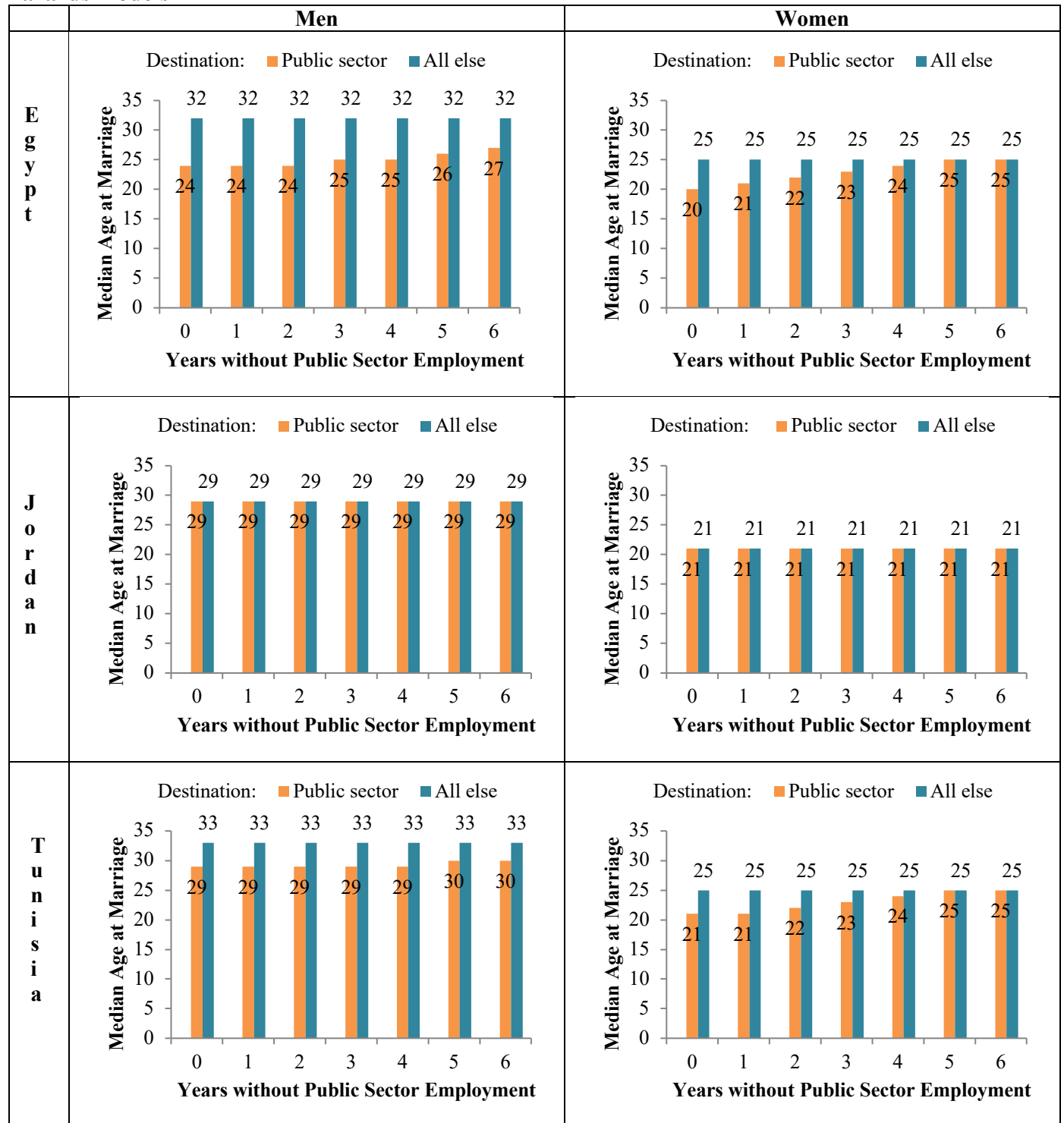
Figures

Fig. 1. Median age at marriage by time spent queuing and whether public sector employment was obtained, based on discrete time proportional hazards models



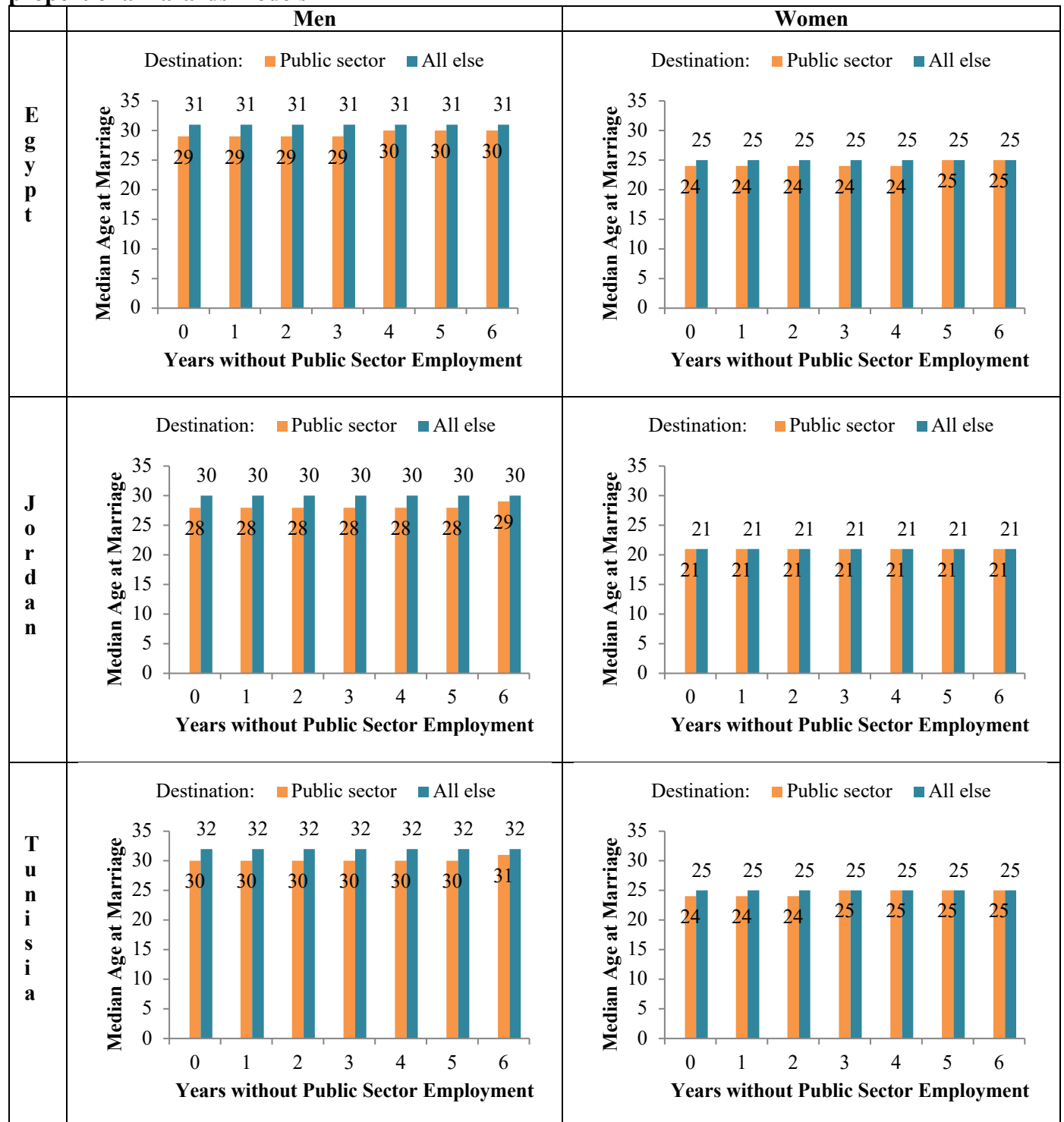
Notes: Based on models in Table 2

Fig. 2. Median age at marriage by time spent without public sector employment and whether public sector employment was obtained, based on 3SRI discrete time proportional hazards models



Notes: Based on “3SRI” models in Table 6

Fig. 3. Median age at marriage by time spent without public sector employment and whether public sector employment was obtained, based on restricted discrete time proportional hazards models



Notes: Based on “restricted sample” models in Table 6

Table 1. Descriptive statistics on marriage and the labor market in Egypt, Jordan, and Tunisia

	Egypt		Jordan		Tunisia	
	Male	Female	Male	Female	Male	Female
Ever married by age (%)						
Age 18	1	15	1	16	0	3
Age 20	3	33	4	28	1	9
Age 25	25	72	30	66	8	38
Age 30	66	88	67	77	31	62
Age 50	98	97	96	86	86	82
Median age of marriage	27	21	27	22	33	27
Mean years of schooling						
Born 1950-1954	7	4	11	7	7	3
Born 1980-1984	10	9	12	12	10	10
Labor force participation rate (%)						
Age 15-64	80	23	71	17	73	25
Age 15-24	48	13	43	11	41	19
Unemployment rate (%)						
Age 15-64	4	24	9	20	11	21
Age 15-24	10	50	20	43	34	37
Share of employment by sector, ages 15-64 (%)						
Public sector	24	51	34	44	25	30
Private formal wage	12	7	23	34	21	29
Private informal wage	38	10	23	12	27	21
Non-wage	26	31	20	10	27	20
Total	100	100	100	100	100	100

Source: Authors' calculations based on ELMPS 2012, JLMPS 2010, and TLMPS 2014

Notes: Ever married by age and median age of marriage calculated based on Kaplan-Meier failure functions based on individuals ages 15-59 at the time of the survey.

Table 2. Discrete time proportional hazards models of age at marriage, by sex and country

	Egypt men	Jordan men	Tunisia men	Egypt women	Jordan women	Tunisia women
Labor market status (M: private informal F: OLF omit.)						
Public	1.368*** (0.052)	1.290*** (0.067)	1.377** (0.157)	1.124* (0.060)	1.079 (0.084)	1.704** (0.330)
Private formal wage	1.188*** (0.050)	0.991 (0.062)	1.165 (0.123)	0.552*** (0.067)	0.708*** (0.069)	0.891 (0.096)
Private informal wage				0.397*** (0.038)	0.506*** (0.064)	0.852 (0.137)
Non-wage	1.080 (0.045)	1.105 (0.078)	1.113 (0.099)	0.768** (0.079)	0.733 (0.150)	1.093 (0.207)
Unemployed	0.521*** (0.051)	0.487*** (0.063)	0.563 (0.179)	0.942 (0.065)	0.559*** (0.069)	1.848*** (0.236)
OLF	0.314*** (0.021)	0.271*** (0.033)	0.518*** (0.064)			
Education (illit. omit.)						
In school	0.495*** (0.039)	0.485*** (0.072)	0.853 (0.111)	0.248*** (0.012)	0.443*** (0.045)	0.735*** (0.058)
Read & Write	0.865* (0.059)	0.979 (0.134)	1.005 (0.136)	1.009 (0.068)	1.125 (0.112)	0.891 (0.084)
Basic	0.854** (0.044)	0.830 (0.108)	1.070 (0.114)	1.228*** (0.051)	1.264* (0.126)	1.101 (0.094)
Secondary	0.737*** (0.034)	0.757* (0.104)	0.788 (0.104)	1.316*** (0.050)	1.294* (0.139)	0.800 (0.101)
Post-Secondary	0.735*** (0.050)	0.821 (0.114)	0.878 (0.167)	0.968 (0.061)	1.484*** (0.162)	0.706* (0.115)
University	0.629*** (0.033)	0.661** (0.094)	0.926 (0.146)	0.887* (0.042)	2.080*** (0.265)	0.711** (0.090)
Mother's education (none omit.)						
Reads and writes	0.967 (0.053)	1.063 (0.054)	0.125** (0.092)	1.140** (0.048)	1.300*** (0.064)	0.148*** (0.065)
Basic	0.799*** (0.052)	0.194*** (0.051)	1.230 (0.171)	0.871* (0.048)	0.248*** (0.050)	1.375*** (0.123)
Secondary	0.833* (0.071)	0.690** (0.086)	1.209 (0.301)	0.846** (0.051)	1.139 (0.106)	1.581** (0.248)
Higher education	0.915 (0.114)	0.743 (0.149)	2.065 (1.099)	0.748*** (0.064)	0.750* (0.101)	0.859 (0.481)
Father's education (none omit.)						
Reads and writes	0.929 (0.035)	0.957 (0.047)	0.286** (0.122)	0.995 (0.034)	1.029 (0.062)	0.350*** (0.079)

	Egypt men	Jordan men	Tunisia men	Egypt women	Jordan women	Tunisia women
Basic	0.761*** (0.037)	0.208*** (0.055)	1.070 (0.098)	0.870** (0.039)	0.201*** (0.038)	1.257*** (0.080)
Secondary	0.887 (0.059)	1.002 (0.099)	1.445* (0.212)	0.953 (0.050)	1.013 (0.084)	1.555** (0.210)
Higher education	0.821* (0.066)	0.948 (0.111)	1.130 (0.509)	0.854* (0.060)	0.901 (0.095)	1.719** (0.358)
Mother worked (did not omit.)						
Did work	1.193*** (0.061)	0.900 (0.099)	0.943 (0.119)	1.109* (0.048)	1.067 (0.100)	0.890 (0.090)
Father's emp. stat. (public omit.)						
Private wage	0.947 (0.043)	0.977 (0.062)	1.319* (0.151)	1.000 (0.042)	0.990 (0.055)	1.366*** (0.129)
Employer	0.998 (0.051)	1.192* (0.103)	1.396* (0.228)	0.996 (0.043)	1.143 (0.091)	1.217 (0.177)
Self-employed	0.959 (0.052)	1.027 (0.071)	1.443** (0.195)	0.965 (0.045)	1.092 (0.067)	1.450*** (0.155)
No job or DK	0.997 (0.174)	0.946 (0.355)	0.557 (0.226)	0.844 (0.191)	0.257** (0.115)	0.879 (0.457)
Father's occup. (Manager omit.)						
Clerical and sales	0.973 (0.057)	0.953 (0.089)	0.807 (0.135)	0.938 (0.046)	0.986 (0.076)	1.466** (0.212)
Skilled agricultural	0.999 (0.051)	0.952 (0.101)	0.794 (0.143)	0.989 (0.045)	0.760** (0.077)	1.687*** (0.258)
Craft and manufacturing	0.965 (0.047)	0.974 (0.097)	0.848 (0.146)	0.928 (0.044)	0.978 (0.085)	1.560** (0.241)
Elementary occupations	0.934 (0.056)	1.037 (0.130)	0.820 (0.144)	1.011 (0.050)	0.948 (0.108)	1.516** (0.223)
No. brothers (living and dead)	1.002 (0.007)	1.005 (0.009)	1.011 (0.016)	1.037*** (0.008)	1.021* (0.010)	1.005 (0.018)
No. sisters (living and dead)	1.040*** (0.009)	1.041*** (0.009)	1.039 (0.021)	1.002 (0.006)	1.038*** (0.011)	1.039** (0.015)
Year (1980-1984 omit.)						
1975-1979	1.325 (0.302)	1.241 (0.339)	0.553 (0.624)	0.904 (0.073)	1.268* (0.138)	0.946 (0.206)
1985-1989	0.740*** (0.067)	0.852 (0.094)	0.504*** (0.102)	0.943 (0.051)	0.889 (0.069)	0.653*** (0.067)
1990-1994	0.649*** (0.058)	0.827 (0.087)	0.465*** (0.083)	0.867** (0.046)	0.991 (0.074)	0.684*** (0.076)
1995-1999	0.554***	0.632***	0.343***	0.739***	0.872	0.501***

	Egypt men	Jordan men	Tunisia men	Egypt women	Jordan women	Tunisia women
	(0.048)	(0.067)	(0.061)	(0.040)	(0.068)	(0.057)
2000-2004	0.751***	0.635***	0.294***	0.860**	0.874	0.425***
	(0.064)	(0.070)	(0.058)	(0.041)	(0.071)	(0.051)
2005-2009	1.052	0.526***	0.264***	1.105*	0.752**	0.423***
	(0.089)	(0.061)	(0.051)	(0.052)	(0.066)	(0.052)
2010+	1.336***		0.272***	1.635***		0.503***
	(0.117)		(0.056)	(0.094)		(0.066)
Region of birth (Gr. Cairo omit. (Egypt) Central omit. (Jordan) North omit. (Tunisia))						
Egypt-Alx Sz C.	0.975			0.981		
	(0.089)			(0.066)		
Egypt-Urb. Lwr.	1.278***			1.211**		
	(0.082)			(0.076)		
Egypt-Urb. Upp.	1.064			1.104		
	(0.072)			(0.074)		
Egypt-Rur. Lwr.	1.483***			1.475***		
	(0.091)			(0.083)		
Egypt-Rur. Upp.	1.470***			1.400***		
	(0.102)			(0.090)		
Jordan-North		0.846**			0.880*	
		(0.045)			(0.046)	
Jordan-South		0.761***			0.780***	
		(0.058)			(0.054)	
Out of Jordan		0.958			1.171**	
		(0.063)			(0.061)	
Tunisia-North West			0.899			0.917
			(0.120)			(0.093)
Tunisia-Center East			1.064			0.802*
			(0.129)			(0.072)
Tunisia-Center West			1.308*			0.912
			(0.155)			(0.088)
Tunisia-South East			1.422*			0.890
			(0.233)			(0.104)
Tunisia-South West			0.572***			0.476***
			(0.093)			(0.072)
Location of birth (urban omit.)						
Rural			1.200*			0.917
			(0.107)			(0.067)
Constant	0.008***	0.018***	0.002***	0.085***	0.092***	0.017***

	Egypt men	Jordan men	Tunisia men	Egypt women	Jordan women	Tunisia women
	(0.001)	(0.004)	(0.001)	(0.007)	(0.014)	(0.003)
Age in year included	Yes	Yes	Yes	Yes	Yes	Yes
N (person-years)	126938	57523	27307	87043	44289	28802

Source: Authors' calculations based on ELMPS 2012, JLMPS 2010, and TLMPS 2014

Notes: *p<0.05; **p<0.01 ***p<0.001

Cells are hazard ratios, standard errors in parentheses.

Significance tests for hazard ratios are in terms of deviations from one.

Standard errors are clustered at the PSU level.

Table 3. Discrete time proportional hazards models of age at marriage including lagged labor market status, by sex and country

	Egypt men	Jordan men	Tunisia men	Egypt women	Jordan women	Tunisia women
Labor market status (M: private informal F: OLF omit.)						
Public	1.422*** (0.134)	1.595*** (0.184)	0.963 (0.461)	0.732* (0.092)	0.760 (0.146)	1.564 (0.569)
Private formal wage	1.051 (0.108)	1.104 (0.166)	1.233 (0.445)	0.145*** (0.031)	0.380*** (0.075)	0.465** (0.118)
Private informal wage				0.130*** (0.018)	0.229*** (0.062)	0.645 (0.179)
Non-wage	1.250* (0.123)	1.125 (0.175)	1.020 (0.412)	0.478 (0.190)	0.322* (0.152)	4.262*** (1.426)
Unemployed	0.678** (0.081)	0.702* (0.114)	0.720 (0.278)	0.649*** (0.079)	0.602* (0.122)	2.916*** (0.599)
OLF	0.404*** (0.039)	0.444*** (0.080)	0.533 (0.175)			
Lagged labor market status (M: private informal F: OLF omit.)						
Public	0.959 (0.091)	0.792 (0.095)	1.475 (0.703)	1.711*** (0.224)	1.554* (0.313)	1.128 (0.426)
Private formal wage	1.156 (0.119)	0.892 (0.133)	0.945 (0.339)	4.775*** (0.973)	2.171*** (0.411)	2.046** (0.519)
Private informal wage				3.700*** (0.359)	2.560*** (0.571)	1.359 (0.353)
Non-wage	0.851 (0.087)	0.981 (0.154)	1.097 (0.443)	1.651 (0.603)	2.372 (1.106)	0.178*** (0.068)
Unemployed	0.703*** (0.073)	0.620** (0.094)	0.753 (0.301)	1.445** (0.184)	0.818 (0.176)	0.502** (0.129)
OLF	0.741*** (0.062)	0.597*** (0.089)	0.970 (0.302)			
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N (person-years)	114815	51289	25278	74734	38193	26113

Source: Authors' calculations based on ELMPS 2012, JLMPS 2010, and TLMPS 2014

Notes: *p<0.05; **p<0.01 ***p<0.001

Cells are hazard ratios, standard errors in parentheses.

Significance tests for hazard ratios are in terms of deviations from one.

Standard errors are clustered at the PSU level.

Controls included for in school, education level, mother's education level, father's education level, father's employment status and occupation, mother worked, number of brothers, number of sisters, year categories, birth region and birth urban/rural, as well as for baseline hazard (age in year).

Table 4. First stage probit marginal effects of 3SRI model for probability of public sector employment, by sex and country

	Egypt men	Jordan men	Tunisia men	Egypt women	Jordan women	Tunisia women
Local public sector emp. (percentage)	0.069*** (0.012)	0.077*** (0.011)	0.069** (0.023)	0.120*** (0.015)	0.016 (0.023)	0.066*** (0.018)
Lagged local public sector emp. (percentage)	-0.049*** (0.012)	-0.048*** (0.011)	-0.038 (0.022)	-0.077*** (0.015)	0.017 (0.023)	-0.070* (0.029)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N (person-years)	108283	43841	21749	69547	32728	19824

Source: Authors' calculations based on ELMPS 2012, JLMPS 2010, and TLMPS 2014

Notes: *p<0.05; **p<0.01 ***p<0.001

Cells are marginal effects (changes in probability), standard errors in parentheses.

Standard errors are clustered at the PSU level.

Controls included for year, in school, education level, mother's education level, father's education level, father's employment status and occupation, mother worked, number of brothers, number of sisters, birth governorate and birth urban/rural along with interactions, as well as for baseline hazard (age in year).

Table 5. Chi-square tests for significance of instruments in first stage and F-tests for significance of instruments in second stage of 3SRI model for probability of public sector employment, by sex and country

	Chi-sq. (first stage)	p-value		F-test (second stage)	p-value	
Egypt men	35.546	0.000	***	270.225	0.000	***
Jordan men	52.440	0.000	***	256.285	0.000	***
Tunisia men	9.699	0.008	**	364.721	0.000	***
Egypt women	67.785	0.000	***	54.540	0.000	***
Jordan women	2.785	0.248		52.547	0.000	***
Tunisia women	14.282	0.001	***	39.441	0.000	***

Source: Authors' calculations based on ELMPS 2012, JLMPS 2010, and TLMPS 2014

Notes: *p<0.05; **p<0.01 ***p<0.001

Table 6. 3SRI discrete time proportional hazards models for impact of public sector employment on age at marriage, by sex and country

Restricted sample						
	Egypt men	Jordan men	Tunisia men	Egypt women	Jordan women	Tunisia women
Public sector emp.	1.486*** (0.053)	1.568*** (0.071)	1.656*** (0.169)	1.216*** (0.063)	1.260** (0.099)	1.581* (0.333)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	108283	43841	21749	69725	32728	23009

3SRI						
	Egypt men	Jordan men	Tunisia men	Egypt women	Jordan women	Tunisia women
Public sector emp.	10.702*** (3.339)	1.016 (0.585)	2.171 (1.691)	8.235*** (2.203)	1.040 (0.449)	7.091** (4.225)
Residual	0.133*** (0.042)	1.545 (0.891)	0.758 (0.610)	0.126*** (0.033)	1.222 (0.543)	0.171** (0.106)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N (person-years)	108283	43841	21749	69725	32728	23009

Source: Authors' calculations based on ELMPS 2012, JLMPS 2010, and TLMPS 2014

Notes: *p<0.05; **p<0.01 ***p<0.001

Cells are hazard ratios, bootstrapped standard errors in parentheses.

Significance tests for hazard ratios are in terms of deviations from one.

Bootstrapped standard are clustered at the PSU level. Bootstraps based on 400 replications.

Controls included for year, in school, education level, mother's education level, father's education level, father's employment status and occupation, mother worked, number of brothers, number of sisters, birth governorate and birth urban/rural along with interactions, as well as for baseline hazard (age in year).