

The Dynamics of Family Formation and Women's Work: What Facilitates and Hinders Female Employment in the Middle East and North Africa?¹

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Abstract

Despite increases in educational attainment, women's employment rates remain very low in the Middle East and North Africa. Difficulties reconciling work and family formation have been identified as an important but under-researched factor in low female employment rates. This paper investigates the dynamic relationship between family formation and women's employment. The paper studies Egypt, Jordan, and Tunisia, leveraging unique retrospective data on work, marriage, child bearing and child rearing. The data allow us to estimate discrete time hazard models for the duration of different labor market statuses. This paper examines three sets of outcomes: (1) duration in employment, (2) duration in non-employment, and (3) duration in different labor market states and specific types of work. We explore the different roles of getting married, being married, expecting children, having children, or having young children as constraints to employment. Findings show that anticipating marriage and getting married are strongly associated with women's employment outcomes. Non-employment is an absorbing state, particularly after marriage.

Keywords: Marriage, Women's Employment, Middle East and North Africa, Duration Analysis.

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1 Introduction

Despite rising education for women, with women in most countries now becoming more educated than men, the gender employment gap in the Middle East and North Africa (MENA) has remained persistently wide (Assaad et al. 2018). The difference between men's and women's employment rates in the region is the largest in the world, reaching around 50 percentage points in 2019, only slightly down from 55 percentage points in 1990 (ILO 2019). Recent studies have identified a variety of potential explanations why women's employment in the region is persistently lower than that of men (Spierings 2014; Spierings et al. 2010; Verick 2018; World Bank 2013, 2018). The first explanation relates to the gendered division of labor in the household and women's disproportionate unpaid work in the household, creating a high opportunity cost for women's time (Spierings et al. 2010). The second explanation concerns the region's macroeconomic structure, with weak job creation overall and the limited job growth concentrated in male-dominated industries (Assaad et al. 2019). The third explanation concerns patriarchal gender norms (Bursztyn et al. 2018; Gauri et al. 2019).

In line with the first explanation for low female employment, namely women's care work, previous research has identified challenges in reconciling marriage and market work as an important driver of low rates of female employment (Assaad et al. 2014; Assaad, Ghazouani, et al. 2018a; Hendy 2015). Yet there is relatively little evidence on the details of how and why marriage and market work are difficult to reconcile, precluding policy action to redress these challenges. To address the shortage of evidence, this paper investigates an under-researched aspect of women's employment in the region: the dynamic relationship between family formation and women's work.

This paper examines how and why family formation is associated with women's employment decisions, as well as what factors, such as child care responsibilities or commuting distances, facilitate or hinder work. The paper, unlike previous multivariate work on the

relationship between women's work and marriage in MENA (Assaad et al. 2017), takes a dynamic approach, looking at the interplay of a variety of events in the life course. Some work has examined the dynamics of unemployment for women (Assaad and Krafft 2016), or included marital status as a control in assessing labor market transitions for women (Yassin 2016). However, no previous work has specifically examined how the dynamics of family formation, namely marriage, child bearing, and child rearing, are associated with market work.

To understand the forces that link family formation and work, this paper examines two main questions, comparing Egypt, Jordan and Tunisia:

- 1) What are the distinct relationships between marriage, childbearing, and child rearing and women's work?
- 2) What factors might mediate the relationships between marriage, childbearing, and child rearing and work?

We focus on Egypt, Jordan, and Tunisia primarily due to the availability of rich data that allow us to assess these dynamic relationships. While they represent the sub-regions of the Maghreb (Arab West) and Mashreq (Arab East), they are unlikely to represent the Gulf states, which have quite different economies as well as some substantial social differences. The three countries do have varying social and economic contexts that can create informative comparisons, as well as some common features to their labor and marriage markets, that can generate meaningful conclusions about common challenges around work and family formation.

2 Literature review

2.1 Conceptual framework

A variety of theoretical explanations have been offered for understanding women's employment in MENA. Spierings et al. (2010) offer a comprehensive conceptual framework for

understanding the micro and macro level determinants of women's employment decisions in MENA. We draw on that framework, which encompasses a variety of other approaches, in developing our understanding and modeling of women's decisions. Critically, their framework recognizes the agency of women, but within a structure of household, local, and national contexts. They organize the determinants of women's employment into needs, opportunities, and values. Needs encompass both the economic requirements (e.g. the macroeconomy) on the larger level and, on the household level, people needing care, care providers, as well as household income. Opportunities are the accessibility and availability of jobs, including local factors such as urbanization and job vicinity, as well as social connections. Women's own education, their human capital, is a key driver of opportunities. Values, including social norms, spouses' values, and women's own values, are critical to understanding women's employment as well.

This framework aligns well with and encompasses a variety of other theoretical frameworks, such as the "new home economics" framework, which expanded rational choice economics to new realms such as marriage and family formation, generating a substantial body of literature around work, marriage, and childbearing decisions (Assaad and Krafft 2015a; Becker 1973; Grossbard-Shechtman 1995; Grossbard-Shechtman 1986; Schultz 1973; Thévenon and Luci 2012). The opportunity cost of women's time links work and family formation decisions. Therefore, factors that shape the opportunity cost of women's time, such as child care (Assaad et al. 2017; Diprete et al. 2004; Hofferth and Collins 2000; Kreyenfeld and Hank 2000) or commute times (Assaad and Arntz 2005), play an important role in work and family formation decisions.

The framework also effectively aligns with the three most common explanations for women's low employment rates in the region. The disproportionate responsibilities women have in caregiving (needs) are considered a key barrier to women's employment (Assaad et al. 2014; Hendy 2015; Hoodfar 1997; Spierings et al. 2010). Additionally, weak overall macroeconomic

performance (needs) coupled with limited job growth concentrated in male-dominated sectors (opportunities) limit women's employment (Assaad et al. 2018, 2019). Lastly, low rates of employment are often attributed to patriarchal gender norms (values) (Bursztyn et al. 2018; Gauri et al. 2019). In this paper we are particularly interested in and focused on testing the importance of the "needs" component, specifically family formation and its associated care requirements, but, as much as possible, we account for and consider other factors as well, such as the macroeconomy.

2.2 Empirical evidence on family formation and work

The global literature identifies the same key factors as in our conceptual framework (opportunities, needs, and values) as important to historical trends and current patterns around married women's employment. A variety of theories have tried to explain changes in women's employment over time, for example the U-shaped hypothesis, based on the observed U-shaped relationship between women's employment and economic development, captured by GDP per capita (Goldin 1994). This hypothesis posits that women's employment declined as production opportunities shifted from home-based to the wider market. Low education, primarily manual labor opportunities, and strong social values against women engaging in such work curtailed women's employment. The expansion of white-collar work, which is less stigmatized, and rising education among women then led to increased employment under the U-shaped hypothesis (Goldin 1994). Yet other theories posit that it was the expansion of opportunities in labor-intensive, export-oriented industries (especially manufacturing) that increased women's employment in developing countries (Rios 1990; Tejani and Milberg 2016). Still others have noted that agriculture, manufacturing, and services have limited explanatory power for women's employment (Klasen 2019). Although structural change may be important, initial economic structures, persistent gender norms, and household economic conditions are posited as key drivers of

women's employment (Klasen 2019). There is mixed evidence in terms of the applicability of these different theories to explain women's employment globally, for different regions, and specifically for the MENA region (Baslevent and Onaran 2004; Çağatay and Berik 1991; Gaddis and Klasen 2014; Klasen 2019; Tejani and Milberg 2016; Verme 2015). Thus, the relative role of opportunities, needs, and values in women's employment remains an important empirical question.

Across contexts, family formation patterns are key determinants of women's work; both marriage and childbearing have important effects on women's labor market outcomes, including employment and wages (Drobnič et al. 1999; Glauber 2007; Goldin 2004; Kleven et al. 2019; Percheski 2008; Petersen et al. 1996; Wilde et al. 2010). Interventions, such as expanding pre-primary care or reforming parental leave policies, can promote women's employment and gender equality in the labor market (Baker et al. 2008; Gelbach 2002; Petersen et al. 1996).

MENA lags behind global trends in women's employment. The region has the world's lowest employment rates for women (ILO 2017). Only 19% of women in Tunisia, 18% in Egypt, and 13% in Jordan are employed (Assaad 2014a; Assaad, Ghazouani, et al. 2018b; Assaad and Krafft 2015b). Within MENA, domestic work, the "second shift" for employed women, is highest for married women in Jordan (37 hours per week), followed by Egypt (31 hours per week) and then Tunisia (20 hours per week) (Assaad et al. 2017). The domestic work pattern is the exact opposite of the pattern of women's employment across countries, suggesting, at least descriptively, that caregiving is a key constraint.

In MENA, women are traditionally responsible for children and other domestic responsibilities (Hoodfar 1997). Norms are such that women's "future is marriage" (Sieverding and Hassan 2016). Education is desirable for potential returns on the marriage market (Adely 2012), rather than for its economic returns. If work and domestic responsibilities are difficult to reconcile, it is market work that gives way (Hoodfar 1997; Kawar 1997). Wage work is often

considered a temporary phase, prior to marriage, potentially to help secure good living conditions at marriage, or to pass the time while waiting for marriage (Amin and Al-Bassusi 2004; Assaad and Krafft 2015a; Krafft and Assaad 2017; Sieverding 2012).

Only some types of work are socially acceptable for women, creating “reservation working conditions” (Dougherty 2014; Groh et al. 2014; Kavar 1997; Sieverding 2012). For example, a study in Jordan found that while 96% of respondents thought it was okay for a woman to work, only 80% thought it was okay for a woman to work outside the home, only 72% thought it was okay for a woman to work if married, only 54% thought it was okay for women to leave children with relatives, only 38% thought it was okay for women to work with men, and only 26% thought it was okay for women to return from work after 5pm (Gauri et al. 2019).

Previous research in MENA has shown, descriptively, that women tend to leave work, especially private wage work, at marriage (Assaad, Ghazouani, et al. 2018a; Hendy 2015; Krafft et al. 2019). Multivariate work has demonstrated marrying by the median age negatively affects women’s chances of currently working, especially in wage work and private wage work (Assaad et al. 2017). Countries with the heaviest domestic work burden had the largest decline in women’s employment with marriage, particularly in private wage work. This finding is consistent with previous studies that highlighted that some types of jobs attract or repel women based on how reconcilable these jobs are with domestic responsibilities (Assaad et al. 2014; Assaad and Arntz 2005; Assaad and Hendy 2013; Hendy 2015; Hoodfar 1997). These domestic responsibilities increase substantially at marriage (Assaad et al. 2017). Additionally, research has shown that women’s employment depends specifically on the number and age of their children (Spierings 2014; Spierings et al. 2010). While the previous multivariate research on work and family formation has focused on relationships at a particular point in time, our research builds on this previous work by taking a dynamic approach, allowing us to better understand what aspects of

family formation drive labor market behaviors.

2.3 Hypotheses

To answer our research questions on the distinct relationships between different aspects of family formation and work, as well as potential mediators and policy levers, we test five hypotheses.

H1: Women disproportionately leave work at marriage.

H2: Women disproportionately leave work in anticipation of marriage.

H3: Whether women leave work depends on the type of work. Women are more likely to leave private sector wage employment than public sector or non-wage work.

H4: Whether women leave work (or start working) depends on the number and age of their children. Women are more likely to leave work and less likely to start work if they have children below six years old – the age of compulsory schooling.

H5: Whether women leave work (or start working) depends on commuting distance and child care availability. Women are more likely to leave work with long commutes, or when child care options are scarce.

H1 and H2 are particularly important for understanding whether it is the actual arrival of responsibilities or anticipation of those responsibilities (which may be more about norms) that drive work exit. H3 investigates whether certain types of work are more reconcilable with marriage. H4 and H5 recognize that women may both leave work or start working depending on the age and number of children, and thus caregiving responsibilities. The impact of these responsibilities may be mediated by factors such as child care or the need to commute to work.

3 Data

3.1 Surveys

In order to understand the interlinked life course decisions of women around marriage, children, and work, data are required on the timing of marriage, fertility, and labor market statuses. Detailed individual and family characteristics are also required. Given the data requirements, we are able to examine three MENA countries: Egypt, Jordan and Tunisia. We use the Egypt Labor Market Panel Survey (ELMPS) 2012, Jordan Labor Market Panel Survey (JLMPS) 2010 and Tunisia Labor Market Panel Survey (TLMPS) 2014 data.

The LMPSs are nationally-representative multi-stage cluster household surveys.⁴ The surveys were undertaken as collaborations between the Economic Research Forum and national statistics offices. Fielding was face-to-face. Individual-level data are collected primarily from individuals themselves (up to three visits are used to minimize proxy respondents). Although the ELMPS 2012 is the third wave of a panel (previous waves in 1998 and 2006), we do not use the panel nature of the data since we have richer, annual retrospective data. JLMPS 2010 and TLMPS 2014 were the baseline waves of planned panels.

The ELMPS 2012 included 12,060 households and 49,186 individuals. The JLMPS 2010 included 5,102 households and 25,953 individuals. The TLMPS 2014 included 4,521 households and 16,430 individuals. We discuss the specific analysis samples used below. Non-response rates varied across contexts and were highest in Tunisia, where household non-response was 9.3% and individual non-response was 6.2% (conditional on the household responding) (Assaad et al. 2016).

⁴ See Assaad and Krafft (2013) for more information on the ELMPS, Assaad (2014b) for more information on the JLMPS, and Assaad, Ghazouani, Krafft, and Rolando (2016) for more information on the TLMPS. Data are nationally representative when weighted. All descriptive statistics are weighted. Results are generally similar for regressions when weighted, but some models (for Tunisia, with the smallest sample) do not converge, so we consistently present regression results that are unweighted.

All of the datasets include detailed labor market histories for those who ever worked as well as information on the timing of first marriages and child bearing. This allows for the creation of data on individuals' labor market states, marital status, and childbearing/child rearing on an annual basis. The resulting data structure is an annualized retrospective panel, where an observation is a woman-year. While the surveys are both pre- and post- Arab Spring, since we are using annual retrospective data, almost all of our woman-year observations are from prior to the Arab Spring. The surveys also include data on a number of potential mediators, including geographic mobility, commute times, and other factors that could potentially facilitate or hinder women's engagement in work.

3.2 Sample

All of our analyses are based on a sample of women aged 15-59 at the time of the survey. We selected this age range because it was the age range with common coverage across the marriage histories and labor market histories across surveys. The resulting analysis samples were 12,065 women in Egypt, 5,779 in Jordan, and 3,985 in Tunisia. As we restrict our analyses to years when women were at least 15, the data cover from 1968-2012 in Egypt, 1966-2010 in Jordan, and 1972-2014 in Tunisia. When data was missing for a particular variable in a particular model, the sample may be slightly smaller.⁵

3.3 Variables

We study a variety of different labor market outcomes for these women, based on the retrospective labor market history. All the outcomes start when women are age 15 or when they exit school,

⁵ This was primarily an issue in Tunisia, where data were generally missing at random due to problems in tablet programming that did not require responses to all relevant questions (Assaad et al. 2016).

whichever is later. Our analyses frequently distinguish between five different labor market states:⁶ (1) public sector wage work⁷ (2) private formal⁸ wage work (3) private informal wage work (4) non-wage work (being an employer, self-employed, or an unpaid family worker), and (5) not employed.⁹ States (1) to (4) are considered forms of employment. The retrospective data capture only market work, so women engaged in subsistence work are considered non-employed. The retrospective data capture all labor market statuses that last six months or longer, but we use annualized data in order to relate to events such as year of marriage. Part-time and intermittent or seasonal market work would potentially be included if it was the main status for the year. We discuss how these outcomes are modeled as durations, below, in the methods section.

Our covariates are designed to capture the dynamic (time-varying) features of women's process of family formation, in line with our conceptual framework (Spierings et al. 2010). Key covariates around our focus determinants of "needs" include a dummy for whether or not a woman has ever married¹⁰ during or prior to the year in question in the annualized panel. This variable is zero before she marries for the first time, then turns to one the year of her first marriage and remains one thereafter. We refer to this specifically as "married" in the text and tables and interpret it as the effect of being married. We also account specifically for the year of marriage, since we expect women disproportionately leave work when getting married, more so than once married for multiple years. The "year of marriage" variable is zero before a woman gets married for the first time, then turns to one the year she gets married for the first time, before reverting to zero thereafter. We interpret this "year of marriage" coefficient as the impact of getting married (that

⁶ We specifically draw on questions of: "Employment status," "Economic sector," "Contract," and "Social security" to construct these outcomes.

⁷ Although we make no assumptions about whether public sector wage work is formal, it almost always is.

⁸ Formal work is defined as work with a contract or social insurance coverage.

⁹ Since we are relying on retrospective data, there are problems in retrospectively reporting unemployment (Assaad et al. 2018) that preclude estimation of unemployment as a separate state.

¹⁰ Married refers to the celebration, co-habitation, and consummation of the marriage, which are co-incident. For Muslims, the marriage contract (*katb kitab*) may be signed at the same time but may also be signed earlier than what we refer to as marriage.

particular year). Since searching for a spouse and engagement are a lengthy process in the region (Salem 2014, 2015), it is possible for women's work dynamics to be affected by the search and engagement process. We therefore include a "year before marriage" variable that equals one only in the year before first marriage and zero otherwise, and a "two years before marriage" variable that equals one two years before first marriage and zero at all other years. These variables allow us to see the potential effects of anticipating marriage on work transitions. These last two variables are only used in specifications where the most recent calendar years are excluded to be able to fully capture the leads. Another critically important covariate is women's time varying labor market status, and how this interacts with marriage.

An under-researched aspect of "needs" in the dynamics of family formation and women's work is the role of childbearing, as distinct from marriage. Thus, we include an indicator for whether a woman gives birth in a particular year, along with a lead, that is a "year before giving birth" variable to capture the effect of leaving work when pregnant or planning for a child. In order to distinguish childbearing and child rearing, we include the number of children in each of four age groups: 0-2, 3-5, 6-11, and 12-18.¹¹ The first two age groups represent children that are not yet in school, but who may have varying child care needs and options, while the last two groups designate children who are primary-school age and then approximately lower or upper secondary aged. We also include two potential proxies for the supply of familial support or child care. First, we include a dummy for whether a woman moved from her place of birth or not,¹² as distance from family supports may affect her ability to reconcile work and her own family formation. Second,

¹¹ We tested, alternatively, using presence of children instead of number but the results were not substantively different. We also tested combining some of the age groups, but the results indicated that there were substantive differences that merited the disaggregation.

¹² In the residential mobility section that contains this question, moves are defined as lasting at least six months. In Egypt, moves require moving at the *shyakha* level (third level of administrative geography), but moving from urban to urban or rural to rural within the same governorate (first level of administrative geography) does not count. In Jordan, moves are on the sub-district level (third level of administrative geography). In Tunisia, moves require moving at the governorate level (first level of administrative geography), but moving from urban to urban or rural to rural within the same governorate does not count.

we include the number of female siblings living, as sisters may also represent potential supports. Since decisions may depend on women's own (time-varying) age as well, we include age and its square (both continuous) in the model.

Since women's opportunity cost of time is a key "opportunities" mediator for the work-marriage relationship, we incorporate women's (potential) commute times, in minutes, as a key predictor. Although we do not have time varying data on women's own commute times (and such data would only be available for working women), we do have commute time for those currently working at the time of the survey. These times are first averaged at the governorate and district levels, for Egypt and Jordan, and at the governorate level for Tunisia. Then, these averages are matched with the individual's yearly time-varying location of residence for Egypt and Tunisia.¹³ For Jordan, data on geographical mobility had no dates. Thus, the average commute times are matched to the current place of residence.

We also include static (time invariant) characteristics of women that shape their "opportunities," including the woman's education level (categorically as illiterate or read and write (reference), below secondary, secondary, university and above), father's and mother's education (categorically as illiterate (reference), read and write, basic (including primary and preparatory), and secondary and above), father's employment status (categorically as public wage (reference), private wage, non-wage, and no job/don't know), and father's occupation (categorically as white collar (reference), blue collar, or skilled agriculture).¹⁴ Country-specific birth regions are included categorically as predictors as well. Since labor market conditions when women left school may be particularly important for their trajectories, we include school leaver cohorts, categorically, in the model.

¹³ The yearly time-varying location of residence in Egypt and Tunisia can be constructed from detailed questions on geographical mobility and the calendar time of changes in the place of residence.

¹⁴ Information about parental employment and occupation statuses is for when the individual was age 15. Father's occupation coded as skilled agriculture also included non-employed, don't know, and missing.

We also work to capture potentially time-varying economic and labor market conditions, which are likely to affect labor market and family formation decisions in terms of needs and opportunities.¹⁵ Specifically, we include continuous time-varying variables for: gross domestic product (GDP) per capita in constant 2010 US dollars, the inflation rate (as a percentage, based on consumer prices), and the female unemployment rate (as a percentage of the female labor force). Some of these variables (particularly inflation and unemployment) are not available for the full period, so we also include a dummy for whether each of these are missing and use the country mean in the continuous variable if missing.

4 Methods

The first set of analyses focus on the duration (spells) of employment. For this set of analyses, we use a sub-sample of women who have ever worked at some point prior to the survey date and analyze the duration of their work, including how work and its duration are affected by marriage and child bearing. Women may have multiple spells of work. For instance, three years of employment followed by seven years of non-employment and then three years working again would be two three-year spells of work. A spell of work ends when a woman spends at least one year not working. These spells' duration may be right censored if a woman is still working at the time of the survey. These initial analyses only distinguish between market work and not working.

The second set of analyses are the complement to the first; they focus on durations of non-employment. Women may have multiple spells of non-employment. A spell of non-employment ends when a woman enters an employment state for at least a year. Women may be right censored on their non-employment duration if they are currently not working.

¹⁵ The data, unfortunately, do not capture any time-varying aspects of values, so we do not include those explicitly in the models, but do note they are likely to be a key aspect of context.

For both the employment and non-employment duration analyses, we have a duration (spell) that can be modeled as a binary outcome. For employment spells, the binary outcome is exit to non-employment. For non-employment spells, the binary outcome is exit to employment. We therefore estimate discrete time hazard models for, first, duration of employment and second, duration of non-employment.

In the case of employment duration, consider t to be time working and T to be exiting work. We use a discrete time hazard, h_{it} , as characterizing the probability of exiting work at a particular point in time (T_i) since starting work (Jenkins 1995):

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

The same concept can be applied to the duration of non-employment since school exit, age 15, or last employment, whichever is later, where t is time (years of non-employment) and T is the event of starting to work.

For each of these outcomes, the hazard is first characterized descriptively, in terms of a Kaplan-Meier survival function for duration of employment (or non-employment) for women. We then estimate multivariate models with a discrete time proportional odds model, the logit model. With covariates X_{it} , this model is (Jenkins 1995):

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

Or

$$\ln\left(\frac{h_{it}}{1 - h_{it}}\right) = \theta(t) + \beta X_{it} \quad (3)$$

The $\theta(t)$ characterizes the baseline hazard. Essentially, our models recognize that the chances of leaving or entering different employment states depend on not only individuals' characteristics, but also the duration of their state to date. After exponentiation, results can be interpreted as odds ratios, multiplying the odds of the hazard. Odds ratios greater than one mean that the covariate

increases the probability of the event, whereas odds less than one mean the covariate decreases the probability of the event.

In subsequent analyses, we allow for multiple possible exits from a state. For instance, for women who are not employed, they may exit non-employment to a variety of different employment states. Denote the possible states as j (e.g., non-wage work, public sector wage work, etc.). Then there are j hazard functions (Allison 1982):

$$h_{itj} = \Pr (T_{tj}|T_t \geq t) \quad (4)$$

These hazard functions characterize the probability of a certain event (for example, exiting non-employment to non-wage work) at time t if exit for any cause has not happened prior to time t . In a multivariate context, it is possible to estimate (Allison 1982):

$$h_{itj} = \{\exp[\theta_j(t) + \beta_j X_{it}]\} / \{1 + \sum_l \exp [\theta_l(t) + \beta_l X_{it}]\} \quad (5)$$

This can be estimated as a multinomial logit competing risk model on the annualized data. The reference outcome of the multinomial logit is no event occurring, i.e. the spell (for instance, public sector work) continuing. Denoting the probability of no event as $j=0$, we can then estimate the log relative risk ratio from the multinomial logit as:

$$\ln \left(\frac{h_{itj}}{h_{it0}} \right) = \theta_j(t) + \beta_j X_{it} \quad (6)$$

By exponentiating this equation, the relative risk ratio here is the probability of event j relative to no event, the reference, similar to the odds ratio earlier. These models are estimated for a variety of different current states, so, for instance, we estimate the probability of different exits from private informal wage work, then non-wage work, and so on.

Models are all estimated separately for each country, with comparable but country-specific characteristics. Standard errors are clustered at the primary sampling unit (PSU) level, which

allows for correlation within PSUs.¹⁶ The estimation of the baseline hazard of exiting work (or entering work or changing states) also illustrates when, relative to their start, women exit (or enter or change) work. In most specifications, we include interactions between the baseline hazard and a time-varying measure of ever married to assess how being married relates to state duration (the baseline hazard). Ultimately, these models can answer questions such as whether or not women exit work in the year preceding marriage, in anticipation of their changing roles, or the year they get married, or while expecting their first child.

It is important to note that, while we include a host of characteristics in our model, we are identifying only correlations or associations, not causation. Previous studies tackling the relationship between marriage timing and women's employment have focused on how labor market outcomes affect marriage timing (Assaad et al. 2010; Krafft and Assaad 2017). Women's employment, in past studies, was demonstrated to be endogenous to the timing of marriage (Krafft and Assaad 2017). Substantial caution is required in interpreting the relationships we observe.

5 Results

5.1 *Descriptive dynamics of employment and marriage*

We first examine the pattern of the duration in employment and how exits from employment to non-employment evolve over time. Figure 1 shows the Kaplan-Meier survival functions for the proportion of women still employed at each year in the employment spell, distinguishing by whether the spell starts before marrying or at/after marriage, for the three countries, Egypt, Jordan and Tunisia. It is important to note that although a spell may start before marriage, it may include

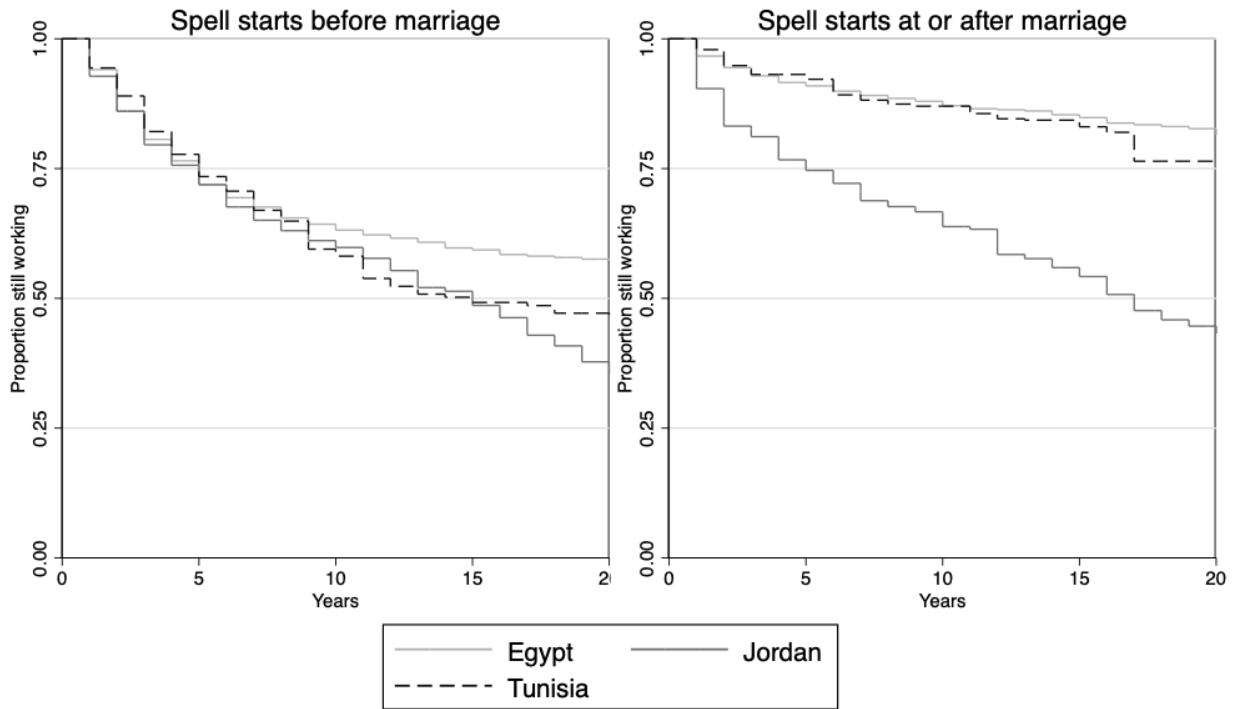
¹⁶ This would include correlation across women in the same PSU, across spells for the same woman, and within spells for the same woman. Note that women rarely have multiple spells; for example, there are 6,223 spells of work across the countries for 5,909 women.

getting married.¹⁷ For the spells starting before marriage, the proportion of women who persist in work declines steadily over time. In all three countries, around 58-63% remain in employment after 10 years. The proportion of women persisting in employment reaches as low as 35% after 20 years in Jordan, followed by 46% in Tunisia, and 57% in Egypt. The median employment spell in Jordan and Tunisia is around 15 years for those who started work prior to marrying.

For women who start working at or after marriage, employment spells are overall longer than those that start before marriage. This result suggests that, if married women start work, they have higher chances of continuing in employment, particularly in Egypt and Tunisia. In Jordan, spells after marriage exhibit a more similar pattern to spells before marriage. In Egypt and Tunisia, around 87% of women who started working at or after marriage still work after 10 years of employment, compared to around only 64% in Jordan. This result suggests that at least in Egypt and Tunisia, women who start work after marriage are highly persistent in work. However, because a lot of unmarried women leave work at marriage, only a select group of women starts to work at or after marriage.

¹⁷ The Kaplan-Meier estimator does not allow for time-varying covariates. We therefore code the distinction between spells starting before marriage versus at or after marriage based on the status in the first year of the spell. The multivariate models, below, do allow for time-varying covariates.

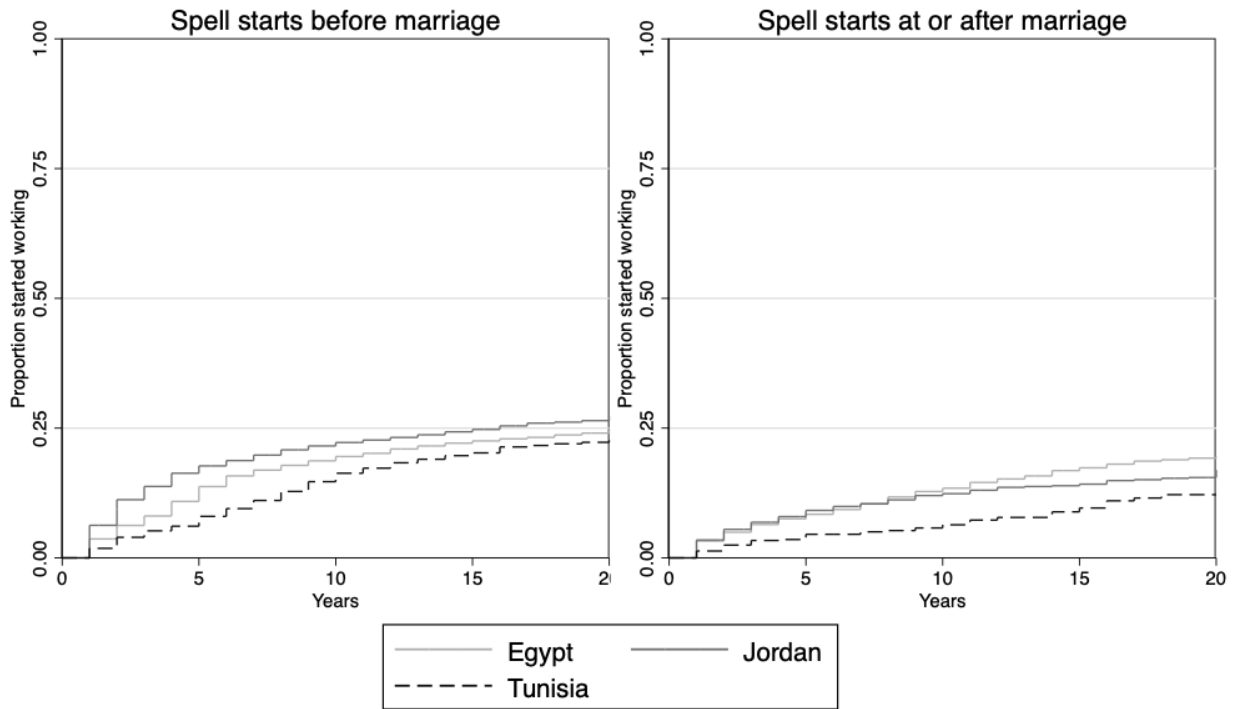
Figure 1. Survival (proportion still working) in employment spells by whether spell starts before or at/after marriage and country



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

We now turn to the second aspect of the dynamics of women's work, which is the duration in non-employment spells. Figure 2 shows the Kaplan-Meier failure functions for the proportion of women who start working and exit non-employment at each year in the non-employment spell. In all three countries, non-employment spells that started before marriage are more likely to end (women are more likely to start work) than spells at or after marriage. Together, the figures show that women starting their state before marriage are more likely to change status than those starting at or after marriage, across both employment and non-employment. Thus, women have more dynamic labor market patterns before than after marriage.

Figure 2. Failure (proportion started working) in non-employment spells by whether spell starts before or at/after marriage and country



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

The pattern of women's survival in different employment states differs greatly, demonstrating that women prefer certain types of employment. Figure 3 shows the Kaplan-Meier survival functions for the proportion of women who are still in same labor market status (public, private formal wage, private informal wage, non-wage, or non-employed). As expected, in all three countries, the non-employed state is the most persistent. Non-employment exit rates are the lowest over time compared to all other (employment) statuses. The status that exhibits the second lowest exit rates, after non-employment, is the public sector with quite long employment spells. The proportion of women who stay in the public sector after five years ranges from around 84%-85%

in Egypt and Jordan to 90% in Tunisia for those who started prior to marriage and 88% in Jordan to 92%-95% in Egypt and Tunisia for those starting at or after marriage.

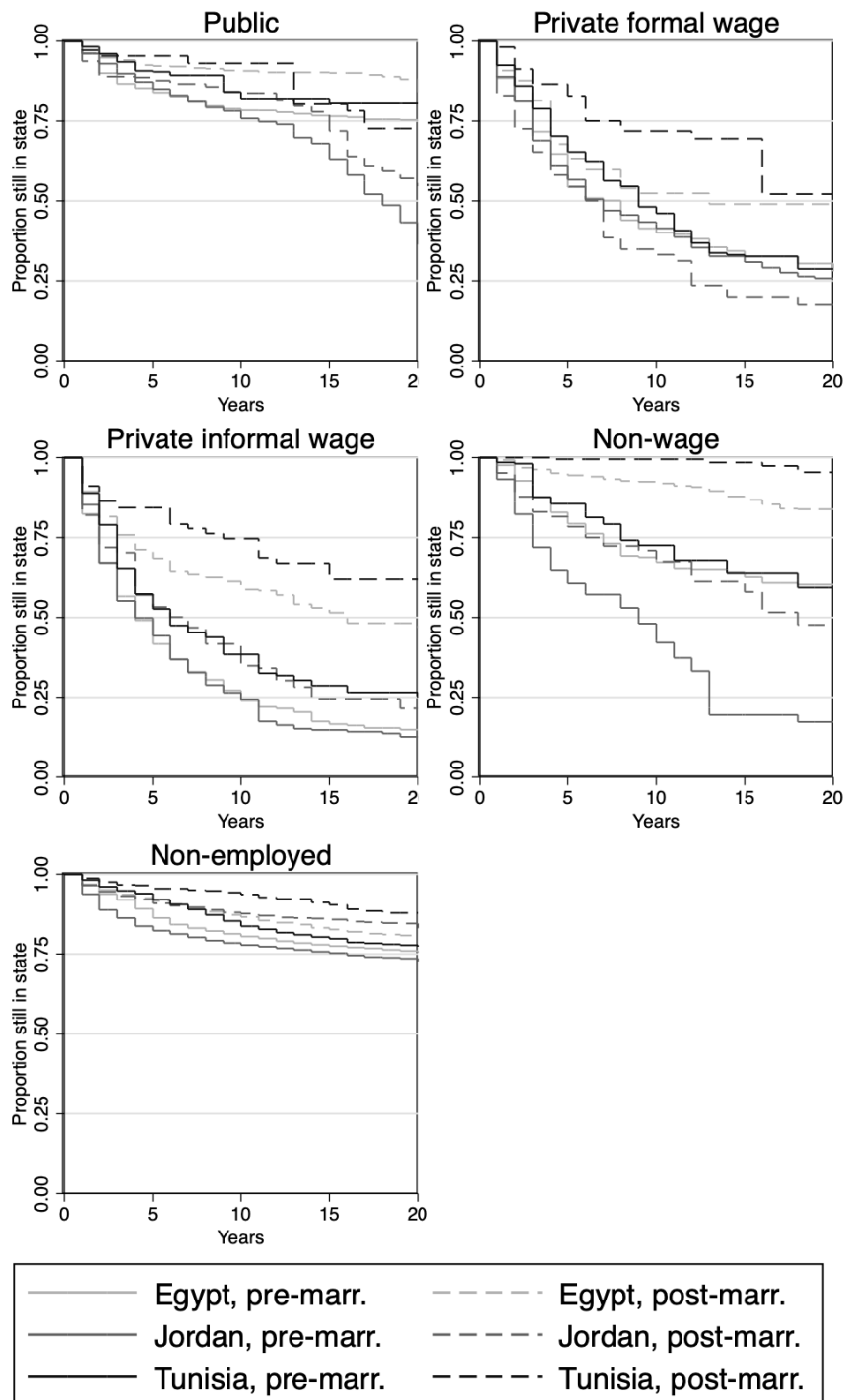
Women who start their employment spells in private formal wage, private informal wage, or non-wage work experience interesting dynamics over the spells and across countries. Particularly in Egypt and Tunisia, the start timing of the spell (pre or post marriage) relates to the pattern of survival. For instance, relative to women who start at or after marriage, those who start private formal or informal wage work prior to marrying have much shorter spells. For women who start such work prior to marriage, the median is 7-8 years for private formal and 4 years for private informal in both Egypt and Jordan, and 9 years for private formal and 6 years for private informal in Tunisia. As for the selected group of women who start working in private wage jobs at or after marriage, they are relatively less likely to leave their jobs. In Egypt, there is a median private formal wage spell of around 13 years and a median private informal wage spell of 16 years. In Tunisia, private formal and informal wage spells are even more persistent for married women than in Egypt, making the gap between those who start before marriage and those who start at or after marriage larger.

For the non-wage state, there are longer employment spells than for private formal or informal work for both start timings (pre or post marriage). Women who start non-wage work at or after marriage are less likely to leave compared to those who start before marriage in all three countries. Non-wage work may be a more long-term reconcilable option with marriage. Generally, and similarly to Figure 1 and Figure 2, women starting their states at or after marriage experience lower movement/exit rates from their initial states.

Overall, the initial descriptive evidence provides suggestive support for H1/H2 in that women who start work before they marry exit more rapidly, possibly at marriage. There is also suggestive evidence for H3, whether women leave work depends on the type of work. These

findings have to be cautiously interpreted due to important selection effects. Women who start at or after marriage represent a distinct group with different characteristics. However, for both groups of women, we see important differences in which states they persist in, particularly non-employment and the public sector, along with non-wage work for married women.

Figure 3. Survival (proportion still in same status) in labor market status spell by status, whether spell starts before or at or after marriage, and country



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

An important question that complements analyses of exits relates to the destination states of women who exit a labor market state. Figure 4 shows the annual transition rates between labor market statuses by status. The first two panels of the graph are presented by time-varying marital status (ever married versus never married) in order to see the overall effect of marriage on the transition between labor market statuses. The second pair of panels are presented for rates of transition the year before marriage or at the marriage year, in order to specifically capture the dynamics of transitions in anticipation of and at marriage (descriptively testing H1 and H2 as well as H3). These figures show the transition rates to only different labor market states. The percentage remaining in a state (not shown) is 100% minus the percentages shown transitioning.

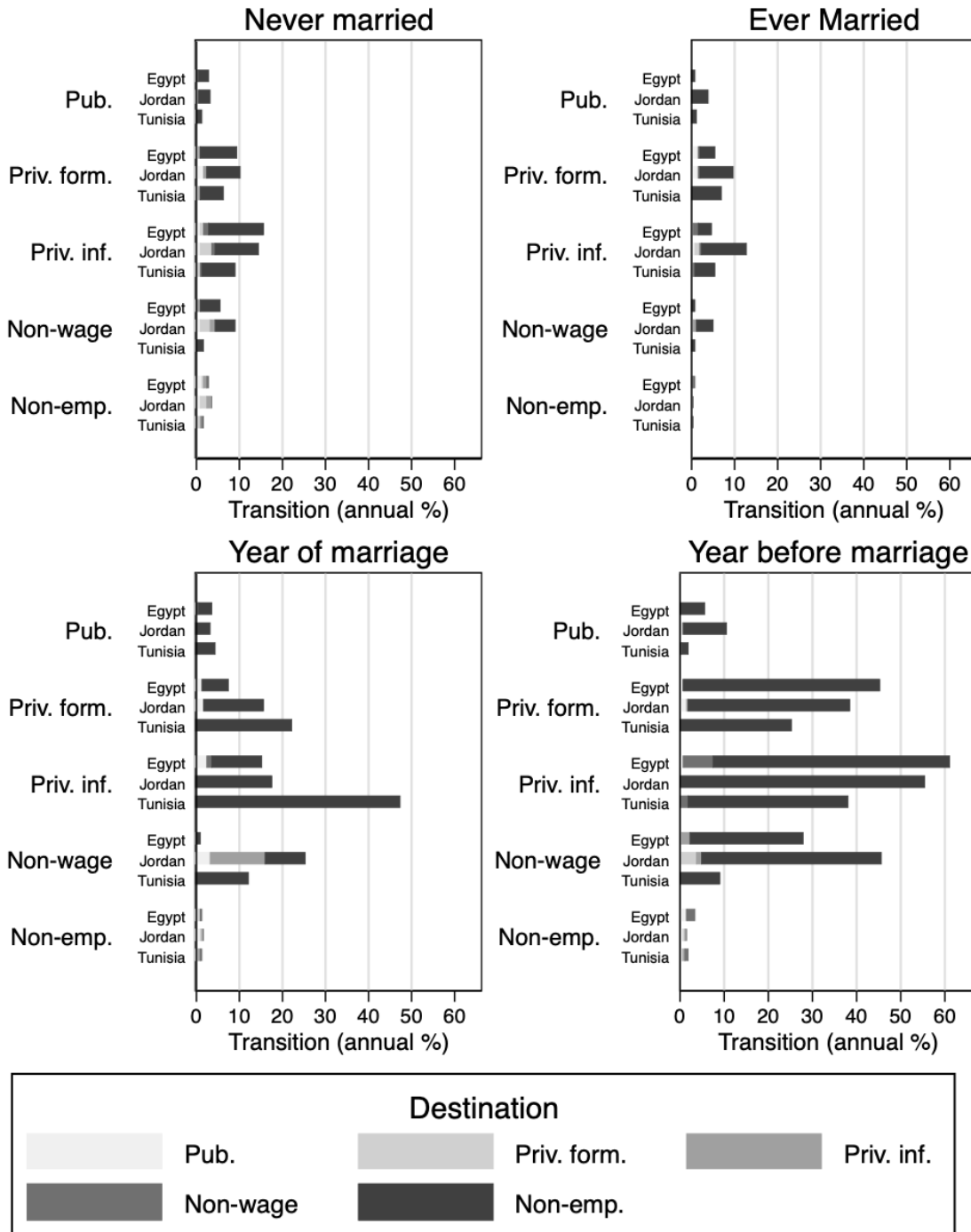
In all three countries, the majority of unmarried women who leave private informal wage work become primarily non-employed (around 13% annually for Egypt, 10% in Jordan, and 8% in Tunisia). For married women, this pattern only persists for Jordan (around 10% annual transition rate to non-employment), whereas transitions rates in Egypt and Tunisia are quite low (around 3-5%). This pattern is mostly because separations happen at marriage or the year before marriage, as discussed below. A similar pattern holds for transitions from private formal wage work, although transition rates are generally lower.

Transition rates presented by whether the labor market status starts one year before marriage or at marriage reveal important patterns. The year of and the year before marriage, exit rates are very high, but to varying degrees across statuses. In the year before marrying, exit rates from private informal wage work are the highest compared to all other labor market statuses, followed by transition rates from private formal wage work (and non-wage work in Jordan). Egypt experiences high transition rates out of these two employment statuses (53% from private informal wage and 44% from private formal wage), as does Jordan (56% from informal and 37% from

formal), with high but slightly lower rates in Tunisia (36% from informal and 26% from formal). The countries' ordering is reversed when we look at transition rates at the year of marriage, with Tunisia having the highest exit rates from both private informal (48%) and formal wage work (22%) followed by Jordan (18% informal and 14% formal), then Egypt (12% informal and 6% formal). This suggests that while Tunisian women are less likely to leave the private sector ahead of marriage, they end up leaving it at marriage. Overall and as expected, the main destination out of both private informal and formal wage work, whether the year before or year of marriage, is non-employment.¹⁸ There is strong descriptive evidence supporting H1 (women leave work at marriage) and H2 (women leave work in anticipation of marriage), with some variation across countries in which dynamic is stronger. Moreover, there is strong descriptive evidence supporting H3, whether women leave depends on the type of work; they particularly exit private sector and especially informal work. In the next section, more in-depth multivariate analysis is conducted for each of these outcomes, duration in employment and in non-employment, exit rates of different labor market states, and transitions between statuses.

¹⁸ These results are quite consistent across school-leaver cohorts as well as by education; see Appendix Figures 1-4.

Figure 4. Annual rates of transition (percentages) between labor market statuses by status, marital status, and whether one year before or at marriage and country



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

5.2 *Multivariate models of employment spells*

Table 1 presents the discrete time logit models for employment spells. The results are presented in terms of odds ratios, i.e. relative changes in the hazard of exit from employment to non-employment. Odds ratios greater than one mean that a characteristic is associated with a higher hazard of exit from employment. Odds ratios less than one mean that a characteristic is associated with a lower hazard of exit from employment. Results are presented first focusing on marriage (Spec. 1, testing H1/H2, leaving work at or anticipation of marriage) and then with child-bearing, child-rearing, and factors that affect access to work to examine the mediators of marriage effects (Spec. 2, additionally testing H4, exit depending on children and their ages, and H5, commuting and child care availability).

The baseline hazard illustrates how the chance of exit varies with duration. For instance, in Jordan it appears that the hazard decreases with time (and is significantly lower in year 5 than the omitted year 1). It is important to note that the baseline hazards are interacted with a time-varying variable for ever being married (“married”). These interactions test whether and how the probability of exiting work is different for ever married women compared to the reference (never married women) depending on the duration of work. In both Egypt and Jordan, and in line with Figure 1, the hazard of exiting work appears to decrease (only sometimes significantly) more over time for ever married women than never married women. This result is likely to be driven by selection: married women who persist in employment are a more select group. The opposite is true in Tunisia, where the hazard appears to rise with time, sometimes significantly, for married women relative to unmarried women.

Keeping in mind the baseline hazard and marriage interactions, there are interesting differences in the main effect of being married. It is not significant in Egypt (but does

insignificantly increase the hazard of exit). It is high and significant, with an odds ratio around 2.4 in Spec.1, more than doubling the odds, in Jordan, indicating that married women are more likely to leave work, particularly in the omitted year 1. In Tunisia the hazard decreases for married women, but insignificantly so.

Although there are mixed patterns with regards to being married, and a likely selection issue, the patterns around anticipating marriage (“year before marriage” and “two years before marriage”) and getting married (“year of marriage”) are much more consistent. There are higher odds of exiting work in the year, year before, and two years before marriage. This result is significant in almost every specification (supporting H1 and H2). An interesting contrast arises between Tunisia, where the odds ratio is highest for the year of marriage, and Jordan and Egypt, where the odds ratio is highest the year before marriage, similar to what was found in Figure 4. These differences in exit timing suggest that while women in all three countries exit both in anticipation of marriage and when they marry, Tunisian women are (relatively) more likely to work up to their marriages, whereas Egyptian and Jordanian women exit further in advance. In terms of child-bearing, there is also a strong anticipatory effect. Women exit work more the year before birth in both Egypt and Jordan (only Jordan is significant) but exit the year of birth in Tunisia. Pregnancy or anticipation of children, not childbirth, appears to be more difficult to reconcile with work. Child-rearing appears to play a smaller role, with no systematic patterns or significant results by the number of children of different ages. There is thus only support for H4, that women leave work depending on their children, in terms of pregnancies. There is some suggestive evidence for H5, on the importance of child care resources, in terms of moving from the birth region (significantly higher probability of exit in Egypt; insignificant but higher elsewhere). Likewise, in Jordan, a higher number of female siblings significantly reduces the hazard of exiting work (insignificant increases in Egypt and Tunisia).

There are interesting—and contrasting—relationships between commuting and exit from work. When women are living in places with longer commutes, they are significantly more likely to exit work in Egypt, with no significant difference for married versus unmarried women. In Tunisia, women who face longer commutes are not significantly more likely to exit (average commute times are also shorter in Tunisia), but there is a positive, albeit insignificant interaction with marriage. The insignificance of the result in Jordan may be due to the fact that commuting time is not time-varying.

Macroeconomic conditions, particularly GDP per capita, also appear particularly important. Interestingly, when GDP per capita is higher, women are significantly more likely to exit work. Other results are more mixed; Jordan shows a strong relationship with unemployment; when it is higher, women are less likely to exit work, potentially retaining jobs in difficult times. However, when inflation is higher, they are significantly more likely to exit work, possibly to focus on home production.

The results of the other predictors are as expected. Highly educated women, who have a greater opportunity cost of time, are less likely to exit work. These women are also more likely to have jobs or have the support system that allows them to reconcile their jobs with marriage or child-bearing/rearing. Exit is more common for women with middling education in Jordan and Tunisia. There are not significant results by parents' education. Father's employment status is only significant in one model for Jordan, but in Egypt women with fathers in blue collar occupations are significantly more likely to exit work, while in Jordan those with skilled agricultural fathers are less likely to do so. This result may be because family networks play a key role in employment, but few women work in blue collar occupations, while more may engage in agriculture.

There are significant regional differences. In Egypt, compared to Greater Cairo, the capital, other regions tend to have lower odds of exit, often significantly so. Women from the South in

Jordan are significantly less likely to exit than women in the Middle region. Compared to the North, women in the Center East of Tunisia are significantly more likely to exit. The age profile suggests that the probability of exiting, after accounting for other factors, first falls and then rises with age. This pattern likely represents women increasingly transitioning into the labor market at adulthood, then eventually exiting as they approach retirement. There are few significant differences by school leaver cohorts, with only those who left school prior to 1969 significantly different than the 2000s cohorts.

Table 1. Discrete time logit models of employment spells (outcome is exit to non-employment) by country

	<u>Egypt</u>		<u>Jordan</u>		<u>Tunisia</u>	
	Spec. 1	Spec. 2	Spec. 1	Spec. 2	Spec. 1	Spec. 2
Married and marriage						
Married	1.369 (0.333)	1.329 (0.464)	2.362*** (0.571)	2.921** (1.100)	0.644 (0.349)	0.149 (0.152)
Year of marriage	2.356*** (0.444)	1.867** (0.390)	1.634** (0.309)	1.377 (0.310)	9.984*** (2.884)	9.822*** (3.407)
Year before marriage	15.239*** (1.744)	14.946*** (1.739)	11.291*** (1.798)	11.064*** (1.783)	9.070*** (2.073)	9.330*** (2.166)
Two years before marriage	4.645*** (0.592)	4.586*** (0.585)	2.409*** (0.488)	2.315*** (0.473)	1.834 (0.588)	1.909* (0.613)
Child-bearing						
Birth in year		0.976 (0.214)		0.849 (0.146)		1.532 (0.545)
Year before birth		1.217 (0.161)		1.587*** (0.213)		1.197 (0.312)
Child-rearing						
No. kids ages 0-2		0.795 (0.117)		1.125 (0.117)		1.049 (0.260)
No. kids ages 3-5		0.899 (0.119)		0.882 (0.082)		1.094 (0.199)
No. kids ages 6-11		0.879 (0.077)		1.055 (0.057)		0.804 (0.150)
No. kids ages 12-18		1.139 (0.098)		1.024 (0.057)		0.760 (0.139)
Moved from birth region		1.428** (0.155)		1.177 (0.109)		1.369 (0.262)
Number of female siblings		1.013 (0.024)		0.954* (0.018)		1.035 (0.044)
Local commuting						

	<u>Egypt</u>		<u>Jordan</u>		<u>Tunisia</u>	
	<u>Spec. 1</u>	<u>Spec. 2</u>	<u>Spec. 1</u>	<u>Spec. 2</u>	<u>Spec. 1</u>	<u>Spec. 2</u>
Local commute (in min.)		1.014** (0.005)		0.997 (0.005)		0.954 (0.035)
Married # Local commute (in min.)		1.005 (0.007)		0.992 (0.007)		1.071 (0.045)
Time varying age						
Age in year	0.911** (0.030)	0.918* (0.032)	0.872** (0.037)	0.867** (0.040)	0.949 (0.058)	0.962 (0.059)
Age in year # Age in year	1.001 (0.000)	1.001 (0.001)	1.002** (0.001)	1.002** (0.001)	1.000 (0.001)	1.000 (0.001)
School leaver cohort (2000+ omit.)						
<1969	3.112** (1.261)	3.228** (1.326)	1.745 (0.765)	1.684 (0.742)		
1970-1979	1.472 (0.455)	1.489 (0.466)	1.367 (0.415)	1.308 (0.400)	1.664 (0.690)	1.702 (0.736)
1980-1989	0.937 (0.198)	0.981 (0.213)	1.213 (0.266)	1.195 (0.267)	1.384 (0.444)	1.413 (0.462)
1990-1999	1.043 (0.139)	1.084 (0.148)	1.018 (0.162)	0.990 (0.163)	1.356 (0.273)	1.292 (0.264)
Macroeconomic conditions						
GDP per capita (constant 2010 dollars)	1.001*** (0.000)	1.001*** (0.000)	1.000* (0.000)	1.000* (0.000)	1.001*** (0.000)	1.001** (0.000)
Female unemployment rate (percentage)	0.993 (0.016)	0.993 (0.016)	0.940*** (0.016)	0.937*** (0.017)	1.034 (0.020)	1.034 (0.020)
Inflation rate (percentage)	0.989 (0.008)	0.989 (0.008)	1.048*** (0.010)	1.049*** (0.010)	0.977 (0.071)	0.967 (0.070)
GDP per capita missing			1.370 (0.572)	1.431 (0.600)		
Female unemployment rate missing	0.611* (0.118)	0.616* (0.119)	0.271*** (0.064)	0.253*** (0.059)	0.848 (0.400)	0.826 (0.394)
Inflation rate missing			0.440 (0.213)	0.437 (0.210)	1.074 (0.436)	1.006 (0.405)
Education (none omit.)						
Below Secondary	0.885 (0.113)	0.858 (0.109)	2.037*** (0.355)	2.075*** (0.363)	1.449* (0.257)	1.422* (0.244)
Secondary	0.732** (0.087)	0.743* (0.091)	1.234 (0.234)	1.205 (0.229)	0.982 (0.246)	0.873 (0.230)
University and Above	0.434*** (0.076)	0.444*** (0.078)	0.655 (0.146)	0.617* (0.138)	0.492 (0.199)	0.442* (0.180)
Mother's education (none omit.)						
Reads & Writes	0.826 (0.111)	0.823 (0.109)	1.145 (0.109)	1.105 (0.108)	0.658 (0.285)	0.692 (0.298)
Basic	0.974 (0.144)	0.975 (0.144)	1.184 (0.461)	1.132 (0.431)	0.839 (0.167)	0.812 (0.164)
Secondary+	0.893 (0.138)	0.891 (0.137)	1.117 (0.188)	1.029 (0.179)	2.443 (1.453)	2.568 (1.545)
Father's education (none omit.)						
Reads & Writes	1.177	1.152	1.060	1.069	0.647	0.670

	<u>Egypt</u>		<u>Jordan</u>		<u>Tunisia</u>	
	<u>Spec. 1</u>	<u>Spec. 2</u>	<u>Spec. 1</u>	<u>Spec. 2</u>	<u>Spec. 1</u>	<u>Spec. 2</u>
Basic	(0.115)	(0.112)	(0.115)	(0.116)	(0.265)	(0.285)
	1.217	1.191	0.544	0.556	1.056	1.052
Secondary+	(0.148)	(0.144)	(0.221)	(0.225)	(0.163)	(0.163)
	1.125	1.145	1.239	1.241	1.117	1.163
	(0.165)	(0.169)	(0.184)	(0.187)	(0.347)	(0.381)
Father's emp. stat. (public omit.)						
Private wage	1.059	1.081	0.993	0.953	0.954	0.958
	(0.106)	(0.108)	(0.113)	(0.111)	(0.201)	(0.206)
Non-wage	0.860	0.890	1.232*	1.213	0.724	0.746
	(0.098)	(0.102)	(0.124)	(0.124)	(0.167)	(0.173)
No job or DK	1.109	1.142	1.621*	1.555	0.635	0.675
	(0.392)	(0.404)	(0.380)	(0.366)	(0.215)	(0.233)
Father's Occupation (White collar omit.)						
Blue Collar	1.259*	1.290*	1.163	1.195	1.282	1.306
	(0.134)	(0.136)	(0.124)	(0.130)	(0.263)	(0.278)
Skilled agricultural	0.924	0.953	0.706*	0.724*	1.415	1.409
	(0.111)	(0.115)	(0.099)	(0.104)	(0.329)	(0.334)
Egypt region of birth (Greater Cairo omit.)						
Alex and Canal cities	0.828	0.878				
	(0.121)	(0.128)				
Urban Lower Egypt	0.609***	0.646**				
	(0.086)	(0.091)				
Rural Lower Egypt	0.423***	0.483***				
	(0.065)	(0.074)				
Urban Upper Egypt	0.643***	0.668***				
	(0.076)	(0.077)				
Rural Upper Egypt	0.364***	0.388***				
	(0.055)	(0.058)				
Jordan region of birth (Middle omit.)						
North			0.941	1.071		
			(0.095)	(0.115)		
South			0.562***	0.632**		
			(0.084)	(0.102)		
Abroad			1.107	1.053		
			(0.118)	(0.115)		
Tunisia region of birth (North omit.)						
North West					0.569	0.572
					(0.166)	(0.181)
Center East					1.966***	1.965***
					(0.348)	(0.363)
Center West					1.464	1.321
					(0.313)	(0.293)
South East					0.771	0.724
					(0.347)	(0.344)
South West					1.031	0.986
					(0.381)	(0.378)
Baseline (years)						

	<u>Egypt</u>		<u>Jordan</u>		<u>Tunisia</u>	
	<u>Spec. 1</u>	<u>Spec. 2</u>	<u>Spec. 1</u>	<u>Spec. 2</u>	<u>Spec. 1</u>	<u>Spec. 2</u>
2	1.305 (0.194)	1.308 (0.196)	0.845 (0.158)	0.837 (0.158)	1.629 (0.449)	1.611 (0.447)
3	1.135 (0.172)	1.147 (0.174)	1.055 (0.199)	1.055 (0.200)	0.879 (0.259)	0.878 (0.257)
4	1.031 (0.174)	1.027 (0.175)	0.704 (0.168)	0.703 (0.169)	0.959 (0.380)	0.897 (0.358)
5	1.020 (0.204)	1.021 (0.203)	0.637 (0.169)	0.623 (0.167)	1.155 (0.409)	1.106 (0.391)
6	0.863 (0.208)	0.879 (0.214)	0.912 (0.259)	0.873 (0.254)	1.530 (0.533)	1.410 (0.490)
7	0.762 (0.196)	0.778 (0.198)	0.474* (0.170)	0.489* (0.176)	0.625 (0.269)	0.579 (0.249)
8	0.892 (0.256)	0.908 (0.259)	0.623 (0.254)	0.611 (0.250)	0.382 (0.259)	0.349 (0.238)
9	1.334 (0.420)	1.374 (0.435)	0.606 (0.268)	0.586 (0.271)	1.007 (0.621)	0.912 (0.560)
10+	0.917 (0.218)	0.979 (0.234)	0.700 (0.181)	0.686 (0.185)	0.840 (0.336)	0.749 (0.296)
Baseline and married int.						
2 # Married	0.828 (0.215)	0.818 (0.213)	1.094 (0.322)	1.056 (0.314)	1.127 (0.668)	1.093 (0.649)
3 # Married	0.687 (0.205)	0.675 (0.203)	0.380** (0.123)	0.374** (0.121)	3.155* (1.790)	2.996 (1.696)
4 # Married	0.609 (0.186)	0.606 (0.185)	0.759 (0.257)	0.726 (0.248)	0.646 (0.491)	0.683 (0.523)
5 # Married	0.598 (0.196)	0.614 (0.200)	0.480 (0.205)	0.477 (0.205)	1.291 (0.839)	1.264 (0.827)
6 # Married	0.728 (0.261)	0.741 (0.266)	0.553 (0.201)	0.567 (0.210)	1.488 (0.959)	1.637 (1.049)
7 # Married	0.534 (0.220)	0.547 (0.222)	0.828 (0.374)	0.807 (0.365)	3.964* (2.601)	4.367* (2.826)
8 # Married	0.339* (0.155)	0.348* (0.157)	0.294* (0.174)	0.307* (0.181)	4.363 (3.590)	4.799 (3.913)
9 # Married	0.216** (0.108)	0.224** (0.112)	0.588 (0.305)	0.622 (0.333)	1.947 (1.564)	2.209 (1.758)
10+ # Married	0.352*** (0.106)	0.341*** (0.104)	0.844 (0.245)	0.859 (0.259)	1.467 (0.814)	1.816 (0.993)
N women-years	40522	40513	13007	12962	6832	6832
N women	3285	3284	1459	1452	751	751

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

Cells are odds ratios

Standard errors in parentheses, clustered by PSU

Baseline hazard for durations of greater than 10 years coded together with 10 years to ensure adequate cell size.

5.3 *Multivariate models of non-employment spells*

We turn now to spells of non-employment in Table 2. Here the hazard of exit from non-employment decreases significantly with time, suggesting that non-employment is an absorbing state—with effects exacerbated at marriage. As we saw in Figure 2, being married is always associated with lower odds of exiting non-employment (starting work), significantly so in Jordan and in Egypt and Tunisia in Spec. 1. Interestingly, there are positive effects on exiting non-employment the year of marriage, significant in some specifications. The picture in anticipation of marriage is more mixed with higher odds of exiting non-employment in Egypt and Tunisia but lower ones in Jordan. This suggests that getting married may bring new opportunities to start work, as well as incentives to exit work.

Women are less likely to exit non-employment the year before a birth, significantly so in Egypt and Jordan. Child-rearing also appears important in exiting non-employment. In Jordan, there are significant reductions in the odds of exiting non-employment and starting work for each additional child 0-2 and 3-5. These results highlight that limited provision of child care and other child support systems may prevent women from working. The same effects do not appear for older children; in fact, a significantly higher hazard of exiting non-employment is observed with an additional child 6-11 in Egypt. This suggests that children reaching school age, whether due to the implied child care or other factors, enables women to potentially return to work or start work. H4, whether women leave work or start working depends on their number and age of children, appears to be true for starting work (exiting non-employment) more so than exiting work.

Potential child care supports from siblings have no significant effects. Moving from the birth region, however, has a significant effect, raising the hazard of exiting non-employment in Tunisia. This may mean that women in Tunisia can move to better employment opportunities. Commute time has an unexpected effect in Jordan; it reduces the hazard of exiting non-employment, but with

a significant interaction for married women in the opposite direction. Commute times appear to matter for unmarried but not married women in Jordan.

The effects of other characteristics are as expected; more educated women are significantly more likely to exit non-employment. There are a few significant associations for more educated mothers, none for fathers. In Egypt, compared to those with public wage fathers, those with private wage fathers are significantly less likely to exit non-employment. There are a few significant differences by region as well as by school-leaver cohorts. The shape of the age profile is an increase in the odds of exiting non-employment with age, which then diminishes. Macroeconomic conditions matter sporadically for exiting non-employment.

Table 2. Discrete time logit models of non-employment spells (outcome is exit to employment) by country

	<u>Egypt</u>		<u>Jordan</u>		<u>Tunisia</u>	
	Spec. 1	Spec. 2	Spec. 1	Spec. 2	Spec. 1	Spec. 2
Married and marriage						
Married	0.564** (0.099)	0.673 (0.158)	0.191*** (0.039)	0.162*** (0.045)	0.438* (0.178)	0.315 (0.198)
Year of marriage	1.239* (0.134)	1.289* (0.153)	1.708*** (0.273)	1.234 (0.216)	1.675 (0.456)	1.607 (0.480)
Year before marriage	1.185* (0.100)	1.207* (0.101)	0.392*** (0.063)	0.393*** (0.063)	1.607* (0.374)	1.620* (0.376)
Two years before marriage	0.763** (0.066)	0.762** (0.066)	0.863 (0.109)	0.841 (0.106)	1.099 (0.224)	1.099 (0.224)
Child-bearing						
Birth in year		1.027 (0.110)		0.919 (0.132)		0.876 (0.225)
Year before birth		0.734*** (0.062)		0.792* (0.092)		0.681 (0.149)
Child-rearing						
No. kids ages 0-2		0.875 (0.068)		0.721** (0.072)		0.996 (0.158)
No. kids ages 3-5		1.052 (0.067)		0.833* (0.073)		0.760 (0.117)
No. kids ages 6-11		1.143** (0.058)		0.947 (0.058)		0.944 (0.095)
No. kids ages 12-18		0.945 (0.067)		1.000 (0.059)		0.932 (0.101)

	<u>Egypt</u>		<u>Jordan</u>		<u>Tunisia</u>		
	<u>Spec. 1</u>	<u>Spec. 2</u>	<u>Spec. 1</u>	<u>Spec. 2</u>	<u>Spec. 1</u>	<u>Spec. 2</u>	
Moved from birth region		1.064 (0.071)		1.079 (0.085)		1.480** (0.222)	
Number of female siblings		1.024 (0.014)		1.020 (0.016)		0.991 (0.022)	
Local commuting							
Local commute (in min.)		1.006 (0.003)		0.989*** (0.003)		0.979 (0.018)	
Married # Local commute (in min.)		0.997 (0.006)		1.014** (0.004)		1.024 (0.029)	
Time varying age							
Age in year		1.306*** (0.041)	1.292*** (0.041)	1.545*** (0.074)	1.626*** (0.083)	1.194*** (0.056)	1.202*** (0.056)
Age in year # Age in year		0.996*** (0.001)	0.996*** (0.001)	0.994*** (0.001)	0.993*** (0.001)	0.997*** (0.001)	0.996*** (0.001)
School leaver cohort (2000+ omit.)							
<1969		0.513** (0.122)	0.513** (0.122)	0.437* (0.143)	0.446* (0.146)		
1970-1979		1.022 (0.187)	1.011 (0.186)	0.640* (0.144)	0.634* (0.144)	2.135* (0.715)	2.199* (0.745)
1980-1989		1.127 (0.146)	1.111 (0.147)	0.759 (0.127)	0.736 (0.124)	2.028** (0.500)	2.024** (0.500)
1990-1999		1.089 (0.087)	1.085 (0.088)	1.052 (0.114)	1.029 (0.111)	1.427** (0.186)	1.414** (0.186)
Macroeconomic conditions							
GDP per capita (constant 2010 dollars)		1.000* (0.000)	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)	1.001*** (0.000)	1.001*** (0.000)
Female unemployment rate (percentage)		0.978* (0.010)	0.978* (0.010)	1.017 (0.013)	1.018 (0.013)	1.049*** (0.014)	1.049*** (0.014)
Inflation rate (percentage)		1.011** (0.004)	1.012** (0.004)	1.010 (0.007)	1.010 (0.007)	0.972 (0.040)	0.970 (0.041)
GDP per capita missing				1.149 (0.338)	1.122 (0.331)		
Female unemployment rate missing		1.284** (0.120)	1.267* (0.119)	1.476** (0.220)	1.495** (0.225)	1.505 (0.379)	1.474 (0.369)
Inflation rate missing				0.871 (0.209)	0.867 (0.209)	0.801 (0.203)	0.777 (0.197)
Education (none omit.)							
Below Secondary		0.979 (0.099)	0.970 (0.097)	1.254 (0.183)	1.226 (0.178)	2.585*** (0.326)	2.477*** (0.310)
Secondary		2.699*** (0.225)	2.730*** (0.228)	2.477*** (0.400)	2.378*** (0.382)	3.375*** (0.507)	3.247*** (0.483)
University and Above		5.352*** (0.546)	5.444*** (0.558)	5.877*** (1.161)	5.612*** (1.107)	3.921*** (0.678)	3.739*** (0.639)
Mother's education (none omit.)							
Reads & Writes		1.042 (0.076)	1.040 (0.076)	0.990 (0.075)	0.980 (0.075)	1.527* (0.323)	1.500 (0.321)
Basic		1.168	1.167	1.194	1.190	1.160	1.142

	<u>Egypt</u>		<u>Jordan</u>		<u>Tunisia</u>	
	<u>Spec. 1</u>	<u>Spec. 2</u>	<u>Spec. 1</u>	<u>Spec. 2</u>	<u>Spec. 1</u>	<u>Spec. 2</u>
Secondary+	(0.099)	(0.099)	(0.220)	(0.221)	(0.154)	(0.154)
	1.238*	1.246**	1.278	1.253	0.611	0.601
	(0.106)	(0.105)	(0.163)	(0.172)	(0.179)	(0.181)
Father's education (none omit.)						
Reads & Writes	1.013	1.008	0.973	0.966	1.021	1.015
	(0.066)	(0.065)	(0.077)	(0.077)	(0.202)	(0.198)
Basic	1.113	1.109	0.883	0.899	1.041	1.038
	(0.080)	(0.079)	(0.189)	(0.188)	(0.127)	(0.125)
Secondary+	1.013	1.013	0.914	0.880	0.924	0.918
	(0.089)	(0.089)	(0.099)	(0.096)	(0.193)	(0.190)
Father's emp. stat. (public omit.)						
Private wage	0.871*	0.878*	0.864	0.855	0.995	1.007
	(0.057)	(0.058)	(0.079)	(0.079)	(0.130)	(0.133)
Non-wage	0.937	0.942	0.968	0.954	0.942	0.963
	(0.056)	(0.057)	(0.083)	(0.083)	(0.149)	(0.156)
No job or DK	0.900	0.894	1.164	1.130	0.565**	0.576**
	(0.144)	(0.143)	(0.219)	(0.216)	(0.117)	(0.121)
Father's Occupation (White collar omit.)						
Blue Collar	1.097	1.099	1.058	1.050	1.039	1.043
	(0.064)	(0.064)	(0.084)	(0.083)	(0.123)	(0.124)
Skilled agricultural	0.970	0.972	0.807	0.819	0.985	0.986
	(0.074)	(0.074)	(0.096)	(0.098)	(0.150)	(0.150)
Egypt region of birth (Greater Cairo omit.)						
Alex and Canal cities	1.066	1.096				
	(0.105)	(0.108)				
Urban Lower Egypt	1.054	1.085				
	(0.089)	(0.092)				
Rural Lower Egypt	1.051	1.087				
	(0.095)	(0.101)				
Urban Upper Egypt	1.244**	1.249**				
	(0.100)	(0.101)				
Rural Upper Egypt	1.052	1.067				
	(0.107)	(0.108)				
Jordan region of birth (Middle omit.)						
North			0.811*	0.881		
			(0.070)	(0.079)		
South			0.906	0.966		
			(0.092)	(0.102)		
Abroad			0.779**	0.751**		
			(0.071)	(0.072)		
Tunisia region of birth (North omit.)						
North West					1.147	1.105
					(0.200)	(0.192)
Center East					1.945***	1.931***
					(0.273)	(0.275)
Center West					0.762	0.748
					(0.129)	(0.124)

	<u>Egypt</u>		<u>Jordan</u>		<u>Tunisia</u>	
	<u>Spec. 1</u>	<u>Spec. 2</u>	<u>Spec. 1</u>	<u>Spec. 2</u>	<u>Spec. 1</u>	<u>Spec. 2</u>
South East					0.466***	0.457***
					(0.094)	(0.092)
South West					1.241	1.161
					(0.326)	(0.336)
Baseline (years)						
2	0.700***	0.702***	0.889	0.884	1.118	1.115
	(0.062)	(0.063)	(0.088)	(0.088)	(0.208)	(0.207)
3	0.487***	0.491***	0.536***	0.529***	0.672	0.671
	(0.051)	(0.051)	(0.069)	(0.069)	(0.140)	(0.140)
4	0.884	0.896	0.582***	0.571***	0.526**	0.524**
	(0.088)	(0.089)	(0.084)	(0.083)	(0.128)	(0.127)
5	0.933	0.950	0.383***	0.375***	0.734	0.728
	(0.094)	(0.095)	(0.068)	(0.067)	(0.171)	(0.169)
6	0.736*	0.755*	0.301***	0.295***	0.518**	0.513**
	(0.092)	(0.095)	(0.061)	(0.060)	(0.131)	(0.130)
7	0.455***	0.470***	0.280***	0.260***	0.517**	0.510**
	(0.071)	(0.074)	(0.065)	(0.061)	(0.132)	(0.130)
8	0.381***	0.395***	0.294***	0.283***	0.634*	0.625*
	(0.072)	(0.075)	(0.070)	(0.068)	(0.145)	(0.144)
9	0.362***	0.376***	0.170***	0.163***	0.823	0.810
	(0.082)	(0.086)	(0.053)	(0.051)	(0.205)	(0.201)
10+	0.186***	0.197***	0.130***	0.128***	0.433***	0.434***
	(0.033)	(0.036)	(0.030)	(0.030)	(0.107)	(0.108)
Baseline and married int.						
2 # Married	0.761	0.768	0.965	0.966	0.761	0.768
	(0.170)	(0.171)	(0.229)	(0.229)	(0.456)	(0.458)
3 # Married	1.241	1.267	1.023	1.016	1.763	1.755
	(0.267)	(0.272)	(0.268)	(0.271)	(0.961)	(0.955)
4 # Married	0.574**	0.593*	1.061	1.113	0.636	0.646
	(0.119)	(0.123)	(0.296)	(0.310)	(0.445)	(0.449)
5 # Married	0.442***	0.455***	1.163	1.188	0.789	0.813
	(0.094)	(0.096)	(0.364)	(0.376)	(0.493)	(0.504)
6 # Married	0.650*	0.665	0.735	0.798	0.839	0.879
	(0.142)	(0.146)	(0.274)	(0.296)	(0.474)	(0.498)
7 # Married	0.737	0.745	1.129	1.320	1.022	1.075
	(0.191)	(0.194)	(0.382)	(0.449)	(0.643)	(0.672)
8 # Married	0.882	0.869	0.994	1.129	0.771	0.822
	(0.236)	(0.235)	(0.369)	(0.421)	(0.465)	(0.492)
9 # Married	0.652	0.629	1.322	1.519	0.619	0.667
	(0.203)	(0.197)	(0.556)	(0.643)	(0.327)	(0.354)
10+ # Married	1.068	0.927	1.505	1.583	1.374	1.462
	(0.232)	(0.204)	(0.388)	(0.423)	(0.579)	(0.625)
N women-years	172973	172884	82196	81942	58349	58343
N women	11758	11752	5329	5309	3414	3413

Notes: *p<0.05; **p<0.01; ***p<0.001
Cells are odds ratios

Standard errors in parentheses, clustered by PSU
 Baseline hazard for durations of greater than 10 years coded together with 10 years to ensure adequate cell size.

5.4 *Multivariate models of spells of different labor market statuses*

We now turn to models where we distinguish between different types of work and non-employment. In these models, exit is ending that type of labor market status. Transitions and destinations are explored further in later tables. The results for non-employment are identical to Table 2 and presented again for comparability. Table 3 presents the results for Egypt. There are significantly higher odds of exit the year of marriage for the public sector and private informal. The year before marriage is associated with significantly higher odds of exit from all states, but especially high odds ratios for private formal, private informal, and non-wage work, as above seen in Figure 4. This result confirms earlier work that it is particularly private sector work that is irreconcilable with marriage, and that women leave such work in advance of marriage (Assaad et al. 2017; Krafft and Assaad 2017).

Women are significantly less likely to leave the public sector the year they give birth (likely due to legally guaranteed and generous maternity leaves) but are significantly more likely to leave both the private formal sector the year before birth, as well as persist in non-employed states. Commute times appear to be particularly a factor in exiting private informal work. Age patterns in the earlier models appear to be driven by the public sector, where there is a falling and then rising chance of exit, possibly due to retirement regulations.

Table 3. Discrete time logit models of labor market spells (outcome is exit from that type) by type of employment, Egypt

	<u>Egypt</u>				
	Public	Private formal	Private informal	Non-wage	Non-employment
Married and marriage					
Married	1.132 (0.742)	3.501 (3.483)	1.660 (0.909)	0.559 (0.542)	0.673 (0.158)

	Egypt				
	Public	Private formal	Private informal	Non-wage	Non-employment
Year of marriage	1.926* (0.574)	1.129 (0.518)	2.521** (0.803)	3.287 (2.014)	1.289* (0.153)
Year before marriage	3.738*** (0.895)	21.803*** (6.486)	28.025*** (5.196)	35.116*** (10.682)	1.207* (0.101)
Two years before marriage	1.946* (0.524)	4.626*** (1.493)	3.879*** (0.628)	7.568*** (2.579)	0.762** (0.066)
Child-bearing					
Birth in year	0.407* (0.151)	0.983 (0.426)	1.457 (0.547)	0.615 (0.278)	1.027 (0.110)
Year before birth	1.454 (0.332)	2.530** (0.883)	1.339 (0.315)	0.709 (0.203)	0.734*** (0.062)
Child-rearing					
No. kids ages 0-2	1.239 (0.264)	1.138 (0.436)	0.844 (0.199)	1.491 (0.355)	0.875 (0.068)
No. kids ages 3-5	1.160 (0.240)	1.507 (0.486)	0.850 (0.163)	0.635 (0.149)	1.052 (0.067)
No. kids ages 6-11	0.776 (0.139)	1.237 (0.465)	1.008 (0.147)	1.073 (0.140)	1.143** (0.058)
No. kids ages 12-18	1.140 (0.167)	0.948 (0.481)	1.020 (0.144)	1.187 (0.157)	0.945 (0.067)
Moved from birth region	1.324 (0.226)	1.441 (0.324)	1.377 (0.258)	1.672 (0.506)	1.064 (0.071)
Number of female siblings	0.999 (0.046)	0.907 (0.054)	0.988 (0.037)	1.058 (0.051)	1.024 (0.014)
Local commuting					
Local commute (in min.)	0.999 (0.011)	1.014 (0.013)	1.025*** (0.007)	1.017 (0.012)	1.006 (0.003)
Married # Local commute (in min.)	1.015 (0.015)	0.987 (0.022)	0.997 (0.014)	1.004 (0.015)	0.997 (0.006)
Time varying age					
Age in year	0.767*** (0.050)	0.831 (0.098)	0.932 (0.064)	0.975 (0.074)	1.292*** (0.041)
Age in year # Age in year	1.003** (0.001)	1.002 (0.002)	1.001 (0.001)	1.000 (0.001)	0.996*** (0.001)
School leaver cohort (2000+ omit.)					
<1969		4.755 (5.579)	4.062* (2.587)	4.422 (3.553)	0.513** (0.122)
1970-1979	1.531 (0.860)	1.181 (1.239)	1.910 (0.964)	2.959 (1.986)	1.011 (0.186)
1980-1989	1.022 (0.442)	0.576 (0.342)	1.381 (0.453)	1.495 (0.703)	1.111 (0.147)
1990-1999	1.201 (0.278)	0.753 (0.258)	0.844 (0.159)	1.715 (0.506)	1.085 (0.088)
Macroeconomic conditions					
GDP per capita (constant 2010 dollars)	1.001* (0.000)	1.000 (0.001)	1.001* (0.000)	1.001** (0.000)	1.000 (0.000)
Female unemployment rate (percentage)	0.973	0.981	0.972	0.962	0.978*

	<u>Egypt</u>				
	Public	Private formal	Private informal	Non-wage	Non-employment
Inflation rate (percentage)	(0.031) 0.970* (0.014)	(0.046) 1.032 (0.026)	(0.021) 1.004 (0.014)	(0.035) 1.009 (0.016)	(0.010) 1.012** (0.004)
GDP per capita missing					
Female unemployment rate missing	0.556 (0.178)	0.457 (0.246)	0.598 (0.179)	1.384 (0.521)	1.267* (0.119)
Inflation rate missing					
Baseline (years)					
2	1.418 (0.329)	0.641 (0.236)	0.961 (0.207)	3.282** (1.323)	0.702*** (0.063)
3	1.370 (0.398)	0.883 (0.322)	0.768 (0.180)	3.093** (1.292)	0.491*** (0.051)
4	0.932 (0.332)	0.886 (0.415)	0.762 (0.193)	2.227 (1.010)	0.896 (0.089)
5	0.651 (0.282)	1.386 (0.640)	0.721 (0.234)	1.766 (0.904)	0.950 (0.095)
6	0.158 (0.165)	0.522 (0.352)	0.910 (0.297)	2.559* (1.215)	0.755* (0.095)
7	0.489 (0.375)	0.178 (0.171)	0.708 (0.253)	2.865 (1.662)	0.470*** (0.074)
8	1.743 (0.909)	1.500 (1.102)	0.793 (0.317)	1.572 (1.067)	0.395*** (0.075)
9	1.007 (0.799)	1.137 (1.188)	1.001 (0.501)	1.023 (0.921)	0.376*** (0.086)
10+	0.644 (0.359)	1.283 (0.858)	0.955 (0.366)	1.771 (1.000)	0.197*** (0.036)
Baseline and married int.					
2 # Married	0.607 (0.259)	0.696 (0.543)	0.841 (0.335)	0.884 (0.625)	0.768 (0.171)
3 # Married	0.442 (0.224)	0.698 (0.474)	1.118 (0.463)	0.429 (0.360)	1.267 (0.272)
4 # Married	0.386 (0.212)	1.800 (1.311)	0.624 (0.322)	0.757 (0.646)	0.593* (0.123)
5 # Married	0.522 (0.336)	1.251 (0.830)	0.742 (0.375)	0.785 (0.678)	0.455*** (0.096)
6 # Married	1.889 (2.138)	2.875 (2.604)	0.740 (0.395)	0.976 (0.927)	0.665 (0.146)
7 # Married	0.780 (0.683)	3.942 (4.570)	0.480 (0.312)	0.388 (0.384)	0.745 (0.194)
8 # Married	0.101** (0.083)	0.878 (0.850)	0.213 (0.185)	0.741 (0.745)	0.869 (0.235)
9 # Married	0.409 (0.378)	1.046 (1.357)	0.511 (0.395)	0.361 (0.496)	0.629 (0.197)
10+ # Married	0.435 (0.259)	0.315 (0.283)	0.412 (0.196)	1.035 (0.816)	0.927 (0.204)

	<u>Egypt</u>				
	Public	Private formal	Private informal	Non-wage	Non-employment
Parent SES	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes
Birth region	Yes	Yes	Yes	Yes	Yes
N women-years	20267	1846	4760	13571	172884
N women	1470	300	741	986	11752

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

Cells are odds ratios

Standard errors in parentheses, clustered by PSU

Baseline hazard for durations of greater than 10 years coded together with 10 years to ensure adequate cell size.

Turning to the results for Jordan in Table 4, there are not significant differences the year of the marriage, while there are for the year before, with particularly high odds ratios of exit from private formal, private informal, and non-wage work. As in Egypt, exits during the year before birth are common, with significantly higher odds in the private sector. Patterns by child age are mixed. There are no significant commute differences for employment states. Women face falling odds of exit over time in both the public and private formal sectors, more so for married women.

Table 4. Discrete time logit models of labor market spells (outcome is exit from that type) by type of employment, Jordan

	<u>Jordan</u>				
	Public	Private formal	Private informal	Non-wage	Non-employment
Married and marriage					
Married	2.807 (1.866)	2.047 (1.022)	2.496 (1.836)	1.364 (2.219)	0.162*** (0.045)
Year of marriage	0.795 (0.336)	1.080 (0.318)	1.072 (0.538)	2.432 (2.483)	1.234 (0.216)
Year before marriage	3.712*** (1.141)	9.120*** (2.076)	11.905*** (3.598)	19.240*** (10.644)	0.393*** (0.063)
Two years before marriage	0.524 (0.329)	2.312*** (0.579)	2.464** (0.702)	1.859 (1.359)	0.841 (0.106)
Child-bearing					
Birth in year	0.677 (0.159)	0.733 (0.228)	1.436 (0.624)	1.930 (0.979)	0.919 (0.132)
Year before birth	1.466 (0.287)	1.617* (0.316)	2.614** (0.796)	2.000 (0.862)	0.792* (0.092)

		Jordan			
	Public	Private formal	Private informal	Non-wage	Non-employment
Child-rearing					
No. kids ages 0-2	1.558** (0.213)	0.784 (0.150)	1.112 (0.265)	0.729 (0.207)	0.721** (0.072)
No. kids ages 3-5	0.942 (0.117)	1.016 (0.164)	0.764 (0.181)	0.495** (0.130)	0.833* (0.073)
No. kids ages 6-11	1.102 (0.083)	1.113 (0.115)	1.155 (0.108)	1.125 (0.195)	0.947 (0.058)
No. kids ages 12-18	1.017 (0.074)	1.159 (0.143)	0.888 (0.121)	1.202 (0.230)	1.000 (0.059)
Moved from birth region	1.501* (0.239)	1.254 (0.184)	0.997 (0.215)	0.533 (0.185)	1.079 (0.085)
Number of female siblings	0.978 (0.031)	1.014 (0.033)	0.946 (0.035)	0.980 (0.062)	1.020 (0.016)
Local commuting					
Local commute (in min.)	0.989 (0.011)	0.998 (0.008)	1.008 (0.012)	1.017 (0.024)	0.989*** (0.003)
Married # Local commute (in min.)	0.992 (0.012)	1.005 (0.010)	0.981 (0.015)	0.995 (0.031)	1.014** (0.004)
Time varying age					
Age in year	0.720*** (0.070)	1.049 (0.101)	1.273** (0.115)	1.005 (0.133)	1.626*** (0.083)
Age in year # Age in year	1.005*** (0.001)	0.998 (0.002)	0.996** (0.002)	0.999 (0.002)	0.993*** (0.001)
School leaver cohort (2000+ omit.)					
<1969	2.117 (1.320)	2.417 (1.873)	1.048 (0.949)	0.703 (1.165)	0.446* (0.146)
1970-1979	1.090 (0.504)	1.580 (0.882)	0.626 (0.407)	0.801 (0.891)	0.634* (0.144)
1980-1989	0.896 (0.339)	1.669 (0.611)	0.912 (0.419)	0.453 (0.417)	0.736 (0.124)
1990-1999	0.645 (0.203)	1.064 (0.248)	0.972 (0.274)	0.686 (0.512)	1.029 (0.111)
Macroeconomic conditions					
GDP per capita (constant 2010 dollars)	1.000 (0.000)	1.001** (0.000)	1.000 (0.000)	1.001 (0.000)	1.000 (0.000)
Female unemployment rate (percentage)	0.950 (0.025)	0.944* (0.026)	0.964 (0.037)	0.943 (0.059)	1.018 (0.013)
Inflation rate (percentage)	1.027 (0.017)	1.028 (0.017)	1.060** (0.020)	1.014 (0.026)	1.010 (0.007)
GDP per capita missing	1.460 (0.861)		2.711 (2.200)	1.326 (1.512)	1.122 (0.331)
Female unemployment rate missing	0.405** (0.139)	0.288** (0.112)	0.754 (0.361)	0.344 (0.254)	1.495** (0.225)
Inflation rate missing	0.677 (0.485)	0.804 (0.703)	0.504 (0.460)	0.813 (0.633)	0.867 (0.209)
Baseline (years)					
2	0.552	0.674	1.396	2.829	0.884

	Jordan				
	Public	Private formal	Private informal	Non-wage	Non-employment
3	(0.232) 0.782 (0.343)	(0.177) 1.142 (0.302)	(0.402) 1.476 (0.485)	(2.024) 2.603 (1.711)	(0.088) 0.529*** (0.069)
4	1.141 (0.556)	0.789 (0.279)	0.582 (0.209)	2.745 (2.321)	0.571*** (0.083)
5	0.783 (0.461)	0.636 (0.221)	0.423 (0.212)	4.193 (3.712)	0.375*** (0.067)
6	0.530 (0.432)	0.908 (0.392)	1.076 (0.474)	0.756 (1.338)	0.295*** (0.060)
7	0.344 (0.366)	1.265 (0.579)	1.011 (0.470)	1.152 (1.033)	0.260*** (0.061)
8	0.805 (0.641)	0.523 (0.317)	0.944 (0.516)	0.721 (0.817)	0.283*** (0.068)
9	0.216** (0.119)	0.155 (0.180)	0.624 (0.368)	1.738 (1.787)	0.163*** (0.051)
10+	0.795 (0.431)	0.847 (0.344)	0.638 (0.289)	5.509 (5.272)	0.128*** (0.030)
Baseline and married int.					
2 # Married	1.357 (0.779)	1.117 (0.458)	0.582 (0.330)	0.691 (0.714)	0.966 (0.229)
3 # Married	0.151* (0.116)	0.693 (0.300)	0.242* (0.160)	0.851 (0.904)	1.016 (0.271)
4 # Married	0.094** (0.074)	0.876 (0.413)	1.536 (0.899)	0.497 (0.595)	1.113 (0.310)
5 # Married	0.097* (0.094)	0.538 (0.316)	2.209 (1.597)	0.232 (0.293)	1.188 (0.376)
6 # Married	0.425 (0.392)	0.763 (0.423)	0.802 (0.565)	2.388 (4.601)	0.798 (0.296)
7 # Married	0.590 (0.679)	0.446 (0.269)	0.689 (0.533)		1.320 (0.449)
8 # Married	0.098* (0.106)	0.582 (0.497)	0.980 (0.827)		1.129 (0.421)
9 # Married		2.969 (3.728)	1.232 (1.107)	1.393 (1.796)	1.519 (0.643)
10+ # Married	0.677 (0.360)	0.590 (0.291)	2.490 (1.454)	0.414 (0.472)	1.583 (0.423)
Parent SES	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes
Birth region	Yes	Yes	Yes	Yes	Yes
N women-years	6847	3128	1733	1112	81942
N women	682	504	325	143	5309

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

Cells are odds ratios

Standard errors in parentheses, clustered by PSU

Baseline hazard for durations of greater than 10 years coded together with 10 years to ensure adequate cell size.

Table 5 presents the results for Tunisia, where some caution is required given small sample sizes. The effects of being married are significant only for private formal (and are a lower odds ratio), but there is substantial exit, highest for the public sector followed by non-wage and private formal, the year of and the year prior to the marriage. Although caution is required given sample sizes, it appears that having young children increases exit from the private formal sector particularly.

Table 5. Discrete time logit models of labor market spells (outcome is exit from that type) by type of employment, Tunisia

	<u>Tunisia</u>				
	Public	Private formal	Private informal	Non-wage	Non-employment
Married and marriage					
Married	1.053 (3.741)	0.028* (0.050)	0.713 (1.320)	0.037 (0.083)	0.315 (0.198)
Year of marriage	20.288* (26.220)	17.348*** (8.112)	4.780* (3.375)	20.592*** (16.935)	1.607 (0.480)
Year before marriage	4.992* (3.196)	11.749*** (3.705)	8.033*** (3.700)	14.132*** (9.558)	1.620* (0.376)
Two years before marriage	2.746 (2.947)	2.116 (0.873)	1.972 (1.281)		1.099 (0.224)
Child-bearing					
Birth in year	1.13e+07*** (1.60e+07)	1.092 (0.423)	1.801 (1.619)	17.792 (45.948)	0.876 (0.225)
Year before birth	2.379 (2.767)	1.150 (0.394)	2.153 (0.991)	21.308** (25.117)	0.681 (0.149)
Child-rearing					
No. kids ages 0-2	0.000*** (0.000)	2.367** (0.721)	0.824 (0.386)	0.184 (0.316)	0.996 (0.158)
No. kids ages 3-5	0.798 (0.743)	2.218** (0.631)	0.797 (0.326)	0.660 (0.382)	0.760 (0.117)
No. kids ages 6-11	1.135 (0.560)	0.897 (0.260)	0.876 (0.330)	0.644 (0.335)	0.944 (0.095)
No. kids ages 12-18	0.827 (0.422)	0.986 (0.441)	0.665 (0.220)	1.875 (0.603)	0.932 (0.101)
Moved from birth region	4.686* (3.589)	1.142 (0.345)	1.802 (0.684)	0.022* (0.036)	1.480** (0.222)
Number of female siblings	1.168 (0.195)	1.035 (0.064)	0.929 (0.067)	1.395* (0.196)	0.991 (0.022)
Local commuting					

		<u>Tunisia</u>			
	Public	Private formal	Private informal	Non-wage	Non-employment
Local commute (in min.)	0.783* (0.086)	0.934 (0.045)	0.948 (0.071)	0.928 (0.152)	0.979 (0.018)
Married # Local commute (in min.)	0.999 (0.160)	1.124 (0.087)	1.023 (0.089)	1.108 (0.124)	1.024 (0.029)
Time varying age					
Age in year	0.803 (0.239)	0.856 (0.109)	1.058 (0.118)	0.842 (0.246)	1.202*** (0.056)
Age in year # Age in year	1.004 (0.004)	1.002 (0.002)	0.998 (0.002)	1.002 (0.005)	0.996*** (0.001)
School leaver cohort (2000+ omit.)					
<1969					
1970-1979	1.183 (1.867)	1.048 (0.739)	3.192 (2.181)	1.015 (2.021)	2.199* (0.745)
1980-1989	1.709 (2.047)	1.364 (0.641)	1.263 (0.622)	1.840 (2.798)	2.024** (0.500)
1990-1999	1.558 (1.413)	1.099 (0.378)	2.952* (1.359)	0.915 (0.915)	1.414** (0.186)
Macroeconomic conditions					
GDP per capita (constant 2010 dollars)	1.000 (0.001)	1.001 (0.000)	1.001 (0.000)	1.000 (0.001)	1.001*** (0.000)
Female unemployment rate (percentage)	1.021 (0.066)	1.070* (0.029)	1.042 (0.033)	1.059 (0.067)	1.049*** (0.014)
Inflation rate (percentage)	0.637 (0.181)	0.903 (0.100)	1.167 (0.129)	0.908 (0.207)	0.970 (0.041)
GDP per capita missing					
Female unemployment rate missing	1.970 (3.509)	2.068 (1.520)	0.347 (0.206)	0.975 (0.963)	1.474 (0.369)
Inflation rate missing	1.771 (2.370)	0.206* (0.162)	3.249* (1.865)	3.825 (4.650)	0.777 (0.197)
Baseline (years)					
2	1.039 (0.681)	1.949 (0.804)	1.268 (0.517)	0.100* (0.112)	1.115 (0.207)
3	0.352 (0.362)	1.093 (0.476)	0.821 (0.391)	0.500 (0.535)	0.671 (0.140)
4	0.727 (1.050)	1.884 (0.989)	1.147 (0.610)	2.711 (2.751)	0.524** (0.127)
5	0.696 (0.478)	1.727 (0.870)	0.948 (0.526)		0.728 (0.169)
6	0.279 (0.339)	1.886 (1.066)	1.189 (0.711)	3.562 (3.635)	0.513** (0.130)
7	0.336 (0.498)	1.284 (0.731)	0.277 (0.295)	1.507 (1.552)	0.510** (0.130)
8		0.298 (0.363)	2.297 (1.936)	2.017 (1.695)	0.625* (0.144)
9	0.276	1.140	2.150	0.564	0.810

		<u>Tunisia</u>				
	Public	Private formal	Private informal	Non-wage	Non-employment	
10+	(0.364) 1.046 (1.147)	(0.956) 0.726 (0.521)	(1.611) 1.351 (0.807)	(0.526)	(0.201) 0.434*** (0.108)	
Baseline and married int.						
2 # Married	0.106 (0.192)	1.048 (1.041)	1.944 (1.695)		0.768 (0.458)	
3 # Married	0.534 (0.828)	5.378 (5.163)	1.640 (1.768)	1.833 (2.917)	1.755 (0.955)	
4 # Married	0.116 (0.259)	0.976 (1.096)			0.646 (0.449)	
5 # Married		2.559 (2.454)	0.413 (0.488)		0.813 (0.504)	
6 # Married		2.993 (3.178)	2.746 (2.990)	0.227 (0.352)	0.879 (0.498)	
7 # Married		4.212 (4.329)	8.108 (11.017)		1.075 (0.672)	
8 # Married		15.071 (21.218)			0.822 (0.492)	
9 # Married		3.939 (4.784)	0.898 (1.250)		0.667 (0.354)	
10+ # Married	0.089 (0.121)	4.737 (4.554)	1.168 (1.066)		1.462 (0.625)	
Parent SES	Yes	Yes	Yes	Yes	Yes	
Education	Yes	Yes	Yes	Yes	Yes	
Birth region	Yes	Yes	Yes	Yes	Yes	
N women-years		1231	1870	1222	1428	58343
N women		141	276	190	152	3413

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

Cells are odds ratios

Standard errors in parentheses, clustered by PSU

Baseline hazard for durations of greater than 10 years coded together with 10 years to ensure adequate cell size.

Cells are blank when perfect predictors

5.5 *Multivariate models of transition between statuses*

In order to assess the relationship between different types of transition and marriage, we now turn to the multinomial logit discrete time competing risk models. Here, relative risk ratios are presented. Small cell sizes for transitions must be kept in mind. Given the typical functional form of falling hazards, we use log-time because the sample size does not support a discrete baseline hazard. We only account for being married, the year of marriage, and the year before

marriage. The omitted category for the destination is the one that is the same as the origin category. For easy comparison of results across countries, Table 6 presents a summary for the main effects of the marriage variables on the transition between labor market statuses by type of employment for Egypt, Jordan, and Tunisia. Appendix Table 1 presents the results for Egypt, Appendix Table 2 for Jordan and Appendix Table 3 for Tunisia.

In Egypt, as expected, for those in the public sector, there is a lower risk of exit to other states over time. If married, women are significantly less likely to switch to private formal wage (and a similar coefficient pertains for informal). The year of the marriage and before, women are more likely to transit to non-employed states. Turning to private formal work, switches to the public sector are significantly more likely for married women, whereas switches to informal or non-wage are less likely the year of marriage. Women who are in private informal work are significantly less likely to switch to public sector work if married, but more likely to switch during the year of the marriage. Married women in private informal work are more likely to switch to non-wage work. This result goes in line with earlier research finding that women's non-wage work significantly increases after marriage (Assaad et al. 2017). Married women in non-wage work are significantly less likely to switch to private sector work. Non-employed women are significantly less likely to leave for any other state except non-wage when married.

Turning now to Jordan, we see similar patterns of married women persisting in public sector work or switching to non-employment. Private formal and informal sector workers are significantly more likely to switch to non-employed states the year of or before the marriage and once married. Non-wage patterns are not clear, however, married women are less likely to transition out of non-employment. Women who are non-employed and married are significantly less likely to make any transitions except to non-wage.

For Tunisia, particular care is required given small sample sizes. Focusing primarily on non-employment, the largest origin, transitions to public sector decrease once married, along with private sector wage work, but not non-wage work. This result is similar to elsewhere, where non-wage work was more interchangeable with non-employment for married women.

Table 6. Summary of marriage associations with transitions between labor market statuses, based on the discrete time competing risk models for Egypt, Jordan and Tunisia

Origin:	Public			Private formal			Private informal			Non-wage			Non-employed		
	Egypt	Jordan	Tunisia	Egypt	Jordan	Tunisia	Egypt	Jordan	Tunisia	Egypt	Jordan	Tunisia	Egypt	Jordan	Tunisia
Destination															
Public															
Married				+	-	-	-	-	-	-	-	-	-	-	-
Year of marr.							+	-	-	-	+		+	+	
Year before marr.				+	-			-	-	-	-				
Private formal wage															
Married	-	-	-				-			-	-	-	-	-	-
Year of marr.		-					-					+			+
Year before marr.	-		-					-	-			-	-	-	-
Private informal wage															
Married			+			-				-	-		-	-	-
Year of marr.		-	-	-	-						+	-			
Year before marr.	-	-		-		-				+		-	-	-	
Non-wage															
Married			-				+						+		
Year of marr.				-	-			-	-						
Year before marr.	-				-		+	-	+				+		-
Non-employed															
Married	-	+			+		-	+		-		-			
Year of marr.	+		+	+	+	+	+		+			+			
Year before marr.	+	+		+	+	+	+	+	+	+	+	+			

Notes: Based on the discrete time multinomial logit competing risk models for Egypt (Appendix Table 1), Jordan (Appendix Table 2), and Tunisia (Appendix Table 3).

Cells with a positive sign (+) denote a positive association between marriage variables and the type of transition, i.e. a relative risk of transition induced by the variable that is greater than 1. Cells with a negative sign (-) show a negative association between marriage variables and the type of transition, i.e. relative risk of transition lower than 1. All cells are based on a 5% significance level.

6 Discussion and Conclusions

Low rates of female employment have long been a challenge for MENA economies. Some key stylized facts about women's employment have been identified in previous research, including the drop in participation at marriage and substantial domestic responsibilities married women face (Assaad et al. 2014; Assaad, Ghazouani, et al. 2018a, 2018b; Hendy 2015; Spierings 2014; Spierings et al. 2010). However, there has been limited research on the mechanisms that might facilitate increased employment for women. This research investigates associations that can shed light on key mechanisms as well to pinpoint key policy levers for increasing the employment rates of women and reducing barriers to women's employment. To that end, the paper examines whether getting married, being married, expecting children, having children, or having young children is the greatest constraint on participation. To answer this question, we focused on several aspects of women's employment and their relationships with the dynamics of family formation. We first examined duration in employment and in non-employment and duration of different labor market states. We then turned to transition rates between statuses.

6.1 *Limitations*

It is important to note that this paper identifies only correlations or associations, not causation. Endogeneity may bias estimates of the relationship between labor market outcomes and family formation.¹⁹ While some characteristics are pre-determined, such as mother's education, precluding reverse causality, they may still suffer from omitted variable bias. For example, mother's education may pick up the effects of socio-economic status, which is associated with mother's education, rather than the causal effect of mother's education. Other variables may suffer

¹⁹ We additionally tested using individual fixed effects (conditional logit models in a discrete time setting) for the employment and non-employment models. Since the models only identify off of women who have variation in their outcomes, all of those with only one right-censored spell are dropped, which substantially reduces the sample size and generates a selected sample. Nonetheless, key results, for example leaving work in anticipation of marriage and being less likely to start work with young children, persisted.

from reverse causality, for example, women who lose their jobs may then get married sooner due to lower opportunity cost of time, rather than women exiting their jobs when they get married (although we use the “year before” variables to try to assess anticipation). Thus, explaining how marriage affects employment is beyond the scope of this paper.

A particular challenge arises in finding good empirical proxies for our underlying theoretical constructs. For example, we attempt to measure child caregiving support networks. Ideally, we would have information about other adults in the household or availability of mothers, sisters, and other caregivers retrospectively, as well as local nursery or kindergarten availability. Unfortunately, such data are not available, and we have to use the rather crude measures of living sisters and moving from place of birth. That these are not usually important determinants of labor market dynamics in our models does not, necessarily, mean that caregiving support is unimportant; we just may not be able to measure it with sufficient accuracy in existing data to detect important relationships. Likewise, we do not have dynamic information on norms.

Moreover, while we attempted to include a wide range of time-varying covariates in order to capture the dynamic aspect of the decision to work, we do not have available data on important time varying dimensions such as the hours of work, or hours of domestic work. We expect that these aspects are associated with employment decisions and are an important area for future data collection and research. The measures of labor markets and family formation we do have may also be measured imprecisely, with some recall error (Assaad et al. 2018).

6.2 Findings

We found strong evidence for H1: women disproportionately leave work at marriage, and H2: women disproportionately leave work in anticipation of marriage. While women in all three countries exit work both in anticipation of marriage and when they marry, Tunisian women are (relatively) more likely to work up to their marriages, whereas Egyptian and Jordanian women exit

further in advance. Tunisia's relatively more gender equitable values (Assaad, Ghazouani, et al. 2018a; Yount and Agree 2004) may play an important role in women continuing to work until their domestic responsibilities actually increase, rather than quitting due to norms or anticipated domestic work.

We also found strong evidence for H3: whether women leave work depends on the type of work. Women were particularly likely to leave private sector wage work and especially private informal wage work. Public sector wage work was relatively more resilient, and women also sometimes did start work, particularly non-wage work, likely in a family business or farm, at marriage. The ability to reconcile public sector work more easily with marriage may be due to its shorter hours and rights to leaves and other benefits (Assaad and Krafft 2015c). Non-wage work may be easier to reconcile because it can be combined with caregiving (Hoodfar 1997). This situation will persist unless solutions are offered to make the private sector a more hospitable work environment to women. Such solutions can involve introducing part-time work provisions and flexible hours, as private sector work tends to involve a greater number of hours (Assaad and Krafft 2015c).

In terms of H4: whether women leave work (or start working) depends on the number and age of their children, it was pregnancy or anticipating childbearing that appeared to be a driver, only sometimes significantly so, but often more so than giving birth in a year (which may be due to maternity leaves in the public sector). Moreover, women are less likely to start work and exit non-employment for each additional child ages 0-2 and 3-5 in Jordan. Women may be more able to work once their children are school aged, a pattern that we see in Egypt with significant exit from non-employment with more primary aged children. This result emphasizes the importance of the availability of child care and other child support systems that may help women to return to work or start working (H5).

Commuting times are another element of women's ability to work. We found that travel to work is a barrier, but primarily for unmarried women. Zoning and transit reforms as well street/transport safety might improve women's employment but do not seem to be a driver for patterns related to marriage. Thus, H5: Whether women leave work (or start working) depends on commuting distance and child care availability is supported only in part, in terms of child care in some contexts.

6.3 Implications

Returning to our conceptual framework, we can confirm the importance of the “needs” aspect of understanding women's employment in MENA. The domestic responsibilities associated with marriage are likely a major driver of exit from employment. Employment rates are inversely related to hours of domestic work nationally (Assaad 2014a; Assaad et al. 2017; Assaad, Ghazouani, et al. 2018b; Assaad and Krafft 2015b). Yet, particularly in Egypt and Jordan, where norms are less gender equitable, women leave work in anticipation of marriage, more so than at marriage itself. This pattern may tie into the “values” component of women's employment decisions. Reservation working conditions and corresponding social norms may make some jobs acceptable while single and saving for marriage, but unacceptable in anticipation or once a spouse is secured or engaged.

Both the reputational risks and logistical difficulties of reconciling private sector work and marriage are a particular challenge. As MENA countries continue efforts to reduce the role of the public sector, the incompatibility of married life and private sector work remains a stark challenge (Assaad et al. 2018). There have been some recent promising studies showing, first, that people's beliefs about social norms are incorrect (too conservative in regards to gender norms and what others consider acceptable) (Bursztyn et al. 2018; Gauri et al. 2019). Second, it may be possible to change behaviors – and even increase women's employment – if norms are

updated (Bursztyn et al. 2018). Either shifting values or updating beliefs about values to be more accurate may increase the ability of women to work.

Adopting an economic strategy that is favorable to women's employment may also increase opportunities and change the economic calculus around needs. For instance, in Egypt, falling exchange rates were induced by the Egyptian pound devaluation in November 2016. This theoretically will lead to higher competitiveness of Egyptian exports and encourage investment in tradable goods. Tradable goods, such as textiles and garments, are industries that women are relatively more likely to work in (World Bank 2018). Leveraging such opportunities could generate positive effects on both women's employment and exports.

Needs, opportunities, and values remain important and relevant aspects of women's decisions to work. An important area for future research is better understanding the relative importance of different factors, to better target policy interventions to open employment opportunities for women. Dynamic data on family formation, in this paper, provided important insight into marriage and anticipation of marriage as the key drivers of exit from employment. Time-varying data on values as well as time-varying local economic conditions are much needed in order to better understand the dynamics of the breadth of drivers of women's employment.

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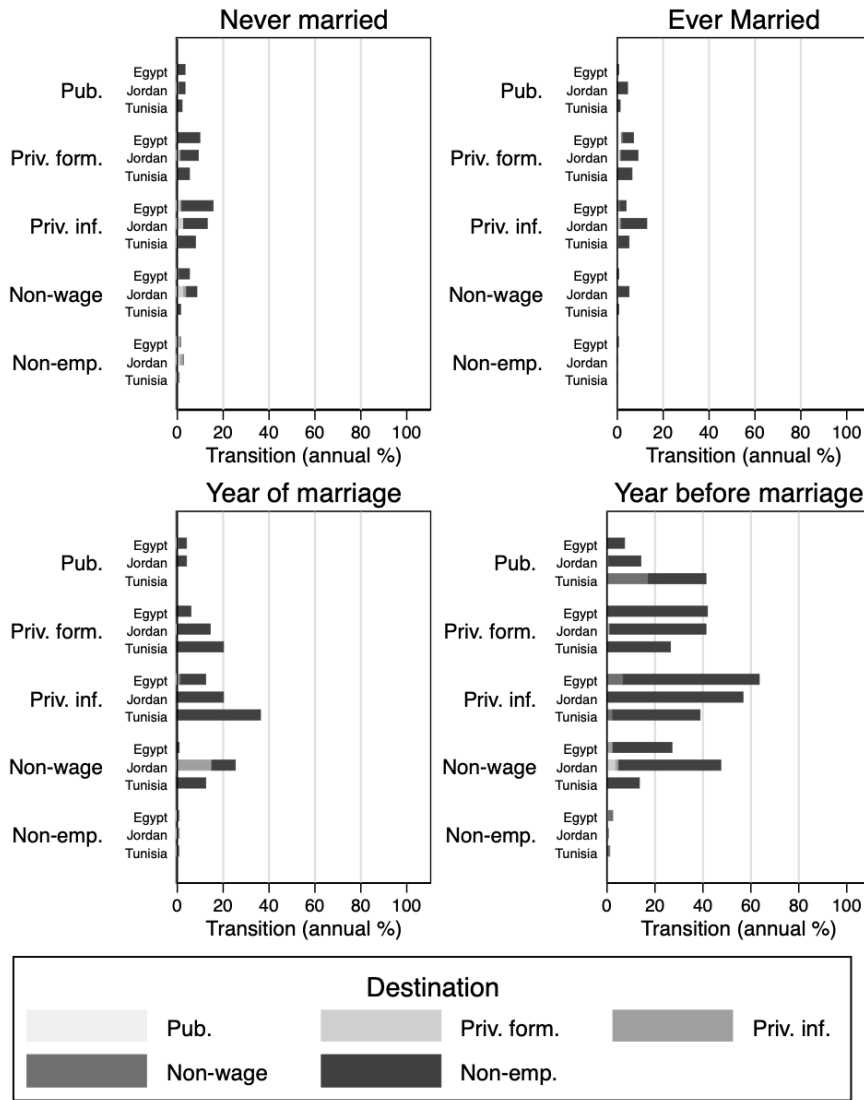
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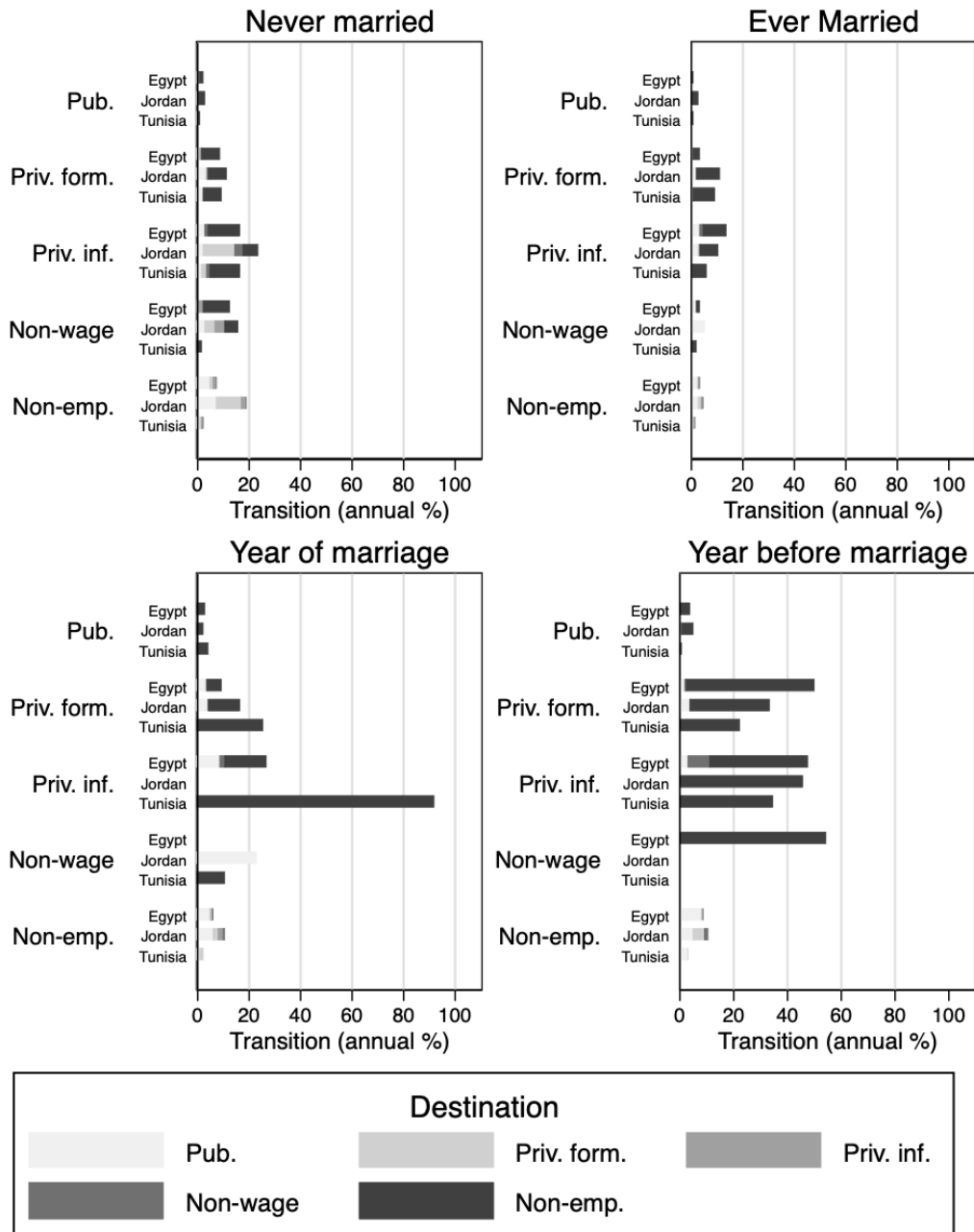
Appendix Figure 1. Annual rates of transition (percentages) between labor market statuses by status, marital status, and whether one year before or at marriage and country, less educated



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

Notes: Less educated is preparatory or less in Tunisia, secondary or less in Egypt and Jordan

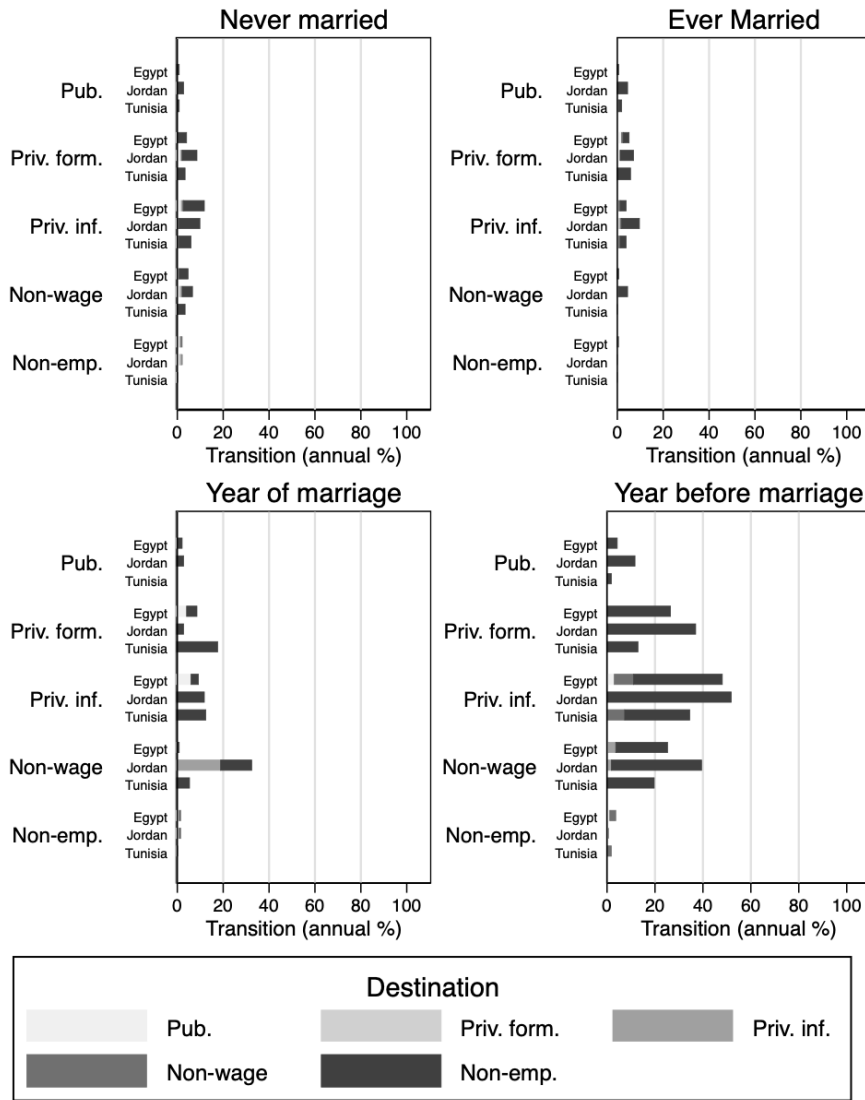
Appendix Figure 2. Annual rates of transition (percentages) between labor market statuses by status, marital status, and whether one year before or at marriage and country, more educated



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

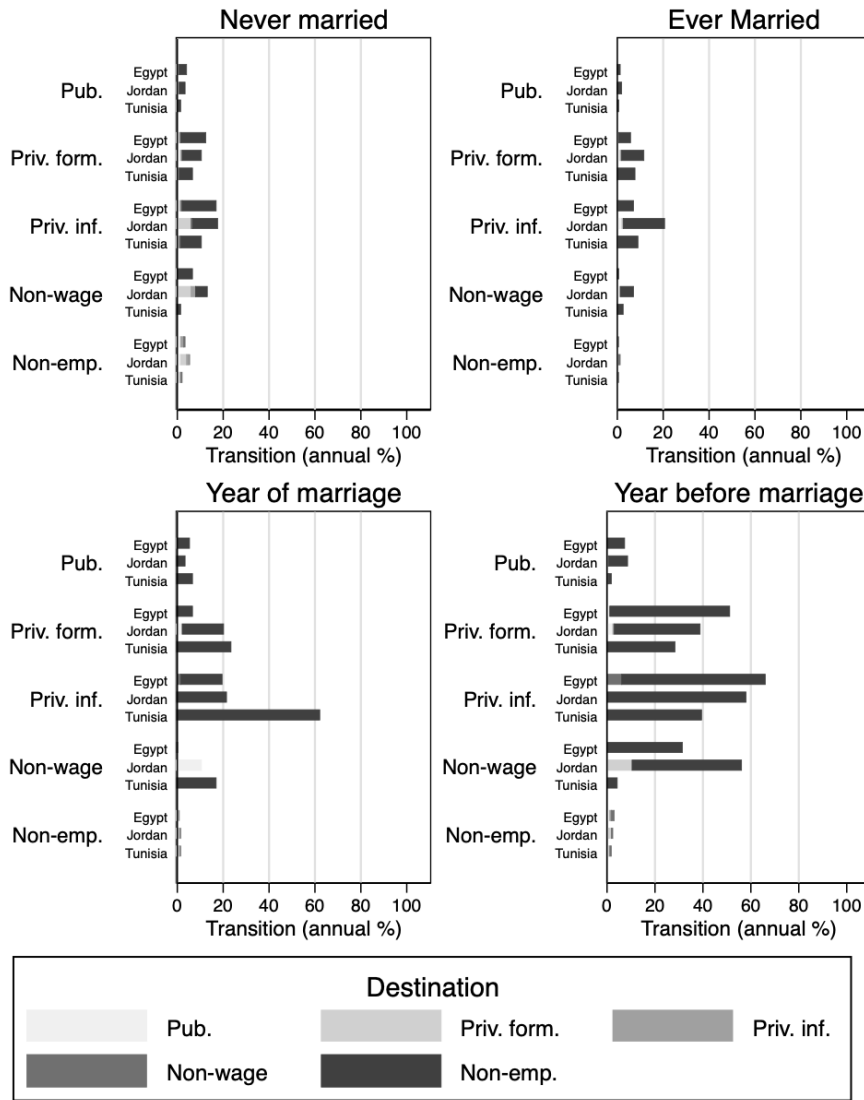
Notes: More educated is secondary and above in Tunisia, university and above in Egypt and Jordan

Appendix Figure 3. Annual rates of transition (percentages) between labor market statuses by status, marital status, and whether one year before or at marriage and country, school leaver cohorts 1989 and earlier



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

Appendix Figure 4. Annual rates of transition (percentages) between labor market statuses by status, marital status, and one year before or at marriage and country, school leaver cohorts 1990 and later



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

Appendix Table 1. Discrete time competing risk multinomial logit models of labor market spells by type of employment, Egypt

Origin:	Egypt				
	Public	Private formal	Private informal	Non-wage	Non-employed
<u>Destination</u>					
Public					
Ln(t)		0.442*** (0.086)	0.790 (0.159)	0.572 (0.175)	0.674*** (0.024)
Married		5.090** (2.942)	0.403* (0.183)	0.482 (0.300)	0.358*** (0.035)
Year of marriage		1.086 (0.870)	5.305* (3.470)	0.000*** (0.000)	1.825*** (0.262)
Year before marriage		4.616* (3.586)	1.364 (1.012)	0.000*** (0.000)	0.980 (0.100)
Private formal wage					
Ln(t)	0.440*** (0.086)		0.646 (0.180)	0.410 (0.356)	0.832* (0.064)
Married	0.336** (0.141)		0.251* (0.164)	0.000*** (0.000)	0.140*** (0.030)
Year of marriage	1.351 (1.509)		0.000*** (0.000)	0.280 (0.275)	1.598 (0.682)
Year before marriage	0.000*** (0.000)		1.081 (1.138)	8.394 (11.252)	0.266** (0.108)
Private informal wage					
Ln(t)	0.406*** (0.101)	0.821 (0.259)		1.405 (0.450)	0.662*** (0.035)
Married	0.244 (0.183)	0.702 (0.613)		0.110*** (0.072)	0.279*** (0.039)
Year of marriage	2.947 (3.475)	0.000*** (0.000)		7.609 (9.740)	0.842 (0.230)
Year before marriage	0.000*** (0.000)	0.000*** (0.000)		6.496** (3.978)	0.308*** (0.073)
Non-wage					
Ln(t)	0.427 (0.205)	0.557 (0.196)	0.862 (0.138)		0.817*** (0.047)
Married	2.717 (2.997)	3.759 (3.883)	3.444** (1.532)		2.449*** (0.398)
Year of marriage	3.688 (3.482)	0.000*** (0.000)	2.333 (1.389)		1.195 (0.230)
Year before marriage	0.000*** (0.000)	13.123 (18.159)	48.999*** (23.007)		11.081*** (1.659)
Non-employed					
Ln(t)	0.602*** (0.052)	0.749* (0.099)	0.723*** (0.054)	1.312** (0.132)	
Married	0.522** (0.113)	1.046 (0.317)	0.477*** (0.083)	0.282*** (0.072)	
Year of marriage	3.782***	2.710*	3.711***	2.618	

<u>Egypt</u>					
Origin:	Public	Private formal	Private informal	Non-wage	Non-employed
	(1.001)	(1.129)	(1.153)	(1.337)	
Year before marriage	3.978*** (0.790)	15.489*** (4.313)	17.380*** (2.767)	17.456*** (4.350)	
N women-years	20323	1849	4723	13561	172986
N women	1470	302	738	986	11759

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

Cells are relative risk ratios

Standard errors in parentheses, clustered by PSU

Appendix Table 2. Discrete time competing risk multinomial logit models of labor market spells by type of employment, Jordan

Origin:	<u>Jordan</u>				
	Public	Private formal	Private informal	Non-wage	Non-employed
<u>Destination</u>					
Public					
Ln(t)		0.732*	0.493**	1.037	0.478***
		(0.105)	(0.129)	(0.391)	(0.027)
Married		1.621	1.007	0.307	0.443***
		(0.510)	(0.596)	(0.259)	(0.062)
Year of marriage		0.911	0.000***	13.332*	1.554*
		(0.580)	(0.000)	(14.243)	(0.308)
Year before marriage		1.925	0.000***	0.000***	0.695
		(1.037)	(0.000)	(0.000)	(0.142)
Private formal wage					
Ln(t)	0.779		0.802	0.517	0.494***
	(0.213)		(0.168)	(0.189)	(0.029)
Married	0.375*		0.489	0.000***	0.208***
	(0.185)		(0.243)	(0.000)	(0.032)
Year of marriage	0.000***		0.000***	0.558	1.317
	(0.000)		(0.000)	(0.193)	(0.380)
Year before marriage	1.937		0.000***	2.289	0.271***
	(1.291)		(0.000)	(2.558)	(0.077)
Private informal wage					
Ln(t)	0.156	0.719		1.259	0.694***
	(0.153)	(0.187)		(0.324)	(0.051)
Married	0.595	0.669		0.153**	0.203***
	(0.861)	(0.319)		(0.090)	(0.034)
Year of marriage	0.000***	0.000***		12.109*	0.912
	(0.000)	(0.000)		(15.343)	(0.385)
Year before marriage	0.000***	1.137		2.318	0.179***
	(0.000)	(1.212)		(2.623)	(0.082)
Non-wage					
Ln(t)		0.680	1.444		0.749**
		(0.468)	(0.517)		(0.078)
Married		4.578	1.199		0.951
		(6.926)	(0.706)		(0.224)
Year of marriage		0.000***	0.000***		0.704
		(0.000)	(0.000)		(0.374)
Year before marriage		0.000***	0.000***		0.975
		(0.000)	(0.000)		(0.474)
Non-employed					
Ln(t)	1.331*	0.781**	0.743***	1.007	
	(0.156)	(0.068)	(0.063)	(0.153)	
Married	1.985**	1.701**	1.675**	2.190	
	(0.430)	(0.307)	(0.320)	(1.079)	
Year of marriage	1.058	1.872*	1.624	2.222	

Jordan						
Origin:	Public	Private formal	Private informal	Non-wage	Non-employed	
	(0.369)	(0.506)	(0.672)	(1.704)		
Year before marriage	5.804*** (1.813)	11.492*** (2.526)	14.955*** (4.169)	41.423*** (23.952)		
N women-years	6945	3143	1733	1186	82196	
N women	688	507	325	145	5329	

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

Cells are relative risk ratios

Standard errors in parentheses, clustered by PSU

Appendix Table 3. Discrete time competing risk multinomial logit models of labor market spells by type of employment, Tunisia

Origin:	Tunisia				
	Public	Private formal	Private informal	Non-wage	Non-employed
Destination					
Public					
Ln(t)		0.990 (0.251)	0.539 (0.282)		0.913 (0.098)
Married		0.000*** (0.000)	0.432 (0.484)		0.482** (0.115)
Year of marriage		1.135 (0.191)	0.000*** (0.000)		2.118 (1.020)
Year before marriage		0.000*** (0.000)	0.000*** (0.000)		1.625 (0.639)
Private formal wage					
Ln(t)	1.031 (0.135)		0.429 (0.201)	17.229*** (11.866)	0.731*** (0.048)
Married	0.000*** (0.000)		1.419 (1.173)	0.000*** (0.000)	0.235*** (0.050)
Year of marriage	1.056 (0.181)		0.000*** (0.000)	31.774*** (22.765)	3.131* (1.477)
Year before marriage	0.000*** (0.000)		0.000*** (0.000)	0.000*** (0.000)	0.308* (0.179)
Private informal wage					
Ln(t)	2.659*** (0.404)	1.172 (0.427)		1.112 (0.982)	0.787** (0.061)
Married	2.67e+06*** (2.82e+06)	0.000*** (0.000)		0.313 (0.656)	0.432*** (0.084)
Year of marriage	0.000*** (0.000)	1.213 (0.254)		0.000*** (0.000)	1.811 (0.840)
Year before marriage	1.263 (0.492)	0.000*** (0.000)		0.000*** (0.000)	0.308 (0.218)
Non-wage					
Ln(t)	1.900 (1.551)		0.572 (0.224)		0.841 (0.082)
Married	0.000*** (0.000)		0.674 (0.574)		1.115 (0.254)
Year of marriage	1.763 (1.229)		0.000*** (0.000)		1.022 (0.593)
Year before marriage	14.246 (25.224)		9.932** (8.630)		10.144*** (2.891)
Non-employed					
Ln(t)	0.731 (0.166)	0.964 (0.105)	0.874 (0.105)	2.028*** (0.429)	
Married	0.537 (0.267)	1.332 (0.277)	0.654 (0.179)	0.331* (0.185)	

Origin:	Tunisia				
	Public	Private formal	Private informal	Non-wage	Non-employed
Year of marriage	6.065* (4.521)	6.977*** (2.344)	16.125*** (8.827)	51.982*** (35.039)	
Year before marriage	2.088 (1.645)	9.882*** (2.833)	8.623*** (3.182)	12.793*** (8.719)	
N women-years	1588	1940	1330	2144	65165
N women	165	285	202	175	3801

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

Cells are relative risk ratios

Standard errors in parentheses, clustered by PSU

Cells are blank when perfect predictors