The Impact of Marriage on Women's Employment in the Middle East and North Africa[1]

By
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Abstract

Marriage is a central stage in the transition to adulthood in the Middle East and North Africa (MENA). This paper investigates the effect of marriage on women's employment in MENA, examining how different types of work are affected by relatively early marriage, defined as marriage by the median age of marriage. An important contribution of this paper is to examine the two main mechanisms by which marriage can affect work: (1) its effect on ever entering work and (2) its effect on exiting work. We endogenize the marriage decision using an instrumental variables approach. We find that marriage by the median age reduces women's probability of market work by 47 percent in Jordan, 30 percent in Tunisia and 16 percent in Egypt. Much of the effect is due to a reduction in the probability of private wage work, which women tend to leave at marriage.

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1. Introduction

The gendered division of labor within the household is a well-established feature of Middle Eastern and North African societies. The normative role of the husband is that of the breadwinner, providing income for the family and assuming minimal responsibility within the home. The normative role of the wife is that of the homemaker, raising the children and assuming almost full responsibility for the domestic sphere (Hoodfar, 1997). For women, marriage adds a substantial domestic work burden, which can make it difficult for them to engage in market work (Assaad, Ghazouani, & Krafft, 2018a, 2018b; Hoodfar, 1997; Krafft, Assaad, & Keo, 2019). Because adult roles—including independent living, socially sanctioned sexual relations, and childbearing—are limited to within marriage, women in the Middle East and North Africa (MENA) region are expected to marry in order to complete their transition to adulthood. With marriage as a virtual imperative, it is market work that gives way when it is irreconcilable with marriage.

Difficulty in reconciling domestic responsibilities and the type of market work readily available to women in MENA contributes to low rates of female labor force participation in the region (World Bank, 2013). Previous research has established the challenges women face in working after marriage and how these challenges vary by the type of work women are engaged in. Specifically, public sector work and non-wage work in a family business or farm tend to be easier to reconcile with marriage than private sector wage work (Assaad, Ghazouani, & Krafft, 2018a; Assaad, Hendy, Lassassi, & Yassin, 2020; Assaad, Krafft, & Keo, 2019; Hoodfar, 1997).

Although sector of work is recognized as a factor mediating the effect of marriage on women's employment, the analysis of this issue to date has been largely descriptive or anthropological (Assaad, Ghazouani, & Krafft, 2018a; Assaad & Krafft, 2021; Hoodfar, 1997;

Krafft, Assaad, & Keo, 2019). The multivariate literature tends to be limited in scope, for instance estimating the relationship between individual characteristics, type of work, and marital status or marriage timing, but not accounting for the potential endogeneity of marriage (Assaad & El-Hamidi, 2001; Assaad & Hendy, 2013). Another strand of the multivariate literature is the single-issue approach, for instance examining the role of geographic mobility in limiting women's work options (Assaad & Arntz, 2005). None of the literature to date has accounted for the potential endogeneity of marriage in relation to women's work. While most women in MENA eventually marry, marriage timing could be advanced or delayed by employment. Gender role attitudes or other unobserved factors may also drive both work and marriage decisions.

By not only taking a multivariate approach, but also accounting for the endogeneity of marriage timing, this paper represents a substantial step forward in research on the impact of marriage on women's employment in the region. In addition to comparing the factors that affect women's participation in different types of work, this paper provides a rich comparative perspective across three MENA countries: Egypt, Jordan, and Tunisia. These three countries have some similarities in gender norms, women's education, and labor market patterns, but also exhibit interesting differences with regard to the timing of marriage and the types of employment available to women. Given their similarities and differences, comparing these three countries can help identify universal challenges for women's employment in the region as well as context specificities that suggest routes to improve women's work opportunities.

We hypothesize that marriage could both prevent women from ever entering work and affect women's exit from work. In order to test these hypotheses, the paper is organized around four main research questions, comparing Egypt, Jordan, and Tunisia:

1) What is the impact of marriage, specifically marriage by the median age, on current employment status? How does this vary by the type of work?
2) What is the impact of marriage on ever engaging in employment? How does this vary by the type of work?
3) For those who ever worked, what is the impact of marriage on exit from work? How does this vary by initial type of work?
4) What job, individual, and household characteristics allow women to better reconcile work and marriage?

To answer the first question, we estimate probability models for the effect of getting married by the median age on being currently employed in various employment states. For the second question, we examine the effect of marriage on the probability of ever engaging in various kinds of employment. In these two models, we use the potentially endogenous variable "married by the median age" as a proxy for marriage for two reasons. First, being married is censored. We have incomplete information about marriage for the group of women who are not currently married but may get married in the future. Thus, we cannot simply use the variable "being married." Second, almost all women eventually marry in the region (Assaad & Krafft, 2015a; Salem, 2014, 2015). Marrying by the median age, which we refer to as relatively early marriage, can either prevent employment or accelerate exit from different types of work. Women who marry later than the median age have more time to enter work and build experience at work. Hence their patterns of exit from employment, after marriage, might be different from those who marry by the median age.

For the third research question, on exit from work for those who ever entered work, we estimate a discrete-time hazard model. We examine how getting married and being married

relate to patterns of exit from work. Finally, to investigate our fourth research question, we use descriptive analyses of some of the job, individual, and household characteristics that may facilitate or hinder continued work after marriage.

Our empirical work is grounded in a theoretical understanding of individuals and families maximizing utility in the face of prescribed gender roles and other constraints. The economic bases (including specialization) that are linked with marriage (Becker, 1973, 1974, 1985) are important in understanding the intersection of gender, labor markets and domestic responsibilities (Bardasi & Wodon, 2010; Gammage, 2010; Sirianni & Negrey, 2000) .

2. Background

Female labor force participation and employment rates in the MENA region are low by global standards (Assaad, Krafft, & Keo, 2019; Ilkkaracan, 2012; Sa'ar, 2017; Spierings, 2014; Spierings, Smits, & Verloo, 2010). Educated women are much more likely to work in the region (Assaad, Ghazouani, & Krafft, 2018b; Assaad & Krafft, 2015b; Assaad, Krafft, & Keo, 2019). For example, in Jordan, less than six percent of Jordanian women who had less than a university education were employed in 2016 (Assaad, Krafft, & Keo, 2019). In contrast, around 35 percent of Jordanian women with a university degree worked. Despite women's educational attainment catching up with, if not surpassing, that of men, women's participation in the labor force has been decreasing over time, due to dwindling employment opportunities in the public sector (Assaad, Hendy, Lassassi, & Yassin, 2020; El-Kogali & Krafft, 2020).

In Egypt, as of 2012, just 18 percent of women aged 15-64 were employed, down from 22 percent in 2006 (Krafft, Assaad, & Keo, 2019). Much of women's participation in Egypt is in the form of unemployment, with rates around 25-35 percent among secondary and higher education graduates (Krafft, Assaad, & Keo, 2019). Among employed women, half (52 percent)

work in government, compared to 27 percent of men (Assaad & Krafft, 2015c). Women who obtain government jobs tend to stay in them until retirement, but women with other types of wage employment tend to exit work at marriage (Assaad & Krafft, 2015c). Unemployed young women express a strong preference for government employment (Barsoum, 2015).

As of 2016, the employment rate of Jordanian women aged 15-64 was just 11 percent, down from 14 percent in 2010 (Assaad, Krafft, & Keo, 2019). A large and rising share of participation is in the form of unemployment; the unemployment rate among women aged 15-24 in Jordan is greater than 60 percent and remains high, around 38 percent, into the 25-35 age range (Assaad, Krafft, & Keo, 2019). Among employed Jordanian women, 49 percent work in the government sector, compared to 42 percent of Jordanian men, and 37 percent work in the formal private sector, compared to 23 percent of men. Women are much less likely than men to work in informal employment or to be employers or self-employed (Assaad & Salemi, 2019).

Tunisia has slightly higher female employment rates than Egypt or Jordan, with around 20 percent of women aged 15-64 employed in 2014 (Assaad, Ghazouani, & Krafft, 2018b). Women face an unemployment rate of around 25 percent. As in the other two countries, the unemployment rate for young women reaches almost 40 percent and is also highest for educated, rural women who cannot easily find suitable jobs locally (Assaad, Ghazouani, & Krafft, 2018b; Hanmer, Tebaldi, & Verner, 2018).

3. Data and Methods

3.1 Data

Assessing the relationship between marriage and work requires data on the timing of marriage and on labor market trajectories, as well as on individual and family characteristics.

Given the data requirements, the paper examines the three MENA countries - Egypt, Jordan,[5] and Tunisia - for which comparable and rich data are available. The study uses data from the 2012 wave of the Egypt Labor Market Panel Survey (ELMPS), the 2016 wave of the Jordan Labor Market Panel Survey (JLMPS), and the 2014 wave of the Tunisia Labor Market Panel Survey (TLMPS). These data sets are publicly available through the Economic Research Forum.[6] The datasets include detailed labor market histories as well as information on age at first marriage. The LMPSs also include important contextual information on the factors that may affect the relationship between work and marriage. We provide additional analyses on these factors, which may also indicate potential policy levers for increasing women's employment.

3.2 Definitions of work

In our analyses we consider various definitions of work. We follow the resolution of the 19th International Conference of Labor Statisticians (ICLS) to define employment, or market work, as work performed for others in exchange for pay or profit (ILO, 2013). Such market work includes wage work in either the public or private sectors and non-wage work, which includes work in an activity aimed at producing a good or service for market exchange as an employer, a self-employed individual, or an unpaid family worker. We separately consider subsistence work, which includes production or processing of primary commodities for own use as food (ILO, 2013). Not included in our definition of subsistence work are other components of own use production work, such as collecting firewood, fetching water, or other household domestic chores. Also, in conformity with the 19th ICLS resolution, our definitions of market work and subsistence work do not include unpaid trainee work and volunteer work. The union of market

[5] We restrict our analyses of Jordan to Jordanians only in order not to confound patterns in Jordan with those of persons in Jordan displaced from other countries.
[6] At www.erfdataportal.com. For more information on the three data sets see Krafft and Assaad (2021), Assaad and Krafft (2013), and Assaad, Ghazouani, Krafft and Rolando (2016).

work and subsistence work constitutes our definition of extended work. Furthermore, in our descriptive analysis, we consider domestic work defined as "all work performed in or for a household or households to provide services mainly for consumption by household members," in conformity with the 20th ICLS resolution (ILO, 2018). We focus on the types of domestic work that are performed unpaid by women in their households (e.g., childcare or cooking).

3.3 Modeling Strategies

3.3.1 The impact of marrying by the median age on work

We initially model the impact of marrying by the median age on current work status. We specify a series of binary dependent variables indicating whether or not the individual participates in different kinds of work, namely (1) extended work, (2) market work, (3) wage work (4) public sector wage work (5) private sector wage work (6) non-wage market work, or (6) subsistence work. Because an important share of women never worked, we also examine the possible effect of relatively early marriage on ever working, by estimating a series of models in which the dependent variable is ever working in the same work statuses listed above. We do not include ever engaging in subsistence work because our retrospective data do not allow us to detect such work in the past.

The main explanatory variable in our models for current work and ever work is a binary variable indicating marriage by the median age, which we treat as potentially endogenous. In a series of sensitivity analyses, we vary the age cutoff to test the robustness of our results to this decision. Because being married by the median age is censored for unmarried women who are younger than the median age of marriage at the time of the survey, we restrict our sample to women who are at or older than the median age of marriage (or the alternative age cutoffs used in the sensitivity analyses). We set the upper age limit to 39 to capture the employment effects

proximate to marriage and during peak child-bearing years. The age restrictions we impose mean that our results are only relevant to women in that age range. They do not introduce any selection bias since age is exogenous.

Among women aged 22-39, the median age at marriage in Egypt in 2012 was 22. This results in a working sample of 7,394 women who are between the ages of 22 and 39. In Jordan, the median age at marriage for women in 2016 was 23, which results in a sample of 3,474 women aged 23 to 39. The median age at marriage for women in Tunisia in 2014 was 27, which results in a sample of 1,327 women between the ages of 27 and 39.

To address the possible endogeneity of the timing of marriage, we instrument for marrying by the median age. We use three sets of instruments: (1) sex ratios in the local area of birth, (2) the ratio of female siblings (including the woman) to all siblings in the woman's natal household, and (3) whether the woman is the eldest among her female siblings. Since the first instrument is a community-level variable, we calculate it at the most detailed geographic level available in population census microdata for each country.

We present a variety of models suited for binary dependent variables when the explanatory variable of interest is also binary and potentially endogenous. These include the instrumental variable (IV) probit model, which has a linear first stage and a probit second stage, and the bivariate probit model, which specifies both stages as probits. We also estimate a regular probit model to compare results with a model that assumes the binary explanatory variable is exogenous. We present these models in detail in the online appendix, which also provides more details about the specification of the instruments and tests of their strength and validity.

Additional control variables used in the models include age, age squared, educational attainment (measured categorically in four levels as no education (the reference), below

secondary, secondary, and above secondary), father's and mother's education (measured in three levels as no education (the reference), below secondary, and secondary or above),[7] father's working status and sector of employment when the individual was 15 years old (specified as public wage worker (the reference), private wage worker, or otherwise, which includes both non-wage workers and those not working), whether the mother was working when the individual was 15, and the region of birth, distinguished by its urban/rural character. We include an additional control for whether the father has a secondary education or above when the individual herself has a secondary education or above. For Egypt, we also control for the ratio of international male migrants to the male population in the village/neighborhood of birth, which is available from the 2006 population census, to control for the possible effects of migration on local sex ratios, which we use as one of our instruments. Such a variable is not available for Jordan and Tunisia.

3.3.2 The impact of marriage on exiting market work

To test the effect of marriage on exiting work, we use current and retrospective data to create an annualized panel of labor market statuses for the sample of women who ever worked. We estimate a discrete-time hazard model with marriage as a time-varying covariate to examine the association between getting married and exiting market work.[8] We control for the type of first job (public sector, private sector, or non-wage work) and interact the time-varying marriage variable with the type of first job. This approach allows us to not only estimate how marriage relates to exit from work but also how this relationship is mediated by the type of employment a woman is in prior to marriage. Although we potentially know a woman's entire employment trajectory, we opt to control for the type of first job, rather than the concurrent job, since the vast

[7] Fathers and mothers with missing information on education levels are added to the no education category.
[8] See the online appendix for more details on the discrete time hazard model we use.

majority of women who ever worked in all three countries had only one job (81 percent in Egypt, 94 percent in Jordan and 76 percent in Tunisia).

Since we are focused in these estimates on the effect of marriage on exit from work, we limit our sample to women who ever worked prior to marriage. We further restrict our sample to women aged 18-39 at the time of the survey in order to capture a sufficient period prior to marriage for most women and still keep the sample comparable to that used in our other estimation models. We use the same controls as in previous models.

Given the time-varying nature of the marriage variable, we are able to add a lead of the marriage variable to estimate whether exit from work occurs in anticipation of marriage or once married. These relationships are explored in more detail in Assaad, Krafft, and Selwaness (2017). Finally, it should be kept in mind that the discrete-time hazard models we use to explore the relationship between timing of marriage and work exit do not allow us to correct for the possible endogeneity of the marriage decision.

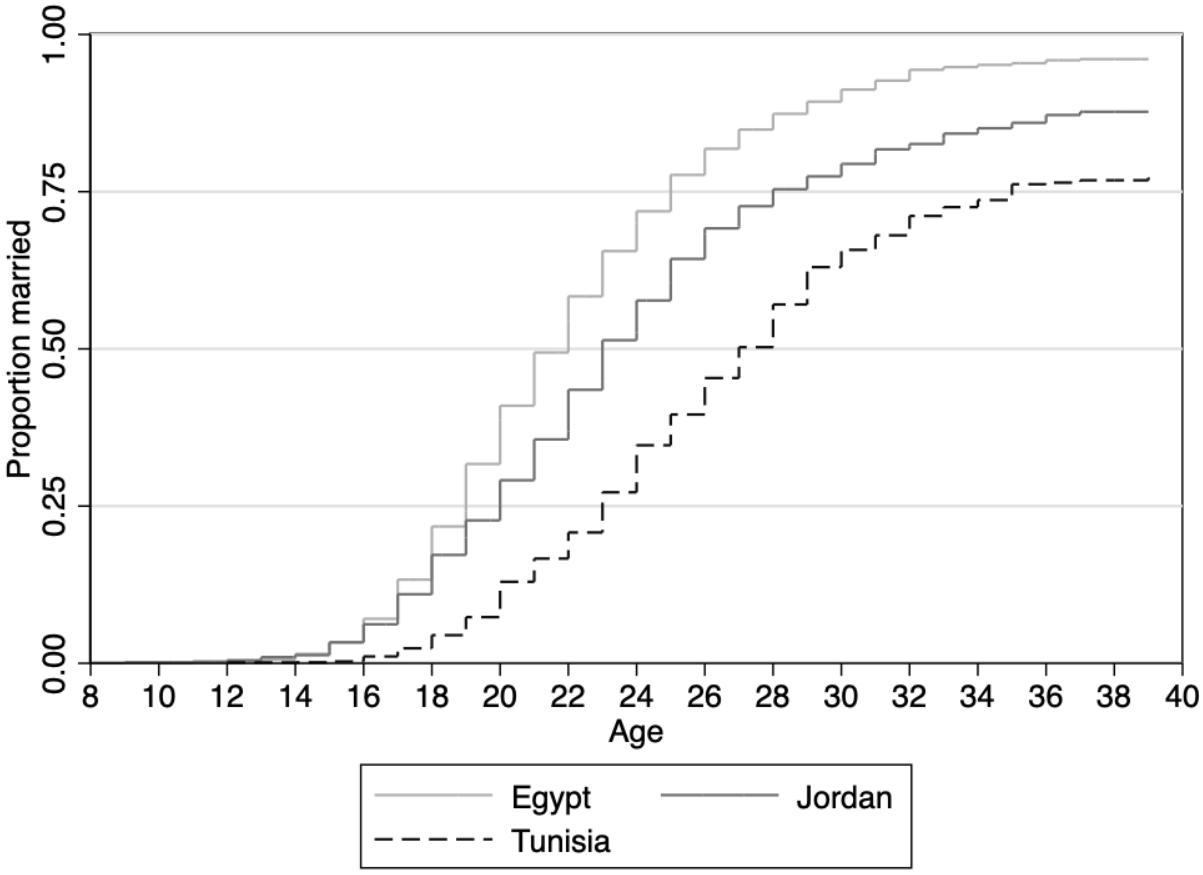
4. Results

4.1 Descriptive results

4.1.1 Age at Marriage

Figure 1 shows the proportion of women married at each age by country. The median age at marriage for the sample of women aged 22-39 is 22 in Egypt, 23 in Jordan, and 27 in Tunisia. Patterns of early marriage, including some teen marriage, are similar in Egypt and Jordan, whereas first marriage occurs later in Tunisia. Marriage is nearly universal in Egypt, but in Jordan only around 88 percent of the sample is married by age 39 and in Tunisia the share is around 78 percent, indicating variation in the universality of marriage.

Figure 1. Proportion of women married at each age by country, ages 22-39.



Source: Authors' calculations based on ELMPS 2012, JLMPS 2016, and TLMPS 2014

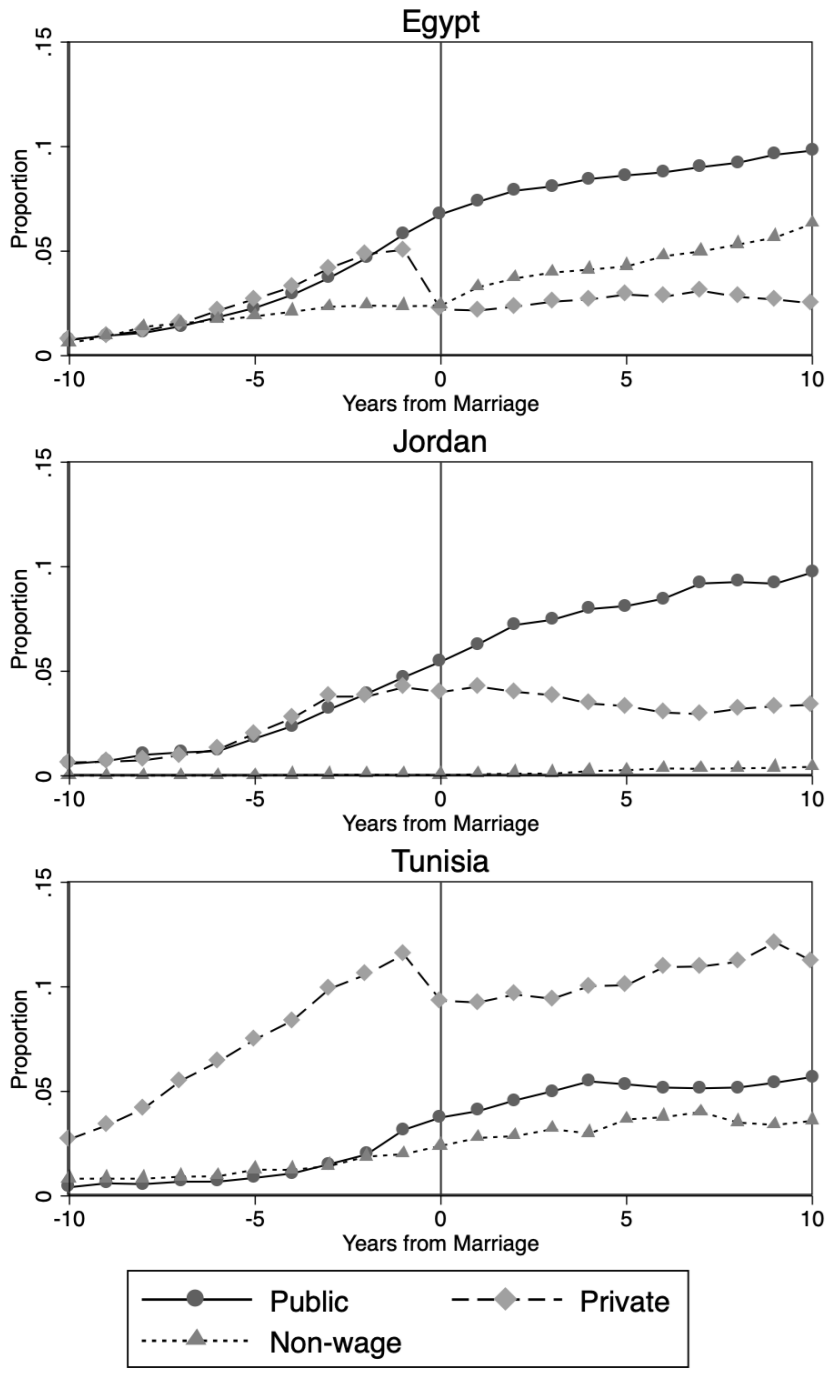
Note: Based on Kaplan-Meier failure functions.

4.1.2 Work and Marriage

Figure 2 traces the proportion of women in different types of work relative to the year of marriage, based on the retrospective data on employment and marriage. Up until the year before marriage in Egypt, the share of women in the public sector is around 5 percent, comparable to the share in private sector wage work. However, at marriage, the share in private sector wage work halves and never recovers, while public sector work continues its rising trend and the trend

in non-wage work shifts upward. In Jordan, private sector wage work plateaus at around 4 percent near the year of marriage. After marriage, it keeps declining steadily. Similar to Egypt, public sector work in Jordan continues rising after marriage, but, unlike in Egypt, non-wage employment is not much of an option for either unmarried or married women. In Tunisia, private sector wage work is more prevalent than in Jordan or Egypt, rising steadily to a peak of about 11 percent of women one year prior to marriage. While it drops at marriage, by two percentage points (p.p.), the drop is smaller than in Egypt in both absolute and relative terms. It also recovers after this initial drop, returning to its pre-marriage level about eight years after marriage, perhaps when women's children have reached school age. As in Egypt, public sector work and non-wage market work both continue to rise after marriage. Given these important relationships between type of work and marriage, we frame our multivariate model outcomes in terms of these types of work. Our hazard model examining the effect of marriage on work exit by type of first employment is designed to estimate the effects shown in Figure 2.

Figure 2. Proportion Employed in Different Types of Market Work by Years from Marriage and Country, Women who Married in the Ten Years Prior to Each Survey

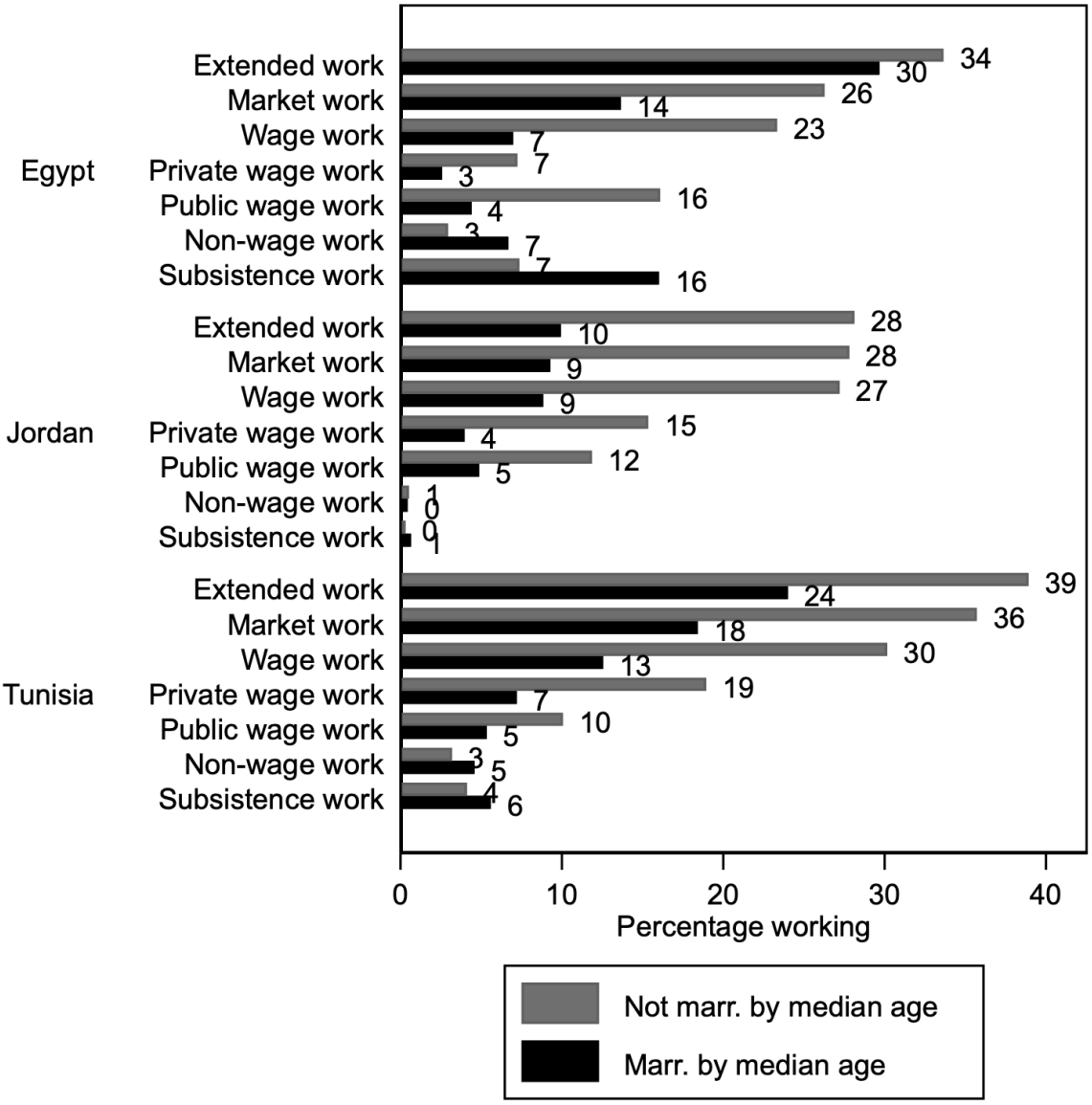


Source: Authors' calculations based on ELMPS 2012, JLMPS 2016, and TLMPS 2014.

Moving to the bivariate association between marriage and work, Figure 3 shows the

percentage of currently employed women in different types of work by whether or not they married by the median age. Women who marry by the median age in all three countries are much less likely to be employed than those who do not. The differential is larger for wage employment than for overall employment. Egypt and Jordan have a nearly 3:1 ratio comparing the proportion of women in wage employment for those who did not marry by the median age to those who did. The ratio across the two groups of the proportion in private wage employment in Jordan is even larger at around 4:1. However, women who do not marry by the median age have very different observable characteristics than those who do (see online appendix for summary statistics). There may also be differences in unobservable characteristics between the two groups. Thus, our multivariate analysis below corrects for both observable characteristics and selection on unobservables in order for valid inferences to be made about the relationship between marrying by the median age and employment.

Figure 3. Percentage currently working in different types of work by marriage by the median age, women, from median age to age 39



Source: Authors' calculations based on ELMPS 2012, JLMPS 2016 and TLMPS 2014

Notes: Women aged 22-39 in Egypt, 23-39 in Jordan, and 27-39 in Tunisia.

4.2 Multivariate model results

4.2.1 Effect of marriage by the median age on work

This section presents the multivariate results of the probability models examining how relatively early marriage affects current employment and ever working in different work statuses. Table 1 presents the reference probability of each of the current work outcomes for a woman who is not married by the median age and the average marginal effect of marriage by the median age for each model.[9] Across models, the effects of marriage by the median age on all current employment statuses are statistically significant, with the exception of extended work in Egypt, non-wage market work and subsistence work in Jordan and Tunisia. Both the magnitude and statistical significance of the effects are similar across specifications, suggesting that the bias due to the potential endogeneity of being married by the median age is small. We therefore focus in the subsequent discussion on the IV probit results and discuss any deviations from these results where relevant.

For all three countries, the impact of being married by the median age on market work in general, wage work, private, and public wage work is negative and statistically significant. It also has a negative effect on extended work in Jordan and Tunisia, almost identical to its effect on market work, since women undertake very little subsistence work in these two countries. This is in contrast to Egypt where subsistence work is more prevalent and where the impact of marrying by the median age on it is positive, counteracting its negative effect on market work and leading to an insignificant effect on extended work, which is the union of subsistence and market work.

The largest effect of marrying by the median age is in Jordan, where the probabilities of

[9] For the bivariate probit model, we calculate the marginal effect as the difference between the probability of working if the individual was married by the median age and that of working if the individual was not married by the median age.

both market and extended work and wage work decline by almost 11 p.p., followed by Tunisia, where the probabilities of market (extended) work decline by 9 (8) p.p., and those of wage work by 11 p.p. The smallest absolute effects of marrying by the median age are observed for Egypt, where the probability of extended work declines by a statistically insignificant 0.4 p.p., that of market work by about 3 p.p., and that of wage work by 5 p.p.

Other coefficients in the models were as expected (not shown, summarizing based on the probit estimates). In Egypt and Tunisia, those with secondary and university education were significantly more likely to engage in wage work and public sector wage work than those who did not complete any educational degree. In Jordan, the probability of work rose with every education level.[10] Having a mother who had worked was associated with a higher probability of currently working, significantly so in Egypt and Tunisia. In Jordan and Egypt, employment rose significantly (and eventually fell) with age.

Given differences in the composition of work in the three countries, we show in Figure 4 the relative effect of marrying by the median age on different kinds of work. The figure confirms that the largest effects of marrying by the median age are observed for Jordan. Marrying by that age reduces the probability of extended work by 44 percent, market and wage work by 47 percent, and private wage work by 59 percent. The reduction in the probability of public sector employment is smaller at 39 percent.

[10] We additionally estimated models with interactions between education and marrying by the median age (probit models, not shown, available from the authors upon request). The interaction of education and marrying by the median age shows that women with university education in Jordan and Tunisia who married by the median age did not experience significantly reduced probabilities of work. Rather, it is women with secondary education in Jordan, and women with less than secondary and secondary education in Tunisia who witnessed a significant drop in their probabilities of work when marrying by the median age. In Egypt, women of every education level become significantly less likely to work when they married by the median age, in comparison with those with no education who experience a significant increase in their probability of work. The different result in Egypt can be explained by the tendency for uneducated women in Egypt to engage in non-wage work, which is less affected by marriage, and the increasing scarcity of public sector jobs, which are more compatible with marriage, for women with higher education.

The second largest relative effects of marrying by the median age are in Tunisia, although measured with less precision than in Egypt and Jordan because of the smaller sample size. The probability of market (extended) work is reduced by 30 (21) percent due to marrying by the median age in Tunisia. The probability of wage work falls by 48 percent, private wage work by 54 percent, and, again, the reduction in public sector wage work is not as large (41 percent).

The impact of marrying by the median age on the overall probability of working is smallest in Egypt, with a statistically insignificant reduction of only 1 percent for the extended definition of work and 16 percent for the market definition. However, the effect is higher on wage work at 32 percent and higher still on private wage work at 40 percent (Figure 4). The effect of marrying by the median age on market work in Egypt is considerably attenuated by the fact that the probability of non-wage market work increases by 54 percent to counteract the reduction in wage employment. The probability of undertaking subsistence work also increases by 32 percent.

Table 1. Average marginal effects of being married by the median age on current employment outcomes for women

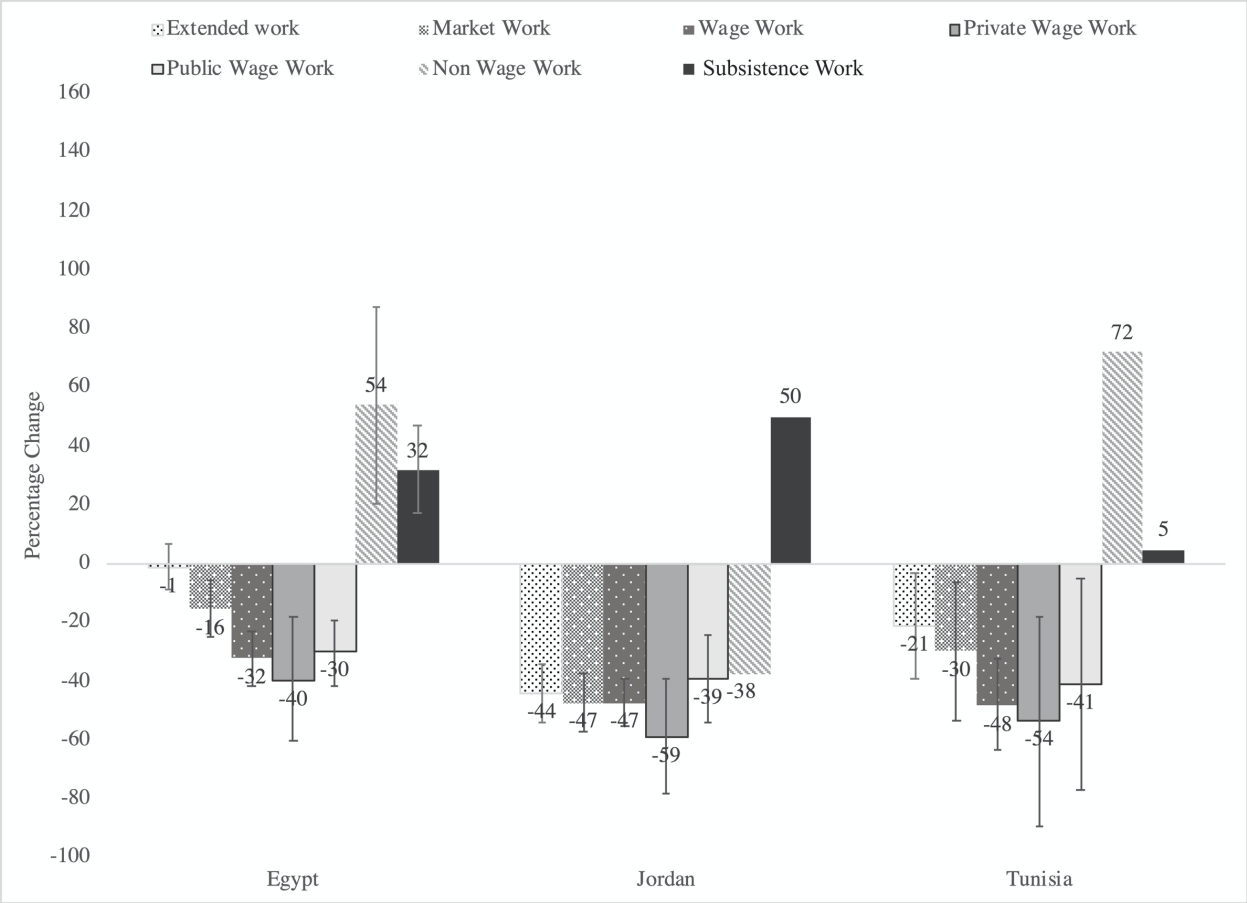
		Egypt (22-39)			Jordan (23-39)			Tunisia (27-39)		
Outcome Variable		Reference Probability	Marginal Effects+	N	Reference Probability	Marginal Effects+	N	Reference Probability	Marginal Effects+	N
Work: Extended Definition	Probit	0.309	-0.004	7356	0.239	-0.106***	3472	0.393	-0.087*	996
			(0.012)			(0.011)			(0.037)	
	IVprobit	0.308	-0.004	7331	0.238	-0.105***	3472	0.391	-0.083*	981
			(0.013)			(0.012)			(0.036)	
	Biv. Probit	0.303	0.001	7331	0.237	-0.105***	3472	0.387	-0.083*	981
			(0.013)			(0.013)			(0.039)	
Work: Market Definition	Probit	0.206	-0.033***	7356	0.231	-0.110***	3472	0.292	-0.090**	997
			(0.009)			(0.011)			(0.034)	
	IVprobit	0.205	-0.032**	7331	0.230	-0.109***	3472	0.292	-0.087*	982
			(0.010)			(0.012)			(0.036)	
	Biv. Probit	0.202	-0.030**	7331	0.229	-0.109***	3472	0.280	-0.086*	982
			(0.010)			(0.011)			(0.034)	
Wage work	Probit	0.161	-0.053***	7356	0.224	-0.107***	3472	0.226	-0.108***	976
			(0.007)			(0.011)			(0.029)	
	IVprobit	0.205	-0.052***	7331	0.224	-0.106***	3472	0.292	-0.110***	961
			(0.008)			(0.011)			(0.030)	
	Biv. Probit	0.159	-0.052***	7331	0.223	-0.106***	3472	0.227	-0.114***	961
			(0.008)			(0.011)			(0.032)	
Private wage work	Probit	0.051	-0.021***	7356	0.105	-0.062***	3472	0.144	-0.077**	975
			(0.005)			(0.010)			(0.025)	
	IVprobit	0.050	-0.020***	7331	0.105	-0.062***	3472	0.145	-0.078**	960
			(0.005)			(0.010)			(0.027)	
	Biv. Probit	0.048	-0.021***	7331	0.104	-0.059***	3472	0.145	-0.079**	960
			(0.005)			(0.010)			(0.029)	
Public wage work	Probit	0.110	-0.033***	7356	0.117	-0.046***	3472	0.083	-0.034*	975
			(0.007)			(0.009)			(0.013)	
	IVprobit	0.110	-0.033***	7331	0.118	-0.046***	3472	0.083	-0.034*	960
			(0.007)			(0.009)			(0.015)	
	Biv. Probit	0.109	-0.032***	7331	0.117	-0.044***	3472	0.081	-0.031*	960
			(0.007)			(0.008)			(0.015)	
Non-wage work	Probit	0.039	0.020**	7356	0.009	-0.004	2265	0.051	0.032	876
			(0.006)			(0.003)			(0.018)	

		Egypt (22-39)			Jordan (23-39)			Tunisia (27-39)		
Outcome Variable		Reference Probability	Marginal Effects+	N	Reference Probability	Marginal Effects+	N	Reference Probability	Marginal Effects+	N
	IVprobit	0.039	0.021**	7331	0.008	-0.003	2265	0.050	0.036	864
			(0.007)			(0.010)			(0.022)	
	Biv. Probit	0.038	0.020**	7331	0.006	-0.003	3472	0.043	0.031	961
			(0.006)			(0.006)			(0.016)	
Subsistence work	Probit	0.097	0.032***	7356	0.009	0.004	2700	0.102	0.002	969
			(0.007)			(0.003)			(0.020)	
	IVprobit	0.098	0.031***	7331	0.008	0.004	2700	0.109	0.005	864
			(0.008)			(0.024)			(0.024)	
	Biv. Probit	0.098	0.031***	7331	0.007	0.003**	3472	0.092	0.005	980
			(0.006)			(0.001)			(0.019)	

Notes: (i) *p<0.05; **p<0.01; ***p<0.001 (ii) Standard errors in parentheses are clustered by the district of birth (Egypt), the sub-district of birth (Jordan), and the governorate of birth distinguished by urban or rural (Tunisia). (iii) The reference woman is not married by age 22 in Egypt, age 23 in Jordan, and age 27 in Tunisia. (iv) Controls are included.

+ Bootstrapped clustered standard errors with 400 replications are shown in parentheses.

Figure 4. The relative change in the probability of different current employment outcomes for women due to marrying by the median age, by country (percentages)



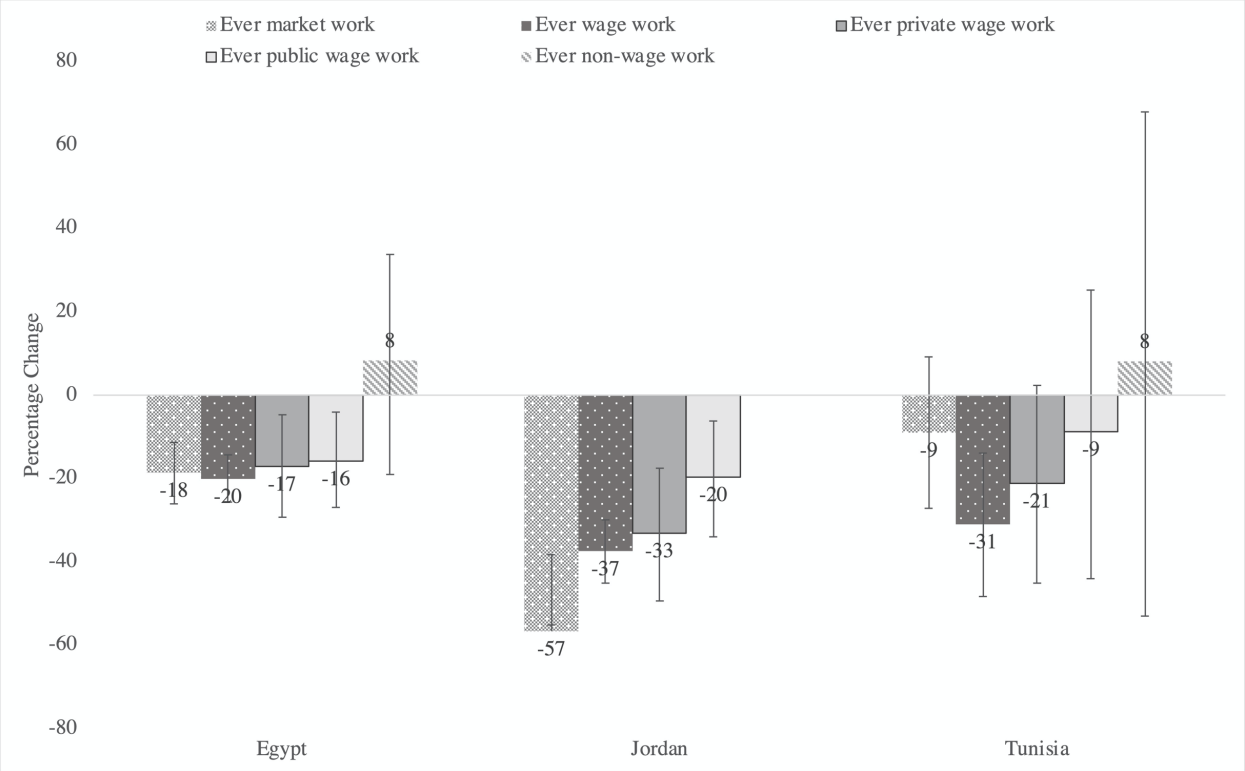
Source: Authors' calculations based on the IV probit estimates of marginal effects and reference probabilities shown in Table 1.

Notes: Bars indicate 95 percent confidence intervals. Bootstraps were not implementable for non-wage work and subsistence work in Jordan and Tunisia due to small sample sizes.

To further elucidate the mechanisms behind the effect of marrying by the median age on women's work, we estimate the impact of marrying on ever working in these various work states. This allows us to determine the extent to which relatively early marriage reduces the probability of working by discouraging entry into work in the first place as compared to its effect on inducing women to leave work after marriage. As shown in Figure 5, marriage by the median

age significantly reduces ever engaging in market work by 57 percent in Jordan, 18 percent in Egypt, and (a statistically insignificant) 9 percent in Tunisia. Moreover, women marrying by the median age are significantly less likely to ever engage in wage employment, by 37 percent in Jordan, 31 percent in Tunisia, and 20 percent in Egypt. This is mostly due to a reduction in the probability of ever entering private wage work, which declines by 33 percent in Jordan, 21 percent in Tunisia, and 17 percent in Egypt. The reduction in the probability of ever working in the public sector for those marrying by the median age is lower, at 20 percent in Jordan, 16 percent in Egypt and a statistically insignificant 9 percent in Tunisia. Thus, much of the effect of marrying by the median age on current work status in Jordan is due to never entering work in the first place. However, for both Egypt and Tunisia, the reduction in the probability of currently working for those married by the median age is due to the combined effects of never entering in the first place and exiting certain kinds of work after marriage, an issue to which we turn next.

Figure 5. The relative change in the probability of ever engaging in different employment types for women due to marrying by the median age by country (percentages)



Source: Authors' calculations from IV probit estimates of marginal effects and reference probabilities shown in Table 2.

Notes: Bars indicate 95 percent confidence intervals. The sample of women who were ever engaged in non-wage market work in Jordan is insufficient to draw reliable estimates and therefore not shown.

Table 2. The effect of being married by the median age on ever working for women

		Egypt (22-39)			Jordan (23-39)			Tunisia (27-39)		
Outcome Variable		Reference Probability	Marginal Effects+	N	Reference Probability	Marginal Effects+	N	Reference Probability	Marginal Effects+	N
Ever work	Probit	0.288	-0.059***	7393	0.288	-0.135***	3500	0.435	-0.043	999
			(0.011)			(0.012)			(0.039)	
	IVprobit	0.303	-0.056***	7388	0.288	-0.163***	3500	0.436	-0.039	984
			(0.012)			(0.012)			(0.040)	
	Biv. Probit	0.296	-0.052***	7388	0.288	-0.137***	3500	0.418	-0.029	984
			(0.011)			(0.012)			(0.039)	
Ever wage work	Probit	0.254	-0.077***	7393	0.284	-0.136***	3500	0.352***	-0.097**	1010
			(0.009)			(0.012)			(0.031)	
	IVprobit	0.253	-0.051***	7359	0.284	-0.106***	3472	0.354	-0.110***	961

		Egypt (22-39)			Jordan (23-39)			Tunisia (27-39)		
Outcome Variable		Reference Probability	Marginal Effects+	N	Reference Probability	Marginal Effects+	N	Reference Probability	Marginal Effects+	N
			(0.008)			(0.011)			(0.031)	
	Biv. Probit	0.247	-0.073***	7388	0.284	-0.137***	3500	0.353	-0.096**	994
			(0.010)			(0.013)			(0.035)	
Ever private wage work	Probit	0.133	-0.045***	7393	0.154	-0.095***	3500	0.255***	-0.078*	1010
			(0.008)			(0.011)			(0.030)	
	IVprobit	0.131	-0.043***	7388	0.153	-0.094***	3500	0.255	-0.075*	994
			(0.008)			(0.012)			(0.031)	
	Biv. Probit	0.126	-0.044***	7388	0.153	-0.092***	3500	0.251	-0.075*	994
			(0.008)			(0.012)			(0.034)	
Ever public wage work	Probit	0.135	-0.039***	7393	0.141	-0.056***	3500	0.088***	-0.030*	1010
			(0.007)			(0.010)			(0.013)	
	IVprobit	0.135	-0.040***	7388	0.141	-0.056***	3500	0.088	-0.031*	994
			(0.008)			(0.010)			(0.015)	
	Biv. Probit	0.134	-0.038***	7388	0.141	-0.054***	3500	0.086	-0.027	994
			(0.007)			(0.010)			(0.015)	
Ever non-wage work	Probit	0.055	0.020**	7393	0.007	-0.001	2827	0.067***	0.025	984
			(0.007)			(0.003)			(0.017)	
	IVprobit	0.055	0.021**	7388	0.007	-0.000	2827	0.067	0.029	952
			(0.007)			(0.007)			(0.021)	
	Biv. Probit	0.052	0.019**	7388	0.005	-0.001	2827	0.063	0.026	952
			(0.007)			(0.001)			(0.019)	

Notes: (i) *p<0.05; **p<0.01; ***p<0.001 (ii) Standard errors in parentheses are clustered by district of birth (Egypt), sub-district of birth (Jordan), and the governorate of birth distinguished by urban or rural (Tunisia). (iii) The reference woman is not married by age 22 in Egypt, age 23 in Jordan, and age 27 in Tunisia. (iv) Controls are included.

+ Bootstrapped clustered standard errors with 400 replications are shown in parentheses, with the exception of non-wage work and subsistence work in Jordan and Tunisia, due to small sample size, where the non-bootstrapped (analytical) standard errors are shown.

4.2.2 Robustness to choice of cutoff for age at marriage

In order to check the robustness of the probability model results to the choice of cutoff for age at marriage, we ran sensitivity analyses on different age cutoffs other than the median age, namely marriage by ages 24 and 26 for Jordan and Egypt and by ages 22 and 24 for Tunisia (see online appendix). Marriage across the various cutoffs still negatively affects the probability of employment, wage employment, private and public wage employment, indicating that our main result holds.

4.2.3 Marriage and the hazard of exiting work

We now turn to the effect of marriage on the probability of exiting work, conditional on entry into work. The results of the discrete-time proportional hazard model are presented in Table 3 as exponentiated coefficients, which can be interpreted as odds ratios. Getting and being married is a time varying binary covariate that turns on the year of marriage and stays on. Year before marriage is a leading version of this variable, which is on only the year prior to marriage to see if individuals leave work in anticipation of marriage.

We find that the "year before marriage" variable significantly increases the hazard of exiting work. The magnitude of the odds ratio for that variable in specification 1 suggests that the hazard of leaving work in the year before marriage is 13 times higher than in other years for Egypt, six times higher in Jordan and 11 times higher in Tunisia. For Tunisia, marriage itself has an additional effect on the hazard of leaving work. This is in line with the findings of Selwaness and Krafft (2021) who concluded that anticipating both marriage and child-bearing significantly shaped work decisions. Moreover, women whose first job was in the private sector are significantly more likely to exit work than their peers who started in the public sector.

When we add interactions between the marriage timing covariates and the type of first

job (specification 2), we find that the odds ratio of the year before marriage variable drops from 13.1 to 3.6 in Egypt, from 5.8 to 3.6 in Jordan, and from 11.3 to a statistically insignificant 1.7 in Tunisia. With the interaction terms, this odds ratio now shows the effect of anticipating marriage on those initially employed in the public sector, the reference category. It is not surprising that this effect is much smaller than the overall effect, as is clear from Figure 2. The odds ratio is significantly higher for private wage work and non-wage work, as indicated by the interaction term between the "year before marriage" variable and these initial job states.

Table 3. Discrete time proportional hazards model of exiting work, women who ever worked, ages 18-39

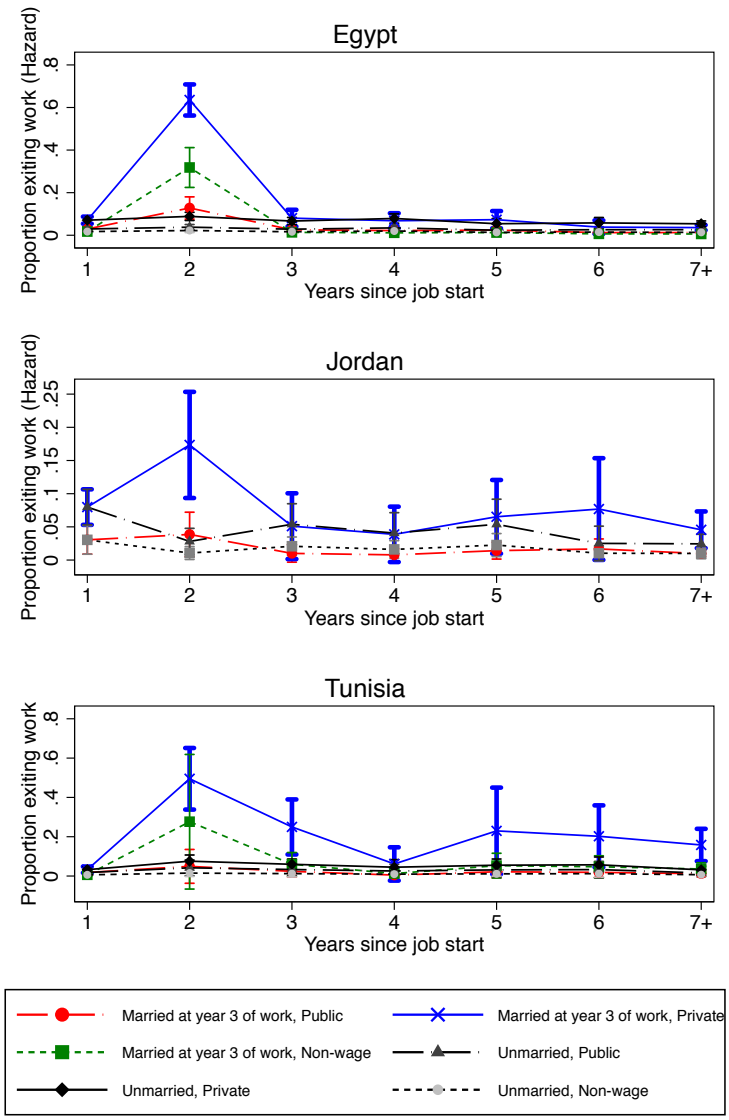
	(1)	(2)	(3)	(4)	(5)	(6)
	Egypt		Jordan		Tunisia	
	spec. 1	spec. 2	spec. 1	spec. 2	spec. 1	spec. 2
Age	1.072	1.075	1.181	1.195	0.700*	0.672*
	(0.106)	(0.109)	(0.254)	(0.263)	(0.117)	(0.112)
Age squared	0.800	0.794	0.689	0.673	1.640*	1.746*
	(0.130)	(0.132)	(0.227)	(0.226)	(0.399)	(0.425)
Getting and being married						
Married	0.995	1.718	1.356	0.962	3.870***	0.473
	(0.122)	(0.561)	(0.347)	(0.620)	(1.113)	(0.461)
Year before marriage	13.113***	3.595***	5.771***	3.642**	11.313***	1.677
	(1.579)	(0.881)	(1.661)	(1.624)	(3.398)	(1.558)
Type of first job (public sector work omit.)						
Private wage	3.749***	2.056***	3.275***	2.217*	7.514***	2.062
	(0.489)	(0.354)	(0.854)	(0.887)	(3.550)	(1.161)
Non-wage	1.096	0.615*	1.323	9.714***	1.550	0.408
	(0.200)	(0.151)	(0.634)	(6.171)	(0.980)	(0.301)
Type of first job and married interaction (public sector work*unmarried omit.)						
Private wage # Married		1.367		1.983		7.891*
		(0.361)		(1.094)		(7.092)
Non-wage # Married		0.914				7.422
		(0.351)				(7.630)
Type of first job and year before marriage interaction (public sector work*any year other than year before marriage omit.)						
Private wage # Year before marriage		5.102***		1.639		7.258
		(1.385)		(0.803)		(7.896)

	(1)	(2)	(3)	(4)	(5)	(6)
	Egypt		Jordan		Tunisia	
	spec. 1	spec. 2	spec. 1	spec. 2	spec. 1	spec. 2
Non-wage # Year before marriage		5.967***				11.837*
		(1.992)				(13.258)
Controls and baseline hazard included	Yes	Yes	Yes	Yes	Yes	Yes
N	13,572	13,572	3,909	3,852	2,669	2,669

Notes: (i) *p<0.05; **p<0.01; ***p<0.001 (ii) Standard errors in parentheses are clustered by the district of birth (Egypt), the sub-district of birth (Jordan), and the governorate of birth distinguished by urban or rural (Tunisia).

As an illustration of the marriage effects, we show the hazard of exit by the type of first job, distinguishing two profiles: those who never married and those who married after three years of work. As illustrated in Figure 6, the highest hazard of exit from work is observed in year 2, the year prior to marriage, if a woman started as a private wage worker. There is a similar but more attenuated exit pattern for non-wage work in Egypt and Tunisia. For those starting as public sector workers, marriage has only a small effect on the hazard of exit in all three countries.

Figure 6. The proportion of women exiting work (hazard) with each year since job start by country, type of first job, and marital status, ages 18-39



Source: Authors' calculations based on the estimates shown in Table 3.

Note: Bars indicate 95 percent confidence intervals.

4.3 Factors mediating the work and marriage relationship

We now turn to examining how women's domestic responsibilities may preclude working outside the home.[11] In MENA, working outside the home is only considered appropriate if women can continue fulfilling their domestic responsibilities (Hoodfar, 1997). To assess the time burden of domestic responsibilities, we compare in Figure 7 the hours of domestic, subsistence and market work for women aged 18 to 49 across different labor market and marital statuses. Domestic work, as previously defined, includes child and elder care as well as doing chores such as cooking and laundry. Across all three countries, domestic responsibilities do not appreciably decrease for women who are employed; this essentially means that women have to work a second shift once married in order to work outside the home.[12]

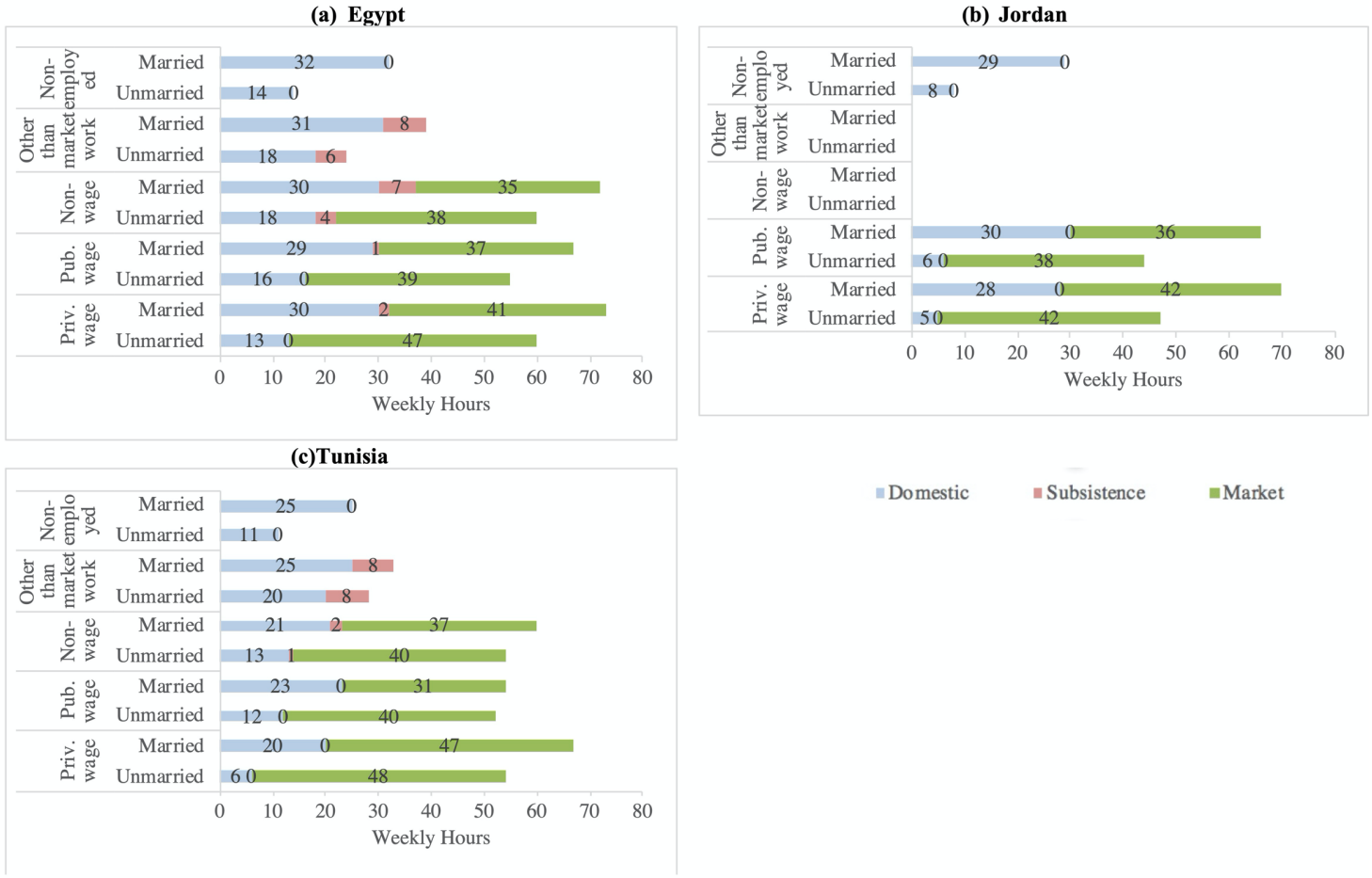
In Tunisia, the overall workload is lowest, with married women working 25 hours on domestic work if not employed, and 20-25 hours if employed. In Egypt, the domestic workload is similar for married women – 29-32 hours regardless of employment status. Likewise, in Jordan married women face a high domestic workload: 28-30 hours. The relatively lower domestic workload in Tunisia compared to Egypt and Jordan may explain some of the differences in women's employment rates in these three countries, which decline in line with increasing domestic responsibilities.

When women are unmarried, their hours of domestic work are moderate. For example, unmarried women who are not employed engage in 8-14 hours per week of domestic work across countries. Such domestic responsibilities are relatively more easily reconciled with market work, which ranges from an average of 42-48 hours across countries in private wage work to 38-

[11] See Assaad, Krafft, and Selwaness (2017) for additional analyses of potential mediators, including child care, maternity leave, the gender composition of workplaces, and commute times.
[12] Women engaged in other than market (i.e. subsistence) work have high hours of domestic work as well.

40 hours in the public sector. However, notably, even these hours of market work for unmarried working women are lower than is typically the case for men (Assaad & Krafft, 2015c). Subsistence work, for those who engage in it, averages relatively few hours, suggesting why it is more reconcilable with marriage. Market hours of work drop in most cases for married women. Together with our multivariate analysis, this suggests that women are working less on both the extensive and intensive margins, after marriage.

Figure 7. Hours of work (market, subsistence, domestic) per week by country, labor market status, and marital status, women aged 18-49



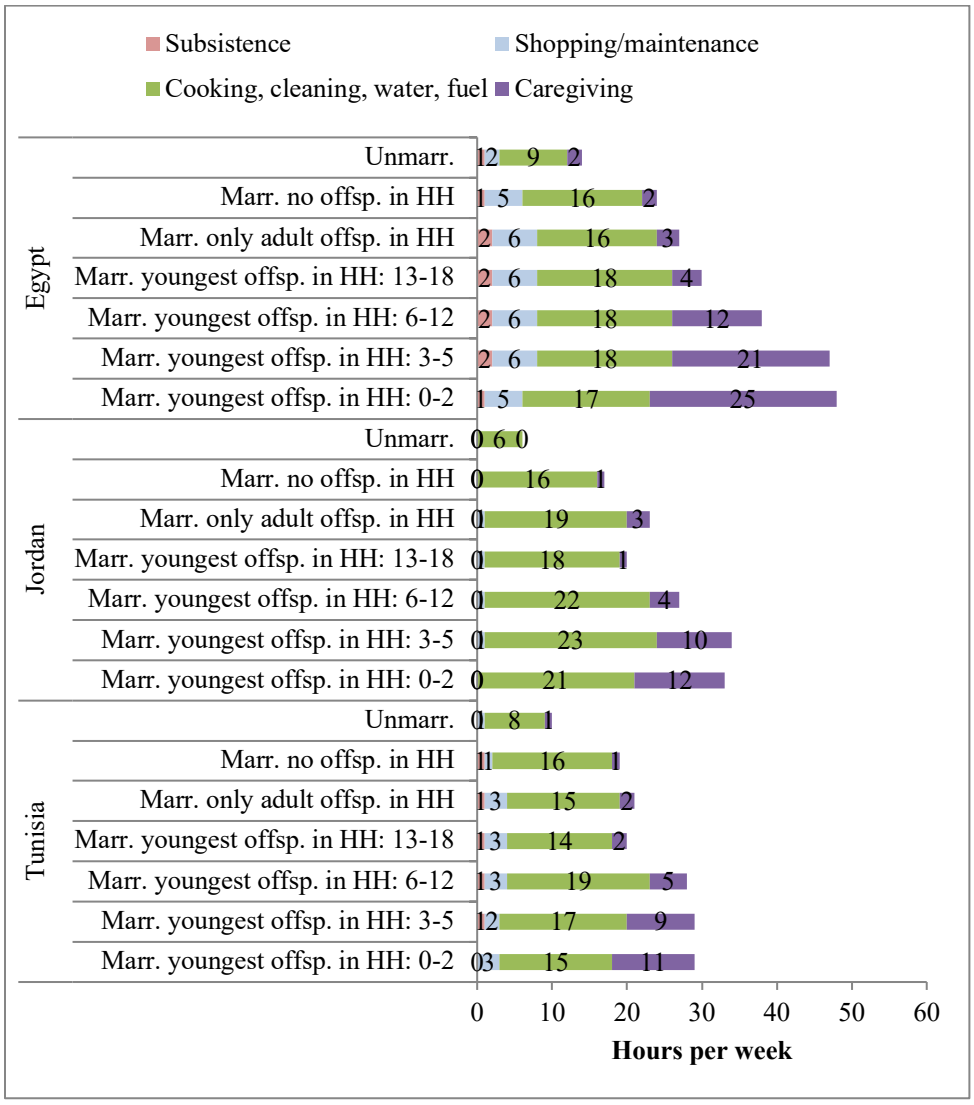
Source: Authors' calculations based on ELMPS 2012, JLMPS 2016, and TLMPS 2014

Notes: Other than market work and non-wage work suppressed in Jordan due to small sample sizes.

Domestic work related to caregiving may be a particular challenge for women with young children. Figure 8 explores the hours spent in subsistence work and domestic work, splitting domestic work into: (1) shopping/maintenance activities, (2) cooking, cleaning, water, and fuel, and (3) caregiving, by marital status and age of youngest child for women aged 18-49 (who responded to the fertility module of the questionnaire). The average hours per week of shopping and maintenance rises with marriage but then is relatively invariant to children's ages. Caregiving is greatest with an offspring 0-2 but also substantial with children ages 3-5 and then drops somewhat when children reach school age (six). Cooking and cleaning responsibilities are also highest with young children. These additional burdens with young children may in part explain why Tunisia, with a lower fertility rate, has lower domestic work burdens.[13]

[13] In these countries, employment of domestic help is very limited. Just 0.4 percent (in Egypt) and 0.5 percent (in Tunisia) and 5.6 percent of employment (in Jordan, including non-Jordanians) is in activities of households as employers (i.e. domestic help).

Figure 8. Hours spent in various types of subsistence and domestic work by marital status and age of youngest child, women aged 18-49

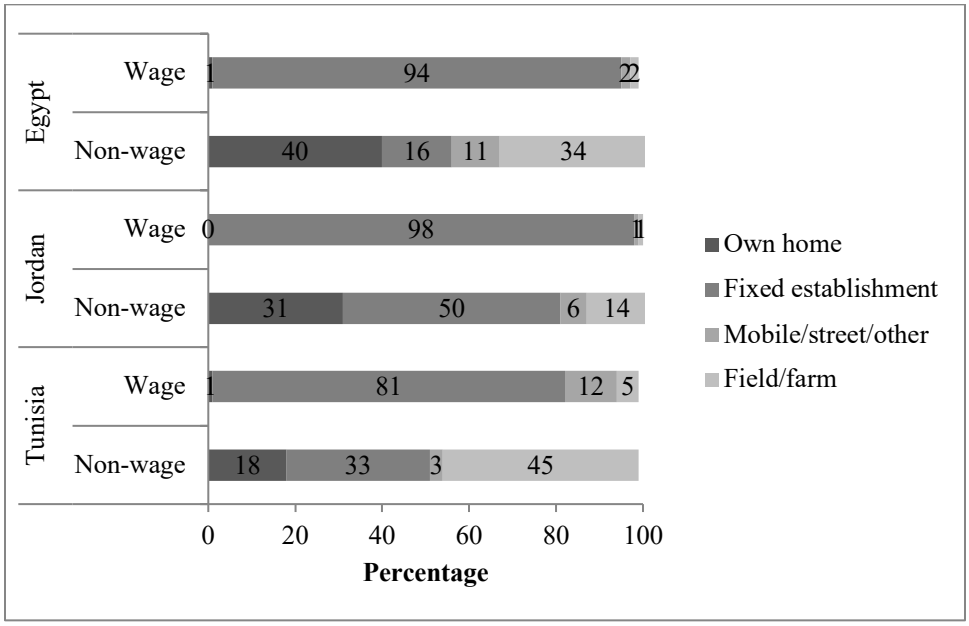


Source: Authors' calculations based on ELMPS 2012, JLMPS 2016, and TLMPS 2014

A further important dynamic relates to the location of work. Lengthy commute times are a particular challenge for married women, given their "second shift" at home, and limit women's engagement in market work (Assaad & Arntz, 2005; Ehab, 2018). Non-wage work may be appealing particularly because it is often co-located with the residence (e.g., a home-based business or family farm) (Hoodfar, 1997). Figure 9 shows the location of market work workplaces by country comparing wage and non-wage female workers aged 18-49 years. While

the vast majority (81-98 percent across the three countries) of wage workers work in an establishment, many non-wage workers work in their own homes or a field or farm (45 percent in Jordan, 63 percent in Tunisia, and 74 percent in Egypt), which may provide important proximity and flexibility and explain the rise in non-wage market work at marriage in Egypt and Tunisia.

Figure 9. Location of Market Work by Country and Wage Status, Employed (Market Definition), Women aged 18-49



Source: Authors' calculations based on ELMPS 2012, JLMPS 2016, and TLMPS 2014

5. Discussion and conclusions

We show in this paper that reconciling domestic and work responsibilities within marriage is an important factor in reducing women's ability to engage in market work. During the MENA region's state-led development stage in the post-independence era, educated women were readily able to access paid employment through the public sector. Public sector employment, with its shorter hours, more generous maternity benefits and childcare provisions,

was more reconcilable with women's domestic responsibilities within marriage. As MENA economies underwent restructuring in the 1980s and 1990s, employment opportunities in the public sector shrank (Assaad, 2014). While male new entrants increasingly found employment in the informal economy, female new entrants found such work to be highly inhospitable and increasingly withdrew from the labor force altogether. If they entered informal employment, it was often on a temporary basis, until they married (Assaad, Hendy, Lassassi, & Yassin, 2020).

Our objective in this paper was to examine the effect of marriage on various types of employment for women. While our aim is not to focus on the timing of marriage *per se*, because almost all women eventually marry, we explore the effects of relatively early marriage on work. An important contribution is our attempt to address the potential endogeneity of the timing of marriage in relation to employment, using instruments for the timing of marriage. Our results suggest that marrying by the median age affects the probability of work negatively in all three contexts. The biggest average effect on overall employment is found for Jordan and is mostly due to never entering employment in the first place in anticipation of marriage. In Tunisia and Egypt, the effect of marriage on current employment status is a combination of never entering and exiting work at marriage.

It also appears that the greater availability of non-wage work in Egypt and Tunisia is providing an alternative for women to remain employed after marriage. Wage work is more affected by marriage than overall work, more so in Tunisia and Jordan, followed by Egypt. In the case of Egypt, it is the greater albeit declining prevalence of public sector work (or the lower prevalence of private sector work prior to marriage) that is proving somewhat protective of women's continued ability to work after marriage. Participation in private wage work is most affected by marriage. Marrying by the median age reduces the probability of private wage work

by nearly 59 percent in Jordan, 54 percent in Tunisia and by about 40 percent in Egypt. It is important to keep in mind our results are based on women who were 22 (Egypt, 2012), 23 (Jordan, 2016) or 27 (Tunisia, 2014) to 39 years old. Our samples thus represent a specific generation of women; future changes in the economy and society could shift the relationship between work and marriage and are an important area for future research.

We also examine the effect of marriage on exiting work. We find that the effect of marriage on the hazard of work exit is largest for those who start in private wage employment compared to non-wage market work and public sector work. We also find that women leave work in the year prior to marriage at higher rates than at or during marriage, probably in anticipation of marriage. This result is in line with our descriptive statistics on the relationship between the timing of marriage and employment, showing that women in Egypt and Tunisia leave private wage employment at marriage and then the proportion in private wage employment stabilizes thereafter.

In exploring the factors mediating the marriage-employment relationship, we find that women's domestic workload within marriage plays an important role. Not only are these workloads much higher after marriage than before marriage, but they also vary little by employment status. Notably, the countries with the heaviest workloads for married women, Jordan and Egypt, are also the countries with the lowest women's employment rates. Married Tunisian women have substantially lower domestic work burdens than their counterparts in either Jordan or Egypt.

The social norms that make the "second shift" of caregiving the responsibility of women need to change to encourage men's involvement in domestic care responsibilities, and allow women to reconcile work outside the home and family life (Economic Research Forum & UN

Women, 2020; United Nations Development Program (UNDP), 2020). Recent research from Saudi Arabia (Bursztyn, Gonzalez, & Yanagizawa-Drott, 2020) and Jordan (Gauri, Rahman, & Sen, 2019) highlights that people substantially underestimate the social support for women's work, implying public information campaigns may shift perceptions and behaviors. Public information campaigns that emphasize fathers' roles in parenting and caregiving (UNICEF, 2009) can be an important complement to promoting women's work. Policies and laws can also shift norms. Tunisia's progressive legislative gender parity laws, passed in 2016, led to women occupying 47 percent of local council positions by 2018 (UN Women, 2018). In the long-term, these shifts in representation may shift perceptions and realities of women's roles.

Until equitable gender roles are realized, developing a paid care economy can provide an important opportunity to support women's work. Women need more publicly provided or subsidized high-quality childcare. Care provision must be offered for enough hours to be reconcilable with work (Krafft & Lassassi, 2020). Current policies that impose childcare requirements on employers that hire more than a certain number of women simply contribute to the reluctance of these employers to hire married women. Similarly, policies that force employers to bear the full cost of paid maternity leaves discourage employers from hiring married women. Jordan in 2010 introduced a policy change that shifts the cost of maternity leave to a maternity insurance scheme and away from employers (Brodmann, Jillson, & Hassan, 2014). Though the impact of this policy has not yet been evaluated, it is a step in the right direction in terms of adopting gender-neutral policies that eliminate gender-specific costs to employers.

Policies that encourage employers to provide part-time work, opportunities for job-sharing, and telecommuting could also go a long way in allowing women to reconcile their household responsibilities with their employment in the interim. By the same token, policies that

impose a fixed cost per worker, such as daily or monthly rather than hourly minimum wages, should be avoided. Finally, measures that expand markets and remove market obstacles for time-saving services such as prepared food, laundry services and childcare to reduce women's domestic burdens should be strongly promoted. Testing and evaluating such policies is an important area for future research.

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