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Explaining the MENA Paradox: Rising Educational Attainment, Yet Stagnant Female Labor Force Participation

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Abstract

BACKGROUND—Despite rapidly rising female educational attainment and the closing, if not reversal, of the gender gap in education, female labor force participation rates in the Middle East and North Africa (MENA) region remain low and stagnant. This is a phenomenon that has come to be known as the "MENA paradox". Even if increases in participation are observed, they are typically in the form of rising unemployment rather than employment.

METHODS—We use multinomial logit models estimated, by country, on annual labor force survey data for four MENA countries – Algeria, Egypt, Jordan and Tunisia – to simulate trends in female participation in different labor market states (public sector, private wage work, non-wage work, unemployment and non-participation) for married and unmarried women and men, of a given educational and age profile.

RESULTS—Our results confirm that the decline in the probability of public sector employment for educated women is associated with either an increase in unemployment or a decline in participation.

CONCLUSIONS—We argue that failure of employment rates to increase in line with women's rapidly rising educational attainment – the so-called MENA paradox -- can be primarily attributed to the change in opportunity structures facing educated women in the MENA region in the 2000s, rather than the supply-side factors traditionally emphasized in the literature to explain low female participation in MENA.

CONTRIBUTION—We argue that female labor force participation among educated women in four MENA countries – Algeria, Egypt, Jordan and Tunisia -- is constrained by adverse developments in the structure of employment opportunities on the demand side. Specifically, the contraction in public sector employment opportunities has not been made up by a commensurate increase in opportunities in the formal private sector, leading to increases in female unemployment or declines in participation.

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Keywords

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1. Introduction

Over the past four decades, countries in the Middle East and North Africa (MENA) region have made impressive strides in achieving gender parity in education (World Bank 2012). Since 1970, countries in the region have recorded the fastest progress in human development (United Nations Development Program 2010). According to the World Bank report (2012), five MENA countries (Oman, Saudi Arabia, Tunisia, Algeria and Morocco) were among the top 10 fastest movers over this period. The region as a whole is close to achieving gender parity in primary and secondary enrollment rates, comparing favorably to Low and Middle Income (LMI) countries worldwide.

Paradoxically, these considerable investments in human capital have not been matched by increases in women's economic participation (World Economic Forum 2016). Recent data illustrates that the MENA region continues to rank the lowest, globally, in terms of women's economic participation and opportunity (World Economic Forum 2012). While more than 50 percent of the female population, aged 15 and above, participates in the labor force in Sub-Saharan Africa, East Asia and the Pacific, Europe and Central Asia, and Latin America and the Caribbean, the corresponding figure in MENA is only 20percent. Only South Asia comes close at a rate of 26 percent.[5] Rates of Female Labor Force Participation (FLFP)are low throughout the region with almost all MENA countries having participation rates below the LMI average (World Bank 2012). The disconnect between rising educational attainment and low and stagnant rates of economic participation has been dubbed by the World Bank as the "MENA paradox" (World Bank 2013).

While the literature on FLFP in MENA has emphasized supply-side factors, such as conservative gender norms and heavy domestic work burdens, as limiting female participation in the region, we argue that the failure of participation to increase with educational attainment is due to adverse developments on the demand side of the labor market rather than to changes in these supply-side factors. If anything, supply-side factors, such as age at marriage, fertility and even patriarchal gender norms have evolved in a direction that is conducive to greater participation among educated women.[6] The main change on the demand side, which is common to most countries in the region, is the substantial slowdown in public sector hiring. The public sector has been the main source of employment for educated workers, and especially educated women, in MENA for a long time (Assaad 2014; Yassin and Langot 2018). Our results show that the dramatic slowdown in the hiring of educated women (and men) by the public sector has not been counterbalanced by a commensurate increase in employment opportunities in the formal

[5]All global comparisons of participation rates are based on ILO modelled estimates for 2018 (ILO 2019).
[6]See Assaad and Krafft (2015); Salem (2012, 2015); Assaad, Krafft, and Selwaness (2017); Assaad, Ghazouani, and Krafft (2016); Krafft (2020) for evidence relating to delayed marriage and falling long-run fertility.

private sector. This is in line with the theoretical findings of Yassin and Langot (2018). Neither informal private employment nor non-wage employment have constituted viable options for educated women in MENA, leaving unemployment and non-participation as the remaining options.

Previous work has shown that different types of work are differentially accessible to women in MENA countries depending on the stage they are in in their life course and the education levels they have achieved (Nazier and Ramadan 2018; Hendy 2015b, 2011, 2020; Assaad and El-Hamidi 2001, 2009; Assaad, Hendy, and Yassine 2014). Specifically, less educated women tend to have limited access to wage work and are often confined to home-based self-employment or unpaid family work, if they participate in the labor force at all. Educated married women strongly prefer work in the public sector because of its shorter hours and generous maternity and family leave policies, and they generally shun work in the private sector, especially when such work is informal. Unmarried women can sometimes engage in private sector wage work, but often quit that work upon marriage(Hendy 2015a, 2015b; Assaad, Krafft, and Selwaness 2017). This means that while informal wage work is the fallback position for men who are unable to obtain work in the formal sector, waiting in the unemployment queue or non-participation is typically the fallback position for women.

In examining FLFP over time in MENA, it is therefore essential to distinguish between different types of work, control for marital status and educational attainment, and account for urban and rural differences. Controlling for compositional shifts in the population is critical to being able to distinguish underlying trends driving participation from compositional effects. This is precisely what we attempt to do in this paper for four MENA countries --Algeria, Egypt, Jordan and Tunisia -- for which multiple cross-sections of microdata from official labor force surveys have recently become available. We begin by documenting the very rapid increase in educational attainment in these countries and the closing of the gender gap in education. Despite the narrowing or even reversal of the gender gap in education, we show that the trend in female participation is stagnant and, where it is rising, the increase is coming entirely from an increase in female unemployment rather than employment.

To analyze the trends in participation in various types of work corrected for compositional shifts in the population, we estimate annual multinomial logit models, separately for each country and for never married and married women and men. We relate the probability of participation in different types of employment, namely public sector work, private wage work, and private non-wage work, as well as the two non-employment states, unemployment and out of the labor force, to individual characteristics, such as educational attainment, age, urban/rural location and region. Using these annual models, we simulate the probability of participation in each of these 5 states in each country over time for individuals with a reference profile, namely a married and a never married 30-year old female or male university graduate.

Our results confirm that the predicted probability of participation is indeed decreasing for married and never married university-educated women in Algeria and Jordan. Overall participation exhibits no clear time trend in Egypt, but is rising in Tunisia. The probability of

participating in public sector employment is declining in all four countries, although the decline has been slower in Algeria until recently. This decline is not being compensated for by increases in the probability of private wage employment, which is a limited option for married women anyway. Probabilities of private wage employment are either increasing slightly, stagnant, or even declining in recent years. The probabilities of non-wage employment for educated women are quite low, well below 3 percent in all four countries, suggesting that non-wage employment is not much of an option for university-educated women. Unemployment is the only component of participation that appears to be rising consistently for university-educated women in three of the four countries studied here. In fact, in Tunisia, the increase in the probability of unemployment more than makes up for the increase in participation observed there. In Jordan, where unemployment has been stable in recent years, participation has been falling steadily. In short, our findings show that employment opportunity structures have been contracting significantly for educated women in the four MENA countries in question. The loss of employment opportunities in the public sector has not been made up by a commensurate increase in the private sector resulting in either an increase in unemployment or a reduction in participation.

The rest of the paper is organized as follows. In Section 2, we review the existing literature on FLFP in the MENA region identifying the relevant gaps in the literature. Section 3 describes the data sources and methods adopted in our analysis. Section 4 discusses the descriptive results to contextualize and motivate our analyses. Section 5 presents our empirical results and simulations and section 6 concludes.

2. Literature Review

The literature on FLFP documents important differences in trends between developed and developing countries. Specifically, a sharp rise over the past two decades in participation in most countries of the the Organisation for Economic Co-operation and Development (OECD) and, a slow increase, if not a stagnant trend, in many developing countries(Thévenon 2013; Verick 2014). Many studies link FLFP to economic growth, poverty reduction and economic strengthening (Verick 2014), cultural or societal factors (Olsen and Mehta 2006; Neff, Sen, and Kling 2012), income level of spouse, expected nominal wage, and fertility decisions (Klasen and Pieters 2012), advancement in household technologies (Greenwood, Seshadri, and Yorukoglu 2005),declines in childcare costs (Attanasio, Low, and Sánchez-Marcos 2008) and, medical services improvement (Goldin and Katz 2002; Albanesi and Olivetti 2016).

The studies on the MENA region attribute the observed low FLFP to two main reasons: ‘conservative social/gender norms’ and ‘religiosity’(Clark, Ramsey, and Adler 1991; Inglehart and Norris 2003). Spierings (2014) attributes the low level of women’s employment in Muslim countries to patriarchy, concluding that differences among countries adopting different strands of Islam are actually more important than differences between Islamic and Christian countries in general. Comparing migrants from different regions of Turkey, Guner and Uysal (2014) find that migrants from provinces with a higher share of religious party votes exhibit lower labor supply behavior. Similarily, Glas, Spierings, and Scheepers (2018)find that the salience of religion in daily life raises women’s attitudes

towards gender equality. This study finds that "religious socialization is multifaceted and gendered, and that certain men and women are inclined and equipped to deviate from dominant patriarchal religious interpretations" (Glas, Spierings, and Scheepers 2018).

Other authors have emphasized the role of customs and traditions- such as the primacy of the family or domestic sphere in women's lives-over that of Islam(Miles 2002; World Bank 2004; Verme, Barry, and Guennouni 2016). More recently, using data from the World Values Survey, Diwan and Vartanova (2017) found that differences in women's education, personal values, and country norms relating to patriarchy explain most of the regional variations in FLFP around the world. Other researchers have explored the role that conservatism plays in shaping the low FLFP rate in MENA, namely in Turkey (Göksel 2013; Dildar 2015). The findings of Gündüz-Hoşgör and Smits (2008) support the U-shaped curve hypothesis, which suggests that increasing modernization leads to a fall followed by a rise in female employment. Göksel (2013) finds that both urbanization and education play important roles and that religiosity and social norms have a negative effect on participation in urban areas, but not in rural areas. Similarly, Dildar (2015) considered cultural constraints such as the sexual division of labor within the household and the gender ideology and found similar results. Interestingly, Ilkkaracan (2012)argues that weak macroeconomic growth and the absence of a strong pull on the demand side in Turkey did not pose a sufficient challenge to the male breadwinner model and the traditional gender division of labor. She further argues that the absence of legal or institutional work-family reconciliation mechanisms and the pervasiveness of informal jobs, which are generally unattractive to women, have also contributed to the perpetuation of the traditional gender division of labor. Recent studies use the "identity economics" approach of Akerlof and Kranton (2009) to argue that women from traditional families in the region breach their identities when taking on employment outside the home and that this identity-which is shaped by Islam and cultural traditions-significantly affects women's labor market decisions (Hayo and Caris 2013). Finally, in a comprehensive study of the determinants of women's employment in six Arab countries, Spierings, Smits, and Verloo (2010) found that care duties and traditionalism play an important role at the micro level and that economic development and societal norms mattered at the macro (district) level.

In spite of restrictive gender norms in the MENA region, women and particularly educated ones, aspire to be employed, irrespective of marital status. In a 2010 World Bank survey of Jordanian female community college graduates entering the workforce, 92 percent said they planned to work after graduation and 76 percent said they expect to be working full time(Groh et al. 2016). This is consistent with attitudes reflected in the World Values Survey where 80 percent of women in Egypt and Jordan disagreed with the statements that "A woman with a full time job cannot be a good mother" and that "Having a full-time job interferes with a woman's ability to have a good life with her husband" (World Bank 2010). The important role of education in female participation in the labor force has been highlighted in a number of studies. Analyzing the relationship between education and employment in a large number of countries, Bussemakers et al. (2017) find that education attainment makes more of a difference in participation in countries with conservative gender norms and in countries where service sector jobs are relatively more scarce. In analyzing micro-level evidence from eight developing countries, Klasen et al. (2019) find different

shapes of the education participation relationship. The relationship is positive and linear for Brazil and South Africa. For countries most similar to ours in terms of gender norms (India, Indonesia and Jordan), they find a U- or J-shaped relationship, suggesting that participation takes off after a certain educational threshold is reached. Our concern in this paper is not so much how participation relates to education, but how this relationship has changed over time in MENA.

Within the MENA region, it is important to distinguish between oil and non-oil economies. Some authors such as Karshenas and Moghadam (2001), Moghadam (2004a) and Moghadam (2004b) have studied the role of oil and oil-related revenues in perpetuating conservative social norms as a way to explain the specificity of the MENA economies and, they found that income from oil-related revenues typically flows into the hands of male heads of households, which perpetuates the traditional male breadwinner/female homemaker model. This patriarchal culture is also important in explaining gender outcomes in the region including labor market behavior (Moghadam 2004b). On a similar basis, Ross (2008) confirms the idea that oil rather than Islam is the main cause for low FLFP in the oil producing countries of the MENA region. Similarly, Esfahani and Bahramitash (2015) explain that the flow of financial resources from oil rents tends to enable women to be self-employed and open their own firms and, that customs and traditions are behind the low FLFP, and not Islam. In contrast, Groh and Rothschild (2012) re-examine Ross' data and find that Islam is more influential than oil when it comes to the low FLFP in MENA.

The literature on MENA has also looked at linking FLFP to trade patterns and particularly exports. Başlevent and Onaran (2004)analyze the effect export-orientated growth on FLFP in urban Turkey and controlled for supply-side as well as demand-side factors to find that although long-term economic growth positively impacts employment and participation at the province level, export-orientation has a weaker impact, but is more important for the participation of unmarried women.

The literature we reviewed has mainly been concerned with explaining the relative level of participation in different parts of the world and its determinants, but not so much with the trend of participation over time in a given context. The arguments about the role of patriarchal culture, religion and oil are solely based on cross-sectional variation across countries rather than changes over time. Because microdata from comparable surveys in multiple years has been hitherto unavailable, much of the discussion of trends in the literature relies on aggregate data (cf. Tansel 2002; Tsani et al. 2013). A recent study that makes use of microdata (namely the Egypt Labor Market Panel Surveys of 1998, 2006 and 2012) for these purposes is Hendy (2015b). The latter shows that participation has declined over time for educated women and that much of this decline is due to the declining participation of married women. Chapman (2015)examines how economic development in the MENA region has affected FLFP using a panel dataset of 20 different countries and over the time span 1990-2012. She bases her analysis on the U-shape hypothesis and finds that the low labor force participation of women in the region can be explained in part by the country's economic phase resulting in a transition towards the bottom of the U-shaped curve. Fallah et al. (2019) analyze the effects of labor demand shocks on the labor force participation trends of Palestinian women.

We aim to contribute to this literature by highlighting the role of changes in opportunity structures, as economies transition away from public sector employment, in hindering the increase in FLFP expected from improved levels of educational attainment among women.

3. Data and Methods

We compiled and harmonized microdata from official labor force surveys in four countries, namely Egypt, Jordan, Algeria and Tunisia, spanning the period from 2000 to 2017.[7] The longest series of surveys is available for Egypt where we have Labor Force Surveys (LFS) covering the time period from 2000 to 2017 (Central Agency for Public Mobilization Statistics (CAPMAS) various years and the Open Access Micro Data Initiative (OAMDI) 2018 of the Economic Research Forum).For Jordan, we have data from the Employment and Unemployment Surveys(EUS)for 2000 to 2016, with the exception of 2004, (Department of Statistics (DoS) various years and OAMDI 2017). For Algeria, we have data from the Household Survey on Employment for 2001 to 2007 and 2010 (National Statistical Office (ONS) various years). Finally, for Tunisia, we have data from the National Survey of Population and Employment for 2005 to 2008 and 2010 to 2013 (National Institute of Statistics (INS) various years and OAMDI 2016). Because the data sets are all from official labor force surveys, which apply the recommendation of the international conferences of labor statisticians, they use similar definitions of labor market states and are reasonably comparable to each other.[8]

We define labor force participation as those who are either employed or seeking employment (the unemployed) out of the working age population 15-64. As proposed by the 19thInternational Conference of Labor Statisticians, employment is defined as work for pay or profit, which does not include either subsistence work or domestic chores (ILO 2013). We further sub-divide the employed in three labor markets statuses, namely public sector employment (which includes government and public enterprise employment), private sector wage work (which includes both formal and informal wage work)[9], non-wage work (which includes self-employment and unpaid family work, as well as a small number of employers). Therefore, we estimate a series of annual multinomial logit models on a polychotomous outcome variable indicating these three employment states, and two non-employment statuses, namely unemployment and non-participation. We estimate separate models for never married and currently married males and females between the ages of 18 and 59. The explanatory variables we include in these models are age and age squared, own education (four categories), region (including the urban-rural distinction), dummy variables indicating the presence in the household of children under two years of age, between 3 and 5 years old, between 6 and 11 years old, and the presence of boys and girls of age between 12 and 17.[10]

[7]Unlike Hendy (2015b), we use the official labor force surveys and not the labor market panel surveys (ELMPS, TLMPS and JLMPS), to obtain the longest possible time series for each of the three countries and also to ensure comparability with Algeria, for which only the official labor force surveys are available.

[8]An exception to this was the fact that some surveys distinguished between formal and informal employment and some did not. We therefore refrained from making the distinction between formal and informal wage employment that we used in the descriptive discussion above in our multivariate analysis.

[9]Informal wage work is defined by the absence of both a contract and a social insurance associated with the occupied job.

[10]The four educational levels are “no certificate”, “lower secondary”, which includes primary and lower secondary, “secondary and post-secondary”, which includes upper secondary and post-secondary education up to 2 years after the secondary stage, and “university” which includes post-secondary education of three or more years.

We also include controls for the presence in the household of individuals who work in the public sector, in the private sector for wages, or as non-wage workers, other than the individual him or herself.[11]

Because we estimate separate equations for never married and currently married individuals, we attempt to make the two samples as observationally similar as possible by using propensity score weighting.[12]We estimate separate probit equations for being married for females and males by year and use these equations to predict propensity scores for being married. We use these propensity scores to create weights to apply to our multinomial logit models based on these propensity scores.[13]The propensity score weights are designed to give married individuals with a low (high) propensity to be married a high (low) weight and, conversely, never married individuals with a high (low) propensity to marry a high (low) weight, thus making the two samples more observationally similar. The regressors used in the probit equations are age and age squared, education (in four levels), region including urban/rural distinctions, and variables indicating the proportion married in the individual's province of residence by age18, and by ages 19 to 21, 22 to 24, 25-27, 28-30, 31 to 35, and older than 36. These variables are calculated separately for males and females (see Table A.2. in the online Appendix).

The estimates from the propensity-score weighed multinomial logit models are then used to simulate the probability of participation in each labor market state in each country in each year separately for a never-married and a currently married reference woman and man who are university-educated, live in an urban area in the region that includes the capital (Greater Cairo in Egypt, the urban part of the Central region in Jordan, the urban part of the North-Central region in Algeria, and urban Greater Tunis in Tunisia). We also compute 95 percent confidence intervals around these simulated probabilities. We use these over-time estimates to compare the trends of participation in each labor market state across the four countries. Finally, to assess the robustness of our results and conclusions, we carry out sensitivity analyses to changing the age and education profile of the reference individual upon which the simulations of the probability of participation in the different labor market states in each country in each year are based. We also test the sensitivity of our results to the inclusion of the propensity score weights.

4. Rising Educational Attainment but Stagnant Participation: A Paradoxical Trend

We start this section by examining the substantial progress made in the four countries under consideration in terms of educational attainment and the essential closing if not the reversal of the gender gap. First, we examine the distribution of the female and male population over the age of 25 by educational attainment in 1980, 1995 and 2010 in all four countries as

[11]We exclude these household composition variables from the male participation equation.
[12]We exclude previously married individuals (divorced and widowed) from our sample. They are likely to be sufficiently different from either never married or currently married individuals in terms of labor market behavior, but their numbers were not sufficiently large to warrant separate estimation.
[13]If the predicted propensity score for being currently married is p, the weight is calculated as 1/p if the individual is married and 1/(1-p) if the individual is never married. The propensity scores are winsorized at 0.05 and 0.95 before creating the weights to avoid creating excessively high weights.

ascertained by the Barro and Lee educational attainment in the world dataset (Barro and Lee 2013). As shown in Table 1, the proportion of women aged 25 and above with less than secondary education has fallen substantially in all four countries. The most substantial decline was in Jordan, where it decreased from 89 percent in 1980 to 39 percent in 2010, followed by Egypt, then Tunisia and Algeria. Similar declines were observed for men, so that the stock of women aged 25 and above with less than secondary education still exceeds that of men in all four countries. The increase in those with secondary and tertiary educational attainments was also substantial. The proportion of women aged 25 and above with secondary education increased seven fold in Jordan, six-fold in Egypt, and more than four-fold in both Algeria and Tunisia from 1980 to 2010. The proportion of those with tertiary education increased from nearly zero to double digits over the same period, except in Egypt, where it went from 1percentto 7 percent. Women aged 25 and above have achieved parity with men in tertiary education in Algeria and are approaching parity in the other three countries.

The rise in women's educational attainment and the closing if not reversing of the gender gap is even more apparent when we focus on younger generations. Figure 1 shows the proportion of individuals attaining an above secondary and a secondary (but less than above secondary) level of education by year of birth and sex in the four countries under consideration. It is notable that in all four countries, the proportion of women with above secondary education among younger generations has already exceeded the proportion of men at that level of educational attainment. Again, this happened fairly early in Jordan (by the 1970 birth cohort). By the 1985 birth cohort, nearly 40percent of Jordanian women had a post-secondary education, compared to about 30 percent of men. Again, Algeria came next with the proportion of post-secondary women exceeding that of men prior to the 1980 birth cohort. However, the fastest gains in the proportion of post-secondary graduates among recent cohorts have been in Tunisia, where this proportion has reached 33 percent among women and only 23 percent among men born around 1989. Gender parity in the proportion of post-secondary graduates was reached most recently in Egypt, where nearly 28 percent of the 1987 cohort of women have post-secondary education as compared to about 26 percent of men.

Given the strong positive relationship between female education and FLFP (Chamlou, Muzi, and Ahmed 2011), the expectation was that such rapid increases in educational attainment would translate into rapid increases in female participation. This has not been the case, however. Figure 2 shows the trend in male and female labor force participation in each of the four countries from the early 2000s to the latest date available in our data.[14] Note that the MENA region as a whole went through substantial political turmoil associated with the Arab Spring uprisings that started in late 2010. This turmoil has significantly affected the Egyptian, Jordanian and Tunisian economies, both through direct disruptions as well as through the effects of neighboring country conflicts.[15]

[14]We fit a linear trend line to the data. For Egypt and Jordan, we fit separate linear trendlines prior to and after 2007 because in both instances there were methodological changes in the measurement of participation that resulted in one time changes in the level.
[15]To learn more about the effects of the Arab Spring on these economies please refer to Assaad and Krafft (2015b), Assaad and Boughzala (2018) and Krafft and Assaad (2019).

Married male participation is almost universal and flat in three of the four countries and is lower and declining slightly in Jordan, where male participation rates are among the lowest in the world (Assaad, Krafft, and Keo 2019). The participation of never married men is lower and declining slightly in all countries except Tunisia, probably a reflection of increasing educational enrollments. Among never married women, the trend in participation is increasing slightly in Algeria, is almost completely flat in Jordan and Tunisia, and is declining in Egypt at least since 2007. Participation rates among currently married women are not only lower, but also exhibit flat trends in Algeria, Egypt and Jordan and a slightly declining trend in Tunisia.

An analysis of labor market participation by educational attainment shows that although participation increases strongly with education for women, the relationship with education is weakening over time. As shown in Figure A.1 in the online appendix, participation rates for secondary and tertiary educated women are either declining over time (the case for Algeria and Egypt), and, where they are almost flat, unemployment rates among educated women are rising sharply. These trends suggest that the opportunity structures for educated women in all four countries has deteriorated markedly in the past two decades; a trend that shows up as either declining participation or increasing unemployment.

To further investigate this hypothesis, we examine the labor market structure facing educated new entrants in all four countries since the mid 1980s. We do this by looking at the type of jobs educated new entrants obtained by their year of entry into employment, exploiting retrospective data on the characteristics of first jobs from various surveys.[16] We do this for all new entrants with secondary education and above, separately for males and females.[17] As shown in Figure 3, the proportion of both males and females with secondary education and above in all four countries that obtained public sector employment as their first job was very high in the mid 1980s and has tended to decline since then. In Algeria, Jordan and Tunisia, it was over 60 percent in 1985 and declined to just over 40 percent in the mid 2000's. Since then, it increased slightly in Algeria, declined a little further in Jordan and then stabilized, and declined and then recovered after 2010 in Tunisia. In Egypt, the proportion of educated male workers taking government jobs as their first job had already declined to 45 percent by 1985 and continued to decline sharply thereafter to reach just over 10 percent by 2015.

Educated female workers were even more dependent on public sector employment in all four countries in the mid 1980s. The proportion who obtained a public sector job as their first jobs was 60 to 70 percent in Jordan and Tunisia and as high as 80 to 90 percent in Egypt and Algeria. Again, this proportion fell more or less steadily in all four countries thorough the early 2000s. It then stabilized somewhat in Algeria, Egypt and Jordan through the early 2010's but continued to decline in Tunisia. By 2015, the proportion of educated female new entrants getting public sector jobs (among those receiving any kind of employment) had fallen to 10 percent in Tunisia, 35 to 40 percent in Egypt and Jordan, but remained fairly high at nearly 65 percent in Algeria.

[16]Given the low rates of job-to-job mobility, first jobs are generally a good indicator of future job opportunities in MENA (Yassine 2015; Assaad, Krafft, and Yassin 2017; Yassin 2013).

[17]Although are simulation are for university graduates, we use secondary and above in thee graphs because the sample size would be too small otherwise to get reliable trends from retrospective data on first jobs.

Private formal wage employment has taken up only a limited portion of the slack created by the decline in public employment for educated new entrants in all four countries. Whereas the share of public sector employment fell by 30 percentage points (p.p.) for educated male new entrants in Egyt from 1985 to 2015, the share of formal private wage employment increased by less than 10 p.p. during the same period. Similarly a 20 p.p. decline in public sector employment in Algeria was met by hardly any increase in the share of private formal wage employment. The share of private formal wage employment increased more in Jordan and Tunisia, but is still only making up for about half of the decline in the share of public sector employment. The main option left for educated male new entrants was informal wage employment as shown in the third row of Figure 3.[18] The share of such employment increased substantially in all four countries.

While men in MENA must eventually find some kind of employment, women have the option of staying out of the workforce in order to avoid taking up low-quality jobs in the informal economy. As shown in Figure 3, the share of formal private wage employment increases more among educated female new entrants than their male counterparts over time, especially in Jordan and Tunisia. The share of informal wage employment among female new entrants increased substantially in Egypt and, more recently, in Algeria and Tunisia, but from very low initial levels.

The preceding analysis has clearly shown that the economic restructuring that occurred away from public sector employment in all four countries did not succeed in creating sufficient formal private sector jobs to compensate for the decline in public employment opportunities. The resulting growth of informality created an adverse labor market environment for educated women, many of whom preferred to either remain unemployed or completely withdraw from the labor force altogether rather than take up an informal employment. There were clear variations in this pattern among the four countries. Algeria experienced less of a decline in public sector employment opportunities than the other countries, and was even able to increase the share of such employment somewhat in recent years. Jordan and Tunisia were much more successful than Egypt in creating opportunities in the formal private sector, even though these opportunities were not sufficient to absorb all the educated new entrants no longer being accommodated in the public sector.

5. Simulation Results on Participation Trends by Type of Employment

As indicated in the methods section, we estimated a series of propensity-score weighted annual multinomial logit models by country, sex and marital status on a polychotomous outcome variables that has five states: (i) public sector employment, (ii) private wage employment, (iii) non-wage employment, (iv) unemployment, and (v) non-participation.[19] We then use these models to undertake simulations of the probability of participating in each of these states by year and country separately for never married and currently married

[18]The final option not shown here, non-wage employment, is relatively limited among educated new entrants and has only changed slightly over time.

[19]We are unable to distinguish in our multivariate analysis between formal and informal private wage employment because a number of the surveys we use do not include information about either social insurance coverage or the presence of written contracts, the variables needed to identify informal employment.

women and men of a given profile, as a way to correct for compositional differences in the working age population. The profile we simulate for is a 30-year old university graduate who lives in an urban area in the region of her/his country that includes the capital city. We conduct sensitivity analyses in Section 6that alter this profile by changing the age to 20 and 25 and changing the reference education level to secondary rather than university.

Illustrative results from the multinomial logit models for the year 2010 by country are shown in Table A.1 in the online Appendix. The simulations themselves are presented graphically in two ways. First, we show separate results for each country and each labor market state, together with the 95 percent confidence intervals around our estimates in Figure 4. We also fit four-period median splines through the estimates to smooth the trend over time. Figure 5 shows the results of the simulation for all four countries on the same chart to facilitate comparisons. In Appendix Table A.3, we report t-statistics for tests of differences in the predicted probabilities across the first and the last year, the middle to last year and the first to middle year in our time series for each country to determine whether there is in fact a significant trend over time.

We start with a country-by-country discussion of the simulation results, after which we compare trends across the four countries. As shown in Panel A ofFigure 4, the probability of government employment for university–educated women in Algeria was quite stable from 2001 to 2010. The t-tests shown in Appendix Table A.3 show a significant decrease in the probability of government employment for never married women but no significant trends for currently married women in Algeria. In contrast, the probability of public sector work increased for never married men and declined for married ones. The probability of private wage work has generally been low for female university graduates in Algeria, especially if they are married. It has increased slightly in the mid-2000s, but the trend has flattened again in recent years. The t-tests show a mildly significant increase (at the 10 percent level) across the first and last year for never married women, but not across other sub-periods and not for married women. The probability of private sector wage work has increased for men, whether never married or currently married. The probability of non-wage work is low for both female and male university graduates in Algeria. Nonetheless, the t-tests show significant increases in this probability in the second half of the period for both never-married and married women and in the first half for never-married ones. After an initial decline, the probability of unemployment in Algeria increased for university-educated women, which is in contrast to men, where it continued to decline across the entire period. The t-tests show a significant decline for never married and married men across the entire period, which is primarily due to the decline in the first half of the period. The probability of inactivity increased in the first half of the period for both never married and married women. The trend in inactivity was declining or flat in the second half, but t-tests show a significant increase over the entire period, driven primarily by the early increases.

The results for Egypt are shown in Panel B ofFigure 4.[20] Unlike Algeria, Egypt has experienced a slow declining trend in the probability of public sector employment for the

[20]Note that we break the median spline in 2007 to reflect the change in data collection methodologies that occurred in Egypt at that point in time.

reference university-educated woman and man throughout the 17-year period for which we have data. This declining trend is significant for both never married and currently married women. Men have experienced a similar decline in the probability of public sector employment in Egypt, showing that it was driven by overall changes in the structure of employment rather than gender-specific trends. The probability of private wage work increased substantially and significantly for both never married and currently married women in Egypt. It increased for men as well in the first half of the period and then flattened thereafter. Like in Algeria, the probability of non-wage work for female university graduates in Egypt is very low. T-tests show a significant decrease in this probability for both never married and currently married women in the first half of the period and an increase only for the never married ones in the second half of the period but, overall, the levels are very low and fluctuating. For men, the probability of nonwage work was higher for married men and fairly flat for all men over the entire period. The probability of unemployment rose significantly for both never married and currently married women in Egypt in the first half of the period and for the currently married ones in the second half, only to decline slightly in recent years. Married men are almost never unemployed in Egypt and the trend for never married men was relatively flat. Finally, the probability of inactivity showed considerable fluctuations in trend over the period under consideration. The t-tests show that this probability increased significantly for never married women over the whole period. For men, inactivity rates were low throughout the period.

Like in Egypt, university-educated women in Jordan have experienced a sharp decline in the probability of public sector employment in the period under consideration. As shown in Panel C ofFigure 4, the probability of public sector employment for the reference never married and currently married woman in Jordan declined sharply from 2000 to 2016.[21] The decline is highly significant for both sub-periods and for both never married and currently married women. In contrast, the probability of public sector work among men in Jordan remained relatively flat throughout most of the period, with the exception of a slight declining trend since 2010 for never married men. Private sector wage work did increase somewhat in Jordan for never-married women, but is far from making up for the decline in public sector employment. The increase in such work is particularly significant in the second half of the period. The increasing trend for both never married and married women in Jordan is substantially sharper than that for men. Again, the probability of non-wage work is very low in Jordan and generally exhibits a declining trend, which is statistically significant for never married women over the entire period. University-educated men in Jordan also appear to have a declining trend in non-wage work. There was a significant increase in the probability of unemployment in Jordan in the first half of the 2000s, especially for never married women. This increase reversed for a few years, but then resumed since 2010. Currently married women show similar trends, but a lower level of unemploment. Never married men also experienced a similar trend in unemployment but their fluctuations are less pronounced than for women. Like in Egypt, married men in Jordan have very low unemployment rates.

[21]We break the spline in 2007 in Jordan to reflect the change in data collection methodology that occurred at that point in time.

The most notable pattern in Jordan is the secular increase in the probability of inactivity for both never married and currently married women throughout the period under consideration. The increase in the probability of inactivity is only significant, however, for currently married women, over the first half of the period and over the whole period. Thus, the reduction of opportunities in the public sector in Jordan has primarily manifested itself in a reduction in participation for educated married women rather than a secular increase in unemployment, with the possible exception of the years since 2010, where unemployment has increased.

Similarly to Jordan and Egypt, Tunisian university-educated women experienced a sharp decline in the probability of public sector employment, which was nearly halved over the course of 8 years (2005-2013) for both never married and currently married women. The decline in public sector employment is statistically significant for both groups and across both sub-periods. Never married men experienced a similar decline in the probability of public sector employment, but the decline was more muted among married men, especially in recent years. The probability of private wage work initially increased in Tunisia for all four groups under consideration, but the trend reversed right at the time of the 2010 revolution. Even prior to the negative shock of the revolution, its increase was insufficient to make up even a fraction of the decline in public sector employment. Statistical tests confirm a significant increase in private wage work for both never married and currently married women in the first half of the period but a significant decline for both groups in the second half. Over the entire period under consideration, the probability of private wage work increased significantly for never married women but declined for the currently married ones.

Non-wage work in Tunisia exhibits contradictory trends. In the first half, there is a strong declining trend for never married women but an increasing trend for the currently married ones. In the second half, the trend is strongly declining for both groups of women. The negative shocks to both wage and non-wage employment associated with the 2010 revolution manifested themselves as sharp increases in the probability of unemployment in Tunisia. Unemployment had been increasing prior to the revolution for never married women, but the increase accelerated after 2010. Unemployment was on a slight downward trend prior to the revolution for currently married women and reverted to a sharply increasing trend after 2010. Never married men saw a steady increase in unemployment throughout the period but did not see the same acceleration in the increase after the revolution like their female counterparts. Similarly to the other countries, unemployment among married men was very low throughout the period.

The deterioration in employment conditions brought about in Tunisia by declining public sector employment and weak growth in private wage employment did not translate into rising inactivity for university educated women. In fact, inactivity among never married women declined as their unemployment rates increased. Among currently married women, inactivity was flat and then also declined slightly in recent years as unemployment shot up. Inactivity declined as well among never married men and remained very low across the period among currently married men.

Bringing the results of all four countries together in Figure 5, we only show the median splines rather than the individual estimates and confidence intervals. First, we note that the probability of public sector employment has been declining steadily for university-educated women in all four countries throughout the period under consideration, with the possible exception of Algeria where the decline dates from the late 2000s. The pattern is more complicated among men. Among never married men, there were steady declines in public sector employment in Egypt and Tunisia, more recent declines in Jordan, and an increase in Algeria, at least until 2010, the period for which we have data. For currently married men, there were early declines in Algeria, Egypt, and Tunisia, but a slightly rising trend in Jordan.

The probability of private sector wage work has been rising for never married university-educated women in the second half of the period in Egypt and Jordan. It also rose from very low levels in Algeria and Tunisia, but the trend reversed in Tunisia after the 2010 revolution. Among currently married women, the trend in private wage work is upward in Algeria and Jordan, upward and then downward in Tunisia, and mostly downward in Egypt. Even when rising, in no country is private wage work rising sufficiently to make up for the decline in the likelihood of public sector employment.

The probability of unemployment was rising everywhere in recent years for never married women, but nowhere as fast and as steadily as in Tunisia. In Algeria, it rose mildly from 2005 to 2010. In Jordan it rose sharply from 2000 to 2005, declined from 2005 to 2012, before resuming its increase from 2013 to 2016.Similarly, in Egypt, it increased sharply from 2000 to 2004, declined from 2004 to 2008, and then pursued a mostly rising trend from 2008 to 2017. For currently married women, the probability of unemployment was relatively flat in Algeria, rose sharply in Egypt after the 2011 revolution and then declined, and has been rising since the onset of the Arab Spring in both Jordan and Tunisia. Unemployment among never married men has been lower than among never married women and had more attenuated trends. In Egypt, Jordan and Tunisia, unemployment among never married men was adversely affected by the onset of the Arab Spring, although not as much as for their female counterparts. In Algeria, unemployment actually exhibited a declining trend among never married men. Unemployment among married men in all four countries is quite low since men must first secure a job before they can marry (Krafft and Assaad 2017).

The trend in the probability of inactivity seems to reflect the trend in unemployment for both never married and currently married women. Whenever unemployment is rising, inactivity appears to be declining and vice versa. There are similar effects among men as well, but the tendency among them is for inactivity to be relatively low in general.

6. Sensitivity Analyses[22]

We conducted a number of sensitivity analyses to determine whether the trends we observe are a function of a number of decisions we made. First, we tested whether propensity score weighting made any difference. Propensity score weighting appears to make a small difference in the size of the confidence intervals but no discernible difference in the observed

[22]The results of the sensitivity analysis are available in the online appendix B.

trends. This holds across countries, men and women and martial status (see Figure B.1 in the online appendix). We then test whether changing the age at which the predictions were made to 25 or even 20 made a difference. The main differences observed were in the level of the probability of the various labor market states, but the observed trends were quite robust to changing the reference age, with few minor exceptions. (See Figure B.2 in the online appendix). In Algeria, a weakly significant rising trend in inactivity among 30-year old never married women seems to disappear, if not reverse, for younger women. Finally, we checked if choosing to predict for secondary school graduates rather than university graduates made a difference (See Figure B.3 in the online appendix). Again, we found only minor differences in trend. For example, the minor recovery in the probability of public sector employment we observed for university graduates in Algeria in the second half of the period did not seem to hold for secondary school graduates. Women with secondary school certificates in Jordan and Tunisia have a much lower probability of public sector employment than their university educated counterparts, and thus do not exhibit the same declining trend in that kind of employment. The same applies to men in Tunisia. Also, female secondary school graduates in Tunisia do not exhibit the same sharp increase in unemployment observed for their university-educated counterparts.

7. Conclusion

We argue in this paper that the failure of FLFP to increase in the four MENA countries under consideration despite the rapid increases in educational attainment is due to the deterioration of the employment opportunities available to educated women rather than to changes in the supply-side factors that have traditionally constrained FLFP in the MENA region. As public sectors contracted, private wage employment failed to increase sufficiently to absorb the slack, leading to either an increase in unemployment or in inactivity. In Algeria, where public sector opportunities did not change that much for women in the period we observe (up to 2010), we notice the least increase in unemployment and inactivity among women. In Egypt and Jordan, unemployment and inactivity fluctuate during the period under consideration, but in an inverse pattern of each other. In Tunisia, the response to reduced opportunities in the public sector, and later in the private sector in the aftermath of the revolution, is a sharp increase in unemployment, also mirrored by a decline in inactivity.

Understanding the driving forces behind the trend in FLFP in MENA is essential to devising policies to increase women's involvement in the economy. For decades, increasing opportunities in the public sector for educated women had brought these women into the paid labor force in large numbers and, in turn, provided a powerful impetus for increased educational attainment. With the slowdown in the growth of public sector employment, if not its retrenchment, employment opportunities for educated women have been seriously curtailed. Based on these trends, we argue that failure of employment rates to increase in line with women's rapidly rising educational attainment – the so-called MENA paradox -- can be primarily attributed to the change in opportunity structures facing educated women in MENA in the 2000s, rather than the supply-side factors traditionally emphasized in the literature to explain low female participation in MENA.

This is the first attempt to use a large set of harmonized cross section micro datasets to examine the patterns of female labor force participation in MENA. Admittedly, it suffers from a number of limitations, such as our inability to distinguish between formal and informal private wage work in many of the surveys. We were also unable to examine previously married women and men (namely divorced and widowed) as a separate category due to sample size constraints. We were also unable to go deeply into urban/rural differences in patterns of employment for women and men. Finally, we are only able to provide suggestive evidence linking the stagnation in female participation and increase in unemployment to demand-side factors rather than establish a causal relationship. We hope that future research will be able to go further in establishing such a causal link.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

References

Akerlof George A., and Kranton Rachel E.. 2009. “Economics and Identity.” The Quarterly Journal of Economics CXV (3): 715–53.

Albanesi Stefania, and Olivetti Claudia. 2016. “Gender Roles and Medical Progress.” Journal of Political Economy 124 (3): 650–95. 10.1086/686035.

Assaad Ragui. 2014. “Making Sense of Arab Labor Markets: The Enduring Legacy of Dualism.” IZA Journal of Labor {&} Development 3 (1): 1–25. 10.1186/2193-9020-3-6.

Assaad Ragui, and Mongi Boughzala, eds. 2018. The Tunisian Labor Market in an Era of Transition. Oxford: Oxford University Press.

Assaad Ragui, and Fatma El-Hamidi. 2001. “Is All Work the Same? A Comparison of the Determinants of Female Participation and Hours of Work in Various Employment States in Egypt.” In The Economics of Women and Work in the Middle East and North Africa. Research in Middle East Economics, edited by Cinar Mine. Vol. 4. Greenwich, CT: JAI press.

—. 2009. “Women in the Egyptian Labor Market: An Analysis of Developments, 1988-2006.” In The Egyptian Labor Market Revisited, edited by Assaad Ragui, 219–58. Cairo, Egypt: The American University in Cairo Press.

Assaad Ragui, Ghazouani Samir, and Krafft Caroline. 2016. “Marriage, Fertility, and Women’s Agency and Decision Making in Tunisia (Forthcoming).” Economic Research Forum Working Paper Series. Cairo, Egypt.

Assaad Ragui, Hendy Rana, and Yassine Chaimaa. 2014. “Gender and the Jordanian Labor Market.” In The Jordanian Labour Market in the New Millennium, edited by Assaad Ragui, 105–43. Oxford, UK: Oxford University Press.

Assaad Ragui, and Krafft Caroline. 2015a. “An Empirical Analysis of the Economics of Marriage in Egypt, Morocco, and Tunisia.” In The Oxford Handbook of Africa and Economics: Policies and Practices, edited by Monga Celestin and Yifu Lin Justin. Vol. 2. Oxford, UK: Oxford University Press.

—., eds. 2015b. The Egyptian Labor Market in an Era of Revolution. Oxford, UK: Oxford University Press.

Assaad Ragui, Krafft Caroline, and Keo Caitlyn. 2019. “The Composition of Labor Supply and Its Evolution from 2010 to 2016 in Jordan.” In The Jordanian Labor Market between Fragility and Resilience, edited by Krafft Caroline and Assaad Ragui, 11–42. Oxford, UK: Oxford University Press.

Assaad Ragui, Krafft Caroline, and Selwaness Irene. 2016. “The Impact of Marriage on Women’s Employment in the Middle East and North Africa (Forthcoming).” Economic Research Forum Working Paper Series. Cairo, Egypt.

—. 2017. “The Impact of Marriage on Women’s Employment in the Middle East and North Africa” 1086. Economic Research Forum Working Paper Series. Cairo, Egypt.

Assaad Ragui, Krafft Caroline, and Yassin Shaimaa. 2017. “Comparing Retrospective and Panel Data Collection Methods to Assess Labor Market Dynamics.” IZA Discussion Paper Series, no. 11052.

Attanasio Orazio, Low Hamish, and Virginia Sánchez-Marcos. 2008. “Explaining Changes in Female Labor Supply in a Life-Cycle Model in Female Labor Supply Explaining Changes Life-Cycle Model.” The American Economic Review 98 (4): 1517–52. 10.1257/aer.98.4.1517.

Barro Robert J, and Jong Wha Lee. 2013. “A New Data Set of Educational Attainment in the World, 1950-2010.” Journal of Development Economics 104: 184–98. 10.1016/j.jdeveco.2012.10.001.

Başlevent Cem, and Onaran Özlem. 2004. “The Effect of Export-Oriented Growth on Female Labor Market Outcomes in Turkey.” World Development 32 (8): 1375–93. 10.1016/j.worlddev.2004.02.008.

Bussemakers Carlijn, Kars van Oosterhout Gerbert Kraaykamp, and Spierings Niels. 2017. “Women’s Worldwide Education–Employment Connection: A Multilevel Analysis of the Moderating Impact of Economic, Political, and Cultural Contexts.” World Development 99: 28–41. 10.1016/j.worlddev.2017.07.002.

Chamlou Nadereh, Muzi Silvia, and Ahmed Hanane. 2011. “Understanding the Determinants of Female Labor Force Participation in the Middle East and North Africa Region: The Role of Education and Social Norms in Amman.” 31.

Chapman Kelsey A. 2015. “Economic Development and Female Labor Force Participation in the Middle East and North Africa: A Test of the U-Shape Hypothesis.” Gettysburg Economic Review 8 (1): 3.

Clark Roger, Ramsbey Thomas W, Adler Emily Stier, Source Gender, and No Mar. 1991. “Culture, Gender, and Labor Force Participation: A Cross-National Study.” Gender and Society 5 (1): 47–66.

Dildar Yasemin. 2015. “Patriarchal Norms, Religion, and Female Labor Supply: Evidence from Turkey.” World Development 76 (2012): 40–61. 10.1016/j.worlddev.2015.06.010.

Diwan Ishac, and Vartanova Irina. 2017. “THE EFFECT OF PATRIARCHAL CULTURE ON WOMEN’S LABOR FORCE PARTICIPATION Ishac Diwan and Irina Vartanova.” 1101. Cairo, Egypt.

Esfahani Hadi Salehi, and Bahramitash Roksana. 2015. “GENDER , ENTERPRISE OWNERSHIP, AND LABOR ALLOCATION IN MENA : THE ROLES OF ISLAM, OIL, Hadi Salehi Esfahani and Roksana Bahramitash Working Paper 951 October 2015.” 951.

Fallah Belal, Bergolo Marcelo, Saadeh Iman, Arwa Abu Hashhash, and Mohamad Hattawy. 2019. “The Effect of Labor-Demand Shocks on Women’s Participation in the Labor Force: Evidence from Palestine.” 2019–08. *Partnership for Economic Policy Working Paper*. 10.2139/ssrn.3410521.

Glas Saskia, Spierings Niels, and Scheepers Peer. 2018. “Re-Understanding Religion and Support for Gender Equality in Arab Countries.” Gender and Society 32 (5): 686–712. 10.1177/0891243218783670. [PubMed: 30369717]

Göksel Idil. 2013. “Female Labor Force Participation in Turkey: The Role of Conservatism.” Women’s Studies International Forum 41I (P1): 45–54. 10.1016/j.wsif.2013.04.006.

Goldin Claudia, and Katz Lawrence F.. 2002. “The Power of the Pill: Oral Contraceptives and Women’s Career and Marriage Decisions.” Journal of Political Economy 110 (4): 730–70. 10.1086/340778.

Greenwood Jeremy, Seshadri Ananth, and Yorukoglu Mehmet. 2005. “Engines of Liberation.” Review of Economic Studies 72 (1): 109–33. 10.1111/0034-6527.00326.

Groh Matthew, Krishnan Nandini, David McKenzie, and Tara Vishwanath. 2016. “The Impact of Soft Skills Training on Female Youth Employment: Evidence from a Randomized Experiment in Jordan.” IZA Journal of Labor and Development 5 (1). 10.1186/s40175-016-0055-9.

Groh Matthew, and Rothschild Casey. 2012. “Oil, Islam, Women, and Geography: A Comment on Ross (2008).” Quarterly Journal of Political Science 7 (1): 69–87. .

Guner Duygu, and Uysal Gokce. 2014. “Culture , Religiosity and Female Labor Supply.” 8132. IZA Discussion Paper. Bonn, Germany. file:///Users/ragui/Downloads/SSRN-id2432396.pdf.

Hayo Bernd, and Caris Tobias. 2013. “Female Labour Force Participation in the MENA Region: The Role of Identity.” Review of Middle East Economics and Finance 9 (3): 271–92. 10.1515/rmeef-2013-0021.

Hendy Rana. 2011. “Marriage and Labor Market Transitions : A Structural Dynamic Model.”

—. 2015a. “A Quarter Century of Changes in Labor Force Participation.” 973. Cairo, Egypt.

—. 2015b. “Women’s Participation in the Egyptian Labor Market: 1998-2012.” In The Egyptian Labor Market in an Era of Revolution, edited by Assaad Ragui and Krafft Caroline. Oxford University Press.

Ilkkaracan Ipek. 2012. “Why So Few Women in the Labor Market in Turkey?” Feminist Economics 18 (1): 1–37.

ILO. 2013. “Resolution Concerning Statistics of Work, Employment and Labour Underutilization Adopted by the Nineteenth International Conference of Labour Statisticians.” In. Geneva, Switzerland: Iternational Labour Organization. https://www.ilo.org/global/statistics-and-databases/meetings-and-events/international-conference-of-labour-statisticians/19/WCMS_230304/lang--en/index.htm.

—. 2019. “ILO Labour Force Estimates and Projections: 1990-2030.” Vol. 2019. Geneva, Switzerland. ww.ilo.org/ilostat/faces/oracle/webcenter/portalapp/pagehierarchy/Page27.jspx?subject=ILOEST&indicator=EAP_2EAP_SEX_AGE_NB&datasetCode=A&collectionCode=ILOEST&_afrLoop=3025940551009525&_afrWindowMode=0&_afrWindowId=1crur2cngv_1#!%40%40%3Findicator%3DEAP_2.

Inglehart Ronald, and Norris Pippa. 2003. Rising Tide Gender Equality and Cultural Change around the World. Cambridge University Press. 10.1503/cmaj.112132.

Karshenas Massoud, and Moghadam Valentine M.. 2001. “Female Labor Force Participation and Economic Adjustment in the MENA Region.” In The Economics of Women and Work in the Middle East and North Africa, edited by Olmsted Jennifer, 51–74. Emerald Insight.

Klasen Stephan, and Pieters Janneke. 2012. “Push or Pull? Drivers of Female Labor Force Participation during India’s Economic Boom.” IZA Discussion Paper Series 6935 (6395): 1–34.

Klasen Stephan, Pieters Janneke, Manuel Santos Silva, and Le Thi Ngoc Tu. 2019. “What Drives Female Labor Force Participation? Comparable Micro-Level Evidence from Eight Developing and Emerging Economies.” 12067. IZA Discussion Papers.

Krafft Caroline. 2016. “Why Is Fertility on the Rise in Egypt? The Role of Women’s Employment Opportunities (Forthcoming).” Economic Research Forum Working Paper Series. Cairo.

—. 2020. “Why Is Fertility on the Rise in Egypt? The Role of Women’s Employment Opportunities.” Journal of Population Economics. .

Krafft Caroline, and Assaad Ragui. 2016. “Employment’s Role in Enabling and Constraining Marriage in the Middle East and North Africa (Forthcoming).” Economic Research Forum Working Paper Series. Cairo, Egypt.

—. , eds. 2019. The Jordanian Labor Market Between Fragility and Resilience. Oxford, UK: Oxford University Press.

Miles Rebecca. 2002. “Employment and Unemployment in Jordan: The Importance of the Gender System.” World Development 30 (3): 413–27. 10.1016/S0305-750X(01)00123-1.

Moghadam Valentine M. 2004a. “Patriarchy in Transition: Women and the Changing Family in the Middle East.” Journal of Comparative Family Studies 35 (2): 137–62.

—. 2004b. “Towards Gender Equality in the Arab/Middle East Region: Islam, Culture, and Feminist Activism.”

Nazier Hanan, and Ramadan Racha. 2016. “Women’s Participation in Labor Market.” Working Paper ERF 2016.

Neff Daniel, Sen Kunal, and Kling Veronika. 2012. “The Puzzling Decline in Rural Women’s Labour Force Participation in India: A Re-Examination.” 196. GIGA Working Papers. Vol. 55. GIGA Working Papers. file:///Users/ragui/Downloads/SSRN-id2143122.pdf.

Olsen Wendy, and Mehta Smita. 2006. “The Right to Work and Differentiation in Indiuan Employment.” Indian Journal of Labour Economics 49 (3): 389–406.

Ross Michael L. 2008. “Oil, Islam, and Women.” American Political Science Review 102 (01): 107–23. 10.1017/S0003055408080040.

Salem Rania. 2012. “Trends and Differentials in Jordanian Marriage Behavior: Marriage Timing, Spousal Characteristics, Household Structure and Matrimonial Expenditures.” Economic Research Forum Working Paper Series. Economic Research Forum Working Paper. Cairo, Egypt.

—. 2015. “Changes in the Institution of Marriage in Egypt from 1998 to 2012.” In The Egyptian Labor Market in an Era of Revolution, edited by Assaad Ragui and Krafft Caroline, 162–81. Oxford, UK: Oxford University Press.

Schmitz S, and Kluve J. 2014. “Social Norms and Mothers’ Labor Market Attachment.” 8115. IZA Discusion Paper. Bonn, Germany.

Spierings Niels. 2014. “The Influence of Patriarchal Norms, Institutions, and Household Composition on Women’s Employment in Twenty-Eight Muslim-Majority Countries.” Feminist Economics 20 (4): 87–112.

Spierings Niels, Smits Jeroen, and Verloo Mieke. 2010. “Micro- and Macrolevel Determinants of Women’s Employment in Six Arab Countries.” Journal of Marriage and Family 72 (5): 1391–1407. 10.1111/j.1741-3737.2010.00772.x.

Tansel Aysıt. 2002. “Economic Development and Female Labor Force Participation in Turkey: Time-Series Evidence and Cross-Province Estimates.” 02/3.

Thévenon Olivier. 2013. “Drivers of Female Labour Force Participation in the OECD.” OECD Social, Employment and Migration Working Papers, no. 145: 58. 10.1787/5k46cvrgnms6-en.

Tsani Stella, Paroussos Leonidas, Fragiadakis Costas, Charalambidis Ioannis, and Capros Pantelis. 2013. “Female Labour Force Participation and Economic Growth in the South Mediterranean Countries.” Economics Letters 120 (2): 323–28. 10.1016/j.econlet.2013.04.043.

Verick Sher. 2014. “Female Labor Force Participation in Developing Countries.” IZA World of Labor, no. 9: 1–10. 10.15185/izawol.87.

Verme Paolo, Abdoul Gadiry Barry, and Jamal Guennouni. 2016. “Female Labor Participation in the Arab World: Evidence from Panel Data in Morocco.” Labour 30 (3): 258–84. 10.1111/labr.12078.

World Bank. 2004. Gender and Development in the Middle East and North Africa: Women in the Public Sphere.

—. 2010. “Narrowing The Gap: Improving Labor Market Opportunities for Women in Egypt - Arab Republic of Egypt Gender Assessement 2010.” Washington DC. http://documents.worldbank.org/curated/en/708201468246922588/pdf/546980ESW0p.

—. 2013. Opening Doors: Gender Equality and Development in the Middle East and North Africa. Washington, DC: World Bank.

World Economic Forum. 2016. The Global Gender Gap Report 2016. World Economic Forum. Vol. 25. 10.1177/0192513X04267098.

Yassin Shaimaa. 2013. “Structural Labor Market Transitions and Wage Dispersion in Egypt and Jordan.” Economic Research Forum Working Paper Series, no. 753.

Yassin Shaimaa, and Langot Francois. 2017. “Informality , Public Employment and Employment Protection in Developing Countries.” 11014. IZA Institute of Labor Economics Discussion Paper Series.

Yassine Chaimaa. 2015. “Job Accession, Separation and Mobility in the Egyptian Labor Market Over the Past Decade.” In The Egyptian Labor Market in an Era of Revolution, edited by Assaad Ragui and Krafft Caroline, 218–40. Oxford, UK: Oxford University Press.

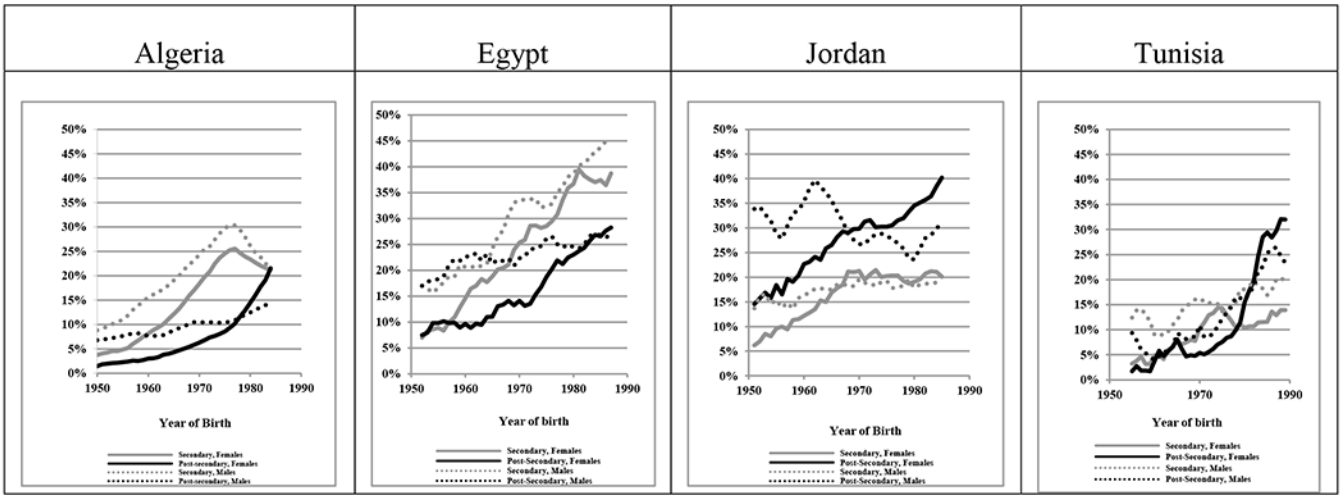


Figure 1. Proportion with Above Secondary and Secondary Education by Country, Gender and Year of Birth

Source: Computed by the authors using the official labor surveys of Algeria (2001-2007, 2010), Egypt (2008-2014), Jordan (2000-2014) and Tunisia (2005, 2006, 2008, 2010, 2013).

Note: Curves are smoothed using a 5-period moving average trendline.

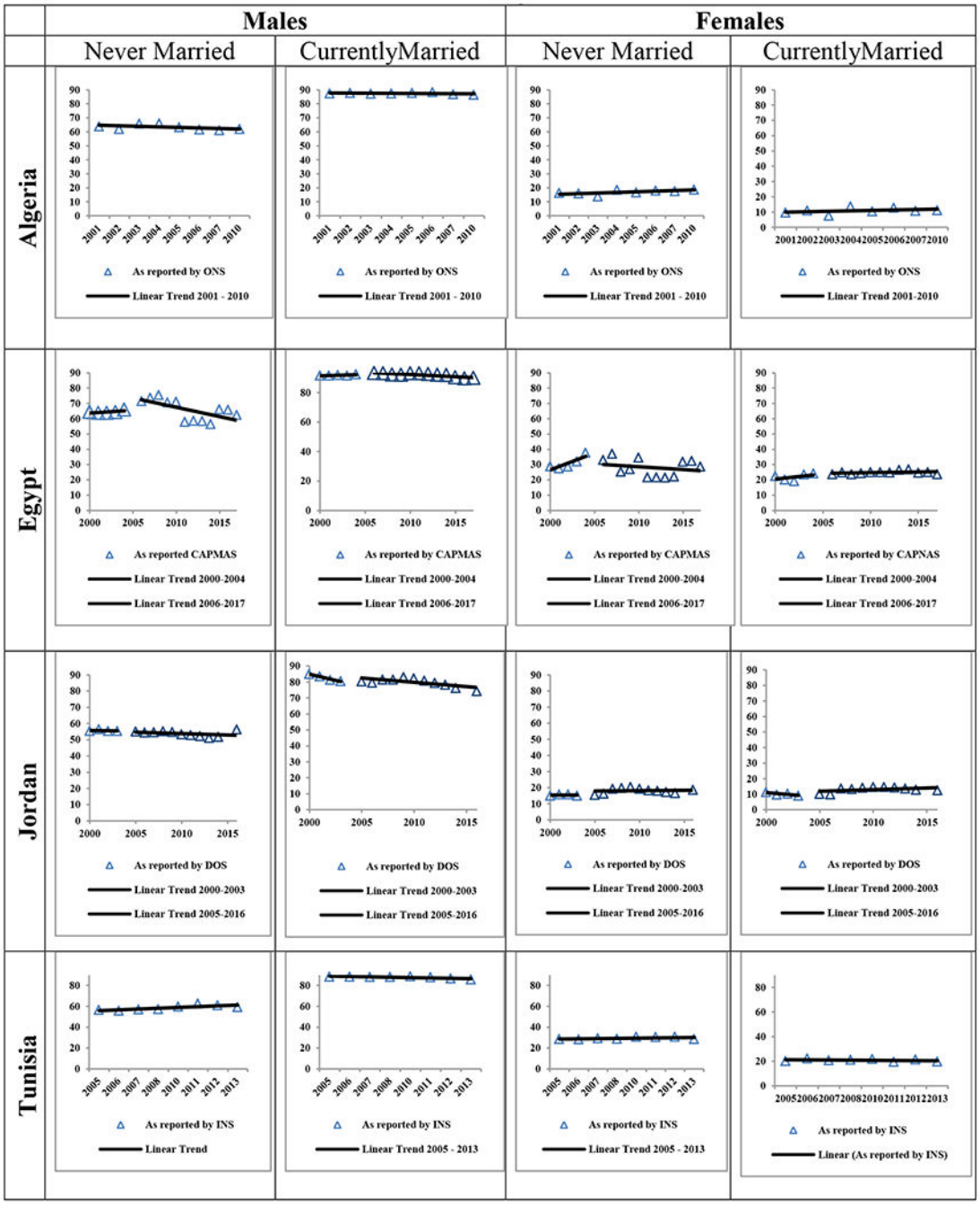


Figure 2. Trends in Average Male and Female Participation Rates by Country and Marital Status, Ages 15-64

Source: Computed by the authors using data from official labor force surveys in each of the four countries. See data section in text for more details.

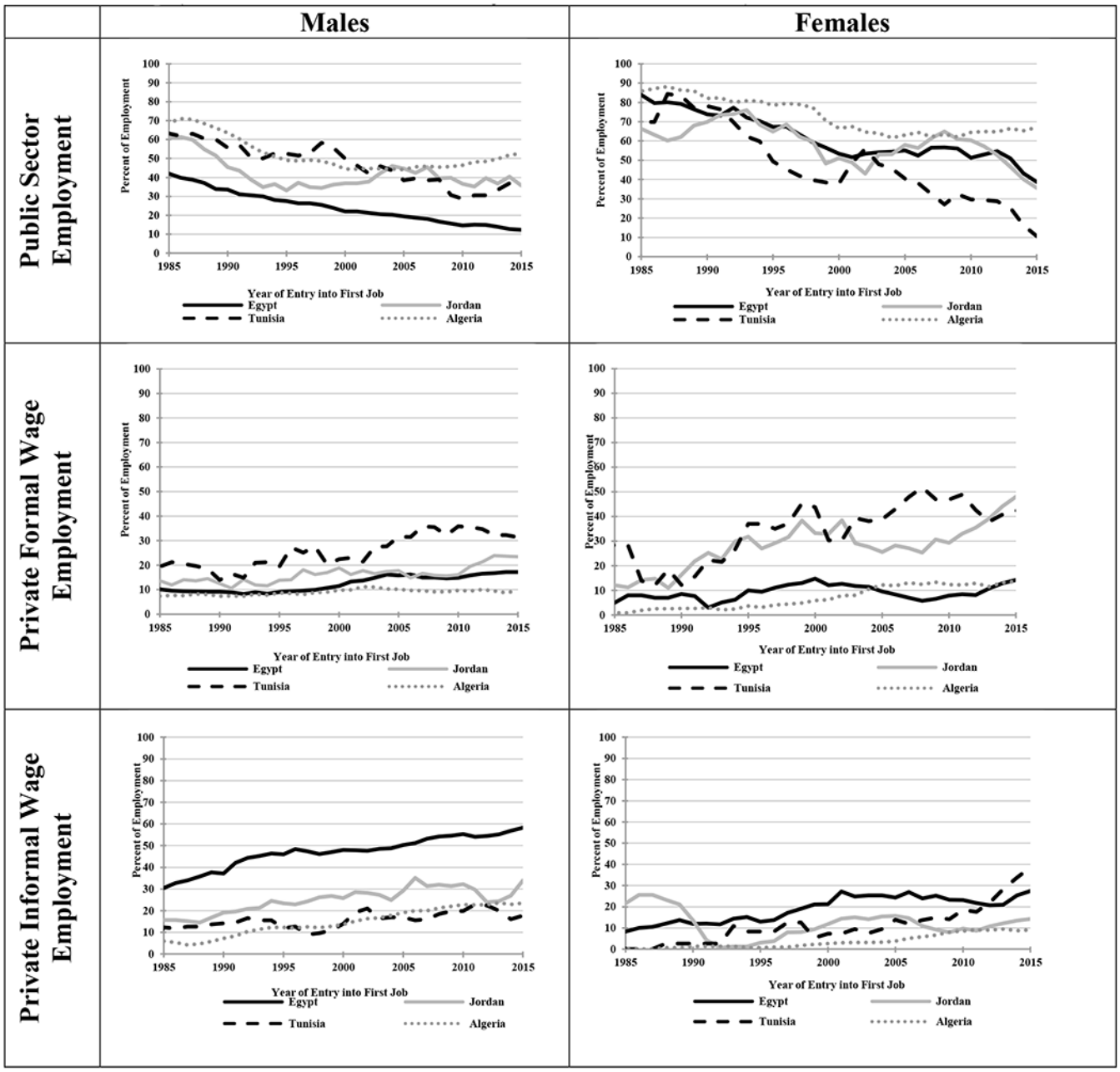


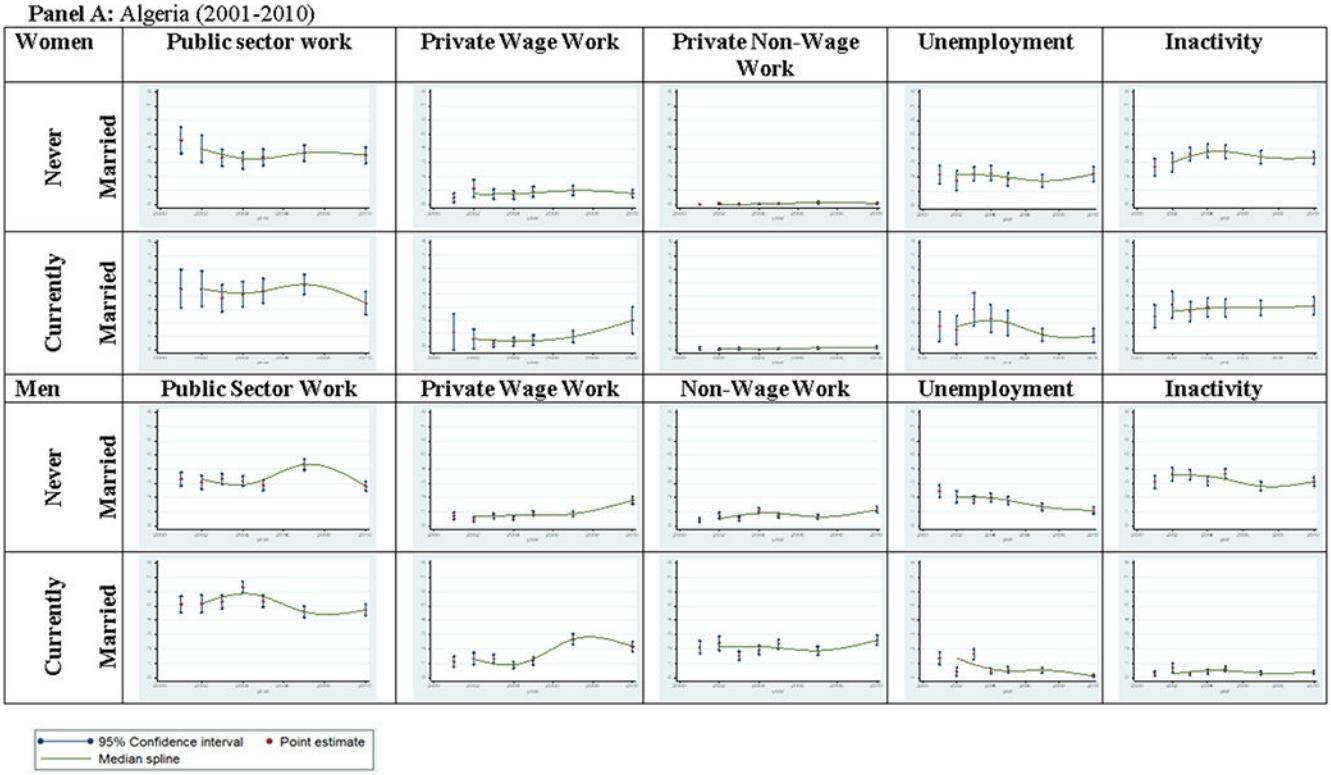
Figure 3. Proportion of Employment in Different Sectors for the First Job by Year of Entry and Country (Individuals with Secondary Education or Above)

Source: Computed by the authors using data from the official labor force survey in Algeria (2010), the Egypt Labor Market Panle Survey of 2012 for Egypt, the Jordan Labor Market Panel Survey of 2010 for Jordan and the Tunisia Labor Market Panel Survey of 2014 for Tunisia.

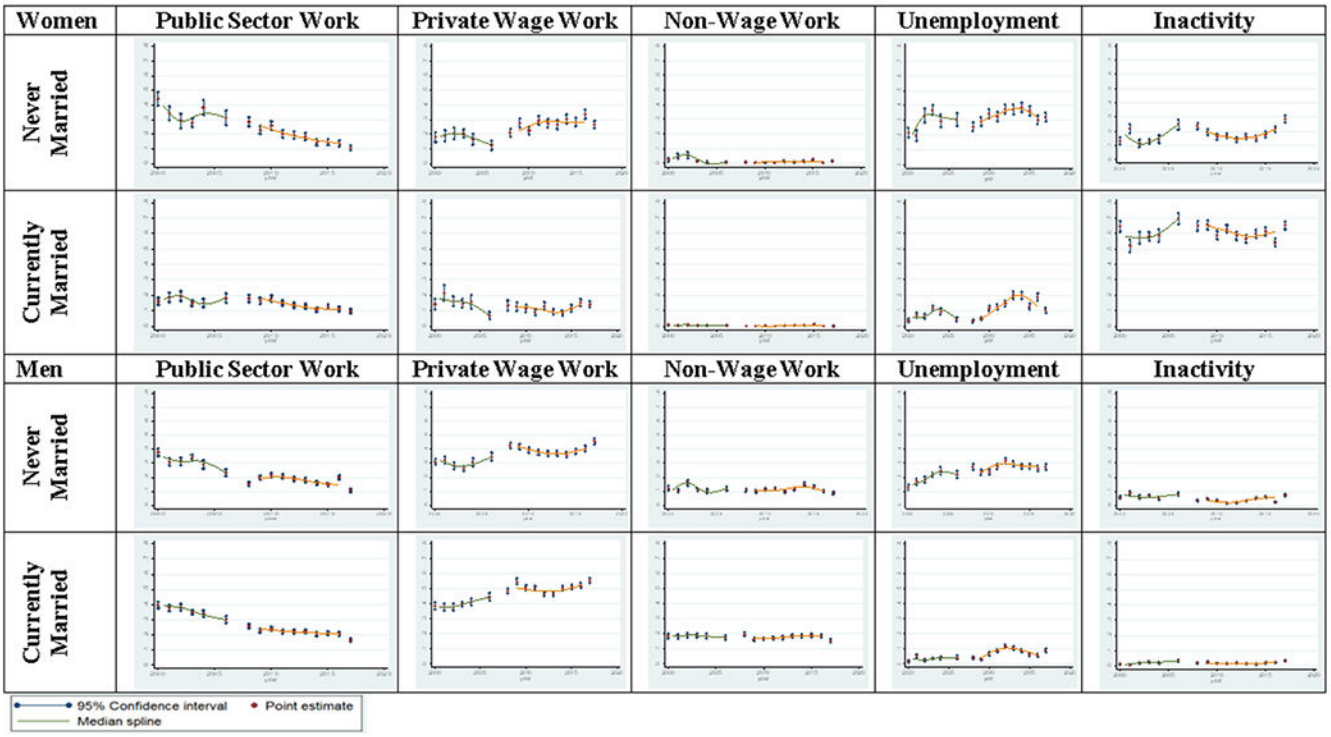
SeeOAMDI, http://www.erf.org.eg/cms.php?id=erfdataportal. Economic Research Forum (ERF).

Note: A six-period moving average trend line is used to smooth the fluctuations in the data.

Panel A: Algeria (2001-2010)



Panel B: Egypt (2000 - 2017)



Panel C: Jordan (2000 - 2016)

Panel D: Tunisia (2005 - 2013)

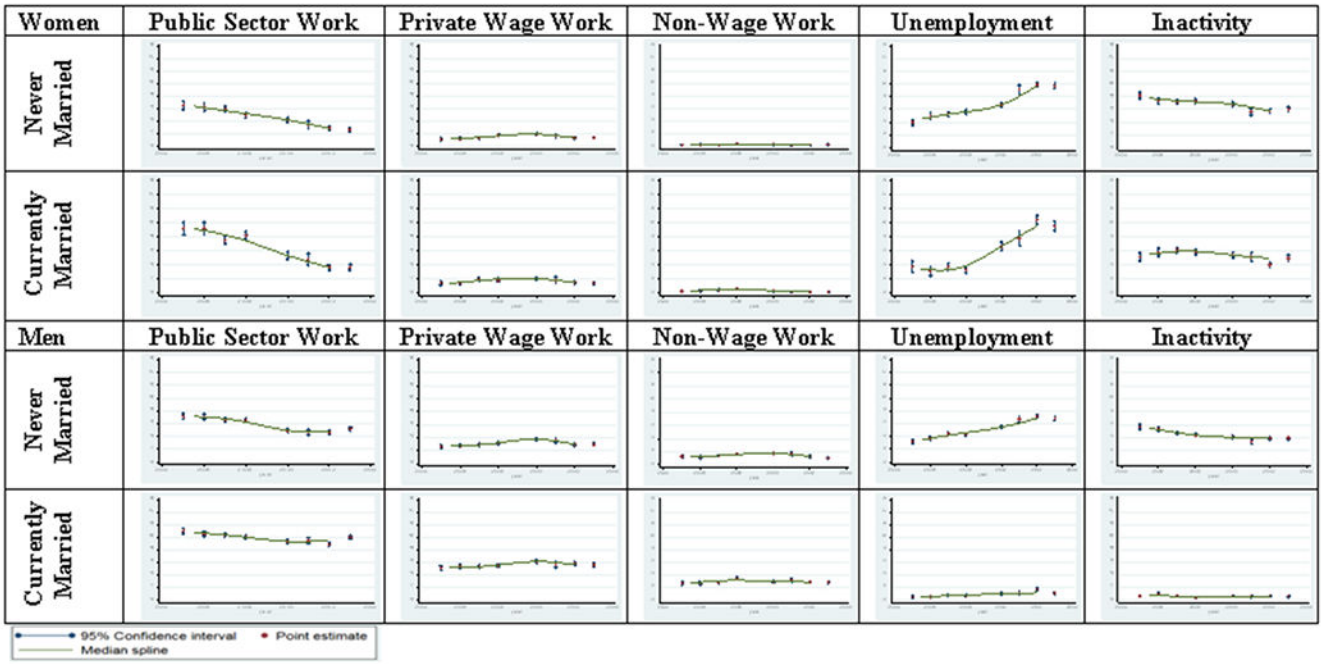


Figure 4:

Simulated Probabilities of Labor Market States for a 25-Year Old University Educated Female and Male, by Marital Status and Country

Source: Based on simulations conducted using multinomial logit models on data from official labor force surveys in each of the four countries. See data and methods section in text for details.

Note: Simulations are carried out for a 30-year old university-educated female or male residing in an urban area in the region of her/his country that includes the capital city. Four-period splines are used to smooth fluctuations in the simulation results.

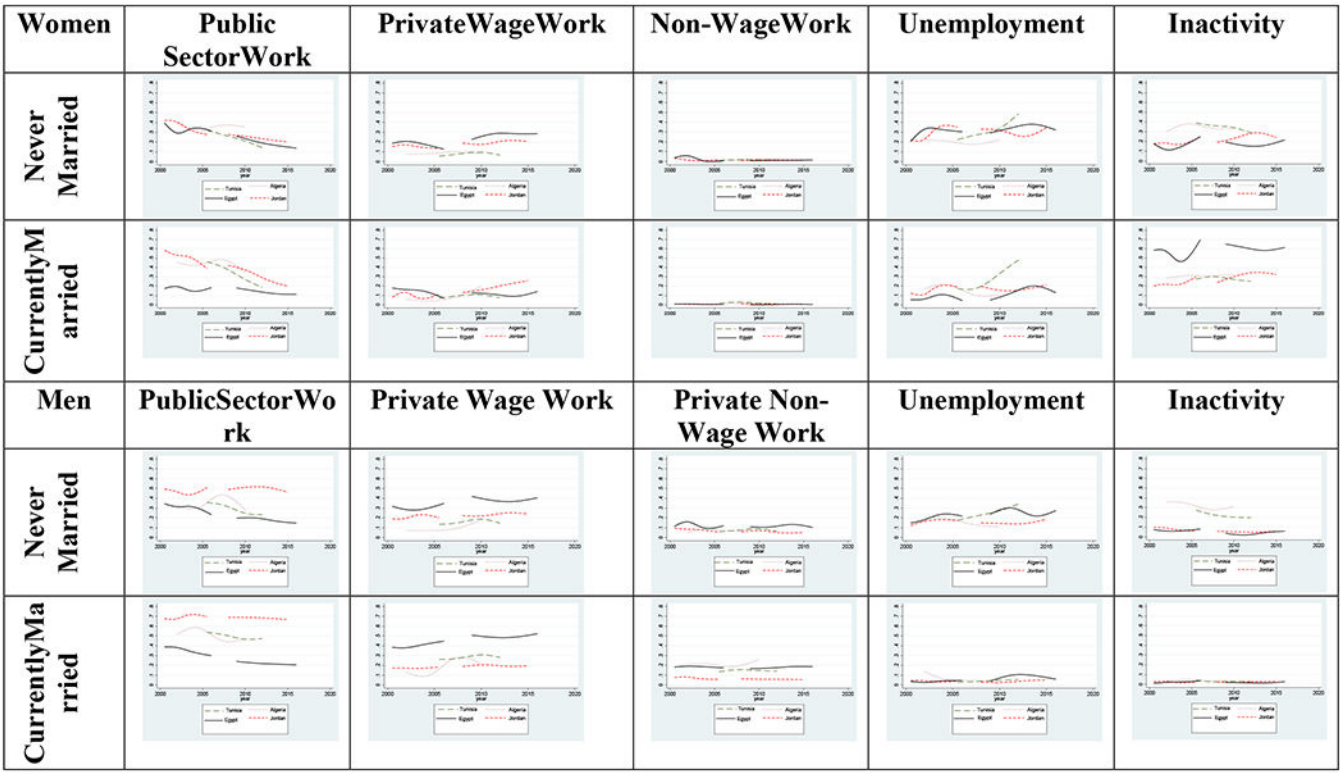


Figure 5.

Simulations of the Probability of Participation by Type for Never Married and Currently Married Women in Algeria, Egypt, Jordan and Tunisia

Source: Based on simulations conducted using multinomial logit models on data from official labor force surveys in each of the four countries. See data and methods section in text for details.

Note: Simulation are carried out for a 30-year old never married and currently married university-educated female and male residing in an urban area in the region of her/his country that includes the capital city. Four-period splines are used to smooth fluctuations in the simulation results.

Table 1:

Proportion of Population Aged 25 and Above by Educational Attainment and Sex, 1980, 1995, 2010

Country	Year	Female			Male			All		
		Less than Secondary	Secondary	Tertiary	Less than Secondary	Secondary	Tertiary	Less than Secondary	Secondary	Tertiary
Algeria	1980	96	4	0	88	10	1	92	7	1
	1995	85	12	3	73	20	6	79	16	5
	2010	73	17	10	69	21	10	71	19	10
Egypt	1980	92	6	1	80	15	6	86	10	4
	1995	79	19	2	61	33	6	70	26	4
	2010	56	37	7	39	47	13	48	42	10
Jordan	1980	89	8	3	72	18	10	81	13	7
	1995	57	35	8	43	41	15	50	38	12
	2010	31	57	13	22	60	19	26	58	16
Tunisia	1980	95	5	1	83	14	3	89	9	2
	1995	84	13	3	68	25	7	76	19	5
	2010	67	22	11	53	33	15	61	27	13

Source: Computed by the authors using data from Barro & Lee (2013).