



# DEMOGRAPHIC RESEARCH

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*Research Article*

**Explaining the MENA paradox:  
Rising educational attainment yet stagnant  
female labor force participation**

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## Contents

1	Introduction	818
2	Literature review	821
3	Data and methods	824
4	Rising educational attainment but stagnant participation: A paradoxical trend	826
5	Simulation results on participation trends by type of employment	833
6	Conclusion	843
	References	844

## **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 phenomenon is 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 nonparticipation) 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 the MENA paradox can be primarily attributed to the change in opportunity structures facing educated women in the MENA region in the 2000s rather than to the supply-side factors traditionally emphasized in the literature.

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## **CONTRIBUTION**

We argue that female labor force participation among educated women in 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 matched by a commensurate increase in opportunities in the formal private sector, leading to increases in female unemployment and declines in participation.

## **1. Introduction**

Over the past five decades, countries in the Middle East and North Africa (MENA) have made impressive strides in achieving gender parity in education (World Bank 2013). Since 1970, countries in the region have recorded the fastest progress in human development in the developing world (United Nations Development Program 2010). According to the World Bank (2012), five MENA countries (Oman, Saudi Arabia, Tunisia, Algeria, and Morocco) were among the top ten fastest movers over this period. The region as a whole is close to achieving gender parity in primary and secondary school 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% 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 20%. Only South Asia comes close, at a rate of 26%.<sup>5</sup> Rates of female labor force participation (FLFP) are low throughout the region, with almost all MENA countries below the LMI average (World Bank 2013). The disconnect between rising educational attainment and low and stagnant rates of economic participation has been dubbed the MENA paradox by the World Bank (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

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<sup>5</sup> All global comparisons of participation rates are based on International Labor Organization estimates for 2018 (ILO 2019).

market rather than 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.<sup>6</sup> 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, 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 private sector. This is in line with the theoretical findings of Yassin and Langot (2018). Neither informal private employment nor non-wage employment has offered viable options for educated women in MENA, leaving unemployment and nonparticipation as the remaining options.

Previous research has shown that different types of work are differentially accessible to women in MENA countries depending on their education and stage in life (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. 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 nonparticipation 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 distinguishing between underlying trends driving participation and 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 micro-data 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. We show that despite the

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<sup>6</sup> See Assaad and Krafft (2015); Salem (2012, 2015); Assaad, Krafft, and Selwaness (2017); Assaad, Ghazouani, and Krafft (2016); and Krafft (2020) for evidence relating to delayed marriage and falling long-run fertility.

narrowing or even reversal of the gender gap in education, the trend in female participation is stagnant. Where participation is rising, the increase is coming entirely from 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 (public sector work, private wage work, and private non-wage work) as well as two nonemployment states (unemployment and out of the labor force) to individual characteristics, such as educational attainment, age, urban/rural location, and region. Using annual models, we simulate the probability of participation in each of these five states in each country over time for individuals with certain profiles – namely, married and never-married 30-year-old female and male university graduates.

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. The probabilities of non-wage employment for educated women are quite low, well below 3% 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 matched 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. Section 6 concludes.

## **2. Literature review**

The literature on FLFP documents important differences in trends between developed and developing countries – specifically, a sharp rise in participation over the past two decades in most countries of the Organisation for Economic Cooperation and Development (OECD) and a slow increase, if not stagnation, 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 child care costs (Attanasio, Low, and Sánchez-Marcos 2008); or medical services improvement (Goldin and Katz 2002; Albanesi and Olivetti 2016).

Studies on the MENA region attribute the observed low FLFP to two main factors: 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. Similarly, Glas, Spierings, and Scheepers (2018) find that the salience of religion in daily life increases women’s support for 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 the 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. Dildar (2015) considered cultural constraints, such as the sexual

division of labor within the household and 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 identity 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 – particularly educated ones – aspire to be employed, irrespective of marital status. In a 2010 World Bank survey of Jordanian female community college graduates, 92% said they planned to work after graduation and 76% said they expected to be working full time (Groh et al. 2016). This is consistent with attitudes reflected in the World Values Survey, where 80% of women in Egypt and Jordan disagreed with the statements “A woman with a full-time job cannot be a good mother” and “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 educational attainment makes more of a difference in participation in countries with conservative gender norms and in countries where service sector jobs are relatively 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 those in our study 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) and Moghadam (2004a, 2004b), studied the role of oil and oil-related revenues in perpetuating



conservative social norms to explain the specificity of the MENA economies. 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 of 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 to open their own firms, and that customs and traditions are behind the low FLFP, not Islam. In contrast, Groh and Rothschild (2012) reexamine 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, particularly exports. Başlevant and Onaran (2004) analyzed the effect of export-orientated growth on FLFP in urban Turkey and controlled for supply-side as well as demand-side factors. They found that although long-term economic growth positively impacts employment and participation at the province level, export-oriented growth has a weaker impact but is more important for the participation of unmarried women.

The literature we reviewed is mainly concerned with explaining the relative level of participation in different parts of the world and its determinants, and 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 micro-data 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). Hendy (2015b) uses micro-data (the Egypt Labor Market Panel Surveys of 1998, 2006, and 2012) to show 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 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 a country's economic phase, resulting in a transition toward the bottom of the U-shaped curve. Fallah et al. (2019) analyze the effects of labor demand shocks on 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 micro-data from official labor force surveys in Egypt, Jordan, Algeria, and Tunisia for the period spanning 2000 to 2017.<sup>7</sup> Surveys from Egypt – reported by the Central Agency for Public Mobilization Statistics (CAPMAS) and the Open Access Micro Data Initiative (OAMDI) of the Economic Research Forum – cover the entire 2000–2017 period. For Jordan, we have data from employment and unemployment surveys for the period 2000 to 2016, with the exception of 2004, with information reported by the Department of Statistics (DOS) and the 2017 OAMDI. For Algeria, we have data from the Household Survey on Employment for 2001–2007 and 2010, with information reported by the National Statistical Office (ONS). Finally, for Tunisia, we have data from the National Survey of Population and Employment for 2005–2008 and 2010–2013, with information reported by the National Institute of Statistics (INS) and the 2016 OAMDI. Because the datasets are all from official labor force surveys, which apply the recommendations of international conferences of labor statisticians, they use similar definitions of labor market states and are reasonably comparable to one another.<sup>8</sup>

We define labor force participants as those in the working-age population (15–64) who are either employed or seeking employment (the unemployed). As proposed by the 19<sup>th</sup> International Conference of Labor Statisticians, employment is defined as work for pay or profit, not including subsistence work or domestic chores (ILO 2013). We further subdivide employment into three labor market statuses: public sector employment (which includes government and public enterprise employment), private sector wage work (which includes both formal and informal wage work),<sup>9</sup> and non-wage work (which includes self-employment and unpaid family work). We estimate a series of annual multinomial logit models on a polychotomous outcome variable indicating these three employment states, plus two nonemployment statuses: unemployment and nonparticipation. 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; education (four categories); region (including the urban/rural distinction); and dummy variables

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<sup>7</sup> Unlike Hendy (2015b), we use the official labor force surveys and not the Egypt Labor Market Panel Survey, Tunisia Labor Market Panel Survey, and Jordan Labor Market Panel Survey to obtain the longest possible time series for these countries and also to ensure comparability with Algeria, for which only the official labor force surveys are available.

<sup>8</sup> An exception was the fact that some surveys distinguished between formal and informal employment and some did not. Therefore, in our multivariate analysis, we refrained from making the distinction between formal and informal wage employment that we used in the descriptive discussion.

<sup>9</sup> Informal wage work is defined by the absence of both a contract and social insurance associated with the occupied job.

indicating the presence in the household of children under 2 years of age, between 3 and 5, between 6 and 11, and between 12 and 17.<sup>10</sup> We also include controls for the presence in the household of other individuals who work in the public sector, in the private sector for wages, or as non-wage workers.<sup>11</sup>

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.<sup>12</sup> 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. Based on these propensity scores, we create weights to apply to our multinomial logit models.<sup>13</sup> The weights are designed to give married individuals with a low (or high) predicted probability of being married a high (or low) weight and, conversely, to give never-married individuals with a high (or low) predicted probability of being married a high (or 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 in the individual's province of residence who are married by age 18, by 19–21, by 22–24, by 25–27, by 28–30, by 31–35, and after age 36. These variables are calculated separately for males and females. (See Table A-2 in the online appendix.)

The estimates from the propensity-score-weighted 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 and live in an urban area in the region that includes the national capital (greater Cairo in Egypt, the urban part of the central region of Jordan, the urban part of the north-central region of Algeria, and urban greater Tunis in Tunisia). We compute 95% confidence intervals around these simulated probabilities. We use 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 based on changing the age and education

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<sup>10</sup> The four educational levels are “no certificate”; “lower secondary,” which includes primary and lower secondary education; “secondary and post-secondary,” which includes upper secondary and up to two years of post-secondary education; and “university,” which includes post-secondary education of three or more years.

<sup>11</sup> We exclude these household composition variables from the male participation equation.

<sup>12</sup> 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.

<sup>13</sup> 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 the creation of weights to avoid creating excessively high weights.

profile of the reference individual upon whom the simulations 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 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% in 1980 to 39% in 2010, followed by Egypt, 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 sevenfold in Jordan, sixfold in Egypt, and more than fourfold 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 1% to 7%. 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 a post-secondary and a secondary (but less than post-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 post-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 40% of Jordanian women had a post-secondary education, compared to about 30% 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 reaches 33% among women and 23% among men born around 1989. Gender parity in the proportion of post-secondary graduates was reached most recently in

Egypt, where nearly 28% of the 1987 cohort of women have post-secondary education, as compared to about 26% of men.

**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 and Lee (2013).

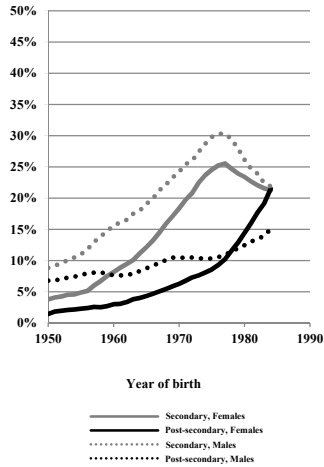
Given the strong positive relationship between female education and FLFP (Chamlou, Muzi, and Ahmed 2011), the expectation was that such rapid increases in educational attainment would translate into rapid increases in female participation. This has not been the case, however. Figure 2 shows the trend 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.<sup>14</sup> Note that the MENA region as a whole went through substantial political turmoil associated with the Arab Spring uprising, which started in late 2010. This turmoil significantly affected the Egyptian, Jordanian, and Tunisian economies, both through direct disruptions and the effects of neighboring-country conflicts.<sup>15</sup>

<sup>14</sup> We fit a linear trend line to the data. For Egypt and Jordan, we fit separate linear trend lines prior to and after 2007, because in both instances methodological changes in the measurement of participation resulted in one-time changes in the level.

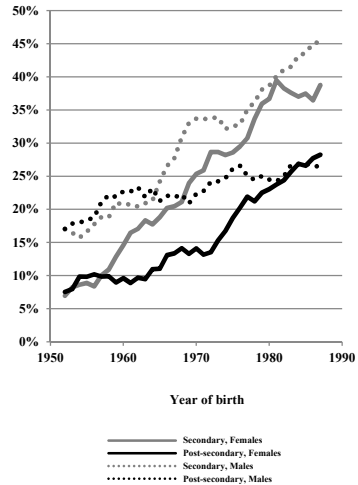
<sup>15</sup> To learn more about the effects of the Arab Spring on these economies, please refer to Assaad and Krafft (2015b), Assaad and Boughzala (2018), and Krafft and Assaad (2019).

**Figure 1: Proportion with secondary and post-secondary education by country, gender, and year of birth**

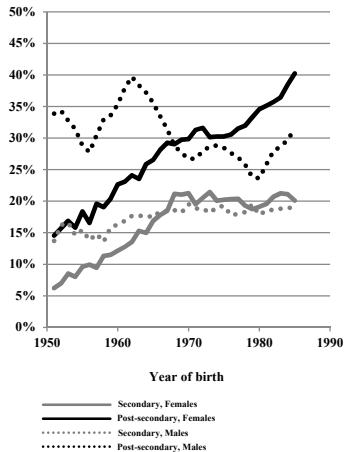
Algeria



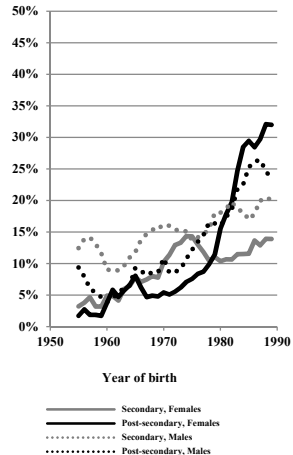
Egypt



Jordan



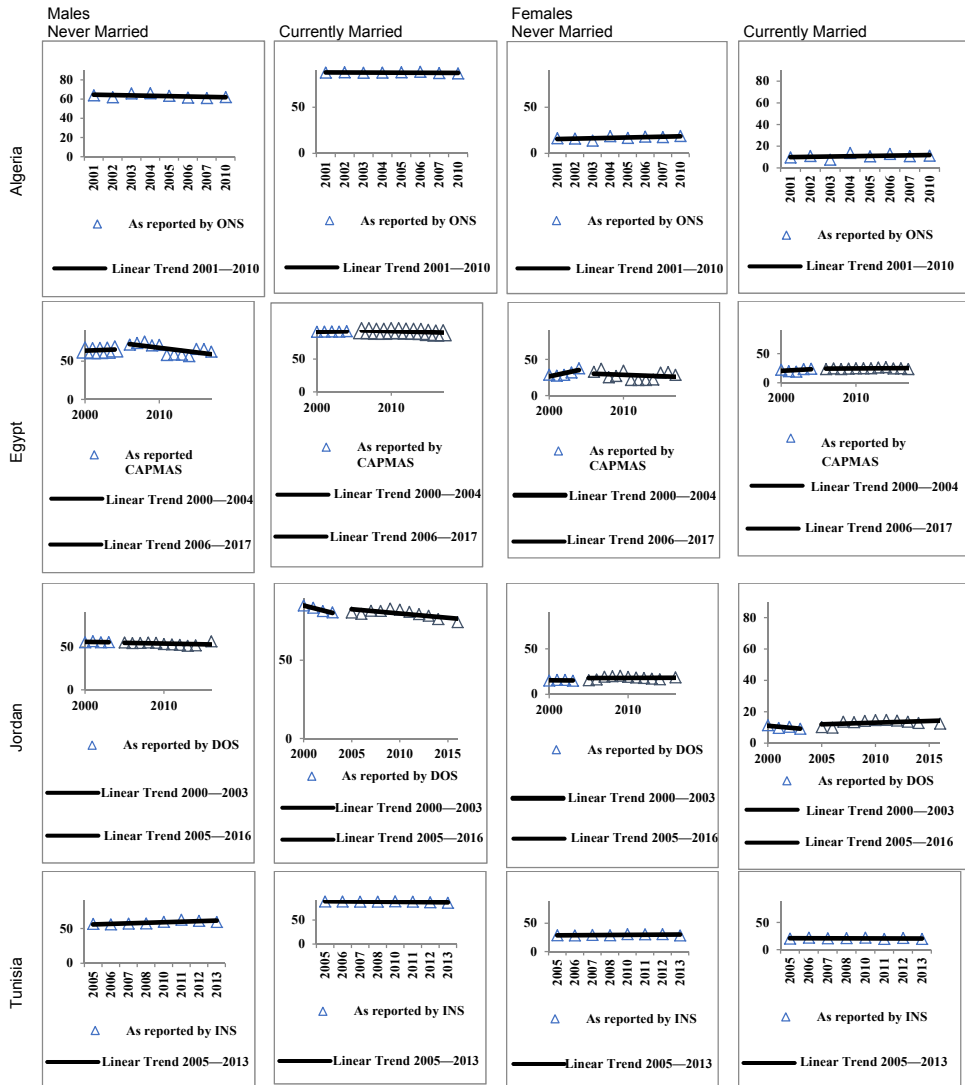
Tunisia



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 five-period moving average trend line.

**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.

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 force 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 women with secondary and tertiary education are declining over time in Algeria and Egypt, and where participation rates 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 have 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 job educated new entrants obtained by their year of entry into employment, exploiting retrospective data on the characteristics of first jobs from various surveys.<sup>16</sup> We do this for all new entrants with secondary education and above, separately for males and females.<sup>17</sup> As shown in Figure 3, the proportion of both males and females with secondary education and above who obtained public sector employment as a first job was very high in the mid-1980s in all four countries and has tended to decline since then. In Algeria, Jordan, and Tunisia, it was over 60% in 1985 and declined to just over 40% in the mid-2000s. 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 a first job had already declined to 45% by 1985 and continued to decline sharply thereafter to reach just over 10% 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 a first job was 60% to 70% in Jordan and Tunisia and as high as 80% to 90% in

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

<sup>17</sup> Although our simulations are for university graduates, we use secondary and above education in these graphs because otherwise the sample size would be too small to get reliable trends from retrospective data on first jobs.



Egypt and Algeria. Again, this proportion fell more or less steadily in all four countries through the early 2000s. It then stabilized somewhat in Algeria, Egypt, and Jordan through the early 2010s 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% in Tunisia and 35% to 40% in Egypt and Jordan, but it remained fairly high, at nearly 65%, in Algeria.

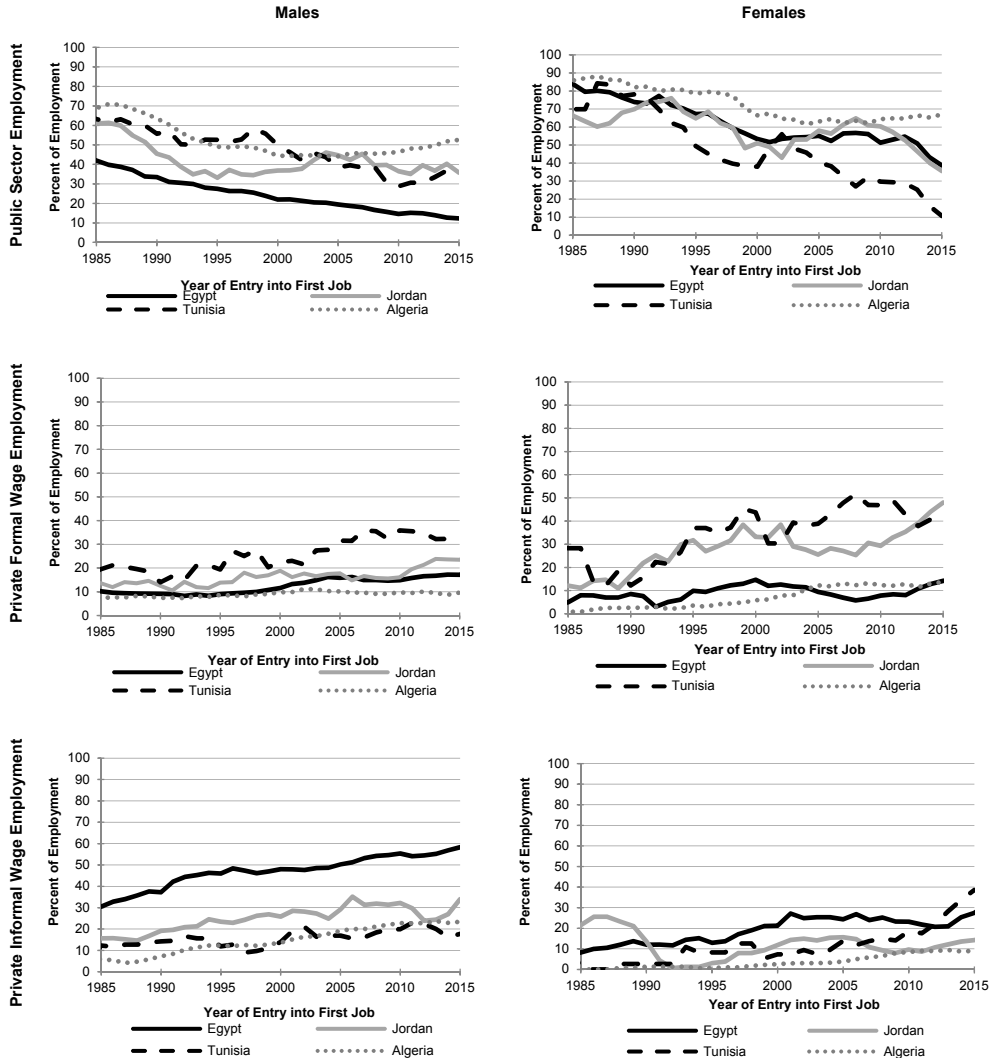
Private formal wage employment has taken up only a limited portion of the slack created by the decline in public employment for educated new entrants in all four countries. Whereas the share of public sector employment fell by 30 percentage points for educated male new entrants in Egypt from 1985 to 2015, the share of formal private wage employment increased by less than 10 percentage points during the same period. Similarly a 20 percentage point 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 still makes up only about half the decline in the share of public sector employment. The main option left for educated male new entrants has been informal wage employment, as shown in the third row of Figure 3.<sup>18</sup> 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 to avoid taking 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 among 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.

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<sup>18</sup> Not shown here, the option of non-wage employment is relatively limited among educated new entrants and has changed only slightly over time.

**Figure 3: Proportion of employment in different sectors for the first job by year of entry and country (individuals with secondary education and above)**



Source: Computed by the authors using data from the official labor force survey in Algeria (2010), the Egypt Labor Market Panel Survey of 2012, the Jordan Labor Market Panel Survey of 2010, and the Tunisia Labor Market Panel Survey of 2014. See OAMDI, <https://erf.org.eg/erf-data-portal/>.

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

The preceding analysis has clearly shown that the economic restructuring that reduced the share of 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 to completely withdraw from the labor force rather than accept informal employment. There were clear variations in this pattern among the four countries. Algeria experienced less of a decline in public sector employment than the other countries and has even been 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 polychotomous outcome variables with five states: public sector employment, private wage employment, non-wage employment, unemployment, and nonparticipation.<sup>19</sup> We then used these models to undertake simulations of the probability of participating in each of these states by year and by country separately for never-married and currently married 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 the country that includes the capital city. In Section 5 we conduct sensitivity analyses that alter this profile by changing the age to 20 and 25 and by 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 are presented graphically in two ways. First, we show separate results for each country and each labor market state, together with the 95% 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 Table A-3, we report t-statistics for tests of

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<sup>19</sup> In our multivariate analysis, we are unable to distinguish 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.

differences in predicted probabilities across the first and the last year, the middle to the last year, and the first to the 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 of Figure 4, the probability of government employment for university-educated women in Algeria was quite stable from 2001 to 2010. The t-tests illustrated in 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 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% level) across the first and last year for never-married women but not across other subperiods and not for currently 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 currently 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, for whom it continued to decline across the entire period. The t-tests show a significant decline for never-married and currently 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 currently 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 of Figure 4.<sup>20</sup> Unlike Algeria, Egypt has experienced a slow declining trend in the probability of public sector employment for the reference university-educated women and men 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 by 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

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<sup>20</sup> 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.

period and then flattened thereafter. As 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 non-wage work was higher for currently 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.

As in Egypt, university-educated women in Jordan experienced a sharp decline in the probability of public sector employment in the period under consideration. As shown in Panel C of Figure 4, the probability of public sector employment for the reference never-married and currently married women in Jordan declined sharply from 2000 to 2016.<sup>21</sup> The decline is highly significant for both subperiods 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 the increase 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 currently 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 resumed after 2010. Currently married women show similar trends but a lower level of unemployment. Never-married men experienced a similar trend in unemployment, but their fluctuations are less pronounced than for women. As in Egypt, married men in Jordan have very low unemployment rates.

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<sup>21</sup> 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. However, the increase in the probability of inactivity is significant only 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, during which unemployment has increased.

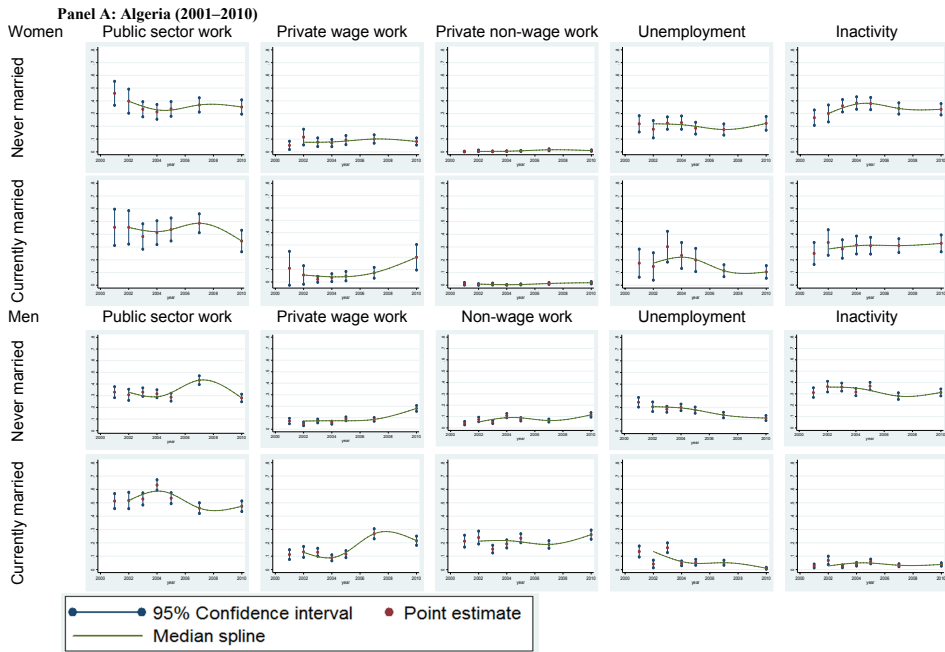
Similar to those in Jordan and Egypt, university-educated women in Tunisia experienced a sharp decline in the probability of public sector employment, which was nearly halved over the course of eight years (2005–2013) for both never-married and currently married women. The decline in public sector employment is statistically significant for both groups and across both subperiods. Never-married men experienced a similar decline in the probability of public sector employment, but the decline was more muted among currently 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, the increase was insufficient to make up for 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 currently married ones.

Non-wage work in Tunisia exhibits contradictory trends. In the first half of the period, there is a strong declining trend for never-married women but an increasing trend for 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 but 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 acceleration in increase after the revolution that their female counterparts experienced. Similar to the other countries, unemployment among married men was very low throughout the period.

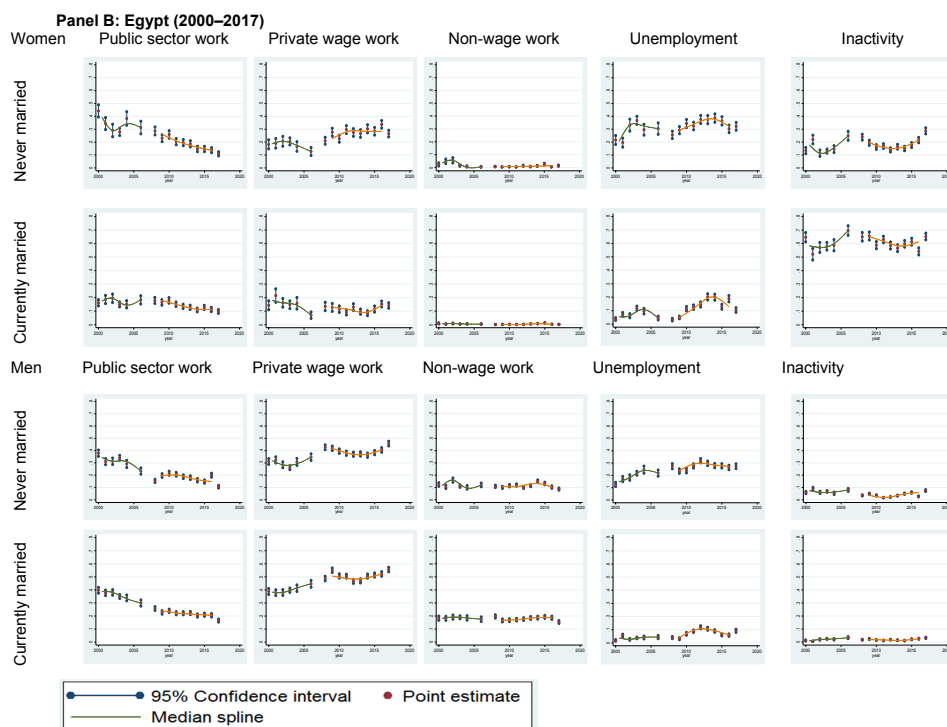
The deterioration in employment conditions in Tunisia brought about by declining public sector employment and weak growth in private wage employment did not

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 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.

**Figure 4: Simulated probabilities of labor market states for a 25-year-old university-educated female and male, by marital status and country**

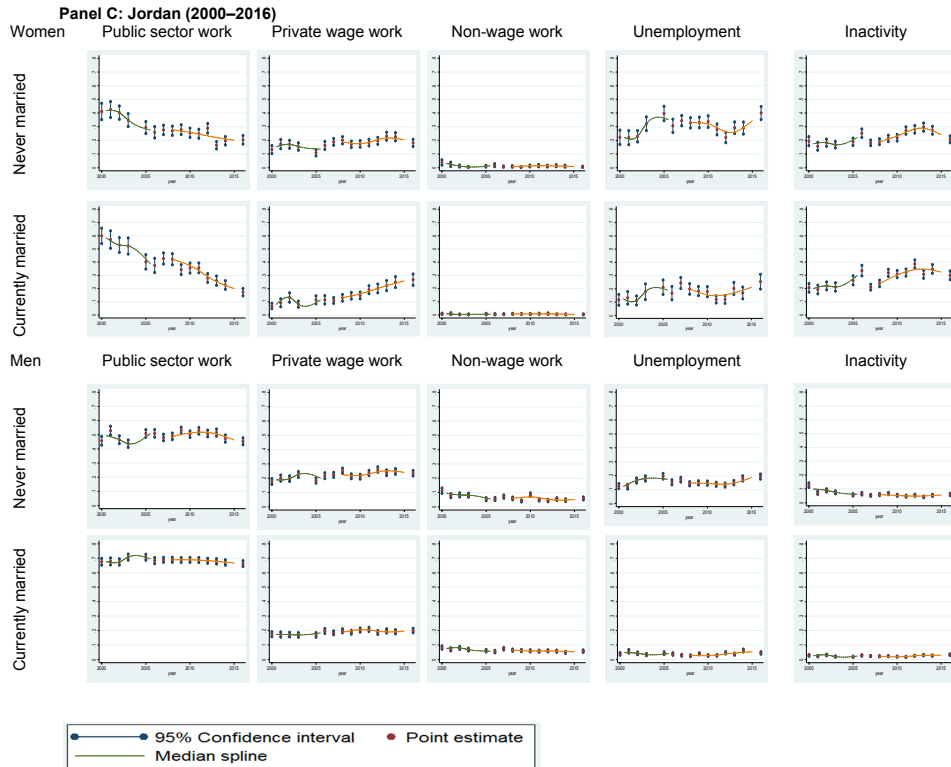


**Figure 4: (Continued)**

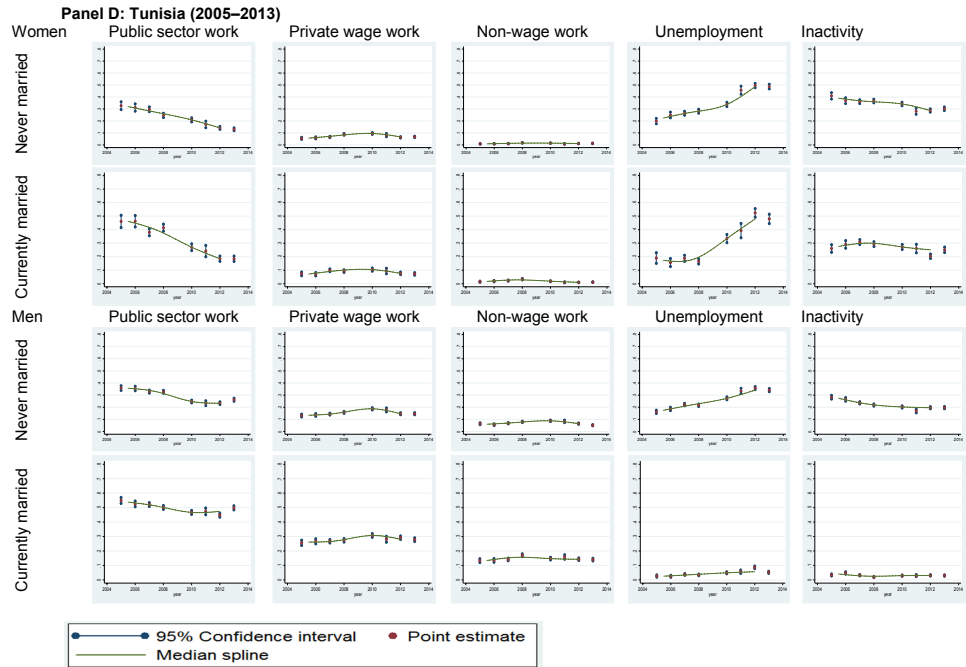




**Figure 4: (Continued)**



**Figure 4: (Continued)**

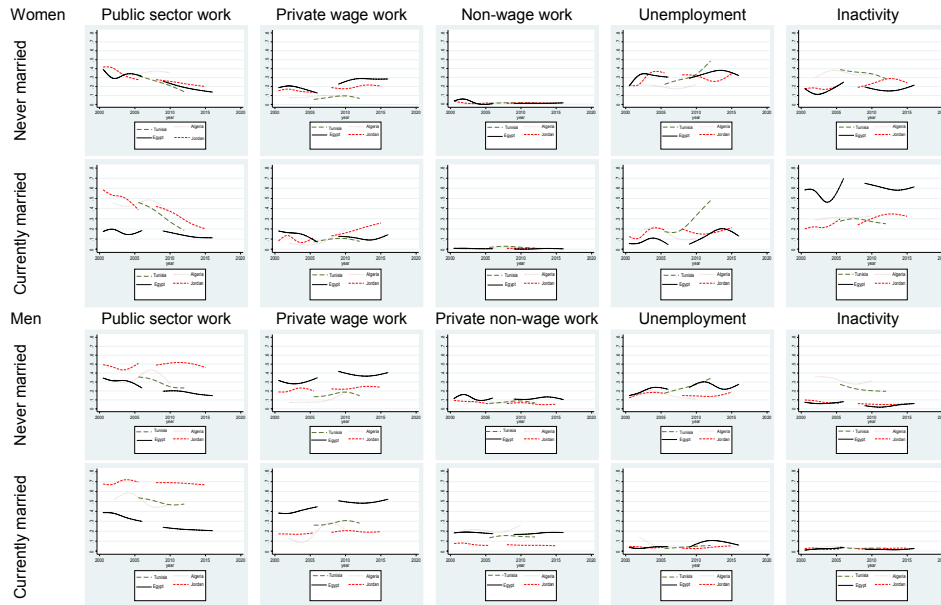


*Source:* Based on simulations conducted using multinomial logit models on data from official labor force surveys in each of the four countries. See data and methods section in text for details.

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

Bringing the results of all four countries together in Figure 5, we show only 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 end of 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.

**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:* Simulations are carried out for 30-year-old never-married and currently married university-educated females and males residing in an urban area in the region of the country that includes the capital city. Four-period splines are used to smooth fluctuations in the simulation results.

The probability of private sector wage work rose 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 private wage work is rising, in no country is it rising sufficiently to make up for the decline in the likelihood of public sector employment.

The probability of unemployment rose 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 and 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 has 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 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.

We conducted a number of sensitivity analyses to determine whether the trends we observe are functions of the decisions we made.<sup>22</sup> 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 trends. This holds across countries, men and women, and marital status. (See Figure B-1 in the online appendix.) We then tested 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 whether predicting 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 that 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.

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<sup>22</sup> The results of the sensitivity analyses are available in the online appendix.

## 6. Conclusion

We argue in this paper that the failure of FLFP to increase in the four MENA countries under consideration, despite rapid increases in educational attainment, is due to the deterioration of employment opportunities available to educated women rather than to changes in 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 an increase either in unemployment or 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 inversely to one another. In Tunisia, the response to reduced opportunities in the public sector, and later in the private sector in the aftermath of the revolution, was 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 for educated women in the public sector 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 the 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 number of harmonized, cross-sectional micro-datasets to examine 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 are unable to examine previously married (divorced or widowed) women and men as a separate category due to sample size constraints. We are also unable to go deeply into urban/rural differences in patterns of employment for women and men. Finally, we can provide only suggestive evidence linking the stagnation in female participation and the increase in unemployment to demand-side factors rather than establishing a causal relationship. We hope that future research will go further in establishing such a link.

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