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The Arab Spring, a setback for gender equality? Evidence from the Gallup World Poll

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ABSTRACT

Combining a unique dataset from the Gallup World Poll for the period 2009–2018 with Wolfsfeld et al.'s (2013) protest index, we evaluate the impact of the Arab Spring pro-democracy protests on gender equality in eleven Middle Eastern and North African countries. We use a difference-in-differences approach and find a negative impact of mass protests on female access to labor markets and support for women's rights in the years following the events. In particular, a one-standard-deviation increase in the protest intensity lowered female participation rates by 3.7 % points. Likewise, Arab Spring protests significantly lowered support for women's legal rights, occupational rights, and divorce rights. Findings are robust to different samples, alternative model specifications, omitted variable bias, and an alternative protest measure from Steinert-Threlkeld (2017). Regarding potential mechanisms, we suggest that a shift in the Arab *zeitgeist* towards a less secular society might help explain our findings.

1. Introduction

The international community has committed itself to eliminating gender inequalities by 2030 (SDG 5). Yet, with less than a decade left to reach this goal, large gender gaps persist in employment, political empowerment, access to assets, and legal rights and freedoms in many parts of the world, particularly within countries in the Middle East and North Africa (MENA) (Vásquez & Porčnik, 2019; WEF, 2019). Informal institutions such as social norms are a key factor behind differences in gender outcomes across countries and world regions (Azmat & Petrongolo, 2014; World Bank, 2011). For instance, female labor force participation (FLFP) in 2019 was merely 20.2 % for MENA countries on average, the lowest figure among all world regions and only a slow increase from 17.4 % in 1990 (ILO, 2020). The low status of women in MENA countries has often been linked to Arab culture, to Islam's influence on legislation, as well as to the petrol economy (Gouda & Potrafke, 2016; Kostenko et al., 2008).

It has been argued that the division of labor between women and men has been largely persistent over time mainly because of deep historical and cultural roots that determine gender norms (Alesina et al., 2013; Boserup, 2007; World Bank, 2011). However, in spite of this inertia, gender roles do constantly adjust to demographic, economic, technological, and political shocks (e.g., Albanesi & Olivetti, 2016; Goldin & Katz, 2002; Greenwood et al., 2005; Fogli & Veldkamp, 2011; Teso, 2019). As an example of a major political shock,

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the United States experienced a steep rise in female labor force participation from 28 % in 1940 to 36 % in 1945 when women were needed in companies and factories to replace men who had left to serve in the war. Two generations and a series of shocks later, U.S. women had reached a participation rate of 57.5 % in 1990 (Blau et al., 2014). In contrast, the 1979 Iranian Revolution, which replaced a secular with an Islamic regime, reversed many of the achievements and rights gained by Iranian women in the decades before. The revolutionary government, despite encouraging women's political mobilization and girls' education, enforced laws and practices unfavorable for women, barred the judiciary to women, and dismissed many professional women from government jobs (Keddie & Richard, 2003).

In 2011, several MENA countries experienced a significant political shock known as the "Arab Spring". Protests in many Arab countries were mainly driven by dissatisfaction with the low standard of living, poor labor market conditions, lack of political voice, and high levels of corruption (Arampatzi et al., 2018; Chaney et al., 2012; Dang & Ianchovichina, 2018; Ianchovichina, 2018). The Arab Spring protests, which rapidly spread across the MENA region within only two months after protests first broke out in Tunisia in December 2010, resulted in significant political disruptions in numerous MENA countries, including regime changes in some of the countries with the strongest protest intensity (Egypt, Libya, Tunisia, and Yemen). Protestors were mainly male, however women also fought for democratization side by side with men on the Arab streets (Al-Ali, 2012; Moghadam, 2018). The core beneficiaries of the Arab Spring were the Islamist movements, because they were the best organized opposition in the MENA region (Tibi, 2013). As a result, the replacement of secular dictatorships with Islamist-oriented parties in many protest countries may threaten to signify a return to more traditional gender roles and a setback for women's rights (Chamkhi, 2014; Feldman, 2020; Fox et al., 2016; Gouda & Potrafke, 2016; Tibi, 2013). These developments are what motivate the current study. Using differences in the intensity of protests across the MENA region, the present study aims to identify the impact of Arab Spring protests on gender equality trends in MENA countries.

Using a large number of nationally representative country samples across the MENA region and a long sample period, this study aims to quantify the impact of Arab Spring protests on gender equality, particularly focusing on female access to labor markets and support for women's rights. We use data from the Gallup World Poll (GWP) from up to 17 MENA countries (11 of which with before & after waves [2]) for the period 2009–2018 and combine it with the protest index from Wolfsfeld et al. (2013) to account for protest intensity across Arab countries. Following earlier studies, we employ a difference-in-differences approach to isolate respective treatment effects. We further investigate potential mechanisms such as changes in the level of secularism in protest countries, which we believe might have been a key channel for the Arab Spring's impact on gender equality.

Our study contributes to the literature on the effect of the Arab Spring on gender equality in the following ways: First, compared to earlier quantitative cross-country studies – which have usually employed the Arab Barometer and the World Value Surveys – we add new evidence from a large number of surveys collected by the Gallup World Poll for a long time period surrounding the protests (2009–2018). Second, we use both "soft" (attitudes towards women's rights) and "hard" gender outcomes (labor force participation) and carefully examine the robustness of our results. Third, we examine the reduction in Arab Spring countries' levels of secularism as an important mechanism behind these gendered effects (cp. Glas et al., 2019). We further examine a few alternative mechanisms. At a more general level, our study contributes to a growing literature on the effects of demographic, economic, technological, and political shocks on gender equality or women's empowerment (e.g., Ager et al., 2017; Goldin, 1991; Grosjean & Khattar, 2019).[3] We further contribute to the literature on the relationship between democracy and gender equality (Beer, 2009; Inglehart et al., 2002; Norris & Inglehart, 2001), as well as to the literature on the relationship between politics, religion, and gender in the Arab world (Glas et al., 2019; Gouda & Potrafke, 2016; Kostenko et al., 2016; Moghadam, 2014, 2018). In addition, our study adds to the literature on the general economic and political consequences of the Arab Spring. While some studies have examined the negative consequences of the protests on Arab economies (Acemoglu et al., 2018; Matta et al., 2019), most of the literature has focused on political consequences. Studies have shown that the Arab Spring considerably changed the political landscape in the MENA region, enabling Islamists to move to the forefront of Arab politics as power holders (e.g., Al-Anani, 2012; Tibi, 2013; Chamkhi, 2014; Netterstrøm, 2015). In the meantime, countries have settled into diverse forms of government where often autocratic and democratic features are combined (Abushouk, 2016; Miller et al., 2012; Roy, 2012), whereas ethnic politics and religious divides have affected Arab dictators' responses to the Arab Spring protests (Hodler, 2018).

The remainder of this article is organized as follows. Section 2 presents related empirical and theoretical literature. Section 3 introduces our dataset, key variables, summary statistics, and the empirical strategy. Section 4 reports estimation results, first of the baseline regressions and related tests for parallel trends, followed by heterogeneity analysis, as well as several robustness checks. We then discuss potential mechanisms that are likely to drive our results in Section 5 before concluding in Section 6.

2. Gender, social norms, and the Arab Spring

Women's empowerment matters both intrinsically and instrumentally. It not only affects basic human rights for half of the population directly, but it has also been recognized to facilitate economic and human development, and thus the achievement of the Sustainable Development Goals (Duflo, 2012; Kabeer, 2005; Klasen, 2002; Nussbaum, 2000; World Bank, 2011).

[2] The 11 countries are Algeria, Egypt, Iraq, Jordan, Kuwait, Lebanon, Saudi Arabia, Syria, Tunisia, UAE, and Yemen. Among those, Kuwait does not provide information on labor force participation, while Algerian surveys do not have gender norms information (Saudi Arabia lacks one of the three gender norms variables). Thus, we will have 10 countries with before and after waves for each outcome variable in the regression analysis except for a wife's right to initiate a divorce (9).

[3] Our study also contributes to a growing literature on protests (e.g., Aidt & Franck, 2015; Campante & Chor, 2012, 2014; Madestam et al., 2013).

Our empirical analysis is motivated by several theoretical concepts. Neila Kabeer (2005), in her discussion of the concepts of gender equality and women's empowerment, defines power as the ability to make choices, and stresses the importance of agency and resources as enabling factors that drive achievements. Agency is people's ability to make and act on their own life choices. In this respect, the power over strategic life choices is of particular importance. According to Kabeer "strategic life choices include where to live, whether and whom to marry, whether to have children, how many children to have, who has custody over children, freedom of movement and association". We consider whether to work outside the home and follow a career path as another strategic life choice. The ability to make strategic life choices depends on the institutional setup in a country. Cultural or ideological norms may lead to gender bias in agency and resources. Subordinate groups are often unlikely to challenge these social norms if this "does not appear possible or carries heavy personal and social costs". Akerlof and Kranton (2000) arrive at a similar conclusion in their behavioral model of economics and identity, showing how gendered social norms impact the household division of labor and gender discrimination in the workplace. The capability approach developed by Amartya Sen, Martha Nussbaum, and others also acknowledges the importance of social institutions and social and legal norms in determining a person's capabilities, agency, and life outcomes (Robeyns, 2005).

Culture and social norms are dynamic and change over time. It is unclear, however, whether there is any causal relationship between democracy and gender equality. Inglehart et al. (2002), in their seminal paper analyzing data from 70 societies, conclude that modernization is the key factor behind both. The authors find that economic development drives cultural change that encourage both the rise of women in public life, and the development of democratic institutions.

Democratic elections lead to a political shift towards self-expression values (Inglehart et al., 2002). Regime changes in elections can lead to advancements in gender equality, yet also to setbacks, depending on the relative strength of political movements in society (Eksi & Wood, 2019; Glick, 2019; Harnischfeger, 2008). In particular, when democratic elections erode secularist ideas in public policies and social norms, gender norms may regress. Indeed, regime changes that were triggered by the Arab Spring saw secular regimes being replaced by Islamist regimes in several Arab countries. According to Tibi (2013), Islamist movements were the core beneficiaries of the Arab Spring, because they were the best organized opposition in the MENA region.

> "The Arab Spring was not of their making, but they were in a position to incrementally take over and be in charge of all affairs and at all levels. Their professed plan for change is based on an envisioned replacement of the secular order of the sovereign nation-state by a 'nizam islami'/'Islamic system' based on what they believe to be 'shari'a'. Islamists' shari'a state is not a contribution to a genuine democracy.[4] […] Islamist movements often only approve elections, but dismiss other democratic values as Western." (Tibi, 2013)

The conflict between Islamic systems and women's rights has regularly been pointed out by many feminist scholars (e.g., Nussbaum, 2000; Deylami, 2014). Modern liberal democracies hold that religious liberty is a very important value. The same democracies also defend as central a wide range of human rights and liberties. Nussbaum (2000), however, asserts that "religious traditions have indeed been powerful sources of oppression for women". Islamic law, in particular, often collides with women's freedom of movement, the right to seek employment outside the home, the right to assemble, the right to bodily integrity, the right to education, and the right to hold and to inherit property. Thus, legal systems influenced by shari'a constitute a major obstacle for women to make strategic life choices and to reach their full capacity. Thus, Islamic societies often drift towards greater gender inequality.

Empirical evidence supports the conflict between Islamic systems and women's rights. Gouda and Potrafke (2016) show that legal discrimination against women is more pronounced in countries where Islam is the source of legislation. Glas et al. (2019) find that religious service attendance reduces both support for gender equality in education and politics in MENA countries. They further show that support for gender equality is particularly low among Muslims and men, and that the religiosity effect is partially mitigated in more secular societies.

Several studies have investigated the effects of the Arab Spring protests on gender outcomes in recent years (Alexander & Apell, 2016; Bargainet et al., 2019 Charrad & Zarrugh, 2014; El-Mallakh et al., 2018; Fox et al., 2016; Moghadam, 2018; Glas & Spierings, 2020). Some studies have focused on Egypt and have come to different conclusions. EI-Mallakh (2018) and Bargain et al. (2019) both use two waves of survey data surrounding the 2011 protests in Egypt. El-Mallakh et al. (2018) finds that the protests reduced intra-household differences in labor force participation between women and men, while Bargain et al. (2019) find a significant improvement in women's final say regarding decisions on health, socialization, and household expenditures, as well as a decline in the acceptance of domestic violence and girls' circumcision. In contrast to these studies, Moghadam (2018) reports a patriarchal backlash after the first democratic elections in fall 2011, which saw only 9 out of 498 elected Egyptian MPs being female. A female MP from the Salafist Nour party even attempted to undo the *khul'a* law, the Egyptian law stipulating a woman's right to initiate divorce. Fox et al. (2016) examine the effects of Arab Spring protests across countries. Using waves two (2010/11) and three (2013) of the Arab Barometer, and employing a difference-in-differences approach, the authors compare changes in attitudes towards women's equality between waves and between three Arab Spring countries (defined as countries that underwent regime change) and six non-Arab Spring countries, adjusting for covariates. The study finds that support for "Muslim feminism" (an interpretation of gender equality grounded in Islam) increased over the period, particularly in Arab Spring countries. In contrast, support for "secular feminism" (a secular, "Western" interpretation of women's rights) declined. The authors suspect that the revolutionary sentiments that had rejected authoritarian regimes, which had often been oriented towards the West, also rejected the support for Western symbols including

[4] Egypt's Muslim Brotherhood does not deny that their goal is a state based on *shari'a* (see the election program of the Egyptian Muslim Brothers party, the Freedom and Justice Party (FJP)). Throughout modern history, Egypt has been the forerunner for political movements in the Arab region (Tibi, 2013).

secular interpretations of women's rights. Instead, the "Arab streets" might have initiated "a Muslim feminist model that grounds gender equality in an interpretation of Islam" (Fox et al., 2016). Glas and Spierings (2020) combine data from the Arab Barometer and the World Value Surveys for 10 Arab countries surveyed at least once before and once after the Arab Spring events. Their study finds positive time trends in the support for feminism across most Arab countries during the period under investigation (2006–2014).

Based on the above theoretical considerations and existing, but inconclusive empirical evidence, it is therefore an important empirical task to examine the impact of the Arab Spring protests and regime changes on gender equality and women's empowerment. This paper examines the hypothesis that Arab Spring events might have had negative repercussions for female labor force participation and gender norms in the countries most affected by the events.

3. Data and empirical approach

3.1. Data and variables

This study uses data from the Gallup World Poll (GWP) which continually surveys residents in more than 150 countries around the world. According to Gallup (2018b), the GWP represents more than 99 % of the world's adult population. Typical GWP surveys collect samples from 1000 individuals in each country, including both core and supplementary questions. In many countries, surveys are collected on an annual basis. For the purpose of this study, we use all available surveys between 2009 and 2018 for up to 17 MENA countries.[5] Full information on all variables required for our main estimations is available for a sample of 143,478 adults in working age (15−64). When excluding countries that have only a before- or an after-Arab Spring survey wave, yet not both, we are left with a final sample of 112,124 observations across 10 MENA countries and between 2009 and 2018. This sample will be used for the analysis of Arab Spring exposure on female labor force participation, and will allow us a medium-term evaluation of Arab Spring events on women's labor market outcomes.

For a woman to be empowered, i.e., to have the ability to make and act on her own life choices, she needs to have access to employment and economic resources (Bethmann & Rudolf, 2018; Doss, 2013; Kabeer, 2005). Thus, the first and foremost dependent variable in this study is female labor force participation. Table 1 presents summary statistics on the variables used in the following analyses. Overall, there is a wide gap in labor force participation between females (26.3 %) and males (73.1 %) across the Arab region.[6] A woman's agency and her economic and political participation strongly depend on societal prescriptions about the roles that women and men play in society, i.e., prevalent gender norms. During the period of interest, Gallup also collected questions on attitudes towards women's rights, however only in 2009 and 2011. Thus, the number of observations in these gender norms' variables is substantially smaller than for labor market outcomes. Observing these variables in 2009 and 2011 (during and right after Arab Spring protests) will allow us to conduct an evaluation of short-run effects for gender norms. We make use of the following 3 variables: support for women's legal rights, occupational rights, and divorce rights.[7] According to Table 1, approximately four out of five respondents agree to the statements that "Women and men should have equal legal rights" (*equal rights across gender* hereafter) (80.3 %) and that "Women should be allowed to hold any job that they are qualified for outside the home" (*women's unrestricted access to occupations*) (79.4 %). In contrast, only 57.6 % agree to the statement "Women should have the right to initiate a divorce" (*women's right to initiate divorce*).

Our baseline protest index is taken from Wolfsfeld et al. (2013) and measures the "level of *significant protests* during the most important weeks of the Arab Spring". Wolfsfeld et al.'s protest measure focuses on the most active week of protest in each country and on protests that involved at least one thousand participants (= "significant protest"). The authors examine a total of eight days from the first significant protest of the chosen week. The scale ranging from 0 to 8 indicates the number of days on which significant protests took place during the most intense week of protests in each country. As a robustness check, we will also use an alternative protest measure constructed by Steinert-Threlkeld (2017), which is the number of protests from November 1, 2010 through December 31, 2011 based on the Integrated Conflict Early Warning System (ICEWS) machine-coded event data (Boschee et al., 2015). The distribution of protest measures by country can be found in Table A1 in the appendix. Arab Spring protests first broke out in Tunisia on December 18, 2010, and rapidly spread throughout the Arab world during the following two months. According to Wolfsfeld et al. (2013), 8 consecutive days of significant protests took place in Tunisia, Egypt, Algeria, Bahrain, Lybia, Syria, and Yemen. The total number of protests recorded by Steinert-Threlkeld (2017) were highest in Egypt (3379), followed by Syria (2057), Yemen (1885), Tunisia (882), Bahrain (798), and Lybia (663). Both protest measures indicate protest intensity at the country level, not at the (within-country) regional level. While the latter would have been preferred, such data are not consistently available across the MENA region. Table A1 provides further information on the current situation of women in Arab countries. Female labor force participation is

[5] It should be noted that Gallup continued collecting surveys even during the protest year 2011 and civil war years. Certain regions were not surveyed in some years such as the Al-Mahra governorate in Yemen and the Quneitra and Homs governorates in Syria due to security concerns (Gallup, 2018a). Since the excluded governorates are unlikely to have seen improvements in women's empowerment post-Arab Spring compared to surveyed regions, this study's results are likely to measure lower-bound effects.

[6] Labor force participation in the GWP is measured using a set of questions on the current occupation of the survey respondent. The variable that we use in this study follows standard international definitions and considers a person as in the labor force if she/ he is either employed part time or full time, or is currently unemployed (i.e., not working, but looking for a job and ready to start a job). We restrict our sample to ages 15–64.

[7] These are the three variables that are available in most GWP surveys, hence the reason why we use them. Information on support for women's political rights was only available in very few surveys.

Table 1
Summary statistics.

	Mean	Std. Dev.	Min	Max
Labor force participation	0.499	0.500	0	1
LFP (females)	0.263	0.441	0	1
LFP (males)	0.731	0.443	0	1
Gender attitudes (1 =yes, 0 =no)				
Equal rights across gender ("Women and men should have equal legal rights.")	0.803	0.398	0	1
Women's unrestricted access to occupations ("Women should be allowed to hold any job [.].")	0.794	0.405	0	1
Women's right to initiate divorce ("Women should have the right to initiate a divorce.")	0.576	0.494	0	1
Arab Spring indicators				
Protest index,Wolfsfeld et al. (2013)	5.060	3.300	0	8
Ln number of protests,Steinert-Threlkeld (2017)	6.411	1.250	4.06	8.13
Post (1 if year $\geq$ 2011)	0.508	0.500	0	1
Individual characteristics				
Age 15–24	0.333	0.471	0	1
Age 25–39	0.374	0.484	0	1
Age 40–54	0.216	0.411	0	1
Age 55 +	0.078	0.267	0	1
Female	0.497	0.500	0	1
Completed elementary or less	0.438	0.496	0	1
Secondary or some tertiary	0.473	0.499	0	1
Completed 4-year college	0.089	0.285	0	1
Never married	0.413	0.492	0	1
Married	0.538	0.499	0	1
Separated	0.002	0.039	0	1
Divorced	0.020	0.139	0	1
Widowed	0.028	0.166	0	1
Immigrant	0.076	0.265	0	1
Muslim	0.942	0.234	0	1
Household characteristics				
HH size	4.328	1.950	1	30
No of children 0–14	1.870	2.215	0	52
Income quintile	3.025	1.407	1	5
Rural area/ farm	0.228	0.420	0	1
Small town/ village	0.168	0.374	0	1
Large city	0.416	0.493	0	1
Suburb of large city	0.188	0.391	0	1

Notes: N = 112,124 for all except attitude variables. All available GWP survey rounds from 2009 to 2018 for MENA countries were pooled. Countries that do not have both a before- and an after-Arab Spring survey wave were excluded from the sample. Sampling weights are applied.

particularly low in Yemen (6.1 %), Iraq (12.2 %), Jordan (15.3 %), Syria (15.5 %), and Algeria (16.1 %). Women's freedom of movement is most limited in Iran, in Jordan, in Qatar, in Saudi Arabia, and in Yemen. Moreover, according to the Global Gender Gap Report (WEF, 2019), out of 153 countries in the world, no Arab country is ranked better than 120, while Iraq and Yemen are ranked last in the world in terms of gender equality.

3.2. Empirical strategy

Pooling the Gallup World Poll 2009–2018 for all countries with at least one before and one after survey wave, we can estimate a difference-in-differences model as follows:

$$y_{ijct} = \beta_0 + \beta_1 Protest_c \times Post + \beta_2 Protest_c + \delta X_{ijct} + \theta X_{ijct} \times Post + \sigma_{jc} + \rho_t + \varepsilon_{ijct}, \quad (1)$$

where *i*, *j*, *c*, and *t* denote individual, region, country, and year respectively.[8] y_{ijct} represents the main gender outcome, namely labor force participation and gender norms (*equal rights across gender*, *women's unrestricted access to occupations*, and *women's right to initiate divorce*). *Post* is the time dummy equal to '1' for the post-Arab Spring period (2011 onward) and '0' for the base period (2009–2010), and $Protest_c$ is the treatment variable indicating the protest intensity in country *c*, ranging from 0 to 8, where a larger number signifies

[8] We decided to use region (within-country regions or provinces) instead of country to control for more precise spatial effects.

Table 2
Effects of Arab Spring exposure on female labor force participation.

	(1) Labor Force Participation	(2)
	Female	*Females & Males*
Protest	-0.00784***	-0.00144
	(0.00238)	(0.00242)
Post × Protest	-0.00849***	-0.00242
	(0.00275)	(0.00223)
Female		-0.468***
		(0.0320)
Female × Protest		0.00336
		(0.00537)
Post × Female		0.0855***
		(0.0272)
Post × Protest × Female		-0.0112***
		(0.00387)
Individual Controls	YES	YES
Household Controls	YES	YES
Controls × Post	YES	YES
Region FE (Within-country regions)	YES	YES
Year FE	YES	YES
Observations	54,809	112,124
No of regions	172	172
No of countries	10	10
R-squared	0.184	0.302

Notes: Linear probability models are estimated. Robust standard errors in parentheses are clustered at the region level, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

higher protest intensity. The coefficient β_1 is the difference-in-differences (DD) estimator, representing the effect of protest intensity on the outcome variables. Coefficient β_2 captures the average difference between the treatment and control groups. It should be noted that the mechanics of this setup are equivalent to the standard DD estimator using a binary treatment variable.[9] While one could simply recode Arab Spring protests into a binary variable where '1' indicates high-level protests, and '0' otherwise (like e.g. Fox et al., 2016), we believe that this unnecessarily reduces the information contained in our protest measure. For a robustness check, however, we will also present an estimation in which we treat $Protest_c$ as a binary variable.

Covariates X_{ijct} include individual characteristics (female, age groups, birth cohorts, education level, marital status, immigrant status, Muslim dummy) and household characteristics (household size, number of children aged 0–14, income quintile dummies, level of urbanization dummies). They help to control for the difference in observable characteristics between the treatment and control groups and may therefore improve the precision of the model. We further control for the interactions of *Post* and covariates X_{ijt} to deal with the potential diverging trends in observables which may cause divergent trends in our outcome variables. The terms $\sigma_{jc}$and ρ_t denote region and year dummies, respectively, and also serve to enhance statistical inference.[10] The error term is denoted by ε_{ijt} and is assumed to be well-behaved. We further correct standard errors for clustering at the regional level. Eq. (1) can be estimated using a linear probability model or alternatively a probit/logit estimator. For the case of gender norms, Eq. (1) will be estimated only over the two available years 2009 and 2011, using female and male samples combined. In this case, β_1 will show us whether and how gender norms across both sexes were affected by the Arab Spring in the short run.

While Eq. (1) is the appropriate model for gender norms, it is not sufficient to isolate sex-specific impacts on labor force participation. For example, a negative coefficient estimate for β_1 in a regression across the female sample could merely reflect worsening labor markets for everyone in protest countries, rather than a weakening of women's relative position. Thus, in order to test for gender differences in the impact of the Arab Spring on labor force participation, we combine female and male samples and extend Eq. (1) to include a triple-interaction term and a series of corresponding double-interaction terms with the female dummy:

[9] The number of countries (≥10) in our analysis should not be misunderstood as a small-sample problem, since the important sample size is found within each group. For example, Card and Krueger (1994), in a seminal paper, use the DD method to study the impact of a raise in the minimum wage on employment. The authors use New Jersey as the treatment group (which experienced a raise in the minimum wage) and Pennsylvania as the control group (no change). The study uses only two states, but many observations (restaurants) in each state. Instead of using a single treatment and a single control group, we group Arab countries into five groups with differing treatment intensities (0, 1, 2, 4, and 8) according to Wolfsfeld et al. (2013). We then have many individual observations within each group.

[10] It should be noted that below results do hold also when omitting region fixed effects. Results are available from the authors upon request.

Table 3
Effects of Arab Spring on Attitudes Towards Women's Rights.

	(1) *Equal rights across gender*	(2) *Women's unrestricted access to occupations*	(3) *Women's right to initiate divorce*
Protest	0.0138***	-0.00825***	0.0320***
	(0.00165)	(0.00180)	(0.00300)
Post × Protest	-0.0102**	-0.0127***	-0.0182***
	(0.00455)	(0.00396)	(0.00634)
Female	0.129***	0.149***	0.220***
	(0.0121)	(0.0141)	(0.0160)
Muslim	-0.0606***	-0.0495**	-0.167***
	(0.0198)	(0.0213)	(0.0238)
Individual Controls	YES	YES	YES
Household Controls	YES	YES	YES
Controls × Post	YES	YES	YES
Region FE (Within-country regions)	YES	YES	YES
Observations	25,377	25,311	22,829
No of regions	103	103	96
No of countries	10	10	9
R-squared	0.091	0.095	0.181

Notes: Linear probability models are estimated. Robust standard errors (adjusted for clustering at the regional level) in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

$$y_{ijct} = \gamma_0 + \gamma_1 Protest_c \times Post \times Female_{ijct} + \gamma_2 Protest_c \times Post + \gamma_3 Protest_c \times Female_{ijct} + \gamma_4 Post \times Female_{ijct} + \gamma_5 Protest_c + \delta X_{ijct} + \gamma X_{ijct} \times Post + \sigma_{jc} + \rho_t + \epsilon_{ijct}, \quad (2)$$

In Eq. (2), y_{ijct} indicates labor force participation of individual i in region j of country c in year t. The key coefficient of interest is then γ_1 which denotes gender inequality in the impact of the Arab Spring protests on labor force participation, while γ_2 is the impact of the Arab Spring on males' labor force participation.

Several sensitivity checks will be conducted to assess the robustness of the above empirical model and related baseline results. First, we will conduct several tests to provide evidence for the parallel trends assumption. Second, alternative samples will be used in order to assess the representativeness of the baseline sample. Third, various alternative model specifications will be employed, including logistic regression, binary treatment, matching, and region-specific trends. Fourth, we will use an alternative protest measure from Steinert-Threlkeld (2017). Lastly, we will test for potential selection on unobservables following Altonji et al.(2005) and Oster (2019).

4. Results

4.1. Arab Spring exposure and women's outcomes

Table 2 presents results of estimating Eqs. (1) and (2) for labor force participation (LFP) over a pooled sample of 112,124 individuals from 10 MENA countries surveyed between 2009 and 2018.[11] Column (1) shows the results of estimating over the female sample only and suggests that female labor force participation (FLFP) was slightly lower in protest countries prior to the outbreak of Arab Spring protests (*Protest*). Moreover, the interaction term between protests and the post dummy (*Post* × *Protest*) has a negative and highly statistically significant coefficient estimate, indicating a negative impact of protests on FLFP.

It could be argued that, rather than suggesting a deterioration of women's relative status, in protest countries labor force participation might have fallen for both women and men due to civil unrest and its negative impact on labor markets and the economy. In order to control for this effect, we can use male labor force participation for comparison and examine if women were in fact worse off in Arab Spring countries. Hence, column (2) uses the entire sample of females and males in working age and expands the analysis to the model introduced in Eq. (2). First, it can be noted that female participation rates were on average 46.8 % points lower than those of their male counterparts over the period from 2009 to 2018. Second, male LFP was not significantly negatively affected by Arab Spring protests (*Post* × *Protest*), ruling out the possibility of labor markets deteriorating the same for all following the protests. Third, and of most interest in this study, the female-specific impact of the protests (*Post* × *Protest* × *Female*) is negative and statistically significant. This suggests that female participation rates were negatively affected by Arab Spring protests, holding everything else, including trends in male participation rates, constant. The coefficient estimate (−0.0112) is statistically significant at the 1-percent level and suggests that, ceteris paribus, a one-standard-deviation increase in the level of protests lowered female participation rates by 3.7 % points in the post-protest period. The micro evidence is confirmed by the macro evidence on the divergent trends of female labor force

[11] The regressions without controlling for individual and household covariates, and region and year dummies yield very similar results as those reported in Tables 2 and 3. Results are available upon request.

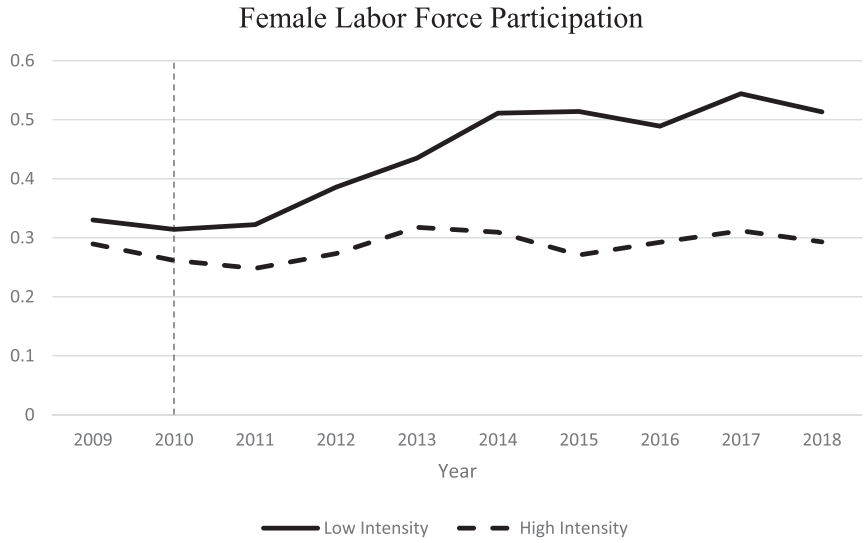

Fig. 1. Trends of female labor force participation by protest intensity. Data Source: Gallup World Poll (2009-2018)

participation after the Arab Spring as shown in Fig. 1.

As discussed above, the division of labor between women and men is rooted in gender norms, i.e., socially prescribed gender roles. Table 3 shows the results of estimating effects of Arab Spring exposure on gender norms, more specifically on attitudes towards women's rights. Regressions were run over 10 countries and the years 2009 (before) and 2011 (after), therefore measuring *short-run* changes in attitudes around the Arab Spring. Estimations were carried out using the entire sample of both female and male respondents in working age. Estimates from Table 3 indicate that across all three outcomes, female and non-Muslim residents of MENA countries are significantly more likely to support an expansion of women's rights. Moreover, the interaction between protest intensity and the post period (*Post* × *Protest*) is negative and statistically significant for all three outcomes, suggesting a worsening of attitudes towards women's rights in countries that experienced protests. Coefficient estimates suggest that a one-standard-deviation increase in protests was associated with a reduction in the support for the three women's rights statements by 3.4, 4.2 % and 6.0 % points, respectively.[12] Table 3 results indicate that gender norms were negatively affected by Arab Spring protests in the short-run, which is in line with negative longer-run effects on FLFP found in Table 2. Our results lend support to the findings of Fox et al. (2016) that the Arab Spring reduced the support for "secular feminism" in the MENA region. However, our findings are in contrast to the improvement of female labor force participation and gender attitudes that were found in the case of Egypt (EI-Mallakh, 2018; Bargain et al., 2019), which may imply that the case of Egypt is different from the overall change in the region.

The micro evidence from Table 3 is also supported by macro evidence from the Human Freedom Index (Vásquez & Porčnik, 2019) and Varieties of Democracy (Coppedge et al., 2019). In Fig. 2, we look into two measures of women-specific freedom, women's security and safety (Panel A) and women's movement (Panel B), and two measures of women civil liberties, access to justice for women (Panel C) and property rights for women (Panel D). Countries were grouped into a high-intensity protest group (protest intensity={4, 8}) and a low-intensity protest group (protest intensity={0, 1, 2}). The figure shows that women's freedom sharply decreased after the Arab Spring, especially in countries with higher levels of protests, and the recovery in the measure of women's movement also turns out to be slower for those high-intensity countries. Regarding women civil liberties, both access to justice for women and property rights for women only decreased and gradually recovered in countries with higher levels of protest intensity after the Arab Spring. In countries with lower levels of protest intensity, access to justice for women gradually increased after the Arab Spring and the property rights for women remained virtually unchanged.

4.2. *Validity of the parallel trends assumption*

The key assumption of difference-in-differences regressions is the parallel trends assumption. If there were omitted time-varying heterogeneous shocks to regional labor markets or to gender norms, our results could be biased. We can exploit pre-Arab Spring data to perform a falsification test. We have access to two waves of data (2009 and 2010) for labor force participation prior to the Arab Spring. Therefore, we can conduct a placebo test to assess whether FLFP in 2009 and 2010 were affected by the subsequent 2011 protests. We define a pseudo post-treatment indicator that takes a value of "1" for respondents observed in 2010 and "0" for those

[12] We further tested for potential gender-specific effects for attitudes towards women's rights using a model equivalent to Eq. (2). However, gender-specific terms were insignificant. Estimation results are available from the authors upon request.

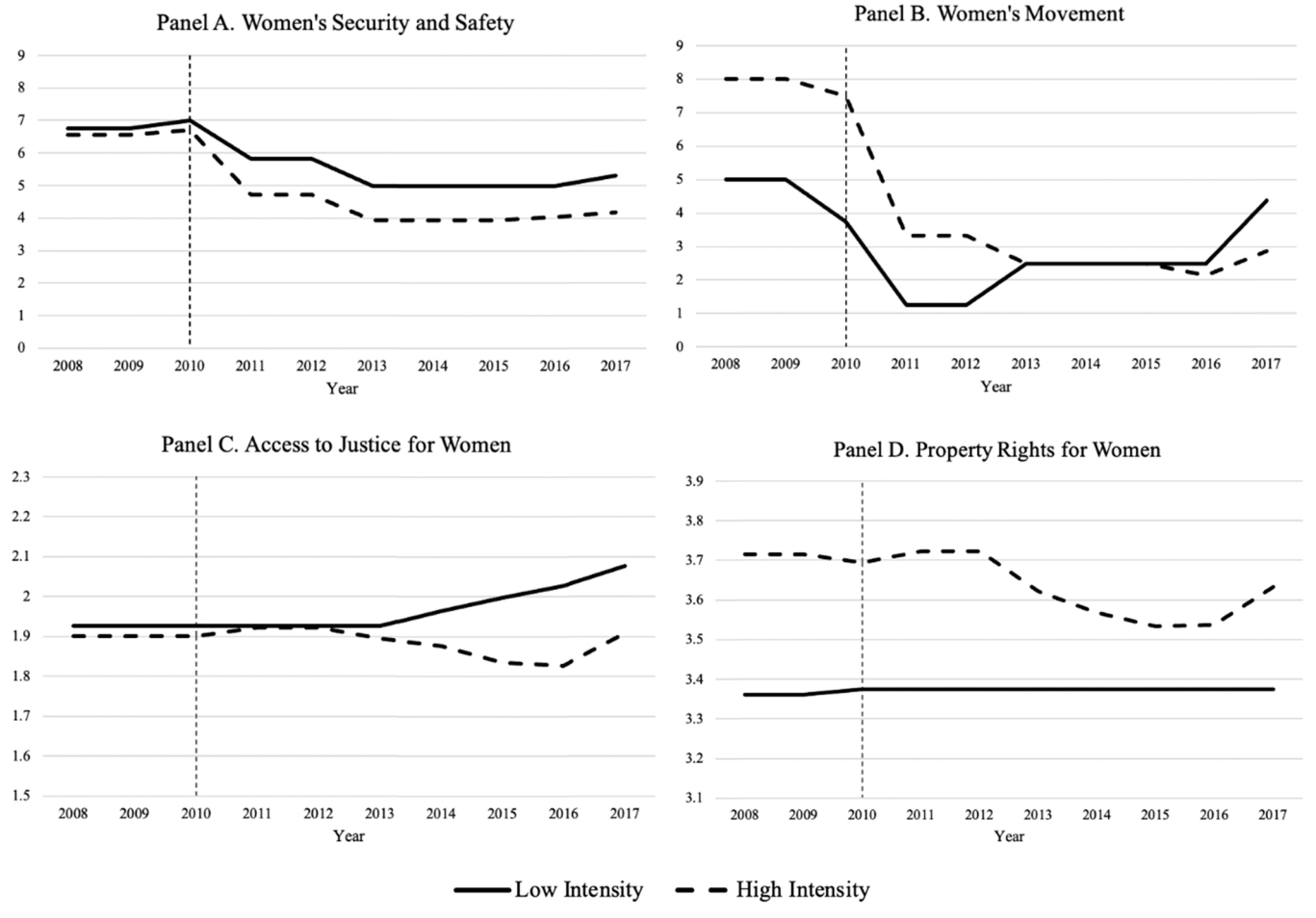

Fig. 2. Trends of women-specific freedom and women civil liberties by protest intensity. *Notes*: Data for Panels A and B come from Human Freedom Index (2019). Women's security and safety includes two components: female genital mutilation and inheritance rights. Women's movement measures whether women and men have the same legal rights to apply for national identity cards, to apply for passports, and to travel outside the country. The values of both measures range from 0 to 10, with a higher value representing a higher degree of freedom. Data for Panels C and D come from Varieties of Democracy. Access to justice for women is derived from the question "Do women enjoy equal, secure, and effective access to justice?" Property rights for women is derived from the question "Do women enjoy the right to private property?" The value of former ranges from 0 to 4, and that of the latter ranges from 0 to 5. A higher value represent a more positive response. The figure is for the 11 countries in our baseline regression analysis.

Table 4
Placebo test for labor force participation.

	(1) Labor force participation	(2)
	Females	*Females & males*
Pseudo Post × Protest	0.00505	-0.00524
	(0.00363)	(0.00414)
Pseudo Post × Protest × Female		0.00844
		(0.00598)
Individual Controls	YES	YES
Household Controls	YES	YES
Controls × Pseudo Post	YES	YES
Region FE (Within-country regions)	YES	YES
Observations	13,180	26,670
No of regions	100	100
No of countries	10	10
R-squared	0.197	0.330

Notes: "Pseudo Post" takes value 1 for respondents in year 2010, and 0 in year 2009. Other control variables are same as in Tables 2 and 3. Robust standard errors in parentheses are clustered at the region level, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5
Heterogeneity of treatment effects.

	(1) Married	(2) Unmarried	(3) Young	(4) Old	(5) Urban	(6) Rural	(7) High education	(8) Medium education	(9) Low education
Panel A: Labor Force Participation									
Post × Protest × Female	-0.0152***	-0.00427	-0.00671*	-0.0136***	-0.0143***	-0.00108	-0.0112*	-0.00789*	-0.00237
	(0.00438)	(0.00379)	(0.00398)	(0.00417)	(0.00463)	(0.00423)	(0.00603)	(0.00408)	(0.00568)
Observations	67,887	44,237	56,517	55,607	70,106	42,018	18,180	55,787	38,157
R-squared	0.378	0.259	0.272	0.360	0.304	0.309	0.155	0.289	0.331
Panel B: Equalrights									
Post × Protest	-0.00890*	-0.0108**	-0.00903*	-0.0109**	-0.00327	-0.0240***	-0.00829	-0.00757*	-0.0163**
	(0.00526)	(0.00456)	(0.00476)	(0.00533)	(0.00499)	(0.00787)	(0.00687)	(0.00441)	(0.00682)
Observations	15,404	9973	13,390	11,987	17,325	8052	4029	13,359	7989
R-squared	0.106	0.092	0.090	0.110	0.088	0.119	0.116	0.102	0.115
Panel C: Womenanyjob									
Post × Protest	-0.00935**	-0.0161***	-0.0126***	-0.0127**	-0.00533	-0.0259***	-0.0133**	-0.0104**	-0.0142***
	(0.00438)	(0.00480)	(0.00422)	(0.00517)	(0.00440)	(0.00737)	(0.00571)	(0.00448)	(0.00534)
Observations	15,362	9949	13,342	11,969	17,268	8043	4011	13,310	7990
R-squared	0.098	0.107	0.101	0.103	0.093	0.122	0.100	0.107	0.107
Panel D: Divorceright									
Post × Protest	-0.0116*	-0.0260***	-0.0218***	-0.0139**	-0.0179**	-0.0127	-0.0214**	-0.0182***	-0.0148*
	(0.00672)	(0.00706)	(0.00699)	(0.00683)	(0.00709)	(0.0134)	(0.0106)	(0.00658)	(0.00798)
Observations	13,758	9071	11,999	10,830	15,530	7299	3675	11,966	7188
R-squared	0.188	0.186	0.188	0.190	0.187	0.183	0.237	0.193	0.166

Notes: Other control variables as in Tables 2 and 3. Robust standard errors (adjusted for clustering at the regional level) in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. "Young" includes all individuals up to the median sample age (32). "Urban" includes those that live in large cities or suburbs of large cities.

Table 6
Robustness Checks - Alternative Samples.

	(1) *Labor Force Participation*	(2) *Equal rights across gender*	(3) *Women's unrestricted access to occupations*	(4) *Women's right to initiate divorce*
Panel A: Prime work age (25–64)				
Post × Protest	0.00397	-0.0101**	-0.0115**	-0.0131**
	(0.00257)	(0.00496)	(0.00449)	(0.00646)
Post × Protest × Female	-0.0146***			
	(0.00477)			
Observations	82,677	18,133	18,073	16,349
R-squared	0.346	0.0889	0.0860	0.177
Panel B: Without immigrants				
Post × Protest	-0.00258	-0.0108**	-0.0122***	-0.0165**
	(0.00248)	(0.00460)	(0.00401)	(0.00639)
Post × Protest × Female	-0.0110***			
	(0.00420)			
Observations	102,654	22,467	22,410	20,359
R-squared	0.295	0.094	0.097	0.183
Panel C: Adding countries with only before or after wave				
Post × Protest	-0.00397*	-0.00955**	-0.0120***	-0.0172***
	(0.00225)	(0.00447)	(0.00389)	(0.00646)
Post × Protest × Female	-0.00834**			
	(0.00420)			
Observations	143,478	28,175	28,086	26,371
R-squared	0.292	0.095	0.098	0.180

Notes: Other control variables as in Tables 2 and 3. Robust standard errors (adjusted for clustering at the regional level) in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

observed in 2009. Regression results are reported in Table 4 and follow the same structure as in Table 2. The coefficients of the pseudo treatment on FLFP in both columns are not statistically significant. Besides, Fig. 1 shows graphically the time trends of FLFP before the Arab Spring are almost parallel. We thus conclude that our results on labor force participation are unlikely to be driven by differing pre-existing regional labor market trends. With regard to effects on gender norms estimated in Table 3, we face data restrictions since these variables were only measured once before and once after the Arab Spring in the GWP. We can therefore not estimate a similar placebo test for attitudes towards women's rights. While this is unsatisfactory, we try to exploit external measures of women-specific freedom from the Human Freedom Index (Vásquez & Porčnik, 2019) and Varieties of Democracy (Coppedge et al., 2019) to proxy for trends in gender norms. In Fig. 2, the pre-2010 trends of the two women-specific freedom measures and two women civil liberty measures turn out to be almost parallel between countries with higher levels of protests and those with lower levels of protests. This lends some support to the parallel trends assumption for gender norms. We will further test for the presence of omitted variable bias in our results in Section 4.5 below.

4.3. Heterogeneity in treatment effects

How national protests and related political changes affect individuals can further differ depending on their demographic characteristics such as marital status, age, education, and location. Table 5 examines heterogeneity in treatment effects on LFP and gender norms by estimating separate regressions for married versus unmarried (single, divorced, separated, or widowed) in columns (1) and (2), young versus old respondents in columns (3) and (4), urban versus rural in columns (5) and (6), and those with low, medium, and high levels of education in columns (7)-(9), respectively.[13] The main coefficients of interests are presented following baseline models in Tables 2 and 3.

Panel A of Table 5 shows that Arab Spring events mainly affected married women's labor force participation. The coefficient of the female-specific impact (*Post* × *Protest* × *Female*) is 3.5-times higher for married women compared to unmarried women, and it is insignificant for the latter group. This is not surprising given that traditional gender roles are more likely to be enforced within marriage compared to outside of marriage (Grossbard-Shechtman, 1984). A one-standard-deviation increase in the level of protests lowered married females' LFP rates by 5.2 % points, while leaving unmarried females' LFP unaffected. Panel A also suggests negative impacts of the Arab Spring on FLFP particularly for women older than the median age of 32 ("old"), for women living in or adjacent to large cities ("urban"), as well as for women with higher levels of education. According to Panel B, the support for women and men having equal legal rights was affected more negatively by Arab Spring protests within rural and low-educated population groups. Panel

[13] "Young" includes all individuals up to the median sample age (32). "Urban" includes those that live in large cities or suburbs of large cities. An individual is considered to have "low education" if she has completed elementary education at most; "medium education" refers to having secondary or some tertiary education; "high education" means that the person has completed a 4-year college or above.

Table 7
Robustness Checks - Alternative Model Specifications.

	(1) *Labor Force Participation*	(2) *Equal rights across gender*	(3) *Women's unrestricted access to occupations*	(4) *Women's right to initiate divorce*
Panel A: Logit model				
Post × Protest	-0.00363	-0.0115**	-0.0138***	-0.0189***
	(0.00237)	(0.00488)	(0.00399)	(0.00633)
Post × Protest × Female	-0.00811**			
	(0.00396)			
Observations	112,124	25,377	25,311	22,816
R-squared	0.250	0.0936	0.0991	0.144
Panel B: Binary treatment variable				
Post × Protest	-0.00410	-0.0674**	-0.0754***	-0.172***
	(0.0157)	(0.0292)	(0.0272)	(0.0381)
Post × Protest × Female	-0.0869***			
	(0.0287)			
Observations	112,124	25,377	25,311	22,829
R-squared	0.302	0.091	0.095	0.183
Panel C: Binary treatment variable with propensity score matching				
Post × Protest	-0.0122	-0.0802**	-0.112***	-0.185***
	(0.0203)	(0.0338)	(0.0319)	(0.0380)
Post × Protest × Female	-0.0616*			
	(0.0335)			
Observations	112,093	25,321	25,254	22,636
R-squared	0.317	0.090	0.102	0.193
Panel D: Donald–Lang Aggregation				
Post × Protest		-0.0096**	-0.0115*	-0.0170
		(0.00434)	(0.00600)	(0.0159)
Post × Protest × Female	-0.0104**			
	(0.00402)			
Observations	172	20	20	18

Notes: Other control variables are same as in Tables 2 and 3. The logit models in Panel A report marginal effects. Panel D reports the estimates by Donal-Lang aggregation method, using the original treatment variable. Robust standard errors in parentheses are clustered at the region level in panels A-C. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The binary treatment variable takes the value 1 if the original protest index is 8 or 4, and takes the value 0 otherwise.

C examines heterogeneity in Arab Spring effects on the agreement that women should be allowed to hold any job. Again, rural areas turned more conservative as a result of the protests. Surprisingly, this was also the case for unmarried women. Lastly, Panel D disentangles the protests' negative effect on the support for women's rights to initiate a divorce. The negative effect is found strongest among the unmarried, young, educated, urban population, the group which constituted the major source of protestors. The latter is in line with Kostenko et al. (2016) who, using pre-Arab-Spring data, find that younger generations are the most patriarchal in their gender attitudes, a phenomenon they refer to as "retrogression of social values in the younger generations".

4.4. Robustness checks

A series of tests was conducted to check the robustness of our baseline results in Tables 2 and 3 to variations in the sample, in model specification, in the protest measure, and to potential omitted variable bias.[14] We start with results from using alternative samples in Table 6. In Panel A, the sample is restricted to individuals in prime working age (25−64), which meant dropping the population 15–24 which could be seen as still in education and thus potentially affecting LFP results. Restricting the sample to prime-work age confirms our baseline results. The female-specific effect for LFP rises from $|-0.0112|$ to $|-0.0146|$ in absolute terms while maintaining significance at the 1-percent level. The Arab Spring's negative effect on *equal rights across gender* is slightly more pronounced, while it is slightly weaker for *women's unrestricted access to occupations* and *women's right to initiate divorce*. Panel B re-estimates baseline regressions, yet this time excluding immigrants from the sample. Since migrant workers play an important role in the economies of the GCC (Gulf Cooperation Council) countries, these could affect our results. Coefficient estimates in panel B confirm our baseline effects for FLFP and all three gender norms. Panel C of Table 6 estimates with the largest available sample, adding countries that only have a before- or an after-Arab-Spring survey wave, yet not both. This allows expanding the dataset to 17 countries for LFP regressions and 13 countries for gender norms regressions. Using all countries reduces the negative impact of protests on female participation rates; however, baseline results are generally confirmed for all four gender outcomes.

Table 7 presents the results of using alternative model specifications. Panel A reports marginal effects of *logit* regressions for the four

[14] We also add some macro-level measures such as a globalization index and trade openness measure to our baseline models and yield very similar results. Results are available upon request.

Table 8
Robustness Check - Steinert-Threlkeld Protest Measure.

	(1) *Labor Force Participation*	(2) *Equal rights across gender*	(3) *Women's unrestricted access to occupations*	(4) *Women's right to initiate divorce*
Post × Protest	0.000693	-0.0196*	-0.0270**	-0.0364**
	(0.00525)	(0.0111)	(0.0111)	(0.0175)
Post × Protest × Female	-0.0314***			
	(0.00920)			
Observations	112,124	25,377	25,311	22,829
R-squared	0.303	0.091	0.094	0.180

Notes: Other control variables are same as in Tables 2 and 3. Robust standard errors in parentheses are clustered at the region level, *** p < 0.01, ** p < 0.05, * p < 0.1.

Table 9
Robustness to Omitted Variable Bias.

Dependent variables	(1) No controls	(2) Full set of controls	(3) δ	(4)	(5) Bias-adjusted effect (β^*)	(6)
			$\beta^* = 0, R_{\max} = R_f - (R_r - R_f)$	$\beta^* = 0, R_{\max} = 1.3R_f$	$\delta = 1, R_{\max} = R_f - (R_r - R_f)$	$\delta = 1, R_{\max} = 1.3R_f$
Female labor force participation ($\widehat{\gamma_1}$)	-0.00960***	-0.0112***	-7.000	-5.486	-0.0128	-0.0132
	(0.00320)	(0.00387)				
R-squared	[0.231]	[0.302]				
Equal rights across gender	-0.00751**	-0.0102**	-3.792	-3.750	-0.0129	-0.0129
	(0.00313)	(0.00455)				
R-squared	[0.064]	[0.091]				
Women's unrestricted access to occupations	-0.0148***	-0.0127***	6.048	8.063	-0.0106	-0.0111
	(0.00333)	(0.00396)				
R-squared	[0.057]	[0.095]				
Women's right to initiate divorce	-0.0193***	-0.0182***	16.545	16.149	-0.0171	-0.0171
	(0.00680)	(0.00634)				
R-squared	[0.128]	[0.181]				
Individual Controls	NO	YES				
Household Controls	NO	YES				
Controls × Post	NO	YES				
Region FE	YES	YES				
Year FE	YES	YES				

Altonji et al. (2005); Nunn and Wantchekon (2011); Oster (2019). Robust standard errors in parentheses are clustered at the region level, *** p < 0.01, ** p < 0.05, * p < 0.1.

outcome variables in columns (1)-(4). The female-specific effect for FLFP in column (1) is − 0.00811 and significant at the 5-percent level, which is close to the baseline coefficient in column (2) of Table 2. The three coefficients for gender norms in columns (2)-(4) are all significant and have very similar magnitudes as those in the baseline results in Table 3. This confirms that our estimates are also robust to nonlinear model specification. In Panel B, the original protest index was converted into a binary treatment variable, with value 1 if the original protest index is 8 or 4, and 0 otherwise. The coefficient for the FLFP is − 0.0869 and statistically significant at the 1-percent level. The coefficients for the three gender norms are also negative and statistically significant at the 5- or 1-percent level. In Panel C, we further report results from regressions using a binary treatment in combination with propensity score matching. We follow the method proposed by Hirano, Imbens, and Ridder (2003) and adopted in Bargain et al. (2019) to reweight the estimations using the inverse propensity score. Denote p_i the propensity score for each individual i from kernel matching. The weights for the treated and control observations are given by $1/p_i$ and $1/(1-p_i)$, respectively. The results in Panel C appear to be similar to those in Panel B in terms of size and significance level, except that the coefficient in the FLFP regression is reduced to be statistically significant only at the 10-percent level (*p-value*=0.066). In panel D, we report the estimates using the aggregation method proposed by Donald and Lang (2007)[15] The authors showed that the aggregation method works well when the number of groups is small but the number of individuals in each group is large, which is our case. We find that the coefficient in the FLFP regression is − 0.0104 and significant at the 5-percent level, which is very similar to our baseline result. The coefficients for the three gender norms are also negative and similar to those in the corresponding baseline models. However, the coefficient of women's right to initial divorce loses its significance, which is likely to be related with the data limitation: the small number of countries (9) and only two periods of time. Finally, an additional model specification test (not reported in the Table) was conducted in which region-specific trends were added to the baseline model for

[15] We used the command *didregress* in Stata 17 to conduct the regressions.

labor force participation. The resulting female-specific effect is − 0.0115 (cp. to baseline −0.0112) and statistically significant at the 1-percent level.[16]

Table 8 presents results from using the alternative protest measure suggested by Steinert-Threlkeld (2017). Once again, our baseline findings for both FLFP and gender norms are confirmed. The treatment effect for FLFP of − 0.0314 implies that a one-standard-deviation increase in the *Ln number of protests* reduces female participation rates by 3.9 % points, which is very close to the 3.7 % points impact estimated using Wolfsfeld et al. (2013)'s protest index in Table 2. The treatment effect for the three gender norms is − 0.0196, − 0.0270, and − 0.0364 respectively, implying that a one-standard-deviation increase in the *Ln number of protests* reduces the agreement to the three women's rights statements by 2.5, 3.4, and 4.6 % points, respectively, which is close to the baseline effects found in Table 3.

4.5. Robustness to omitted variable bias

One may still be concerned that some omitted variables correlated with protests may bias our results, despite the various robustness checks above. In this section we exploit selection on observables to gauge the bias from unobservables following the method introduced by Altonji et al. (2005) and further developed by Oster (2019). To see how it works, consider two regressions for the same outcome variable: one with a restricted set of covariates, and another with the full set of covariates (as shown in Eq. 1). Denote the estimated treatment effect from the restricted and full model $\widehat{\beta}_r$ and $\widehat{\beta}_f$, respectively. The corresponding R-squared of the two regressions is $\widehat{R}_r$ and $\widehat{R}_f$. Altonji et al. (2005) propose the test statistic $\delta = \widehat{\beta}_f / \left(\widehat{\beta}_r - \widehat{\beta}_f\right)$ to assess the strength of the likely bias arising from unobservables, as the ratio indicates the relative degree of selection on unobservables and observables that would produce a zero treatment effect. In other words, the impact of unobservables must be at least δ times greater than the observables to overturn the results. Nunn and Wantchekon (2011) adopt this method to substantiate the estimated negative impact of historical slave trade on contemporary trust in Africa.

Oster (2019) proposes the following bias adjusted treatment effect, taking into account both the estimated coefficients of interest and the R-squared of the restricted and full model:

$$\beta^* = \widehat{\beta}_f - \delta\left(\widehat{\beta}_r - \widehat{\beta}_f\right)\frac{R_{\max} - \widehat{R}_f}{\widehat{R}_f - \widehat{R}_r} \tag{3}$$

$R_{\max}$ denotes the R-squared from a hypothetical regression of the outcome variable on all observable and unobservable characteristics, which is no bigger than 1. $R_{\max}$ is suggested to be $1.3\widehat{R}_f$ for empirical analysis by Oster (2019). She suggests two related methods to assess the bias from unobservables using selection on observables. The first approach is to calculate how important the unobservables are to explain away the results, that is to calculate δ when $\beta^* = 0$. We thus can derive δ from Eq. (3), $\delta = \frac{\widehat{\beta}_f}{\widehat{\beta}_r - \widehat{\beta}_f}\frac{R_{\max} - \widehat{R}_f}{\widehat{R}_f - \widehat{R}_r}$. Note that $\delta = \frac{\widehat{\beta}_f}{\widehat{\beta}_r - \widehat{\beta}_f}$ used in Altonji et al. (2005) and Nunn and Wantchekon (2011) implicitly assume that $\frac{R_{\max} - \widehat{R}_f}{\widehat{R}_f - \widehat{R}_r} = 1$, which implies that $R_{\max} = \widehat{R}_f + \left(\widehat{R}_f - \widehat{R}_r\right)$. A greater absolute value of δ implies a smaller selection effect on observables, and being greater than one can generally be considered robust (Altonji et al., 2005). The second approach is to calculate a treatment effect β^* under the assumption that the unobservables are as important as the observables, i.e. $\delta = 1$. The treatment effect β^* is thus given by $\beta^* = \widehat{\beta}_f - \left(\widehat{\beta}_r - \widehat{\beta}_f\right)\frac{R_{\max} - \widehat{R}_f}{\widehat{R}_f - \widehat{R}_r}$. When the bias-adjusted effect β^* is similar to the estimates in the full model, we conclude that the bias from the unobservables is unlikely to be significant. The closely-related research on the Arab Spring and female labor market outcomes by El-Mallakh et al. (2018) assesses selection on unobservables following Altonji et al. (2005) and Oster (2019).

We report the results of the two approaches in Table 9. Columns (1) and (2) report the coefficient estimates of the variable of interest (female labor force participation and gender norms) and R-squared. Column (1) reports coefficients of the restricted model, controlling for region and year fixed-effects only. Column (2) reports coefficients of the model with the full set of controls, as shown in Eqs. (1) and (2). In column (3), we present the value of relative degrees of selection between unobservables and observables, δ, that would be necessary to attribute the entire results to the selection effect, under $R_{\max} = \widehat{R}_f + \left(\widehat{R}_f - \widehat{R}_r\right)$ following Altonji et al. (2005) and Nunn and Wantchekon (2011). In column (4) we report δ under $R_{\max} = 1.3\widehat{R}_f$ following Oster (2019). All the estimated δ in the two columns are substantially larger than one, indicating that our regressions are unlikely to be biased by omitted variables (Altonji et al., 2005).

In columns (5) and (6), we report the bias-adjusted effect β^* assuming $\delta = 1$ (Oster, 2019). The difference between the two columns is $R_{\max} = \widehat{R}_f + \left(\widehat{R}_f - \widehat{R}_r\right)$ in column (5), and $R_{\max} = 1.3\widehat{R}_f$ in column (6). All the coefficients in the two columns are very similar to the corresponding coefficients in the full model in column (2). Hence, we conclude that it is unlikely that unobserved factors could have significantly biased our results.

[16] We were not able to carry out the same test for gender norms given that T = 2.

5. Mechanisms

Having found negative effects on gender equality triggered by Arab Spring events, the question of *how* and *why* this occurred needs to be addressed. This section tries to explore some of the potential mechanisms that help explain our findings.

First, in order to understand changing gender norms in the Arab region, it is important to examine the balance of power between *secularists* and *Islamists* (Binzel & Carvalho, 2017; Chamkhi, 2014; Norris & Inglehart, 2011). We believe that the continuous conflict between these two groups – one of the strongest dividing factors within Arab politics – is key to understanding changing gender roles in the Arab region. Earlier literature finds that Arab Spring protests promoted not only democratic ideas, but also a new anti-Western *zeitgeist* and a simultaneous rise in Islamist-oriented political movements (Feldman, 2020; Fox et al., 2016; Gouda & Potrafke, 2016; Tibi, 2013). For many years before protests broke out, most Arab Spring countries had been governed by *secular* dictatorships which had been backed by Western powers for the sake of stability in the region. These dictatorships, however, had increasingly failed to deliver jobs, basic services, and economic progress, and had thus left vast young Arab populations economically vulnerable and dissatisfied with the status quo (Devarajan & Ianchovichina, 2018; Ianchovichina, 2018). Meanwhile, Islamic movements such as the Muslim Brotherhood in Egypt gained popularity by addressing people's basic needs with free social services (Darrag, 2016). When protests broke out and dictatorships were overthrown in 2011, the political influence of Islamic movements rapidly gained momentum and Islamists assumed power in several Arab Spring countries, leading to a fall in secularism.[17] Islamist regimes often censored the arts and media with respect to the way that women were portrayed, enacted laws and regulations that limit the freedom of movement for women, and undermined gender equality achievements in school curricula made during secular governments. Past studies suggest that higher levels of religiosity lead to more legal restrictions on personal liberties (Esteban et al., 2018), an effect particularly pronounced for women in the Arab region (OECD, 2017). Moreover, higher religiosity has been found to lower the support for gender equality in education and politics in MENA countries, particularly when non-secular regimes are in power (Glas et al., 2019). In this way, we argue that as regimes turned more religious after the Arab Spring protests, so did the public discourse, and to the extent that religiosity opposes gender equality, gender norms and the access of women to labor markets may have worsened.

Table 10 examines the relationship between the level of Arab Spring protest intensity and subsequent changes in secularism in all 11 countries that have been used in baseline regressions of Tables 2 and 3. Out of the five countries with the highest level of protest intensity (8), secularism fell in all countries except Algeria, where it remained unchanged. Tunisia and Egypt saw relatively moderate Islamic movements elected into government after the removal of secular dictatorships, while Yemen and Syria slipped into civil war between extremist Islamic forces on the one side and secular dictatorships on the other. Secularism suffered losses in all four cases at the expense of growing influence of political Islamism. Table 10 further shows that in the four countries with the lowest protest intensity (0 or 1), no change in the level of secularism occurred. Among these countries, the three GCC member states (Kuwait, Saudi Arabia, and UAE) continued to be ruled by absolute monarchies along Islamist lines, while the long-democratic Lebanon continued its unique system of confessionalism. In summary, there is strong evidence that secularism declined in countries with more intense protests compared to those with no or only limited protests.

This shift in the level of secularism is likely to have affected gender norms (Table 3) and female labor force participation (Table 2) in the aftermath of the Arab Spring. Islamic movements are generally opposed to feminist interpretations of Islam, which they regard as incompatible with Islamic teachings (Glas & Spierings, 2020). Instead, they aim to establish tighter informal (gender norms) and formal (personal and family law) institutions to guide "proper" gender behavior, which can take on particularly restrictive forms for women. Hence, sharia-based regimes tend to institutionalize gender bias in civic rights and freedoms, as well as in social and economic rights, thereby raising gender inequality (OECD, 2017).

A second possible channel through which protests may have influenced gender equality is via a negative economic or income shock. Within our baseline sample, the correlation between Wolfsfeld's protest index and the change in GDP per capita growth before and after the Arab Spring is negative and significant (correlation coefficient=−0.41),[18] suggesting that countries with higher levels of protests were more likely to suffer from a decline in economic growth.[19] There has been much discussion surrounding the changes in gender equality during an economic crisis. Previous studies have suggested that gender equality may deteriorate during an economic crisis because of son preference and the intrahousehold allocation of scarce resources (Behrman, 1988; Björkman-Nyqvist, 2013; Foster, 1995; Rose, 1999). However, consensus has not been reached on the impact of economic crises on female labor force participation: on the one hand, women are often laid off first or "encouraged" to withdraw from the labor market during a crisis (i.e., a negative demand-side effect) (Kim & Voos, 2007); on the other hand, women may be more likely to enter the labor force when their

[17] Following the 2011 protests, Islamic movements and their political parties gained popularity in more moderate forms in some countries (e.g. the Muslim Brotherhood in Egypt, the Ennahda Movement in Tunisia), and in more extremist forms in other countries (e.g. the Houthi movement in Yemen, the Islamic State in Syria and Iraq).

[18] The change in the average growth rate of GDP per capita before and after the Arab Spring is calculated by subtracting the average growth rate over the period 2003–2010 from the average growth rate over the period 2011–2018. Data on the growth rate of GDP per capita come from the World Development Indicators. The 2007–2008 financial crisis appeared to have hit countries with lower levels of protests slightly stronger, yet they saw a quick recovery.

[19] In countries with higher levels of protests (i.e., protest index=4 or 8), average GDP per capita growth decreased from 2.95 percent to −0.81 percent, while the change was significantly smaller among countries with lower levels of protests (growth rates decreased from 0.20 percent to –0.26 percent on average).

Table 10
Arab Spring Protests and Changes in Secularism, 2009–2018.

Country	Protest intensity	Secularism (change post-Arab Spring)	Description of regime changes and implications for secularism
Algeria	8	no change (reduction post-2019)	President Bouteflika (secular) in power from 1999 until major protests force his resignation in 2019. Moderate Islamist party MSP with strong gains in 2021 elections.
Egypt	8	reduction (temporary)	Mubarak (secular, president since 1981) loses power during Arab Spring. After an interim government (Tantawi), Morsi (Muslim Brotherhood, non-secular) comes to power. Morsi is overthrown a year later by the military. El-Sisi (secular) assumes power.
Syria	8	reduction & war	Al-Assad (secular) in power since 2000. Syrian civil war triggered by Arab Spring protests. Non-secular forces gain strength and territory. Eastern Syria under control of the Islamic State between 2013 and 2017.
Tunesia	8	reduction	Ben Ali (secular, president since 1987) loses power during Arab Spring. Ennahda movement (Islamic) assumes power (2012/ 2013). Since 2014 Ennahda is a junior partner in a coalition with the secular Nidaa Tounes party.
Yemen	8	reduction & war	Saleh (secular, president since 1990) loses power during Arab Spring. He is succeeded by his former vice-president Hadi (2012–2015). The Houthi movement (Islamic) takes over power in 2015.
Iraq	4	reduction & war	Al-Maliki (moderately secular, prime minister 2006–2014), succeeded by al-Abadi (moderately secular, prime minister 2014–2018). Islamic State took control of Western Iraq between 2014 and 2017.
Jordan	4	no change	King Abdullah II (moderately secular) in power since 1999.
Kuwait	1	no change	House of Al Sabah (ruling family, non-secular) in power since founding in 1752.
Lebanon	1	no change	Secular governments (Siniora, Hariri, Mikati, Salam, Hariri) between 2009 and 2018.
Saudi Arabia	0	no change	House of Saud (ruling family, non-secular) in power since founding in 1744.
UAE	0	no change	Six ruling families (non-secular) of the seven Emirates continuously in power.

Notes: Table includes only countries that were used in baseline regressions of Table 2 and 3. Protest intensity from Wolfsfeld et al. (2013). Secularism change coded by authors based on academic literature (e.g., Al-Anani, 2012; Chamkhi, 2014; Netterstrøm, 2015; Tibi, 2013) and public news.

partners become unemployed (i.e., a positive supply-side effect) (Cerrutti, 2000; El-Mallakh et al., 2018; Skoufias & Parker, 2006). Since we find that female labor force participation declined during the negative economic shock that followed the Arab Spring, the demand-side effect might have been stronger than the supply-side effect. Besides, special to the events of Arab Spring, women may have (voluntarily or not) exited the labor force due to shifts in gender norms (negative supply-side effect), as discussed earlier. In fact, this additional supply-side effect can be supported by our finding that Arab Spring exposure mainly reduced access to labor markets among married women, who are more likely to be subject to the enforcement of traditional gender roles compared to their unmarried counterparts (Grossbard-Shechtman, 1984).

A third mechanism worth exploring is sex-specific migration out of protest countries. As protests and civil war tend to induce emigration, we need to check whether such effect might have differed between females and males. We use the GWP question on the "intention to move within the next 12 months" as dependent variable in the models of Eqs. (1) and (2). While we find a slight increase in the intention to move for both sexes (Post × Protest), the gender-specific effect (Post × Protest × Female) is statistically insignificant (Appendix Table A2).

Lastly, we test whether the protests caused feelings of a decrease in personal safety, which might reduce women's labor force participation more than that of men. We ran regressions for the two binary measures of perceived safety from the GWP, whether respondents "feel safe walking alone at night in the city or area where you live", and whether respondents "trust their assets and property to be safe at all times". The results are reported in Appendix Table A3 and show that both men and women report a reduction in perceived safety (columns 1 and 3) in countries with more intense protests, while there is no gender difference in the effect of protests on safety (columns 2 and 4). However, whether the worsening in perceived safety will lead to a reduction in women's labor supply is not conclusive. On the one hand, reduced safety increases the costs of working and these costs are likely to be more salient for female workers on the margin of the decision to work. For example, Robertson et al. (2020) show that the prevalence of violent conflicts reduces labor force participation more for females than for males in South Asia. In particular, the perceived threat of sexual harassment against girls reduces women's labor supply (Chakraborty et al., 2018; Siddique, 2022). On the other hand, conflicts might lead to an increase in women's labor force participation as they try to compensate for lost household income. For example, Menon and van der Meulen Rodgers (2015) show that civil war in Nepal increased women's likelihood of employment. Robertson et al. (2020) also show that greater prevalence of violent conflicts in South Asia may encourage married women to work longer hours. In summary, we find that a higher intensity of protests lowered perceived safety in Arab Spring countries, but we do not have enough evidence to tell whether this was a significant channel driving a reduction in

women's labor supply.

6. Conclusion

This study analyzed the impact of Arab Spring protests on gender equality across the Middle East and North Africa. Exploiting the variation of protest intensity across MENA countries and using multiple waves of the Gallup World Poll surrounding the Arab Spring events, our analyses reveal that, on average, women's status and gender equality experienced a setback in protest countries. Firstly, protests lowered the support for a woman's right to have unrestricted access to occupations, for her right to initiate a divorce, and for equal legal rights for women. Secondly, women's access to work and economic resources was negatively impacted as female labor force participation fell in the aftermath of mass protests. Our findings suggest that a one-standard-deviation increase in the intensity of protests lowered female labor force participation by 3.7 % points (5.2 p.p. for married women) in subsequent years, which is a substantial reduction given the low average level of female labor force participation across the region (26.3 %). A one-standard-deviation increase in protest intensity further reduced support for women's rights by 3.4–6.0 % points, ceteris paribus. Negative effects on female labor force participation were most pronounced among women who were married, in prime work age, urban, and more educated. Our results are largely robust to different samples, alternative model specifications, omitted variable bias, as well as to an alternative protest measure from Steinert-Threlkeld (2017).

The present study's findings are in line with Fox et al. (2016) who found that Arab Spring protests reduced support for "secular feminism" and with Glas et al. (2019) who showed that religiosity reduces support for gender norms, particularly under non-secular government regimes. Our study adds to the growing literature on the political and religious determinants of gender inequality and the political and economic impacts of the Arab Spring (Bargain et al., 2019; El-Mallakh et al., 2018; Moghadam, 2018).

Regarding potential mechanisms that help explain our findings, we find evidence that Arab Spring protests and consequent democratization reduced the level of secularism in protest countries, giving rise to Islamist movements that oppose feminism and favor more traditional gender roles. This appears to be in line with earlier literature suggesting a new anti-Western *zeitgeist* that spread with the Arab Spring and a rise in Islamist-oriented parties aiming to establish Sharia-based regimes that were likely to regress gender roles and women's rights and freedoms (Chamkhi, 2014; Feldman, 2020; Fox et al., 2016; Glas et al., 2019; Gouda & Potrafke, 2016; Tibi, 2013). Other potential channels might have been a gendered impact of the economic crises that followed protests, as well as a reduction of safety which might have affected women's labor supply more than that of men.

These findings suggest that democracy does not automatically lead to gender equality, and that pro-democracy movements can have unintended side effects, confirming earlier studies that point towards the critical role of culture and religion (e.g. Norris & Inglehart, 2001; Inglehart et al., 2002; Kostenko et al., 2016). The Arab Spring has opened the doors of power to Islamists and triggered a long process of change and transition that will put Islamists' theories and practices to the test of democracy (Al-Anani, 2012). Future empirical research will be needed to track longer-term effects of Arab Spring events on various democratic values, including gender equality and women's rights.

Conflict of interest

We declare that we have no competing interests.

Data availability

The authors do not have permission to share data.

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Appendix A

See Appendix Tables A1–A3 here.

Table A1
Arab Spring, political outcomes, and women's situation in MENA countries.

Country	Start date of Arab Spring related protests	Protest intensity and political outcomes[a]	Wolfsfeld et al. (2013) protest index	Steinert-Threlkeld (2017) number of protests	Countries included in baseline regressions (having both before and after waves of GWP)	2019 Female labor force participation rate (age 15–64; modeled ILO estimate) (WDI,World Bank, 2020)	Introduction of voting rights for women	2017 Human Freedom Index		Global Gender Gap Index 2020 (WEF, 2019)
								Women's Security and Safety	Women's Movement	
						(in percent)	(year)	(score 0–10; 10 =most free)		(rank out of 153 countries)
Algeria	29-Dec-10	Government overthrown; new constitution written	8	248	✓[c]	16.1	1962	5	2.5	132
Bahrain	14-Feb-11	Strong civil disorder and government changes	8	798		25.2[e]	1973	5	2.5	133
Egypt	25-Jan-11	Protests, Mubarak government overthrown in Feb 2011; followed by Egyptian Crisis (2011–2014); followed by El-Sisi government	8	3379	✓	23.8	1956	0.65	2.5	134
Iraq	12-Feb-11	Protests ended 23 Dec 2011; followed by civil war	4	585	✓	12.2	1980	4.6	2.5	152
Iran	14-Feb-11	Sustained street demonstrations	2	NA		18.9	1963	5	0	148
Jordan	14-Jan-11	Protests, government changes, constitutional changes, new early elections in 2012	4	511	✓	15.3	1974	5	0	138
Kuwait	19-Feb-11	Protests and government changes	1	161	✓[b]	39.3[e]	2005	5	5	122
Lebanon	27-Feb-11	Protests and government changes	1	261	✓	25.4	1952	6.25	10	145
Libya	17-Feb-11	Government overthrown in Aug 2011; followed by Libyan Crisis	8	663		36.4	1964	8.75	7.5	NA
Morocco	20-Feb-11	Protest and government changes	2	298		23.2	1963	5	7.5	143
Oman	17-Jan-11	Protests (ended in May 2011), minor government changes	0	150		32.5	2003	5	2.5	144
Qatar		No significant protests	0	29		37[e]	1999	5	0	135
Saudi Arabia	11-Mar-11	Minor protests; economic concessions; expansion of women's rights	0	156	✓[d]	19.8[e]	2015	5	0	146
Syria	26-Jan-11	Civil uprising; followed by Syrian Civil War from 15 Mar 2011	8	2057	✓	15.5	1949	5	2.5	150
Tunisia	18-Dec-10	Government overthrown in Jan 2011 (Tunisian/ Jasmine	8	882	✓	26.9	1959	5	10	124

(*continued on next page*)

Table A1 (*continued*)

Country	Start date of Arab Spring related protests	Protest intensity and political outcomes[a]	Wolfsfeld et al. (2013) protest index	Steinert-Threlkeld (2017) number of protests	Countries included in baseline regressions (having both before and after waves of GWP)	2019 Female labor force participation rate (age 15–64; modeled ILO estimate) (WDI,World Bank, 2020)	Introduction of voting rights for women	2017 Human Freedom Index		Global Gender Gap Index 2020 (WEF, 2019)
								Women's Security and Safety	Women's Movement	
						(in percent)	(year)	(score 0–10; 10 =most free)		(rank out of 153 countries)
		Revolution); followed by drafting of a new constitution, democratization and free and democratic elections								
United Arab Emirates		No significant protests	0	58	✓	36.5[e]	2006	5	2.5	120
Yemen	27-Jan-11	Government overthrown in Feb 2012; followed by Yemeni Crisis	8	1885	✓	6.1	1967	4.05	0	153

[a] Sources: Wolfsfeld, 2013; UNESCWA, 2016; World Bank, 2018.
[b] Not available for labor force participation baseline regression.
[c] Not available for gender norms baseline regression.
[d] Not available for baseline regression of women's right to initiate divorce.
[e] Figures exclude female migrant workers, who play a large role in GCC countries. Sources: Planning & Statistics Authority (2019); Dubai Statistics Center (2021); Central Statistical Bureau (2021); General Authority for Statistics (2021); Labour Market Regulatory Authority (2021).

Table A2
Effects of Arab Spring on migration intention.

	(1) *Migration Intention*	(2) *Migration Intention*
Protest	-0.0137***	-0.0137***
	(0.00242)	(0.00389)
Post × Protest	0.00910**	0.00908*
	(0.00361)	(0.00473)
Post × Protest× Female		-0.000
		(0.004)
Individual Controls	YES	YES
Household Controls	YES	YES
Controls × Post	YES	YES
Region FE (Within-country regions)	YES	YES
Observations	97,342	97,342
No of regions	169	169
No of countries	10	10
R-squared	0.046	0.046

Notes: Linear probability model is estimated. Robust standard errors in parentheses are clustered at the region level, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A3
Effects of Arab Spring on Perceived Safety.

	(1) *Safe walking alone at night*	(2)	(3) *Trusting assets and property to be safe*	(4)
Post × Protest	-0.0405***	-0.0438***	-0.0197***	-0.0192***
	(0.00667)	(0.00710)	(0.00313)	(0.00331)
Post × Protest × Female		0.00667		-0.00119
		(0.00566)		(0.00372)
Female	-0.131***	-0.106***	-0.0113	-0.0343***
	(0.0166)	(0.0304)	(0.00945)	(0.0112)
Individual Controls	YES	YES	YES	YES
Household Controls	YES	YES	YES	YES
Controls × Post	YES	YES	YES	YES
Region FE (Within-country regions)	YES	YES	YES	YES
Observations	75,024	75,024	60,129	60,129
No of regions	150	150	117	117
No of countries	10	10	11	11
R-squared	0.117	0.117	0.196	0.196

Notes: Linear probability model is estimated. The sample covers both men and women. Robust standard errors (adjusted for clustering at the regional level) in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

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