Demographic Consequences of Social Movements: Local Protests Delay Marriage Formation in Ethiopia

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Despite their significance, life-course dynamics are rarely considered as consequences of social movements. We address this shortcoming by investigating the relationship between protest and marriage formation in Ethiopia. Building on scholarship in social movements and insights from family demography, we argue that exposure to protest delays marriage formation. To test our theoretical arguments, we created an original panel dataset using geo-referenced data from the 2016 Ethiopia Demographic and Health Survey. We combined the marriage histories of 4,398 young women with fine-grained measures of exposure to local protests that we compiled from two conflict datasets covering events between 2002 and 2016. Using discrete-time event history analyses, we find that protest delays first marriage formation. Additional analyses suggest that political uncertainty and disruptions in interethnic marriages cannot explain this effect. Instead, we provide tentative evidence that protest delays marriage formation by preoccupying large segments of the marriageable population, rendering them unavailable for this critical life-course transition. Our findings pave the way for scholarship on the demographic outcomes of protest and contribute to understanding marriage patterns in a country where the timing of marriage has far-reaching social consequences.

Key words: Social Movements; Family Demography; Marriage; Protest; Discrete-Time Event Analysis

Introduction

More than a decade ago, review articles urged scholars to consider how social movements shape demographic processes (Giugni 2008; Goldstone and McAdam 2001). Although deemed "interesting and little studied", review articles concluded that "the macro level demographic impact of social movements and revolutions has been an especially neglected area of inquiry" (Goldstone and McAdam 2001:220). With this article, we help

advance a systematic investigation of the life-course consequences of social movements by assessing how exposure to protests in Ethiopia affects the timing of marriage formation.

Previous studies have investigated the biographical consequences of social movements in the United States by tracing the life-course trajectories of left-wing activists in the 1960s (McAdam et al. 1998; Van Dyke et al. 2000). These seminal studies show that former activists tended to marry later, were less likely to have children, and had a higher likelihood of staying single. Moreover, the '1960s experience' played a crucial role in establishing new life-course norms (*ibid.*). Although these analyses paved the way for understanding how social movements can influence the life-course, two important research gaps remain. First, by investigating the biographical consequences of one's social movement involvement, previous studies do not consider whether exposure to social movements can exert population-level influence on the life-course of movement audiences. This lacuna in existing scholarship calls for research into the broader demographic impact of social movements (McAdam 1999:117)[ENDNOTE 1], just as scholars have studied how exposure to political conflict can influence demographic outcomes beyond those directly participating (e.g. Castro Torres and Urdinola 2019; Lindskog 2016). Second, studies on the biographical consequences of social movements do not examine how different movement tactics could exert distinct effects on life-course dynamics.

While social movement scholarship has remained silent on the relationship between protest as one tactic of social movements and demographic outcomes, the demographic literature focuses on political conflict more broadly, finding that its impact on

demographic outcomes is highly variable across empirical settings (Jayaraman et al. 2009; Lindstrom and Berhanu 1999; Neal et al. 2016; Shemyakina 2013; Thiede et al. 2020; Torrisi 2022; Valente 2011; Williams et al. 2012). One reason for the inconclusive results is that the effect of conflict on life-course events hinges on the type of conflict event used for the analysis. For example, Williams et al. (2012) find that violent and political conflict events in Nepal accelerate marriage because they increase the threat of harm as well as instability, whereas ceasefires delay marriage because they reduce the threat of harm and instability. Although protest is a form of political conflict, we cannot directly infer the influence of protest on marriage patterns from studies on other types of conflict events (Williams et al. 2012), motivating this analysis of the relationship between protest and marriage formation.

We centre our analysis on Ethiopia – the second most populous country in Africa – which not only plays a pivotal role in the rise of popular protests across low-and middle-income countries but is also currently undergoing a fertility transition propelled by increases in women's age at first marriage (Alazbih et al. 2021; Teller and Hailemariam 2011). Despite these developments, Ethiopia remains one of the poorest countries on the continent, with a high prevalence of early marriages adversely affecting the health and socio-economic outcomes of young women (Gebeyehu et al. 2023). Ethiopia, therefore, provides a welcome empirical opportunity for studying the relationship between social movements and demographic outcomes by shedding light on a core antecedent of the current fertility transition in Sub-Saharan Africa.

The analysis is based on longitudinal protest event data for Ethiopia between 2002 and 2016. We integrated data from two major datasets: the Armed Conflict Location and

Event Data (ACLED; Raleigh et al. 2010) and the Social Conflict Analysis Database (SCAD; Salehyan et al. 2012) to build a comprehensive geo-referenced longitudinal dataset on protest events. We merged this dataset with an originally created panel dataset using young women's marriage histories from the 2016 Ethiopian Demographic and Health Survey (EDHS). We focus on women rather than men because women bear the brunt of premature marriages, and the age at which they marry contributes to the ongoing fertility transition in Ethiopia (Alazbih et al. 2021) where "childbearing occurs largely within marital unions" (Lindstrom et al. 2009:2). In line with the expectations derived from our theoretical framework, we find in discrete-time event-history analyses that protest delays marriage formation in Ethiopia. In additional analyses, we offer tentative support for the theoretical expectation that reduced availability during protests helps explain this effect. However, we find no evidence that protests delay marriage formation by creating uncertainty or disrupting interethnic marriages.

Taken together, the analysis offers novel evidence that protest can delay marriage formation among young women in Ethiopia with far-reaching personal and population-level consequences. More broadly, this article takes a step toward better understanding the demographic outcomes of social movements and helps to bridge the academic divide between demography and social movement scholarship.

On the Relationship Between Protest and Marriage

Marriage is a core social institution often marking the transition into adulthood. The timing of this life course transition has ramifications for a wide range of social outcomes and is especially consequential for young women in low- and middle-income countries. Women from low- and middle-income countries who marry early tend to have more

children and have those children earlier, both of which can negatively affect their health and that of their children (Girls Not Brides 2019). Early marriage has also been found to limit women's school progression, to reduce their prospects for paid work (Delprato et al. 2015; Mensch et al. 1998; Sunder 2019), to curtail their autonomy and negotiating power in decisions related to reproduction and health (Mensch et al. 1998), and to lessen subsequent relationship quality (Neetu et al. 2019). Despite these harmful consequences, early marriage can provide a "way out" of unfavourable home situations (Bartels et al. 2018), and can be understood as a rational strategy to protect children, to retain girls' reputation and to provide an outlet for socially sanctioned adolescent sexuality (Al Akash and Chalmiers 2021).

Research on the determinants of marriage formation has commonly focused on sociodemographic characteristics like education, religion, economic well-being, and place of residence (Mensch et al. 2005; Shapiro and Gebreselassie 2014). More recently, demographers have directed their attention to political conflict as a determinant of life course transitions (Neal et al. 2016; Shemyakina 2013; Thiede et al. 2020; Torrisi 2022; Valente 2011; Williams et al. 2012), inviting scholarly investigation into the impact of protest on marriage formation that builds on this line of work. Despite their preponderance in low-and middle-income countries, protest movements have not been studied as a potential cause of population change. We therefore begin by elucidating the broader association between protest and marriage – focusing on economic and educational factors as shared determinants – before elaborating on three pathways through which protest might influence marriage formation.

Economic and Educational Factors

How do antecedents of marriage formation intersect with causes of protest? A comprehensive review of the social movement literature uncovers a vast number of causes for protest not directly related to marriage formation. For example, the various immediate motivations for participation in protest – whether driven by affect and emotion (Goodwin et al. 2001), rational considerations (Oberschall 1994), social influence (McAdam and Paulsen 1993) or collective identities (Polletta and Jasper 2001) – are not straightforwardly interpreted as causes of marriage formation. Similarly, movement organization (Morris 1981) and the wider political opportunities for collective mobilization (McAdam et al. 1996; Meyer 2004) especially as they pertain to stable political systems (Kitschelt 1986) are not readily conceptualized as determinants of marriage formation.

Yet, protest and marriage have a shared economic basis. Proponents of Resource Mobilization Theory argue that protests become more likely when activists can capitalize on resources such as material support, funding, and monetary assets (McCarthy and Zald 1977). Similarly, economic resources like household wealth, employment status or income influence female age at marriage (Garenne 2004; Shapiro and Gebreselassie 2014; South and Lloyd 1992). Beyond economic factors, educational attainment is a key predictor of both marriage timing (Garenne 2004) and protest (Sawyer and Korotayev 2022). Students form a demographic group that is prone to protest because college campuses can act as hubs for mobilization (Van Dyke 1998) and because students often have a heightened sense of political efficacy (Schussman and Soule 2005).

The implication of this sketching of overlap in the causes of protest and marriage formation is clear. We need to carefully consider educational and economic factors

alongside their accompanying grievances as possible confounders of the relationship between protest and marriage formation. With this caveat in mind, we suggest three pathways that connect local protests and marriage formation. None of these mechanisms purport to exhaustively explain how protest can affect marriage patterns and they do not relate to the particularities of specific protests. Rather, we outline plausible pathways through which protest as a distinct form of contentious politics can impact marriage patterns.

Mechanisms Linking Protest and Marriage

First Mechanism: Uncertainty

The concept of 'uncertainty' – often invoked by demographers to explain marriage and fertility timing – could help us better understand the relationship between protest and marriage formation. However, depending on the context, uncertainty can delay or accelerate life-course decisions. First, in the face of unknown risks of future harm, people may accelerate crucial life-course decisions. For example, personal uncertainty about the HIV status of young people in Malawi correlates with the desire to accelerate childbearing because of AIDS-related anxiety (Trinitapoli and Yeatman 2011), and uncertainty about child mortality among women in Nepal accelerates fertility tempo (Sandberg 2006). Second, during political conflicts, "uncertainty about the future and a desire to postpone irreversible demographic decisions until the situation is clearer" (Caldwell 2004:383) has led scholars to expect delays in life-course decisions, including marriage formation. Empirical evidence largely accords with this expectation demonstrating that marriage formation and childbearing are delayed across different types of conflict and crises (Caldwell 2004; Lerch 2018; Morgan 1991; Sobotka et al. 2011). Although we are open to the possibility that the political instability brought by

protest may create a need for individual stability through accelerated marriage (Williams et al. 2012), we follow the demographic literature to argue that the uncertainty of protest could delay marriage formation.

Second Mechanism: Intergroup Tensions

Protest is public claim-making. The messages and messengers of protest become the subject of discussion not just in the media and among governmental elites but among friends, colleagues, and neighbours. The attention-soliciting messaging facilitates the formation and exchange of opinions about protesters' claims. As a result, protests have the potential to sow political discord among their audiences. The affective dimension of this polarization (Shahin 2023) can create divides so deep that partisans may prefer not to have their children marry into families of different political convictions (Iyengar et al. 2019), and the resulting delays in marriage may also be pronounced when polarisation around protest occurs along ethnic lines.

Third Mechanism: Unavailability for Marriage

Unavailability for marriage at the height of mass unrest lays another path connecting protest and delays in marriage. Analogous to McAdam's (1986:70) notion of 'biographical availability' which describes full-time employment, marriage, and family responsibilities as impediments to movement participation (see also Beyerlein and Hipp 2006), we argue that the time and energy of protest participation deprioritises marriage formation in the short-term, which can cause delays in the transition into marriage. Although a simple restatement of mobilization theory to explain protest outcomes (Amenta and Polletta 2019; Goldstone and McAdam 2001) falls short of differentiating between protest participants and protest audiences, it is nevertheless plausible that the

number of available marriage partners declines at the height of mass mobilisation. This postponement in marriage formation may either occur due to individuals' engagement in protests or through their all-consuming exposure to social unrest, both of which may contribute to delays in marriage formation.

All three mechanisms – uncertainty, intergroup tensions, and unavailability for marriage – lead us to conjecture that protest delays marriage formation. In the results section we provide tentative tests of each mechanism as they may play out in Ethiopia which forms the empirical case of our analysis to which we now turn.

Case Study: Marriage and Protest in Ethiopia

Ethiopia provides an ideal empirical setting to apply our theoretical framework. The country has a fast-growing population with a median age of 18.8 in 2023 (UNDESA 2022), rendering marriage acutely relevant to large segments of the population. Although increases in the female age at first marriage have contributed to the ongoing fertility transition in Ethiopia (Alazbih et al. 2021), most women still marry before their 18th birthday (CSA and ICF 2016). Marriage customs vary by region, ethnicity and religion, but they share economic significance not just for the brides and grooms themselves but also their respective families, who bring assets into "the newly formed unions" (Fafchamps and Quisumbing 2005a:2). For its economic significance, marriage in Ethiopia often takes the form of "an assortative matching process" (Fafchamps and Quisumbing 2005b:348), whereby bride and groom are deemed compatible when they share relevant socioeconomic characteristics. One consequence of assortative matching is that Ethiopian women from wealthier families tend to transition into marriage later (Melese et al. 2021), particularly when economically resourceful men are scarce,

unemployment rates are high, and living costs are up (Gurmu and Mace 2013). Whether marriages are pre-arranged, stem from individual choice, or result from abduction to force the daughter's family to accept an unwanted marriage or a lower bridewealth payment (Boyden et al. 2013), the specific timing of marriage formation and the length of the engagement period (Tilson and Larsen 2000) can vary depending on contextual influences. It is this flexibility in timing which provides the crucial juncture for popular contention to exert influence on marriage formation.

Over the past decades, Ethiopia has experienced a large number of protest events. Between 2002 and 2016, we observe three upticks in protest activity that reflect major anti-government mass protests: the post-2005 election protests, the 2011 Ethiopian Muslims protest and youth protests after 2014 (Figure 1).

[Figure 1 here]

The protests that followed the 2005 general election were fuelled by the broken promise that this election would be fair and bring democratic accountability. Instead, accusations of electoral fraud as well as manipulation of opposition parties and their supporters sparked mass protests across the country after the Ethiopian People's Democratic Revolutionary Front and opposition parties were unable to agree on a new parliament (Arriola 2013; Lyons 2008). The second spike in protests occurred after 2011 and was largely driven by Ethiopian Muslim activists who denounced the government's interference in religious affairs and the detention of religious leaders (Abbink 2014). The protests were expressions of a "political crisis, and a search for new modes of governance of diversity and communal religiosity in Ethiopia" (ibid.:346). The third and largest spike

occurred in response to governmental plans to expand Ethiopia's capital city, Addis Ababa, into surrounding areas. The so-called Masterplan foresaw the expulsion of approximately 6.5 million Oromo people to use their land for development projects (Abbink 2017). Spurred by the prospect of being forced to abandon their lands and broader grievances about historic marginalisation, Oromo people took to the streets when the plan was announced in April 2014. The protests quickly diffused nationwide, providing an opportunity to express grievances beyond discontent with a specific land reform (Abebe 2020).

Beyond causal mechanisms that may connect protest and marriage timing, shared socio-economic roots motivate a systematic analysis of both marriage and protest, while also sensitizing us to potential confounding factors. The economic instability and regional discrepancies as oft-invoked sources of protest in Ethiopia (Addis et al. 2020; Pellerin and Elfversson 2023) suggest that grievances over economic conditions (Kawalerowicz and Biggs 2015) as well as relative economic disadvantages (Gurr 1970) and their perceptions (Power 2018), can fuel mobilization as much as they influence the timing of marriage formation in a country where marriage formation hinges on economic prowess and regional socio-economic conditions (Gurmu and Etana 2014). Ethiopian youth have often protested for "their livelihood", calling "for an end to […] unemployment and economic marginalisation" (Záhořík 2017:265) – socio-economic factors underpinning both protest and marriage formation particularly during its initiation and negotiation period (McDougal et al. 2018). Furthermore, student-involved protests in Ethiopia underscore the importance of education in protest involvement – not only as an enabling factor but also as a focal point of dissatisfaction with an inadequate education system

(Záhořík 2017). Educational attainment in Ethiopia is also positively associated with young women's timing of marriage (Melese et al. 2021).

Against this background of potentially overlapping causes, we can discern different theoretical mechanisms connecting protest and marriage. The Ethiopian youth protests in Oromia between 2014 and 2016 lend face value credence to the first mechanism of *political uncertainty.* For example, participants described their protest motives as the result of "an uncertain and precarious present" leading to a future "yet to be borne out" (Abebe 2020:596). Given that in Ethiopia short-term sacrifices are often made for long-term marital prospects (Fafchamps and Quisumbing 2005a), delays in marriage formation may occur during times of uncertainty.

The second mechanism of intergroup tensions may be of particular relevance in Ethiopia where ethnicity is deeply politicised (Abbink 1997) and movements often address ethnic-based inequalities and marginalisation (Yusuf 2019). In this climate of "ethnic strife" (Sadovskaya et al. 2022:927) protests may have exacerbated polarization around ethnicity with the potential to disrupt interethnic marriages that account for 12% of all marriages in Ethiopia (Bandyopadhyay and Green 2021) and are particularly common in the Oromo society where intermarriages with Amharic and Tigrayan Ethiopians resulted in what has been described as "Oromozation" (Forrest 2004:40). This expectation tallies with reports from Amhara residents of Addis Ababa who described Oromo protesters with ethnic prejudice and recalled how "for weeks, discussions about the incidents dominated private conservations and created rifts in families and friendship circles" (Pellerin and Elfversson 2023:14). Indeed, scholarship on social movements suggests that protests can create sectarian or ethnic divides by activating existing group boundaries (Beissinger 2002;

Tilly 2005). Although this dynamic was contested in Lebanon, where street protests did not strictly adhere to existing ethnic divisions (Majed 2021), in Ethiopia where protests often relate to ethnic divides, protests could have exacerbated ethnic polarization rendering interethnic marriages socially verboten. As a result, a reduced pool of socially acceptable marriage partners may delay marriage formation.

Regarding the third suggested mechanism – unavailability for marriage – all protest waves may have rendered large segments of the population unavailable for marriage as young women and men directed their time and energy toward activism. All-consuming mass unrest may have captivated and engrossed protest audiences of marriageable age or bound them as active participants. In particular, the protest participation of prospective male marriage partners could have affected their availability for marriage and distorted equilibria in the marriage market. This conjecture is corroborated by a male median age at first marriage of 23.8, which is similar to the age of youth protesters in Ethiopia (Woldesenbet et al. 2022).

Data and Variables

We combine data from two sources of data to examine the relationship between exposure to protest and transition into marriage in Ethiopia: 1) georeferenced individual data from the DHS; 2) georeferenced protest event data from two leading protest datasets: ACLED and SCAD.

Individual-Level Data: EDHS

Our individual-level data come from the 2016 Ethiopia DHS. Importantly for our analysis, the EDHS provides two pieces of information. First, it reports the GPS

coordinates of the centroid of the communities where women reside, enabling us to link women to their location. Second, the EDHS provides retrospective information on the month and year when women entered their first marriage. Based on this retrospective information on the timing of marriage, we construct an original panel dataset where the unit of analysis is person-year. We define age 10 as the onset of the risk of first marriage. Age 10 thus serves as the data entry point, whereas the age at first marriage constitutes the data exit point. The survey month and year represent the end of observation. The data are right-censored because not all the women got married by the time they were interviewed. We focus on women aged 15–24 to investigate marriage transitions in early adulthood. The month and year of marriage and survey in the EDHS are based on the Ethiopian calendar, which we convert to the Gregorian calendar to ensure accurate temporal matching with protest events. We also find no evidence of year heaping in the reporting of marriage dates, and that the uneven distribution of marriages within the calendar year is unrelated to protests (Appendix A).

Another important aspect of the EDHS is information on women's migration histories. To accurately assign protest exposure for each person-year, we exclude both visitors and young women who have migrated after the age of 10. In Appendix B we provide empirical evidence in support of our choice to exclude young migrant women from our analysis. Note, however, that results remain unchanged even when non-migrants are included in the sample (Table B2). In total, 71.3% of young women aged 15–24 had been living in the same DHS community since the age of 10, which leaves us with a total of 4,398 women residing in 614 Ethiopian communities.

Protest Event Data: Integrating ACLED and SCAD

We link our person-years dataset with annual protest data at the community level. To address the potential undercounting of protests that may arise from relying on a single data source (Donnay et al. 2019), we employed the methodology developed by Donnay et al. (2019) to integrate data from ACLED and SCAD, which resulted in the most comprehensive protest event dataset available for Ethiopia. We applied the same technique when we integrated four major conflict datasets for compiling relevant control variables as detailed below (Andriano et al. 2023).

To eliminate duplicates of the same protest events the integration process consisted of four steps. For each dataset, we first developed taxonomies for actors, events, and geographic precision. These taxonomies helped us identify duplicates in the two protest datasets. We then apply the MELTT algorithm from Donnay et al. (2019), which uses both protest datasets and the developed taxonomies to generate a list of potential duplicates which are defined as events that are carried out by the same actor and documented across the two datasets. We then reviewed all events flagged as potential duplicates, eliminated them, and merged the datasets into a single integrated dataset. Detailed information on how datasets were integrated are available on GitHub https://github.com/ConflictDatasets/integrated-conflict.

Both datasets provide crucial information about protest events, including their location (i.e. GPS coordinates) and the time of occurrence enabling spatiotemporal merging with the DHS data. SCAD provides information on protests, riots, strikes and other social disturbances that appear in searches of Associated-Press and Agence France-Presse newswires as compiled by the Lexis-Nexis news service. The ACLED database reports protests that appeared in traditional local, national, and international media outlets,

reports from NGOs and international organizations, local organizations as well as news media from Twitter, Telegram, and WhatsApp. Every event is based on at least one news source. Of course, we cannot know how many people were aware of protests. Events that were reported by journalists from abroad when the government disenabled local reporting likely spread by word of mouth whereas other protests reached their audience through local news (Raleigh et al. 2010).

Independent Variable: Protest Exposure

Our treatment is exposure to protest events. We use protest event frequency to quantify protest exposure (Amenta et al. 2010). Although protest size might be better captured by counting protest participants (Biggs 2018), the available data for Ethiopia forces us to adopt the standard approach of "count[ing] the frequency of events in each time interval or geographical unit" (ibid.:366). We focus on event frequency rather than event duration.

We count the number of protest events within a 20-km buffer around each woman's geographic location for every year from the time she turned 10 until marriage.[ENDNOTES 2 AND 3] To ensure that our analysis accurately reflects the impact of protests on subsequent marriage formation, we also introduce a one-month lag to our measures. Because we are interested in how protests affect the timing of marriage formation rather than their effect on the timing of the decision to marry, it is worth stressing that the yearly lookback period before marriage leaves sufficient time for protests to exert impact on marriage formation. In additional analyses (Appendix C) we use the logarithm of the number of protest events and a categorical variable for protest events. These supplementary analyses yield consistent results with our main analysis.

To spatially delimit our protest treatment, we draw a 20 km buffer around each woman's community of residence. For example, for a woman who lives in community 1 in Figure 2, all protest events that fall within area A (blue stars) form part of the treatment but protest events that fall outside of area A (red points), are not considered. For a woman who married in June 2009 and lives in community 1, the treatment variable for the most recent observation is defined as the number of protests between June 2008 and May 2009 that fall within area A. We remind the reader that the DHS communities are villages or village "clusters" which cover very small geographical areas and are distributed across the country (see Figure 3 and Appendix D for details about the DHS communities). For robustness, we use an alternative radius of 10 kilometres to measure exposure to protests and find that the results remain unchanged (Table D1).

[Figures 2 and 3 here]

Control Variables

Like other research on the outcomes of protest, we must confront the possibility that protest and marriage could be explained by the same underlying factors. To do this, we follow several strategies. First, we use a fixed-effect approach that removes unobserved time-invariant confounders at the community level. Community-level fixed effects provide one of the most conservative causal estimation strategies in demographic scholarship which often uses fixed effects that account for heterogeneity at larger geographical levels (e.g., Thiede et al. 2020). Because utilising community fixed effects at an unusually granular level runs the risk of overfitting, we bolster our findings with supplementary analysis using region-fixed effects (Table E1). Results remain consistent.

Our fixed effect approach only accounts for factors that remain constant across all person-year observations within each community such as geographic features, long-standing socio-economic conditions, and location-specific religious, cultural and social characteristics. In a second step, we therefore control for time-varying regional factors that are available from the Area Database of the Global Data Lab[ENDNOTE 4] providing information for every year and region in our originally constructed panel dataset (Smits 2016). We compile variables capturing educational attainment levels through the mean years of education for adults aged 25+, wealth as the mean international wealth index, and gender equality as the percentage of women in paid employment. We link these regional data from 2001 to 2015 with our individual-level panel data by using the woman's region of residence and the year of observation.

We further address the possibility that rapid changes in economic activity and political instability at local levels could create grievances that spark protest while also shifting considerations for marriage. To control for economic activity at a local level, we follow a burgeoning literature in economics (Gibson et al. 2021) by using geo-referenced high-resolution nighttime light intensity data derived from satellite images. Recent studies have empirically validated this measure, deeming it well-suited for approximating economic activity in very small local areas, particularly in low- and middle-income countries (Määttää et al. 2022; Pérez-Sindín et al. 2021). Data on nighttime light intensity are available for each year from 1992 to 2018 at a spatial resolution of 30 arc-second grids (about 1x1 km at the equator) (Li et al., 2020). We create a variable of local socio-economic conditions by calculating the average nighttime light intensity across all grids that fall within a 20-km buffer around the woman's location in the year preceding the year of observation.

Political conflicts – such as armed battles, civil wars or government removals – often cause uncertainty which may affect both marriage formation (e.g., Thiede et al. 2020; Williams et al. 2012) and protest. To address this source of time-variant local confounding, we created another local control variable for conflict events from four different conflict datasets, including ACLED and SCAD – which we used to compile protest variables – as well as the Uppsala Conflict Data Project-Georeferenced Event Data (UCDP-GED; Sundberg and Melander 2013) and the Global Terrorism Database (GTD; START 2013). After integrating these datasets and eliminating duplicate entries, we created a variable measuring exposure to local conflict events, excluding protests, within a 20-km radius for each woman's location in our dataset.[ENDNOTE 5]

Empirical Strategy

We use discrete-time event history analysis to predict first marriage formation. The model reads as follows:

$$\log\left(\frac{p_{iytr}}{1-p_{iytr}}\right) = \alpha_t + \beta protest_{tr} + x_i'\delta + \zeta_y + \eta_r \qquad \text{Eq. (1)}$$

where p_{iytr} is the probability that woman *i* born in year *y* residing in community *r* experiences the event of marriage at age *t*, given that the event has not already occurred. The baseline hazard function, α_t, captures changes in p_{iytr} with *t*; $protest_{tr}$ measures exposure to protest events in community *r* before age *t*; β represents the relationship between exposure to protest events and first marriage formation. η_r and ζ_y are community fixed-effects and woman's year of birth fixed-effects, respectively. The

individual-level sociodemographic controls, x_i', include variables for high educational attainment (whether the woman has incomplete secondary, complete secondary and higher education), religion (Orthodox, Protestant, Muslim, other/none), and ethnicity (Amhara, Oromo, Somali, Tigrayan, other). Robust standard errors are calculated using the Huber–White method.

Results

Descriptive Results

Table 1 describes the sample. Approximately 11.6% of all women were exposed to a protest event at least once during the period of observation, and 38% transitioned into first marriage by 2016. The average age at first marriage was 16.3, and 23.8% of women received at least some secondary education. The majority of women in the sample were of Orthodox denomination and Oromo ethnicity.

[Table 1 here]

Descriptive analyses reveal substantial variation in protest exposure across time and space. Figure 3 illustrates the spatial variation in protest events across 614 DHS communities with the total number of protests ranging from 0 to 142 between January 2002 and May 2016. For instance, exposure to protest was greater in Northern Oromia than in Southern Oromia.

Regression Results: The Relationship Between Protest and Marriage Timing

We now turn to the results of our discrete-time logistic regression models. For ease of interpretation, we express coefficients as odds ratios (Table 2). Odds ratios greater than

1 indicate a positive effect, implying that protest accelerates transition into marriage, whereas odds ratios smaller than 1 reveal a negative effect, indicating that protest delays transition into marriage.

Model 1 shows that exposure to protest delays young women's transitions into first marriage. Specifically, the odds ratio for protest is 0.897, which implies that exposure to each additional protest event decreases the odds of marriage formation by 10.3%. It is worth noting that the odds ratio presents a narrow confidence interval which does not include zero as reflected by the highly significant p-value of < 0.001. To put the magnitude of the finding into context: going from no protest exposure to being exposed to 11 protests[ENDNOTE 6] during the period of observation decreases the odds of marriage formation by 70% ($1 - 0.897^{11}$) – a delay in marriage formation equivalent to being highly educated.[ENDNOTE 7]

[Table 2 here]

Before turning to further robustness checks by means of different model specifications, we corroborate the main result with descriptive trends in marriage and protest by leveraging case-specific knowledge of the large protest wave in Oromia to investigate whether protests are related to declines in marriage within the Oromia region compared to their expected levels. Specifically, we compare the marriage rates in communities in Oromia without any protests between April 2014 and December 2015 to those communities in Oromia that experienced at least one protest event during the same period.[ENDNOTE 8] Should the protests triggered by the announcement of the Masterplan in April 2014 have led to delays in marriages, we would expect communities

with protests to exhibit a starker negative trend in marriage. This is precisely what the evidence suggests. While the marriage rates for women in Oromo communities without protests saw a decrease between 2013 to 2015, we observe a remarkably stronger overall downtrend in communities impacted by the Oromo protests.

Spatial and Temporal Heterogeneity

Returning to the main regression result, we account in additional analyses for the possibility that protests are spatially and temporally correlated. Controlling for the number of protests at baseline by measuring exposure to protests between the age of 8 and 10 does not alter the relationship between protest and marriage formation (Model 2, Table 2). This result suggests that exposure to protests delays marriage formation independently of the socio-economic context before women reach marriageable age.

We further consider the possibility that the main result could be explained by the surge in protests between 2014–2015 (see Figure 1) which was mainly driven by protests in the Oromia region. To address this concern, we conduct an additional analysis where we exclude Oromia from our sample (Model 6; Table 2). The results from this additional analysis are consistent with our original finding.

Time-Varying Socio-Economic Conditions

We next address potential confounding factors related to local socio-economic conditions and their interplay by performing two additional analyses. First, we control for community socio-economic trends using data on night-time light intensity. Second, we control for regional economic well-being and development trends. Together, both set of results show that the socio-economic context to which women are exposed throughout

their adolescence do not affect the relationship between local protest and marriage formation (Models 3–4, Table 2).

Conflict Events

In Model 5 we control for exposure to other conflict-related events to ensure that the impact of protest is not driven by simultaneously occurring conflict events. The impact of protest on marriage formation remains strong and statistically significant, indicating that protests delay marriage formation *independently* of other conflict-related events.

Regression Results: Mechanisms

We now turn to tentative tests of the underlying mechanisms that could explain why protests may delay marriage formation: uncertainty, interethnic tensions, and unavailability for marriage.

Uncertainty

We probe the uncertainty mechanism in two ways. First, building on Trinitapoli and Yeatman (2011) who argue that people with limited opportunities may be more likely to accelerate important life-course decisions in the face of uncertainty, we assess whether the impact of protest on marriage timing varies by women's socioeconomic background. Table 3 presents results from discrete-time event history analyses, incorporating an interaction term for protest and economic disadvantage, low educational attainment, and rural residency[ENDNOTE 9]. Contrary to what would be expected if uncertainty was driving the effect of protest on marriage timing, our analyses reveal no statistically significant difference in the impact of protest on marriage timing depending on socioeconomic background.

[Table 3 here]

Second, we argue that protests could exert greater uncertainty when the media report negatively about them, resulting in greater delays in marriage formation. In the absence of information on media reports about particular protests, we leverage knowledge about the negative portrayal of the Oromia protests of 2015. These protests targeted the government directly (Záhořík 2017), compelling media reports to portray protesters as terrorists and causing residents to oppose the protests (Pellerin and Elfversson 2023). If the uncertainty caused by protest can explain marriage delays, we expect delays to be most pronounced among respondents who consume news media. To ensure that our analysis captures anti-government sentiment we restrict this analysis to women in Oromia. Table 4 presents results from discrete-time event history analyses, incorporating an interaction term for protests and indicators of media exposure. We find strong evidence that the impact of protests on marriage formation significantly varies with exposure to media, but in the opposite direction to what we would expect. We find that protest delays marriage among women who had no exposure to media – those we had expected to be least affected by the uncertainty mechanism. For women exposed to media, we found no significant impact of protest on marriage timing.

[Table 4 here]

Intergroup Tension

Our second mechanism for why protest delays marriage formation stipulated that protests may heighten ethnic polarisation and disrupt interethnic marriages, thereby reducing the

pool of available marriage partners. To test this hypothesis, we assess whether women exposed to protest are less inclined to enter interethnic marriages. We employ a discrete-time logistic regression competing risk analysis[ENDNOTE 10], focusing on two dependent variables: (1) the conditional probability of entering an intraethnic union versus remaining unmarried, and (2) the conditional probability of entering an interethnic union versus remaining unmarried.

The results, displayed in Table 5, indicate that protests lead to a delay in intraethnic marriages, but we do not find evidence that exposure to protest significantly delays interethnic marriages. This finding challenges the notion that protests contribute to interethnic tensions enough to disrupt interethnic marriages. Given the relatively small number of interethnic marriages in our sample, we caution against discarding this mechanism as a possible cause for delays in marriage in different contexts.

[Table 5 here]

Unavailability for Marriage

At the height of major protests, the availability for marriage could be reduced due to all-absorbing protest exposure, young women's own participation in protests or because protests draw on a significant segment of young men of marriageable age thereby reducing the pool of available marriage partners. Due to a lack of data on protest participation, we extrapolate the implications of the availability mechanism to employment – the other core element in McAdam's conceptualization of 'biographical availability' which describes full-time employment and marriage as impediments to movement participation (see Wiltfang and McAdam 1991 cited in Schussman and Soule

2005). For the purpose of indirectly testing the unavailability mechanism, our analogous assumption is that all-encompassing protest not only delays marriage but also increases people's willingness to sacrifice employment.

Table 6 presents the findings from a linear regression analysis where the dependent variable measures employment status at the time of the survey, and the independent variable is exposure to protests.[ENDNOTE 11] To establish temporal order, we measure protest exposure in the month before the survey. To capture men at the prime age for marriage, we restrict the analysis to unmarried men aged 18–30. The analysis aligns with the unavailability mechanism, indicating that protests are associated with decreases in the likelihood of being employed (Model 1). Importantly, the association is concentrated among young unmarried men who are the most biographically available to protest themselves (Model 2). Rather than reflecting a general economic decline – which should lead to decreases in employment across all groups – this result corroborates the interpretation that protest renders relevant segments of the population unavailable for marriage.

[Table 6 here]

Discussion and Conclusion

Scholarship on the outcomes of protest has mainly been concerned with assessing policy and cultural consequences (Amenta et al. 2010; Amenta and Poletta 2019; Giugni 2008), but demographic outcomes of social movements have remained peripheral. When social movement scholars have investigated the influence of movements on the life-course, they tended to focus on the biographies of activists and the broader cultural change to which

social movements can contribute rather than the aggregate-level demographic consequences of protest (Fendrich 1977; Fendrich and Tarleau 1973; McAdam et al. 1998; Sherkat and Blocker 1997). The demographic literature, by contrast, has investigated the effects of conflict events on life-course decisions (Jayaraman et al. 2009; Lindstrom and Berhanu 1999; Neal et al. 2016; Shemyakina 2013; Thiede et al. 2020; Torrisi 2022; Valente 2011; Williams et al. 2012) thereby overlooking the effects of social movements and protests.

With this study, we extended both strands of scholarship by investigating the relationship between protests and first-marriage formation in a novel context: Ethiopian protests spanning the period from 2002 to 2016. We provided a conceptual overview for explaining why and how protest exposure might influence young women's transitions into marriage, and how these expectations may manifest in Ethiopia. We brought theoretical arguments to bear on empirical reality by using rich data on protest, which we procured from independent datasets. The main result from discrete-time event history analyses is that protest is associated with later marriages among young women. We subjected this relationship to rigorous tests of robustness. Specifically, we accounted for types of conflict events, temporal and spatial factors as well as migration. Moreover, we held time-varying regional factors constant and controlled for local socio-economic confounders using high-resolution nighttime light intensity data.

The remarkably robust relationship between protest exposure and marriage timing is consistent with previous demographic studies that found decreases in marriage in the wake of armed conflict (Thiede et al. 2020) but runs counter to the findings from Valente (2011) and Williams et al. (2012) that conflict creates political instability which

accelerates marriage formation. One reason for contradictory results across studies may be variation in how conflict is measured. It has been standard practice to measure conflict by aggregating different types of conflict events for a given geographical area. For example, Thiede et al. (2020) who find that conflict delays transition into marriage, define conflict as battles, which involve both state and non-state actors and incidents of remote violence. Valente (2011), by contrast, focusses on conflict-related casualties. Williams et al. (2012) go beyond definitions of conflict that encompass numerous types of conflict events by differentiating between violent and political conflict. However, the authors continue to group different 'political events' such as states of emergency, large strikes and protests, and major changes in government under one label which clouds our sight on the specific mechanisms that underpin the relationship between political conflict and the timing of marriage. Our focus on protest specifically enabled us to take Williams et al. (2012:1542–1543) on their own terms, to advance a "micro-level event centered conceptualization that can be used to build theories of the connection between specific conflict events and demographic processes."

We have developed and indirectly tested three channels through which protest can delay marriage formation. Defying standard expectations from the literature on the demography of conflict, we find no compelling evidence that uncertainty can explain why protest delays marriage formation in Ethiopia. We view this as an encouraging starting point for future scholarship on how uncertainty during protest may differ from uncertainty during political conflict. Our suggestion: Through diagnostic frames that resonate with movement audiences, social movements might credibly identify social problems while their prognostic frames present remedies to overcome these problems and develop goals for the future (Benford and Snow 2000). Even if ultimately unsuccessful, protests at least

promise to bring about positive change. Insofar as protest movements make demands for *changing* or *preserving* social and economic conditions, they can affect the life-course decisions of protest audiences under conditions of uncertainty. It was outside the scope of this analysis to test whether protests could delay marriage because marriage prospects may be reimagined through what one might term 'positive uncertainty.'

We further examined whether protests may have delayed marriage because of disruptions in interethnic marriages. At least in the case of Ethiopia, this channel does not appear to explain the relationship between protest and marriage timing. Turning the concept of biographical availability on its head, we argued that biographical availability – the absence of constraints in the form of marriage, children, or employment – cannot merely help to explain protest participation. Rather, protest participation and its all-consuming impact on protest audiences can reduce the availability of time and energy for marriage, leading to delays in marriage formation at the height of mass protest. In tentative support of this argument, we find that protests reduce employment, and that this effect is concentrated among those most biographically available to protest.

We thus provided a straightforward explanation for the main finding that protest delays transition into marriage: Protests absorb large segments of the marriageable population, causing them to deprioritise other life course events. A weakness of our test of this 'unavailability mechanism' is that the available data did not allow us to distinguish between protest participants and protest audiences. We were therefore unable to determine whether the unavailability for marriage stems from people's time and energy at protest events or the all-absorbing nature of protest exposure. As social movements begin to be recognised as drivers of demographic processes we call for the inclusion of

questions in demographic surveys that measure respondents' views of and participation in protests and social movements.

Given that our analysis spans 14 years of popular contention across a culturally heterogenous country with diverse marriage practices, we can only speculate about how different types of protests may exert distinct effects on the various marriage formation practices. In particular, ethnographic insights would help us better understand how different marriage formation practices in Ethiopia shape the decision-making processes behind marriage timing. For example, marriages that had already been arranged during or even before childhood may be delayed in times of mass unrest following inter-family negotiations over the appropriate timing of marriage, whereas marriages by choice may be delayed due to the couples' own preoccupation with the protest movement.

Since 2010 the number of protest events across the world has substantially increased (Raleigh et al. 2010), an increase particularly pronounced in low- and middle-income countries. This surge in protests unfolds amidst the fertility transition in Sub-Saharan Africa that is in part driven by increases in the age at first marriage (Harwood-Lejeune 2001; Shapiro and Gebreselassie 2008, 2014). Our analysis thus brings protest movements into the purview of one of demography's foremost explananda. Understanding the implications of these trends for population dynamics calls for concerted efforts from both social movement scholars and demographers. We hope that this analysis will spark further research in this direction.

Endnotes

1. The terms ‘biographical’ and ‘demographic’ consequences are closely related, but the term ‘demographic’ better captures the population-level focus of the outcome of interest.

2. For unmarried women, this is replaced by the time of survey.

3. For example, consider a woman born in June 1995 who married in June 2009. As she starts being “at risk” of marriage from the age of 10 years old in June 2005, she enters our dataset in June 2005 and remains until June 2009. During this period, each year is represented as a row in the dataset for a total of four rows. The independent variable reflects the number of protest events between June 2005 and May 2006 in the first row, the number of protest events between June 2006 and May 2007 in the second row, and so forth.

4. Data retrieved from the Area Database of the Global Data Lab, https://globaldatalab.org/areadata/, version 4.2.

5. The measure of other types of conflict-related events encompasses all types of non-protest events that occurred in the area. These events are categorised following the strategy developed by Donnay et al. (2019) which includes events like territorial dispute, opposition-led violence, atrocity, coercion, state-led violence, strategic destruction, and strategic assault.

6. To put the magnitude of the impact of protest on marriage timing into perspective, we used 11 protest events as a benchmark as this value corresponds to the odds of marriage formation for women with high educational attainment.

7. It is worth noting that the reason for why religion and ethnicity are not significantly related to marriage formation can be attributed to both the inclusion of cluster fixed effects and the fact different religious groups in Ethiopia may overlap ethnically, reflecting the relatively high levels of cultural similarity across religious groups in the country (Appendix E).

8. Note that it is not the point here to make a substantive claim about marriage rates, but to show differences in rates across communities. While the available data do not allow us to substantively interpret marriage rates for 2014, they do not undermine comparability in the change of marriage rates across both types of communities.

9. The model specification is the same as in Model 7 in Table 2: beyond controlling for all variables in Eq. (1), the model also includes the number of protests at baseline, as well as time-varying contextual control variables.

10. This analysis is based on a smaller sample of women because information on the partner's ethnicity is available for only 3,549 women in our sample. Given the limited number of inter-ethnic marriages (68 out of 884 marriages), our model specification includes only variables for exposure to other conflict-related events, age at observation, high education, fixed effects for birth year intervals and for region of residence.

11. The model specification includes men's educational attainment, type of residence, age fixed-effects, region fixed-effects.

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Supplementary Material

Supplementary material is available at Social Forces online.

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Conflicts of Interest

The authors declare none.

Data Availability

The integrated Ethiopia conflict dataset from January 1997 to December 2017 can be downloaded at https://osf.io/6vkm8/. The individual data underlying this article can be downloaded in raw format from the DHS Program at https://dhsprogram.com/methodology/survey/survey-display-478.cfm.

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Tables

Table 1: Summary statistics, women aged 15–24 in Ethiopia.

	Mean/proportion	SE	Mean/proportion	SE
No. of protests	0.734	0.064		
Prevalence of protests	11.616%	0.008		
Nighttime light intensity	1.358	0.091		
No. of other conflict-related events	0.575	0.082		
Proportion of young women in a marriage			37.775%	0.016
Mean age at first marriage			16.339	0.102
Education				
High education			23.773%	0.014
Religion				
Orthodox			39.091%	0.021
Protestant			26.601%	0.021
Muslim			31.387%	0.026
Other			2.921%	0.012
Ethnicity				
Amhara			25.342%	0.014
Oromo			35.044%	0.018
Other			29.191%	0.015
Somali			2.330%	0.002
Tigrayan			8.093%	0.005
Year of birth				
1991			5.734%	0.005
1992			6.803%	0.005
1993			6.737%	0.006
1994			6.461%	0.006
1995			10.752%	0.007
1996			8.604%	0.006
1997			12.387%	0.008
1998			12.834%	0.007
1999			12.463%	0.008
2000			14.175%	0.007
2001			3.050%	0.004
Log international wealth index	2.629	0.007		
Years of education among adults 25+	2.149	0.022		
Percentage of women in paid employment	34.732	0.126		
No. of Observations (person-years)	31,308			

N	4,398

Notes: Proportions and means are calculated adjusting for the complex survey design of the DHS; sample size is unweighted. The age at first marriage is defined as the age at which the respondent began living with her/his first spouse/partner (CSA and ICF 2016).
Source: Analysis of authors' combined dataset based on Ethiopia DHS 2016, ACLED, UCDP-GED, SCAD, GTD, the Area Database of the Global Data Lab, and the nighttime light dataset.

Table 2: Discrete-time logit models of transitions into first marriage (odds ratios).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
No. of protests	0.897*** (0.866, 0.930)	0.897*** (0.866, 0.930)	0.921*** (0.890, 0.952)	0.901*** (0.869, 0.934)	0.902*** (0.869, 0.935)	0.937** (0.902, 0.974)	0.929*** (0.896, 0.964)
No. of other conflict-related events					0.982 (0.942, 1.024)	0.967 (0.920, 1.015)	0.970 (0.929, 1.014)
Number of protests at baseline		0.976 (0.895, 1.064)				0.970 (0.888, 1.060)	0.979 (0.898, 1.067)
Nighttime light intensity			0.816*** (0.756, 0.880)			0.817*** (0.754, 0.886)	0.816*** (0.754, 0.882)
Age	1.527*** (1.492, 1.563)	1.527*** (1.492, 1.563)	1.576*** (1.535, 1.618)	1.541*** (1.461, 1.626)	1.527*** (1.491, 1.562)	1.580*** (1.488, 1.678)	1.584*** (1.496, 1.677)
Education (ref = Low education)							
High education	0.289*** (0.228, 0.368)	0.289*** (0.228, 0.368)	0.285*** (0.224, 0.363)	0.287*** (0.226, 0.365)	0.290*** (0.228, 0.368)	0.287*** (0.224, 0.368)	0.285*** (0.224, 0.363)
Religion (ref = Orthodox)							
Protestant	0.644+ (0.405, 1.024)	0.647+ (0.407, 1.030)	0.649+ (0.409, 1.030)	0.642+ (0.404, 1.018)	0.645+ (0.406, 1.025)	0.717 (0.410, 1.253)	0.651+ (0.410, 1.034)
Muslim	1.186 (0.784, 1.795)	1.187 (0.784, 1.796)	1.194 (0.788, 1.811)	1.187 (0.785, 1.795)	1.184 (0.782, 1.793)	1.218 (0.755, 1.964)	1.191 (0.785, 1.807)
Other	1.061 (0.518, 2.176)	1.062 (0.518, 2.178)	1.060 (0.515, 2.184)	1.078 (0.527, 2.206)	1.060 (0.517, 2.173)	1.136 (0.487, 2.648)	1.064 (0.517, 2.189)
Ethnicity (ref = Amhara)							
Oromo	1.255 (0.774, 2.035)	1.246 (0.767, 2.023)	1.272 (0.786, 2.058)	1.239 (0.765, 2.008)	1.251 (0.772, 2.029)	1.413 (0.801, 2.493)	1.253 (0.773, 2.029)
Other	1.396 (0.816, 2.390)	1.375 (0.799, 2.367)	1.395 (0.816, 2.385)	1.388 (0.812, 2.374)	1.394 (0.815, 2.387)	1.387 (0.774, 2.483)	1.373 (0.799, 2.359)
Somali	1.191 (0.498, 2.849)	1.181 (0.493, 2.827)	1.220 (0.509, 2.924)	1.188 (0.496, 2.844)	1.185 (0.495, 2.840)	1.343 (0.525, 3.432)	1.200 (0.498, 2.892)
Tigrayan	1.477 (0.667, 3.270)	1.477 (0.667, 3.270)	1.537 (0.698, 3.389)	1.482 (0.671, 3.273)	1.476 (0.667, 3.267)	1.628 (0.708, 3.747)	1.534 (0.696, 3.382)
Year of birth (ref = 1991)							
1992	0.925 (0.655, 1.307)	0.925 (0.654, 1.307)	0.936 (0.658, 1.330)	0.932 (0.658, 1.322)	0.923 (0.653, 1.305)	1.036 (0.709, 1.513)	0.941 (0.660, 1.340)
1993	1.163 (0.839, 1.611)	1.165 (0.840, 1.614)	1.202 (0.864, 1.672)	1.181 (0.838, 1.664)	1.160 (0.838, 1.608)	1.224 (0.844, 1.776)	1.225 (0.865, 1.736)
1994	1.221 (0.875, 1.705)	1.232 (0.881, 1.723)	1.284 (0.915, 1.800)	1.259 (0.871, 1.821)	1.221 (0.875, 1.705)	1.283 (0.855, 1.925)	1.332 (0.914, 1.940)
1995	0.975 (0.716, 1.328)	0.987 (0.722, 1.350)	1.035 (0.756, 1.417)	1.010 (0.694, 1.470)	0.975 (0.716, 1.327)	1.081 (0.712, 1.640)	1.078 (0.731, 1.590)
1996	0.902 (0.654, 1.243)	0.909 (0.659, 1.255)	0.988 (0.713, 1.370)	0.941 (0.628, 1.410)	0.901 (0.654, 1.242)	1.019 (0.656, 1.584)	1.030 (0.679, 1.562)
1997	0.702* (0.505, 0.975)	0.703* (0.506, 0.977)	0.795 (0.569, 1.112)	0.735 (0.467, 1.155)	0.701* (0.505, 0.974)	0.778 (0.474, 1.276)	0.826 (0.518, 1.317)
1998	0.594** (0.424, 0.834)	0.595** (0.424, 0.834)	0.698* (0.493, 0.988)	0.627+ (0.385, 1.022)	0.593** (0.422, 0.832)	0.719 (0.419, 1.232)	0.725 (0.436, 1.204)
1999	0.312*** (0.214, 0.456)	0.313*** (0.214, 0.457)	0.375*** (0.254, 0.554)	0.332*** (0.191, 0.578)	0.311*** (0.213, 0.455)	0.381** (0.208, 0.697)	0.393** (0.221, 0.697)

2000	0.231*** (0.153, 0.350)	0.232*** (0.154, 0.351)	0.285*** (0.187, 0.434)	0.246*** (0.133, 0.455)	0.231*** (0.153, 0.349)	0.280*** (0.143, 0.548)	0.299*** (0.158, 0.565)
2001	0.095*** (0.038, 0.237)	0.095*** (0.038, 0.237)	0.124*** (0.050, 0.308)	0.104*** (0.037, 0.289)	0.095*** (0.038, 0.236)	0.119*** (0.040, 0.354)	0.132*** (0.047, 0.370)
Log international wealth index				1.903 (0.746, 4.855)		1.397 (0.497, 3.928)	1.177 (0.438, 3.162)
Years of education among adults 25+				0.607* (0.406, 0.908)		0.830 (0.528, 1.303)	0.827 (0.532, 1.286)
Percentage of women in paid employment				1.014 (0.995, 1.033)		1.009 (0.988, 1.030)	1.011 (0.992, 1.031)
Cluster Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AIC	11,225.37	11,226.92	11,186.19	11,225.24	11,226.62	9,754.93	11,192.19
No. of Observations (person-years)	31,308	31,308	31,308	31,308	31,308	27,409	31,308

+p < 0.10; *p < 0.05; **p < 0.01; ***p < 0.001.

Notes: Estimates are presented as odds ratios.

Table 3: Discrete-time logit models of transitions into first marriage (odds ratios) – Uncertainty mechanism with socioeconomic characteristics.

	(1)	(2)	(3)
No. of protests	0.945*** (0.914, 0.977)	0.922** (0.877, 0.968)	0.926*** (0.891, 0.963)
Wealth index (Ref = Rich)			
Poor		1.381** (1.117, 1.707)	
Education (ref = High education)			
Low education			3.495*** (2.741, 4.458)
No. of protests * Rural	0.949 (0.863, 1.044)		
No. of protests * Poor		1.021 (0.957, 1.089)	
No. of protests * Low education			1.008 (0.949, 1.069)
No. of other conflict-related events	0.971 (0.930, 1.014)	0.970 (0.928, 1.013)	0.970 (0.929, 1.014)
Number of protests at baseline	0.978 (0.896, 1.067)	0.982 (0.899, 1.074)	0.979 (0.898, 1.068)
Nighttime light intensity	0.814*** (0.752, 0.881)	0.817*** (0.755, 0.884)	0.816*** (0.755, 0.883)
Age	1.586*** (1.498, 1.679)	1.586*** (1.498, 1.680)	1.584*** (1.496, 1.677)
Education (ref = Low education)			
High education	0.285*** (0.224, 0.362)	0.298*** (0.234, 0.380)	
Religion (ref = Orthodox)			
Protestant	0.653+ (0.412, 1.037)	0.658+ (0.415, 1.042)	0.651+ (0.410, 1.034)
Muslim	1.191 (0.785, 1.808)	1.187 (0.781, 1.805)	1.193 (0.786, 1.809)
Other	1.064 (0.517, 2.190)	1.086 (0.532, 2.220)	1.065 (0.518, 2.192)
Ethnicity (ref = Amhara)			
Oromo	1.255 (0.775, 2.031)	1.235 (0.766, 1.989)	1.250 (0.772, 2.024)
Other	1.368 (0.797, 2.349)	1.384 (0.802, 2.389)	1.374 (0.799, 2.361)
Somali	1.198 (0.498, 2.883)	1.172 (0.489, 2.812)	1.198 (0.497, 2.887)
Tigrayan	1.538 (0.698, 3.390)	1.579 (0.719, 3.470)	1.533 (0.696, 3.381)
Year of birth (ref = 1991)			
1992	0.938 (0.658, 1.337)	0.935 (0.656, 1.331)	0.941 (0.661, 1.341)

1993	1.222 (0.863, 1.732)	1.227 (0.867, 1.737)	1.226 (0.865, 1.736)
1994	1.330 (0.913, 1.938)	1.332 (0.914, 1.940)	1.332 (0.914, 1.941)
1995	1.078 (0.731, 1.590)	1.067 (0.724, 1.574)	1.078 (0.731, 1.590)
1996	1.032 (0.680, 1.565)	1.041 (0.687, 1.578)	1.029 (0.678, 1.561)
1997	0.828 (0.519, 1.320)	0.824 (0.517, 1.313)	0.825 (0.518, 1.316)
1998	0.728 (0.439, 1.210)	0.726 (0.438, 1.204)	0.724 (0.436, 1.201)
1999	0.396** (0.223, 0.702)	0.395** (0.223, 0.700)	0.392** (0.221, 0.696)
2000	0.301*** (0.159, 0.569)	0.303*** (0.160, 0.573)	0.298*** (0.158, 0.564)
2001	0.133*** (0.047, 0.373)	0.132*** (0.047, 0.371)	0.132*** (0.047, 0.369)
Log international wealth index	1.184 (0.440, 3.187)	1.140 (0.423, 3.068)	1.176 (0.438, 3.161)
Years of education among adults 25+	0.824 (0.530, 1.281)	0.841 (0.539, 1.312)	0.828 (0.532, 1.288)
Percentage of women in paid employment	1.011 (0.991, 1.031)	1.011 (0.992, 1.031)	1.012 (0.992, 1.032)
Cluster Fixed Effects	Yes	Yes	Yes
AIC	11,192.71	11,182.89	11,194.14
No. of Observations (person-years)	31,308	31,308	31,308

+p < 0.10; *p < 0.05; **p < 0.01; ***p < 0.001.

Notes: Estimates are presented as odds ratios.

Table 4: Discrete-time logit models of transitions into first marriage (odds ratios) – Uncertainty mechanism with media exposure.

	(1)	(2)	(3)	(4)
No. of protests	0.597** (0.413, 0.863)	0.833* (0.722, 0.962)	0.725** (0.578, 0.910)	0.622** (0.450, 0.859)
Media exposure (Ref = No)	0.900 (0.487, 1.662)			
Yes				
Reading newspapers (ref = No)				
Yes		0.336* (0.129, 0.875)		
Listening to radio (ref = No)				
Yes			1.151 (0.687, 1.928)	
Watching TV (ref = No)				
Yes				0.781 (0.344, 1.771)
No. of protests * Media exposure	1.615* (1.120, 2.328)			
No. of protests * Reading newspapers		1.279** (1.089, 1.502)		
No. of protests * Listening to radio			1.289* (1.023, 1.624)	
No. of protests * Watching TV				1.557** (1.132, 2.141)
No. of other conflict-related events	0.982 (0.899, 1.072)	0.956 (0.872, 1.047)	0.984 (0.900, 1.076)	0.980 (0.900, 1.068)
Number of protests at baseline	1.063 (0.813, 1.391)	1.030 (0.786, 1.350)	1.048 (0.806, 1.363)	1.061 (0.805, 1.398)
Nighttime light intensity	0.807 (0.601, 1.082)	0.789 (0.586, 1.062)	0.796 (0.593, 1.068)	0.802 (0.598, 1.076)
Age	1.531*** (1.429, 1.641)	1.535*** (1.434, 1.644)	1.528*** (1.426, 1.638)	1.533*** (1.430, 1.644)
Education (ref = Low education)				
High education	0.243** (0.091, 0.650)	0.307* (0.119, 0.790)	0.228** (0.085, 0.612)	0.245** (0.094, 0.639)
Religion (ref = Orthodox)				
Protestant	0.529 (0.202, 1.382)	0.536 (0.200, 1.441)	0.509 (0.194, 1.335)	0.527 (0.201, 1.381)
Muslim	1.024 (0.395, 2.656)	1.001 (0.381, 2.630)	1.039 (0.404, 2.671)	1.031 (0.397, 2.673)
Other	0.887 (0.216, 3.649)	0.745 (0.177, 3.140)	0.935 (0.227, 3.847)	0.863 (0.212, 3.517)
Ethnicity (ref = Amhara)				
Oromo	1.131 (0.439, 2.916)	1.125 (0.429, 2.951)	1.087 (0.423, 2.791)	1.128 (0.437, 2.908)
Other	1.542 (0.331, 7.193)	1.333 (0.272, 6.537)	1.494 (0.318, 7.015)	1.480 (0.303, 7.236)
Year of birth (ref = 1991)				

1992	0.519 (0.188, 1.430)	0.562 (0.210, 1.502)	0.511 (0.190, 1.379)	0.507 (0.185, 1.388)
1993	1.088 (0.407, 2.910)	1.022 (0.382, 2.735)	1.073 (0.404, 2.851)	1.060 (0.400, 2.808)
1994	1.461 (0.586, 3.641)	1.424 (0.567, 3.574)	1.446 (0.584, 3.577)	1.441 (0.576, 3.608)
1995	0.790 (0.337, 1.851)	0.783 (0.336, 1.827)	0.764 (0.331, 1.761)	0.763 (0.327, 1.782)
1996	0.784 (0.289, 2.127)	0.834 (0.311, 2.241)	0.754 (0.283, 2.015)	0.775 (0.291, 2.064)
1997	0.789 (0.289, 2.152)	0.795 (0.295, 2.141)	0.760 (0.285, 2.028)	0.765 (0.286, 2.045)
1998	0.489 (0.185, 1.297)	0.520 (0.196, 1.376)	0.473 (0.182, 1.228)	0.480 (0.184, 1.251)
1999	0.281* (0.088, 0.897)	0.294* (0.094, 0.918)	0.275* (0.088, 0.858)	0.280* (0.089, 0.882)
2000	0.264* (0.076, 0.918)	0.258* (0.076, 0.875)	0.252* (0.073, 0.863)	0.258* (0.075, 0.881)
2001	0.166 (0.013, 2.105)	0.184 (0.013, 2.676)	0.154 (0.012, 1.964)	0.168 (0.013, 2.233)
Cluster Fixed Effects	Yes	Yes	Yes	Yes
AIC	1,464.02	1,460.93	1,468.21	1,464.11
No. of Observations (person-years)	3,899	3,899	3,899	3,899

+p < 0.10; *p < 0.05; **p < 0.01; ***p < 0.001.

Notes: Estimates are presented as odds ratios. The media variables measure whether a woman had ever read newspapers, listened to the radio, watched TV, or engaged in a combination of these media forms.

Table 5: Competing risks discrete-time logit model of transitions into intra-ethnic vs inter-ethnic marriage (odds ratios) – Interethnic tension mechanism.

	Same ethnicity marriage	Inter-ethnic marriage
No. of protests	0.888*** (0.820, 0.956)	0.951 (0.841, 1.061)
No. of other conflict-related events	1.006 (0.963, 1.050)	0.853+ (0.665, 1.040)
Age	1.232*** (1.207, 1.258)	1.315*** (1.226, 1.404)
Education (ref = Low education)		
High education	0.174*** (-0.044, 0.391)	0.225*** (-0.392, 0.841)
Region (ref = Tigray)		
Afar	2.143*** (1.789, 2.496)	0.868 (-1.391, 3.127)
Amhara	1.201 (0.885, 1.516)	1.943 (0.575, 3.312)
Oromia	1.061 (0.755, 1.367)	2.540 (1.254, 3.826)
Somali	1.064 (0.713, 1.415)	0.873 (-0.937, 2.682)
Benishangul	1.228 (0.889, 1.567)	1.640 (0.128, 3.153)
SNNPR	0.543*** (0.233, 0.852)	1.292 (0.001, 2.584)
Gambela	0.962 (0.515, 1.408)	3.419 (1.905, 4.932)
Harari	1.921*** (1.553, 2.288)	5.989* (4.538, 7.441)
Addis Ababa	0.241** (-0.722, 1.204)	6.039* (4.308, 7.769)
Dire Dawa	0.655* (0.256, 1.055)	4.333* (3.005, 5.660)
Year of birth (ref = 1991–1992)		
1993–1994	1.037 (0.823, 1.251)	1.586 (0.875, 2.297)
1995–1996	0.808* (0.602, 1.013)	1.307 (0.575, 2.039)
1997–1998	0.401*** (0.165, 0.638)	0.885 (0.060, 1.710)
1999–2001	0.113*** (-0.236, 0.462)	0.069* (-2.014, 2.152)
AIC	6,970.23	6,970.23
No. of Observations (person-years)	25,900	25,900

+p < 0.10; *p < 0.05; **p < 0.01; ***p < 0.001.

Notes: Estimates are presented as odds ratios.

Table 6: Linear regression model of employment status – Unavailability mechanism.

	(1)	(2)
No. of protests	-0.007*	-0.011**
	(0.003)	(0.004)
Marital status (ref = not married)		
Married		0.067**
		(0.025)
No. of protests * Married		0.011+
		(0.006)
Region (ref = Addis Ababa)		
Afar	-0.006	-0.041***
	(0.011)	(0.009)
Amhara	0.152***	0.149***
	(0.003)	(0.006)
Oromia	0.231***	0.193***
	(0.006)	(0.009)
Somali	-0.213***	-0.079***
	(0.012)	(0.009)
Benishangul	0.155***	0.131***
	(0.002)	(0.006)
SNNPR	0.115***	0.131***
	(0.005)	(0.005)
Gambela	0.105***	0.079***
	(0.006)	(0.005)
Harari	0.068***	0.095***
	(0.020)	(0.016)
Addis Ababa	0.119***	0.135***
	(0.033)	(0.022)
Dire Dawa	-0.007	0.047***
	(0.021)	(0.013)
Age (ref = 18)		
19	0.023	0.012
	(0.041)	(0.037)
20	0.084**	0.102**
	(0.031)	(0.031)
21	0.096**	0.112***
	(0.029)	(0.023)
22	0.145***	0.156***
	(0.034)	(0.034)
23	0.172***	0.173***
	(0.049)	(0.04)
24	0.229***	0.213***
	(0.036)	(0.033)
25	0.257***	0.235***
	(0.053)	(0.044)

26	0.341***	0.284***
	(0.052)	(0.048)
27	0.326***	0.262***
	(0.057)	(0.052)
28	0.322***	0.263***
	(0.064)	(0.047)
29	0.389***	0.267***
	(0.054)	(0.055)
30	0.299***	0.251***
	(0.050)	(0.045)
Education (ref = No education)		
Primary education	-0.025	0.006
	(0.042)	(0.024)
Secondary education	-0.143***	-0.072**
	(0.040)	(0.028)
Higher education	-0.144**	-0.055
	(0.045)	(0.034)
Type of residence (ref = Rural)		
Urban	-0.019	-0.024
	(0.033)	(0.027)
Observations	3,020	5,035

+p < 0.10; *p < 0.05; **p < 0.01; ***p < 0.001. Standard errors are clustered at the regional level.

Notes: The sample in Model 1 includes men who have never been in a union. The sample in Model 2 also includes men who are married or living with a partner, while widowed, divorced, and separated men are excluded.

Figures

Figure 1: Number of protests and other conflict-related events by month.

Notes: These lines display the trend in the number of protests and other conflict-related events across the 614 DHS clusters in Ethiopia. In total, we count 649 protests and 1,606 additional conflict events.
Source: Analysis of authors' combined data set based on Ethiopia DHS 2016 and ACLED, UCDP-GED, GTD and SCAD (see 'Data and Variables' section).

Figure 2: Example of buffer (20 km) around DHS community and intersecting protest events.

Figure 3: Distribution of protest events across DHS communities.

Source: Analysis of authors' combined data set based on Ethiopia DHS 2016, ACLED and SCAD (see 'Data and Variables' section).