When Do Domestic Violence Laws Work? The Role of Social Norms

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Abstract

This paper studies *when* domestic violence laws effectively decrease domestic violence, focusing on laws introduced in Rwanda and Uganda in the 2000s, using household surveys, census and administrative data and geographical variations. I first document that the 2008 Rwandan domestic violence law, which criminalizes domestic violence and allows unilateral divorce upon abuse, led to higher divorce rates and less domestic violence in regions affected by the 1994 Genocide against the Tutsi in Rwanda, where female-biased sex ratios in the marriage market had increased violent marriages. Next, I show theoretically and empirically that the reduction in domestic violence is driven by both improved legal access and changes in social norms. The younger cohort women in the formerly genocide-intense regions—unaffected by the skewed sex ratios but exposed to the older cohort's increased rate of leaving violent marriages—shows less domestic violence, greater bargaining power and reduced justification for wife beating after the law, without a change in their own divorce rates. The reduced justification is particularly pronounced in areas where women from both cohorts interact in workplaces. These findings demonstrate that domestic violence laws deter domestic violence when women's decision to exit violent marriages is not constrained by social norms. This argument is further supported by studying the 2010 Ugandan Domestic Violence Act that criminalizes abuse and the 2015 Ugandan Supreme Court ruling that outlawed bride price refunds upon divorce, which adds external validity to the main findings. From a wider lens, laws aligned with social norms can catalyze behavioral change.

JEL Codes: J12, K38, D74, Z13
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1 Introduction

Domestic violence remains prevalent globally despite a growing number of countries enacting laws against it. About 1 in every 3 women worldwide have experienced physical and/or sexual violence from their partners in their lifetime (WorldBank, 2015). As of 2020, 155 of the 195 countries worldwide have passed domestic violence laws, such as the criminalization of domestic violence and domestic violence being grounds for divorce (WorldBank, 2020). This contrasting pattern casts doubt on the effectiveness of these laws. On the one hand, the economic theory on household bargaining suggests that these laws can increase women's outside options and decrease domestic violence. On the other hand, the laws can increase domestic violence through male backlash. Some existing studies provide empirical evidence for both directions, with ineffective laws being more common in developing countries with strict patriarchal gender norms.[1] Yet, empirical evidence identifying *when* domestic violence laws become effective is scarce.

Theoretical literature on laws and social norms suggests that laws that strongly conflict with prevailing norms can be less effective (Acemoglu and Jackson, 2017). Statistics on domestic violence in South Asia and Sub-Saharan Africa is in line with this result. The 2005 Indian domestic violence law criminalizes dowry-related domestic violence, supplementing the Dowry Prohibition Act of 1961, which outlaws the cultural practice of dowry itself. Yet, both dowry and dowry-related femicide and domestic violence have persisted for decades (Bloch and Rao, 2002). Although unilateral divorce is available to exit a violent marriage in India, most women refrain from it due to the heavy social stigma faced by divorced women. Similarly, the 2007 Sierra Leonean domestic violence law criminalizes domestic violence, but high rates persist, with 48% of women believe that they would be shamed by their community for reporting abuse (Diouf et al., 2023).

This paper provides evidence that domestic violence laws deter domestic violence when women's decision to exit violent marriages is not constrained by social norms. I study the 2008 Rwandan domestic violence law, which criminalized all forms of domestic violence and enabled women to divorce abusive husbands unilaterally. To analyze the effects of the law, I use the geographical variation in the intensity of the 1994 Genocide against the Tutsi in Rwanda, which created variation in where violent marriages were more likely to be located before the law. I find that couples in formerly genocide-intense regions——where male scarcity in the post-genocide marriage market led more women to marry violent men——are more likely to divorce and experience less domestic

[1] See Stevenson and Wolfers (2006), Brassiolo (2016), García-Ramos (2021), Corradini and Buccione (2023) and Gulesci et al. (2024). In contrast to the aforementioned papers, Gulesci et al. (2024) studies the impact of criminalization of domestic violence in Pakistan and finds that the laws are ineffective in the states where attitudes towards domestic violence and divorce are conservative. My paper distinguishes itself by examining when and how domestic violence laws are effective using different sources of variation. It analyzes various types of laws, including those related to divorce and criminalization, and tests its theory in another context for external validity.

violence after the law. I show that the reduction in violence was driven by both improved legal access to divorce and changes in social norms. The younger cohort in the formerly genocide-intense regions, unaffected by the skewed sex ratios, exhibits a reduction in domestic violence without a rise in divorce rates after the law. I argue that the younger cohort's exposure to the older cohort's intolerance of domestic violence, evidenced by the rise in divorce due to domestic violence in the older cohort, deters violence within their own marriages. Consistent with this argument, the younger cohort in genocide-intense regions shows greater bargaining power and reduced justification of domestic violence compared to less intense regions. The reduced justification is particularly pronounced in areas where women from both cohorts interact in confined workplaces. In the final section of the paper, I provide additional evidence supporting the role of social acceptance of leaving a violent marriage in the effectiveness of domestic violence laws by studying Ugandan domestic violence laws. This enhances the external validity of the main findings.

The Rwandan context provides three key variations to study the effect of domestic violence laws. First, the introduction of the national domestic violence law in 2008 created a time variation (before-after the law). The law criminalized all forms of domestic violence, including marital rape. The punishment for domestic violence ranges from six months to two years of imprisonment and a fine.[2] The law also allowed women to divorce their husbands unilaterally if their husbands were violent towards them. Before the law, if a woman experienced domestic violence, she needed her husband's consent to divorce.[3] Second, there is spatial variation in the intensity of the 1994 Genocide against the Tutsi in Rwanda, which led to where violent marriages—intended beneficiaries of the law—are more likely to be located before the law's adoption. In genocide-intense regions, female-biased sex ratios emerged, leading more women of marriageable age during the genocide to marry violent men. Third, there is cohort variation in the impact of female-biased sex ratios because the adult male population—rather than younger males—was predominantly killed during the genocide and incarcerated thereafter. Women younger than the marriageable age during the genocide experienced a balanced sex ratio in the marriage market before the law. However, those living in formerly genocide-intense areas have notable exposure to older cohort's divorces due to domestic violence after the law.

To elucidate the factors affecting domestic violence in this context, I built a simple two-stage search and bargaining model of marriage. The model incorporates the sex ratio in the marriage market, the couple's decisions within the marriage and the law's effect. In the first stage, the woman receives proposals from men, where the probability of receiving a proposal equals the

[2]The law states that the penalty for distorting the tranquility of your spouse on sexual grounds shall be liable to a fine between 50,000 Rwandan francs ($39) and 200,000 Rwandan francs ($155) beyond imprisonment. Average annual income is $780 in Rwanda in 2018.

[3]Community marital property regime is the default regime in Rwanda where divorce legally leads to splitting marital property equally among spouses.

male-to-female sex ratio in the marriage market. There are two types of men in the market, violent and non-violent, and the woman cannot observe the man's type. It is more costly for the woman to reject a proposal in a male-scarce area since it is less likely for her to receive another proposal. Thus, when there are female-biased sex ratios in the marriage market at the time of the marriage, women become less selective and become more likely to be in violent marriages. The model shows that the law decreases domestic violence via two effects and has three testable predictions. First, under the hypothesis that men cannot control their impulses to be violent, the higher the male scarcity at the time of the marriage, the higher the increase (decrease) in the divorce rates (domestic violence rates) after the law. The decrease in domestic violence rates is due to the higher increase in divorce rates only (Divorce Effect). Second, under the hypothesis that men choose to be violent or not, the higher the male scarcity at the time of the marriage, the higher the decrease in the domestic violence rates after the law, independent of a change in the divorce rates (Deterrent Effect). Third, keeping male scarcity constant, the higher the wife's utility of being divorced (i.e., the more socially acceptable divorce is viewed in cases of domestic violence), the higher the decrease in domestic violence rates after the law (The Role of Social Norms in the Law's Effectiveness).

To causally identify the impact of the law on divorce and domestic violence, I employ a difference-in-differences (DID) design as the main empirical specification, using both the time variation (before and after the law) and spatial variation (genocide-intense and non-intense areas). To distinguish the role of social norms (social acceptance of divorce and domestic violence) in the effectiveness of the law, I leverage the cohort variation using multiple strategies. First, I do a subsample analysis estimating the DID by cohort and employ a triple DID using both the cohort, time and spatial variations. Then, I employ a DID event-study design that exploits age at genocide and spatial variation. I use the minimum marriageable age in Rwanda as the event.

Rwandan Demographic Health Surveys (DHS) before and after the law provides information on women's self-reported current marital status and domestic violence experience in the past 12 months. I use genocide court records to measure the geographical variation in the intensity of the genocide. Using the court records, I create a commune level (the geographical unit at the time of the genocide) genocide intensity index following Verpoorten (2012) and LaMattina (2017).[4] DHS cycles are geocoded, which enables me to match women with the communes they were married in (their marriage market). For studying the mechanisms, I use the Rwandan Population and Household Census and geocoded Hospital Management Information System (HMIS) data, which provides the universe of monthly hospitalizations due to domestic violence and post-traumatic stress disorder.

Among women who ever married after the genocide, one standard deviation increase in the

[4]The average area of a commune is 174 km^2.

genocide intensity in a commune leads to 4 percentage points (p-value=0.004) increase in the divorce rate after the law. The estimated impact represents a 67% increase with respect to the sample mean (0.06).[5] Among women who ever married after the genocide, one standard deviation increase in the genocide intensity in a commune leads to 5 percentage points (p-value=0.004) decrease in the sexual or severe physical domestic violence rate after the law.[6] The estimated impact represents a 28% decrease with respect to the sample mean (0.18). The estimates provide support for the divorce effect, where the decrease in domestic violence is due to the dissolution of violent marriages.

Does the law deter domestic violence within violent marriages? If so, can the reduction in domestic violence be partially attributed to the increased social acceptability of divorcing due to domestic violence after the law? I provide evidence for both aspects. First, for the ever-married younger cohort, a one standard deviation increase in genocide intensity within a commune results in no change in the divorce rate but a statistically significant decrease in sexual or severe physical domestic violence rate after the law, indicating a deterrent effect. In contrast, for the ever-married older cohort, a one standard deviation increase in genocide intensity continues to increase the divorce rate and decrease the domestic violence rate, consistent with the overall sample's findings, supporting the divorce effect. Second, using a triple DID approach, I confirm that the cohorts in the genocide-intense regions are statistically different from each other when domestic violence is the dependent variable. Third, using the 2012 Census and a DID event study design, I find that a woman who was of marriageable age during the genocide in a genocide-intense commune is more likely to be divorced after the law compared to a woman who was younger than the minimum marriageable age during the genocide. The results suggest that the younger cohort's exposure to the older cohort's intolerance of domestic violence in the genocide-intense areas——demonstrated by the older cohort's use of divorce to exit violent marriages——deters violence within their own marriages.

The decreased justification of domestic violence and increased bargaining power among the younger cohort in the genocide-intense regions after the law, identified by multiple rounds of household survey data, strengthens the argument. After the law, the younger cohort in formerly genocide-intense areas are more likely to make decisions about large household purchases and their own health either by themselves or jointly with their husbands, compared to their husbands or someone else in the family is deciding for them. Those women are also less likely to justify wife beating in all circumstances (refusing sex, arguing with the husband, burning food, neglecting children, or going out without informing him). Moreover, the decreased justification of domestic

[5]Before the law, the divorce rate in my sample is approximately 0.02.

[6]Severe physical cases are when the wife is either kicked, dragged, strangled, burnt and threatened with a knife, gun or other weapon. Sexual domestic violence cases are being physically forced into unwanted sex and performing sexual acts.

violence is prominent in places where women from both cohorts frequently interact, such as within the 4 km radius catchment area of a coffee mill that was built before the law and provides jobs to women.[7] This further highlights how attitudes toward divorce and domestic violence in women's social environment influence intra-household bargaining and the law's effectiveness.

Female-Biased Sex Ratios & Variation in Violent Marriages. The paper builds on the argument that female-biased sex ratios are the underlying channel behind the spatial variation in violent marriages and, thus, why regions with different genocide intensities respond differently to the law. I empirically provide evidence in favor of this argument. I first show that among the women who married right before the genocide, where there was no male scarcity in the marriage market, an increase in the genocide intensity in a commune has no effect on the divorce and domestic violence rates after the law. The majority of those women had lived in their place of residence since before the genocide. Thus, the husbands in the genocide-intense areas are exposed to genocidal violence. This suggests that the variation in violent marriages is not driven by exposure to genocide but by female-biased sex ratios in the post-genocide marriage market. To further test this, I exploit exogenous variation in radio reception of the state-sponsored station—Radio Television Libre des Mille Collines (RTLM)—that encouraged the genocide against the Tutsis (Yanagizawa-Drott, 2014).[8] It has been documented that armed-group violence by the militiamen during the genocide, rather than local RTLM-induced civilian violence, targeted adult men. RTLM-induced killings were mostly women and children, and it led to a male surplus (Rogall and Zarate-Barrera 2020, Rogall 2021). I find that a one standard deviation increase in the RTLM reception in a commune has no effect on the divorce and domestic violence rates after the law. This further suggests that male scarcity in the marriage market is the underlying mechanism behind the variation. I also use an instrumental variables strategy where I instrument the 2002 commune level sex ratio with the genocide intensity index. The results are in line with the main estimates. Consistent with the model and the empirical results supporting the male scarcity channel, using data on couples' education levels, I also show that women become less selective in the post-genocide marriage market.

Using the universe of monthly hospitalizations for domestic violence and PTSD, I also show that the variation in violent marriages cannot be explained by one or both of the spouse's mental health disorders. Every year, a national mourning to commemorate victims of the genocide occurs in Rwanda, which overlaps with the actual months of the genocide. Recent medical research

[7] See Sanin (2023) for an analysis of how the rapid expansion of Rwandan coffee mills affected female employment and domestic violence. In this study, proximity to a mill——defined as being within its catchment area——is considered plausibly exogenous due to the characteristics of the coffee tree and agricultural conditions.

[8] This check originates from Rogall and Zarate-Barrera (2020), which exploits the RTLM reception as a robustness check to support that post-genocide and gender imbalance induced (local) female political participation leads to improvement in various women's empowerment outcomes.

suggests that the period triggers PTSD symptoms in Rwanda (Kayiteshonga et al., 2022). Using a DID event-study design, I find that it is not more likely for a hospital in a formerly genocide-intense area to have a domestic violence and a (female or male) PTSD patient during the national mourning period compared to one month before the onset of the mourning. Thus, PTSD, at least the severe cases, plausibly do not drive the variation in violent marriages.

As a robustness check for the overall findings, I estimate a placebo DID using two pre-law data cycles, falsely assuming that the law happened between them. I show that couples are not more likely to get divorced in genocide-intense areas after the falsely assumed date of the law. This provides evidence for the parallel trends assumption. The results are also robust to different measures of genocide intensity.[9]

External Validity Using Ugandan Domestic Violence Laws. To test the role of social acceptance of leaving a violent marriage in the effectiveness of domestic violence laws in another context, I study a sequence of domestic violence laws in Uganda using data from the Ugandan Demographic and Health Surveys. In 2010, Uganda criminalized domestic violence, making it punishable by fines and/or imprisonment for up to two years. In 2015, the Ugandan Supreme Court ruled that the refund of the bride price upon marital dissolution is unconstitutional in customary marriages, which sizably decreases the direct cost of separation for women. In Uganda, bride price is a cultural practice where the groom pays the bride's parents a sum of money or property before a customary marriage. This payment is a crucial aspect of the marriage contract, and while the amount varies among tribes, it is significant in most cases. MIFUMI, the largest grassroots women's rights organization in Uganda, took the case to the Supreme Court, aiming to free women from being trapped in violent marriages due to the inability to refund the bride price. In Uganda, data shows that while marital separation is socially acceptable, reporting an abusive spouse to law enforcement (thus exiting a violent marriage in the short term) is not. Using variation across time (before and after the laws) and ethnic groups (those that do and do not consider the bride price as a refundable gift), I examined the effect of each law. Consistent with the model's predictions, I find no effect after the 2010 law, where reporting one's husband to law enforcement is not socially acceptable. However, after 2015, when the economic cost of marital dissolution decreased for women and dissolution was already socially acceptable, women from ethnic groups where the bride price was previously refundable were more likely to separate and experience less physical or sexual domestic violence.

Policy Implications. The results suggest that lawmakers should consider social norms when designing laws. A gradual tightening of the law that is in line with the prevailing norms, as theo-

[9]Since there is no variation in treatment timing, my results are not subject to the issues regarding two-way fixed effects DID estimator.

retically proposed by Acemoglu and Jackson (2017), may be more effective. For instance, allowing unilateral divorce in cases of domestic violence in a country where mutual consent divorce already exists and marital dissolution is socially acceptable could be more effective than solely criminalizing domestic violence in contexts where reporting the husband to law enforcement is not socially acceptable. Additionally, the findings highlight the importance of exposure to law take-up in shaping social attitudes and emphasize the role of information diffusion within women's social networks in the law's effectiveness.

Contributions to the Literature. This paper makes three main contributions. First, it provides empirical evidence that domestic violence laws deter domestic violence when the social cost of exiting a violent marriage is low for the wife. To the best of my knowledge, this is the first paper to identify *when* these laws are effective in addition to determining whether they work. While theoretical studies have explored the interaction between laws and social norms (Benabou and Tirole 2011, Acemoglu and Jackson 2017) and extensive empirical research exists on the effects of expanding women's rights (e.g. divorce and marital property laws, labor laws, reproductive laws and gender quota laws) (Rasul 2006, Stevenson and Wolfers 2006, Wolfers 2006, Field 2007, Anderson and Genicot 2015, Bronson 2015, Voena 2015, Brassiolo 2016, Anderson 2018, García-Ramos 2021, Corradini and Buccione 2023, Gulesci et al. 2024; Ruhm 1998, Rossin-Slater et al. 2013; Goldin and Katz 2002, Bailey 2006, Myers 2017; Chattopadhyay and Duflo 2004, Beaman et al. 2009, Beaman et al. 2012), empirical studies on the interaction between laws, social norms, and family decisions are emerging (Tertilt 2005, LaFerrara and Milazzo 2017, Ashraf et al. 2020, Bau 2021, Moscona and Seck 2024).[10] The results suggest that laws can act as catalysts for changes in social norms, which subsequently influence household decisions, supporting Bau (2021)'s finding that policies can change culture. Moreover, findings for the younger cohort in the genocide-intense regions provide empirical support for the theoretical argument proposed in Acemoglu and Jackson (2017) that a law can be more effective in shaping social norms and behavior when it does not strongly conflict with prevailing social norms.[11]

Second, the results suggest that exposure to individuals who benefit from the law can shape societal norms by signaling acceptable behavior within the community, influencing attitudes, and affecting intra-household decisions. My results align with Dahl et al. (2014), which shows that in Norway, coworkers and brothers are more likely to take paternity leave if their peers do, due to

[10] See Doepke et al. (2012) for a review of women's rights, Goldin (2023) for why and how women in the US obtain legal rights equal to men's and Tertilt et al. (2022) for the political economy of women's rights across countries.

[11] For the younger cohort in the genocide-intense areas, the law is not in strong conflict with social norms on divorce and domestic violence given that the older cohort enhanced the acceptability of leaving a violent marriage for the younger cohort via the rise in their divorce rates. Consequently, there is a change in the younger cohort's attitudes and behaviors.

increased knowledge of employer reactions.[12] Multiple studies focus on how norms and attitudes related to gender persist over time (Fernandez and Fogli 2009, Alesina et al. 2013, Grosjean and Khattar 2019, Alesina et al. 2020, Becker 2022, Miho et al. 2024).[13] My results relate to a set of papers that studies changing nature of social norms, attitudes and beliefs on gender (Beaman et al. 2009, Bursztyn et al. 2020, Field et al. 2021, Giuliano and Nunn 2021, Gulesci et al. 2023, Agte and Bernhardt 2024). In contrast to Bursztyn et al. (2020), which examines the effect of correcting men's beliefs in shared social networks on female labor supply in Saudi Arabia, I focus on women's social environment. My findings suggest that after a law provides women with a threat point, even if men's attitudes remain unchanged, women's exposure to intolerance of domestic violence can influence their own attitudes and enable them to bargain for less violence in the household.

Third, the results add to the literature on domestic violence. A growing empirical literature on domestic violence provides evidence that laws, policies or female employment can decrease or increase domestic violence via an increase in women's outside options (Stevenson and Wolfers 2006, Aizer 2010, Anderberg et al. 2016, Brassiolo 2016, Hidrobo et al. 2016, Haushofer et al. 2019, Sviatschi and Trako 2021, Adams-Prassl et al. 2023, Corradini and Buccione 2023, Lowes 2023, Sanin 2023), reduction in financial stress (Angelucci 2008, Bhalotra et al. 2019, Heath et al. 2020, Arenas-Arroyo et al. 2021, Bhalotra et al. 2021), exposure reduction (Chin, 2011), extractive/instrumental violence (Bloch and Rao 2002, Eswaran and Malhotra 2011, Bobonis et al. 2013, Heath 2014, Anderson and Genicot 2015, Erten and Keskin 2018, Bhalotra et al. 2019, Calvi and Keskar 2021, Erten and Keskin 2021, Erten and Keskin 2022, García-Ramos 2021), male backlash (Angelucci 2008, Luke and Munshi 2011, Tur-Prats 2021, Alesina et al. 2020, Guarnieri and Rainer 2021, Gulesci et al. 2024), unexpected emotional cues (Card and Dahl, 2011) and economic costs of women's physical incapacitation (Sanin, 2023). Empirical evidence shows that increases in domestic violence are prevalent in developing countries where law enforcement is weak, male education rates are low, financial strain is persistent, and gender norms are restrictive. The results suggest that laws or policies aimed at increasing women's outside options are more effective when women's decisions to divorce are not constrained by social norms. In other words, the predictions of divorce threat models (Manser and Brown 1980, McElroy and Horney 1981) can hold in developing country contexts, depending on local social norms.

The organization of the paper is as follows. I first provide information on the Rwandan context (Section 2). Then, I introduce the model, which gives three testable predictions related to the effect of domestic violence laws (Section 3). I then introduce the data sources (Section 4). Section 5 presents the identification strategies. Then, I test the theoretical predictions with data (Section 6).

[12] See Ashraf and Bandiera (2018) for a review on the effect of social interactions with colleagues on effort choices in organizations.

[13] See Bisin and Verdier (2001) and Bisin and Verdier (2023) for a theory and review on cultural transmission.

Section 7 provides empirical evidence which supports female-biased sex ratios as the underlying channel behind the variation in violent marriages. Section 8 provides robustness checks. Section 9 discusses external validity of the results using Ugandan domestic violence laws and data. The last section concludes (Section 10).

2 Institutional Context

In this section, I first provide background information on the 2008 Rwandan domestic violence law. Then I provide information on the 1994 Genocide against the Tutsi in Rwanda, which produced female-biased sex ratios and thus affected women's likelihood of being in a violent marriage before the law's adoption. I conclude with how the female-biased sex ratios also shape women's social environment after the law. I provide a timeline of the events in Figure A1.

2.1 2008 Domestic Violence Legislation in Rwanda

In 2008, Law No. 59/2008 of 2008 on the Prevention and Punishment of Gender-Based Violence was passed by the Rwandan parliament. Rwanda became the first country in Sub-Saharan Africa to pass a comprehensive law to address gender-based violence (Hebert, 2015).[14] All forms of domestic violence, including marital rape, are criminalized. The penalty for domestic violence is six months to two years of imprisonment.[15] The law states that the penalty for distorting tranquility of the spouse on sexual grounds shall be liable to both imprisonment and a fine between 50,000 Rwandan francs ($39) and 200,000 Rwandan francs ($155), which can constitute a quarter of the perpetrator's annual income.[16]

Additionally, domestic violence became grounds for fault divorce, which enabled legally married women to divorce their abusive husbands unilaterally. For both aspects of the law, providing evidence or giving testimony is necessary for anyone who takes their case to court. Upon divorce, child custody will be given to the spouse innocent of violence.[17] Given that 59% of the marriages in Rwanda are civil marriages according to the 2002 Census, the divorce provision applies to the majority of married couples.

[14] Since I focus on violence against married women, I use the term "domestic violence" rather than "gender-based violence" throughout the paper, although domestic violence is a form of gender-based violence.

[15] According to the 2011 US Department of State's Country Report on Human Rights Practices for Rwanda, Rwandan prosecutors received 363 domestic violence cases of which 177 were filed in court, 18 were dropped, one was reclassified, and 167 were pending investigation. Unfortunately, conviction statistics are not available (USDepartmentofState, 2010).

[16] Average annual income is $780 in Rwanda in 2018.

[17] Community marital property regime is the default regime where mutual consent divorce legally leads to splitting marital property equally among spouses.

Before the adoption of the domestic violence legislation, if a woman experienced domestic violence in Rwanda, she needed her husband's consent to get divorced. Both before and after the law, mutual consent and fault divorce are the only recognized types of divorce; unilateral no-fault divorce is not an option. The law recognizes domestic violence as one of the possible faults in a fault divorce.[18]

The law came into effect in September 2008 and is unique for a developing country. First, beyond divorce being a taboo in many developing countries, women are often not formally protected by laws upon divorce and face the possibility of losing assets and custody of their children (Duflo 2012, Anderson 2018). Second, although criminalization of domestic violence is usually one of the first steps in introducing domestic violence legislation, legally recognizing marital rape as a crime is not very common for a developing country. As of today, there are many developing countries where marital rape is still legal, including India, China, Iran, and the Democratic Republic of Congo.

2.2 The 1994 Genocide against the Tutsi in Rwanda and Female-Biased Sex Ratios

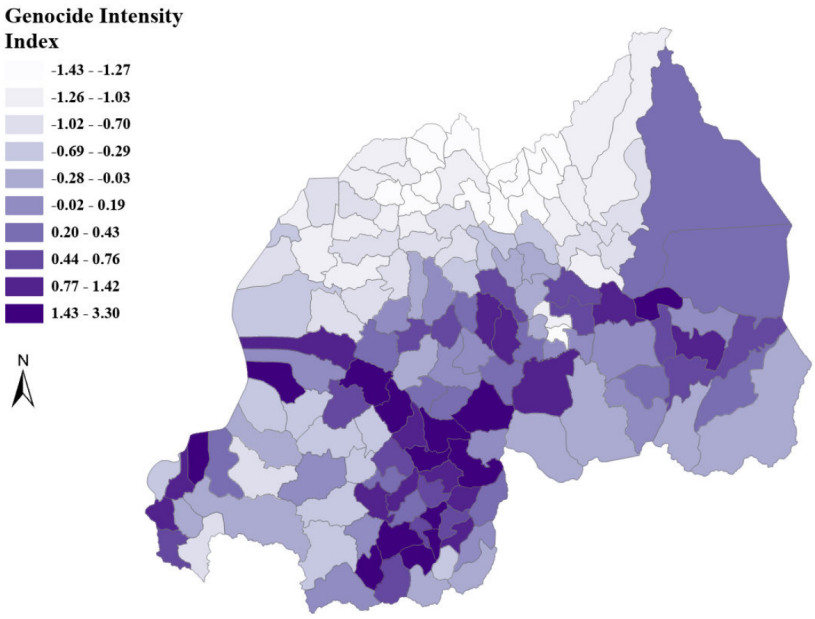
The 1994 Genocide against the Tutsi in Rwanda took place between April 7 and July 15, 1994. In fewer than one hundred days, between 500,000 and 1,000,000 people, mostly from the Tutsi ethnic group, were killed (Verpoorten, 2005). Moderate Hutus who spoke out against the genocide by Hutus against Tutsis were also killed (Yanagizawa-Drott, 2014). The intensity of the genocide varied by commune, which is the geographical unit at the time of the genocide. The geographical variation can be seen in Figure 1.

Female-Biased Sex-Ratios in the Marriage Market Before the Law. Due to the high number of men killed during the genocide and incarcerated thereafter, Rwanda's marriage market after the genocide has a distorted sex ratio (the number of males per number of females is low).[19]

[18] According to the 1988 Civil Code, other faults that ground a fault divorce are a conviction for an offense that brings considerable disgrace to the family (e.g., participation in the genocide), adultery, three years of de facto separation, abandonment of the marital home for more than one year, and infliction of serious injury. Divorce cases are handled in the primary courts. Primary courts constitute the lowest level of the judiciary of Rwanda, and they have civil and criminal jurisdiction.

[19] After the genocide, perpetrators were incarcerated, and the majority of them were male (LaMattina, 2017). According to the 1991 and 2002 Rwandan Census, the share of incarcerated individuals in the population increased from 0.11 in 1991 to 1.3 in 2002, and more than 95% of those incarcerated in 2002 were male (LaMattina, 2017). After the genocide, the Rwanda Census does not ask for ethnicity information, which makes it impossible to see whether the majority of perpetrators are Hutu. However, since the genocide is against the Tutsis by Hutus, it is assumed that most perpetrators are from the Hutu ethnic group. Thus, the marriage market sex ratios (unincarcerated) are distorted not just for the Tutsis but also for Hutus.

Figure 1: Genocide Intensity Index



Notes: Map showing the variation in genocide intensity (index) by commune in Rwanda. Commune is the geographical unit at the time of the genocide. I calculated the index using the Gacaca Court Records following Verpoorten (2012) and LaMattina (2017). The Gacaca courts are a transitional community justice system, that is responsible for the prosecution of the perpetrators of the 1994 Genocide against the Tutsi in Rwanda at the domestic level during the early 2000s.

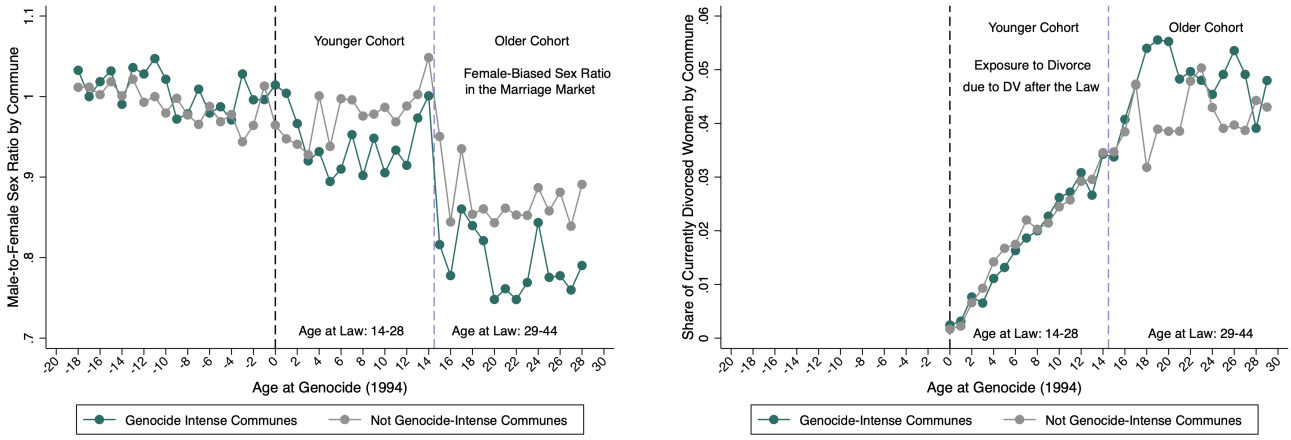
Figure 2 (left) visualizes the negative relationship between genocide intensity and the female-to-male sex ratio by age. Males are scarcer in the genocide-intense communes for the cohorts born after the genocide. The sex ratio is especially low among ages 15-30, which I will refer to as the older cohort hereafter. This is consistent with the previous literature which documents that males, especially adult men, are targeted for death during the genocide (Verwimp 2006, Rogall 2021). The older cohort is also the age interval where approximately 97% of the marriages occur in Rwanda.[20] Based on the figure, high genocide intensity is associated with a low male-to-female sex ratio in the marriage market for the women who married after the genocide. A commune can be thought as a woman's marriage market at the time of the marriage.[21]

Exposure to a Social Environment with Female-Biased Sex Ratios After the Law. Figure 2 (right) suggests that the female-biased sex ratios also shape women's social environment after

[20]Under the Civil Code 1988, the minimum legal age of marriage is 21 years. However, under Article 171 of the Code, the Minister of Justice or his delegate may dispense with the minimum age requirement for serious reasons. Rwanda ratified the Convention on the Rights of the Child in 1991, which sets a minimum age of marriage of 18.

[21]This is a plausible assumption given that mean size of a commune was 174 km^2.

Figure 2: Male-to-Female Sex Ratio and the Share of Currently Divorced Women After the Law by Age at Genocide across Different Genocide Intensities



Notes: The left figure documents the male-to-female sex ratio by age across genocide-intense and not-intense communes where the right figure documents the share of currently divorced women by age across genocide-intense and not-intense communes. Both uses the Rwandan Population and Housing Census 2012.

the law. It plots the share of currently divorced women by age across genocide-intense and not-intense communes. The left and the right figures combined suggest the following. Compared to the younger cohort women in the genocide-intense communes, the older cohort women in the genocide-intense communes experienced more female-biased sex ratios in the marriage market at the time of the marriage. They are also more likely to report being currently divorced after the law. As a result, younger cohort women in the genocide-intense communes are more likely to be exposed to divorce due to domestic violence in their communities after the DV law compared to the younger cohort women who reside in not genocide-intense communes.

3 Model

To elucidate the factors affecting domestic violence in the Rwandan context, I built a simple two-stage search and bargaining model of marriage. The model incorporates the sex ratio in the marriage market, the couple's decisions within the marriage and the effect of the law. I focus only on the divorce aspect of the law in the model.

3.1 Setup

There are two stages in the model, one before and one during the marriage. Before the marriage, I model the marriage market in discrete time with infinitely lived single women who discounts the

future by a discount factor β.[22] Every period, a single woman receives a proposal with probability λ, from a man of type $\alpha \in \{0,1\}$. There are two types of men in the market, violent ($\alpha = 1$) and non-violent ($\alpha = 0$). The violent type man commits domestic violence in the marriage where a non-violent man does not. Thus, the expected utility from a marriage with a non-violent man will be higher. The probability of receiving a proposal, λ, is monotonic in the male-to-female sex-ratio. The probability of receiving a proposal is low when the sex ratio is female-biased (male scarcity).

A woman does not observe the man's type, but she observes a signal $\sigma \in (0,1)$ on his type. The signal is drawn from $f(\sigma|\alpha)$ which satisfies the monotonic likelihood ratio property (MLRP): The higher the signal, the more likely the man is a violent type. Thus, high signals are bad news. At the extreme, these signals are almost perfectly informative.[23] The associated cumulative density is denoted as $F(.)$. After observing the signal, she updates her belief about the man's type and then she decides whether to accept or reject his proposal. Belief updating follows the Bayes rule and the posterior probability of a man being the violent type given the signal is denoted as π_σ.[24] She strictly prefers being married to the man who is least likely to be violent over being single forever. She prefers being single forever to being married to the man who is most likely to be violent.

If the woman rejects the proposal of a man, she obtains per-period utility of being single and continues to search. If she accepts, the couple is married. The man's type and the benefit from the marriage are realized and the woman obtains the per-period utility of being married. Marriage is an absorbing state. Thus, the woman will not be able to get divorced once married. This captures the decision making process of the women who married before the law. Before the law, the divorce rate in Rwanda was very low (approximately 0.02), although divorce was legal. Thus, I assume that women are making a marriage decision thinking that they will be married forever. They are myopic in the sense that they do not anticipate a legal change concerning divorce in the future.

The preferences of the man and the woman depend on their marital status. If they are married, I assume that the preferences can be represented by the utility functions

$$U_m^{married} = \alpha + \xi_m \ \ and \ \ U_w^{married} = -\alpha + \xi_w, \tag{1}$$

where $\alpha \in \{0,1\}$ is the man's type and $\xi_j \in (0,1]$ for $j \in \{m,w\}$ indicates the non-monetary benefit from marriage for women and men. The man's type, α, captures the man's propensity for domestic violence. If $\alpha = 1$, he is the violent type and he derives positive utility from committing violence against his wife. Men and women's non-monetary benefit are independent and ξ_j follows distribution Q_j with support $[\underline{\xi_j}, \overline{\xi_j}]$. $\underline{\xi_j}$ is high enough for the marriage to take place with

[22] I model the marriage market as a one-sided matching market. Men do not behave strategically.

[23] $\lim_{\sigma\uparrow 1} \frac{f(\sigma|\alpha=0)}{f(\sigma|\alpha=1)} = 0$ and $\lim_{\sigma\downarrow 0} \frac{f(\sigma|\alpha=1)}{f(\sigma|\alpha=0)} = 0$

[24] $\pi_\sigma = P(\alpha = 1|\sigma) = \frac{pf(\sigma|\alpha=1)}{pf(\sigma|\alpha=1)+(1-p)f(\sigma|\alpha=0)}$, where p is the prior belief.

the man. $U_w^{married}$ is decreasing in domestic violence and $U_m^{married}$ and $U_w^{married}$ are increasing in non-monetary benefit from marriage. If they are single, I assume that their preferences can be represented by the utility functions

$$U_m^{single} = s_m \ \ and \ \ U_w^{single} = s_w \tag{2}$$

where $s_j \in (0,1]$ for $j \in \{m,w\}$. These represent the outside options. For now, assume that in the absence of domestic violence, both the woman and the man are better off remaining married than being single as in $\xi_w > s_w$ and $\xi_m > s_m$.[25]

When a single woman receives a proposal from a man, she compares the lifetime expected value of marrying today, V_M, with the lifetime expected value of remaining single at least one period, V_S:

$$\max_{Accept,\, Reject} \{V_M, V_S\} \tag{3}$$

where

$$V_M = \frac{-\pi_\sigma + \mathbb{E}[\xi_w]}{1-\beta} \tag{4}$$

$$V_S = s_w + \beta\Big[\lambda \mathbb{E}_\sigma[\max\{V_M, V_S\}] + (1-\lambda)V_S\Big]. \tag{5}$$

V_M is dependent on the posterior probability of the man being the violent type and the woman's expected benefit from the marriage. V_S depends on λ, the probability of receiving a proposal or the sex ratio in the marriage market at the time of the marriage.

There exists a reservation signal $\sigma^*(\lambda, s_w)$, where $V_M(\sigma^*) = V_S(\sigma^*)$. Given that high signals are bad news, she will accept any proposal with a signal below the reservation signal, since those men will be less likely to be the violent type.

$$\sigma^*(\lambda, s_w) = \begin{cases} Accept & \text{if } \sigma(\lambda, s_w) \leq \sigma^*(\lambda, s_w) \\ Reject & \text{if } otherwise. \end{cases} \tag{6}$$

The relationships between the reservation signal, male scarcity and the utility of being single (outside option) are as follows is as follows:

$$\frac{\partial \sigma^*(\lambda, s_w)}{\partial \lambda} < 0 \tag{7}$$

$$\frac{\partial \sigma^*(\lambda, s_w)}{\partial s_w} < 0 \tag{8}$$

[25] I relax this assumption at the end of Section 3.3.1

Observation 1: *The higher the male scarcity in the marriage market, the less selective women are.*
Proof. See Appendix A3.1.

The reservation signal increases if male scarcity increases. When there is male scarcity in the marriage market, women settle down for men who are more likely to be violent-types.

Observation 2: *The better the outside options, the more selective women are in the marriage market.*
Proof. See Appendix A3.2.

The reservation signal decreases if the utility of being single increases. When the utility of being single is higher, it is less costly for women to wait for one more proposal, which makes them more selective in the marriage market.

If the woman accepted the proposal of a violent type man, $\alpha = 1$, in the marriage market, she experiences domestic violence in her marriage and receives $-1+\xi_w$. Before the law, she cannot divorce her husband unilaterally. Thus, she is stuck in the violent marriage. After the law, domestic violence becomes grounds for divorce. Now, she can unilaterally divorce her husband if he behaves violently towards her. She can either remain married forever, or divorce the violent type man and go back to the single pool forever, as represented with the maximization below:

$$\max_{Married,\, Divorced} \left\{ \frac{-\alpha+\xi_w}{1-\beta}, \frac{s_w}{1-\beta} \right\}. \tag{9}$$

By assumption, remarriage is not allowed in the model. (This assumption is based on the data. According to DHS and recent marriage statistics, remarriage rate for women is very low in Rwanda.) After the law, the woman will divorce the violent type man if $-1+\xi_w \leq s_w$.[26] It is important to highlight that according to the law, the woman can initiate divorce *if* her husband behaves violently. Thus, in order to investigate the impact of the law, I model man's violent behavior in the next subsection.

There remain two types of men, violent ($\alpha = 1$) and non-violent ($\alpha = 0$), where the violent type man derives positive utility from exercising violence against the woman. However, now I distinguish between two hypotheses on men's ability to control their violent behavior. Under the lack of self-control hypothesis, the violent type man always behave violently irrespective of the legal context he lives in, because he lacks self-control. Under the choice hypothesis, the violent type man can control his violent impulses and *can choose to inflict violence or not* by maximizing his utility with respect to the woman's outside option. Under both hypotheses, non-violent types do not behave violently either before or after the law's adoption.

[26] If the woman accepted the proposal of a non-violent type man, $\alpha = 0$, her optimal decision is to remain married, assuming $\xi_w > s_w$.

3.2 Lack of Self-Control Hypothesis

3.2.1 Predictions: Divorce Effect of the Law

Recall that the cumulative distribution function of ξ_w is given by Q_w. The probability of divorce conditional on being married to a violent man is thus $Q_w(s_w+1)$.[27] The post law divorce rate, *DivorceRate*, consists of the posterior probability that the man to whom the woman is married is the violent type, π_σ, multiplied by $Q_w(s_w+1)$. Accordingly, *DivorceRate* is given by

$$DivorceRate = \int_0^{\sigma^*(\lambda,s_w)} \pi_\sigma Q_w(s_w+1) dF(\sigma). \tag{10}$$

This is the divorce rate among all couples since the divorce rate for the couples in which husbands are non-violent types is zero. The divorce rate depends on the reservation signal, $\sigma^*(\lambda,s_w)$, since the reservation signal affects women's marriage decisions. Lastly, since there is no divorce before the law in the model, $DivorceRate = \Delta DivorceRate$.[28] The relationship between the $\Delta DivorceRate$ and male scarcity is as follows:

$$\frac{\partial \Delta DivorceRate}{\partial \lambda} < 0. \tag{11}$$

Proof. See Appendix A3.3.

Prediction 1a (Divorce Effect of the Law): *The higher the male scarcity at the time of the marriage, the higher the increase in the divorce rates after the law.*

The higher the male scarcity, the more likely it is that a woman will settle down with a violent husband. This increases the divorce rate more after the law. Mechanically, the increase in the divorce rate should translate into a decline in the rate of domestic violence committed after the law's introduction for couples who remained married; a group of people in abusive marriages are no longer in the married sample due to divorce. This direct effect of the law can be easily seen if the rates of violence before and after the legal reform are compared. The violence rate before the legal reform, $ViolenceRate_{Pre}$, consists of posterior probability that the man is the violent type. Accordingly,

$$ViolenceRate_{Pre} = \int_0^{\sigma^*(\lambda,s_w)} \pi_\sigma dF(\sigma). \tag{12}$$

After the law, the violence rate is calculated for the remaining married couples. The rate will be dependent on the probability of remaining married, $[1-Q(s_w+1)]$. The violence rate after the law, $ViolenceRate_{Post}$, consists of the posterior probability of the man being the violent type multiplied

[27] Given that Q_w is monotonicly increasing in s_w, the probability of divorce is increasing in women's outside option.
[28] This assumption is based on the data. The divorce rate before the law is 0.02 in Rwanda.

by the probability of remaining married. Accordingly,

$$ViolenceRate_{Post} = \int_0^{\sigma^*(\lambda,s_w)} \pi_\sigma [1 - Q_w(s_w+1)] dF(\sigma). \tag{13}$$

When we subtract the pre and post legal reform violence rates from each other, we see that $\Delta ViolenceRate = -\Delta DivorceRate$, which highlights the law's impact via divorce as in

$$\frac{\partial \Delta ViolenceRate}{\partial \lambda} > 0. \tag{14}$$

Proof. See Appendix A3.3.

Prediction 1b (Divorce Effect of the Law): *The higher the male scarcity at the time of the marriage, the higher the decrease in domestic violence rates after the law. This is due to the higher increase in divorce rates.*

The domestic violence rate is calculated among the married couples. Since women divorce violent men, the composition of married couples changes after the law. Violent type men being divorced leads to a decline in the domestic violence rate.[29] Prediction 1b, the divorce effect, shows the first possible mechanism of how a domestic violence law can protect women from future domestic violence. Before the law, if a woman accepted the proposal of a violent type man, she experiences violence in the marriage, but cannot divorce her husband. After the law, the violent type man continues to behave violently since he lacks self-control, but now the woman can divorce him and avoid future violence.

3.3 Choice Hypothesis

Under the choice hypothesis, the violent type man can control his violent impulses and *can choose to be violent or not* by maximizing his utility with respect to the woman's outside option. Before the law, the maximization problem of the man is as follows:

$$\max_d \ \alpha d + \xi_m. \tag{15}$$

As before α and ξ_m are the man's type and non-monetary benefit from marriage respectively as before. For the choice hypothesis, I introduce $d \in \{0,1\}$ to the man's preference, which represents the level of domestic violence he chooses. Before the law, the woman cannot divorce her husband without his consent. Based on the legal context, I assume that divorce can take place only if

[29] Since non-violent type men will never be violent and a woman's optimal strategy is to remain married in the absence of violence, divorce and violence rates among those couples are zero before and after the law.

the utility of being married for both the man's and woman is smaller than their utility of being single, $U_w^{married} < s_w$ and $U_m^{married} < s_m$. In the absence of the law, the violent man is solving an unconstrained maximization problem. Since the violent man, $\alpha = 1$, derives positive utility from violence, he will inflict the maximum possible violence, which is equal to 1.[30] This will be the equilibrium level of violence before the law, $d^*_{Pre} = 1$. Although it is possible for $U_w = -1 + \xi_w < s_w$, as long as $U_m = 1 + \xi_m > s_m$, the couple will remain married and the woman continues to be in a violent marriage.

After the law, the woman is subject to a participation constraint, $P_w = -\alpha d + \xi_w > s_w$. Thus, the man's maximization problem becomes

$$\max_d \ \alpha d + \xi_m \tag{16}$$

$$P_w = -\alpha d + \xi_w > s_w. \tag{17}$$

If the violent-type man chooses to behave violently, his wife will divorce him if $-d + \xi_w \leq s_w$. The condition highlights that the woman's maximum tolerable level of violence is $d_w = \xi_w - s_w$ and she will be indifferent between remaining married and initiating divorce at this level. If $\xi_m > s_m$ and $\xi_w > s_w$, the violent man will shift his violence downward from 1 to $\xi_w - s_w$ so that she will not divorce him. This is the case where a woman's maximally tolerated level of violence binds in equilibrium after the law's introduction, $d^*_{Post} = d_w = \xi_w - s_w$. This can be seen more clearly with the following equality: $d^*_{Post} = min\{d_m, d_w\}$. The violent man's choice of d without P_w is 1, $d_m = 1$, and $d_w = \xi_w - s_w < 1$. Thus, $d^*_{Post} = d_w$.

At d^*_{Post}, the violent man's utility within the marriage is $\xi_w - s_w + \xi_m$. If $\xi_m > s_m$ and $\xi_w > s_w$, $\xi_w - s_w + \xi_m > s_m$, meaning that for the violent man, the utility of being married exceeds the utility of being single for the violent man. At this level of violence, the woman is indifferent between remaining married and initiating divorce. Thus, the couple will remain married where the level of violence in the marriage is lower than before the law. The law deters domestic violence in the marriage.

3.3.1 Predictions: Deterrent Effect of the Law and the Role of Social Norms in the Law's Effectiveness

Accordingly, post law violence rate becomes $ViolenceRate_{Post} = \int_0^{\sigma^*(\lambda, s_w)} \pi_\sigma(d^*_{Post}) dF(\sigma)$, where $d^*_{Post} = \xi_w - s_w$. Subtracting $ViolenceRate_{Pre}$ from $ViolenceRate_{Post}$, the change in the domestic

[30] The non-violent man chooses to not behave violently both before and after the law since he receives disutility from violence.

violence rate becomes:

$$\Delta ViolenceRate = \int_0^{\sigma^*(\lambda, s_w)} \pi_\sigma (d^*_{Post} - 1) dF(\sigma). \tag{18}$$

The relationship between $\Delta ViolenceRate$ and the sex ratio is as follows:

$$\frac{\partial \Delta ViolenceRate}{\partial \lambda} > 0. \tag{19}$$

Proof. See Appendix A3.4

Prediction 2 (Deterrent Effect of the Law): *The higher the male scarcity at the time of the marriage, the higher the decrease in domestic violence rates after the law. This is not dependent on the higher increase in the divorce rates.*

Since under the choice hypothesis, the law deters the violent-type man from violence, and it is more likely that violent-type men will be observed in the areas of male scarcity, the violence rate decreases more after the law in formerly male-scarce areas than in other areas. Prediction 2, the effect of the law via deterrence, shows the second possible way that a domestic violence law can protect women from future domestic violence. After the law, women can walk out of their marriage, which deters the violent-type man from exercising violence. The deterrence effect of the law highlights that a change in domestic violence rates that is independent of an increase in the divorce rate is possible.[31]

The deterrent effect of the law is based on the fact that the wife has an outside option, s_w, which she can choose over staying married. Given the patriarchal social norms and the low divorce rates before the law (although divorce was legal), it is plausible to think that the utility of being single, s_w is dependent on the social cost of being single (divorced) in the community. Let s_w have multiple components such that $s_w = n_w - c_{direct} - c_{social}$, where each represents non-monetary benefit of being single, direct cost of divorce and social cost of divorce respectively. In particular, c_{social} can be thought of social norms around being a divorcee after experiencing domestic violence. Does local social norms play a role in the law's effectiveness?

According to the model, the relationship between $\Delta ViolenceRate$ and the utility of being single

[31] What would happen if $\xi_m < s_m$ and $\xi_w < s_w$? Then, it would be possible to observe divorce after the law under the choice hypothesis. Recall that at d^*_{Post}, the violent man's utility within the marriage is $\xi_w - s_w + \xi_m$. If $\xi_m < s_m$ and $\xi_w < s_w$, $\xi_w - s_w + \xi_m < s_m$, his utility of being single exceeds his utility of being married for the violent man. At this level of violence, the woman is indifferent between remaining married and initiating divorce. Thus, the couple will divorce via mutual consent. This is a case where the violent type man will not find it worthwhile to remain married if he has to inflict a lower level of domestic violence, d^*_{Post}, compared to before the law. This case is developed in detail in Appendix A3.6.

is as follows:

$$\frac{\partial \Delta ViolenceRate}{\partial s_w} < 0. \tag{20}$$

Proof. See Appendix A3.5

Prediction 3 (The Role of Social Norms in the Law's Effectiveness): *Keeping male scarcity constant, for a sufficiently high likelihood of the husband being a violent-type, the higher the wife's utility of being single, the higher the decrease in domestic violence rates after the law.*

Prediction 3 suggests that, keeping the quality of the husband constant, as the utility of being single increases (e.g. via a decrease in the social cost of divorce such as divorce due to domestic violence becoming more acceptable in the community), women initiating divorce after experiencing domestic violence becomes a more credible threat, which deters domestic violence more.

Testing the Predictions with Data. I will be testing the three predictions with data in Section 6. Table 1 summarizes the predictions. After the law, in the genocide-intense areas, observing a disproportionate increase in the divorce rates and a decrease in the domestic violence rates among currently married women will support Prediction 1 and highlight that the law decreases violence via the rise of the divorce rates. The result further suggests that there exist men who engage in domestic violence due to a lack of self-control. After the law, in the genocide-intense areas, observing no changes in the divorce rates and a disproportionate decrease in the domestic violence rates among married and/or among ever-married women will support Prediction 2. Moreover, this suggests that, although men can choose to be violent in the household, a law can deter violence by making it costly for the husband.

Table 1: Mapping the Predictions to Empirics

Prediction	Condition	Sample	$\beta_{Divorce}$	$\beta_{DomesticViolence}$
1	Genocide intensity ↑	All	> 0	< 0
2	Genocide intensity ↑	All	$= 0$	< 0
3	Genocide intensity ↑	Younger Cohort	$= 0$	< 0
		Older Cohort	> 0	< 0

Notes: Younger Cohort; sex ratio is balanced + exposure to divorcees via the Older Cohort.

To test Prediction 3, I will use the younger and older cohorts as subsamples where the former experienced balanced sex ratios at the time of the marriage in the genocide-intense areas. Jointly finding i) evidence for Prediction 2 among the younger cohort and ii) evidence for Prediction 1 among the older cohort supports Prediction 3. As the utility of being divorced increases (divorce due to domestic violence becomes more socially acceptable), domestic violence decreases. Put

differently, the younger cohort experiencing less domestic violence after the law without a change in their divorce rates suggest that their exposure to the older cohort's intolerance of domestic violence, demonstrated by the rise in divorce due to domestic violence in the older cohort, deters violence within their own marriages. This highlights how social attitudes toward domestic violence, such as the social acceptability of exiting a violent marriage, influence the effectiveness of domestic violence laws.[32]

Using information on couple's education levels, I also provide evidence supporting Observation 1, which highlights that women become less selective when there is male scarcity in the marriage market at the time of the marriage.

4 Data

This paper uses three sets of data—commune level data (Gacaca court records, census, RTLM reception, local elections), individual and household level data (household surveys and census), and administrative hospital level data—to measure the effect of the law on divorce and domestic violence and identify the role of social norms in the effectiveness of the law.

4.1 Commune Level Data

Gacaca Court Records. I use Gacaca Court records to use the geographical variation in the intensity of the genocide. The Gacaca courts are a transitional community justice system, that is responsible for the prosecution of the perpetrators of the 1994 Genocide against the Tutsi in Rwanda at the domestic level during the early 2000s. The court's records contain detailed information on the number of accused perpetrators and genocide survivors, including the number of perpetrators who organized the genocide, killed and looted during the genocide as well as the number of people widowed, orphaned and disabled.[33] I followed Verpoorten (2012) and LaMattina (2017) and created a commune level genocide-intensity index. The index is a principal component analysis of the six categories above and captures the intensity of the genocidal violence in a given commune.[34] Table A1 reports the summary statistics on the index and its components. The index is standardized to mean zero and standard deviation one. It takes values between -1.4 and 3.3 where the most intense areas have the index of 3.3.

[32] In order to have a simple model, I did not allow s_w to change over time. Yet, in the empirical analysis section, I will provide support that the utility of being single (divorced) changed after the law jointly due to the law and female-biased sex ratios (exposure to divorced older cohort women) and that is partly why the law effectively decreases domestic violence in Rwanda.

[33] There is no data on the number of killings per commune.

[34] See Verpoorten (2012) and LaMattina (2017) for more detail on the data and the genocide intensity index.

As aforementioned in the context section, a commune can be thought as the marriage market of a woman. There were in total 145 communes where the mean area of a commune is 174 km^2. I choose commune over sector (a unit below the commune, approximately a 50 km^2 area) as the woman's marriage market to allow for a woman to marry a man from a neighboring sector, that is approximately only 0-50 km away. Anectodal evidence suggest that it is uncommon from a woman to marry a man from a different district (a unit with a mean area of 810 km^2.

Census. I use the 1991 Census data to construct commune-level variables such as population density and ethnicity to control for pre-genocide trends in my main empirical specification. The 1991 Census is particularly important as the census before the genocide and the only census that includes ethnicity information. To study the role of social norms in the law's effectiveness, I use the 2012 Census as individual level data, the first census in which Rwanda allowed respondents to distinguish between "divorced" and "separated" when reporting their current marital status. This distinction itself signals that divorce was becoming more common. For robustness checks, I also use the 2002 Census.

Additional Data: RTLM Reception in 1994 and Local Elections in 2011. Yanagizawa-Drott (2014) finds that a radio station, Radio Télévision Libre des Mille Collines (RTLM), led to participation in killings by both militia groups and ordinary civilians. To measure exposure to radio, Yanagizawa-Drott (2014) exploits the mountainous topography of Rwanda and constructed a variable measuring predicted radio coverage of RTLM at the commune level.[35] Rogall and Zarate-Barrera (2020) shows that armed-group violence, rather than local RTLM-induced violence during the genocide, targeted adult men. Moreover, Rogall (2021) highlights that RTLM-induced killings were mostly of women and children and documents that RTLM-induced violence led to a surplus of men. In light of this evidence, I use RTLM reception data to test the relationship between sex ratio, likelihood of being in a violent marriage and the effect of the law. Rogall (2021) finds that sex ratio imbalances also affect the share of local female politicians after the genocide in Rwanda. I also use local elections data from the post law period (2011) to study the role of local female politicians in the law's effectiveness.

Additional Data: Panel of Mills. I exploit the plausibly exogenous variation in areas with workplaces where women from both cohorts interact, using a panel dataset of mills I created in Sanin (2023). This dataset includes GPS coordinates and the year of opearation of every mill in Rwanda as of 2018 and harmonizes information from the Rwanda GeoPortal and Macchiavello and Morjaria (2020).

[35] See Yanagizawa-Drott (2014) for more details on the dataset.

4.2 Individual and Household Level Data

In order to investigate the impact of the law on divorce and domestic violence, I use the Rwandan Demographic Health Surveys (DHS). DHS is a nationally representative, cross-section individual and household-level survey conducted in developing countries every five years. I use 2005, 2010/11, 2014/15 and 2019/2020 cycles for my analysis. The surveys collect demographic and health information from women aged 15-49 and men aged 18-59.

I focus on two main outcome variables: marital status and incidence of domestic violence in the past 12 months. I created a binary variable that takes the value of one if a woman's current marital status is divorced and zero if her current marital status is married. The data also contains information on whether married (divorced) women experienced domestic violence in their current (most recent) marriage in the past 12 months. Information on women's domestic violence experience is collected via a domestic violence module. DHS randomly selects one women per household for the module. Thus, the number of women who answered the domestic violence questions will always be less than the number of women who answered the women's questionnaire (divorce outcome).

The module asks partnered women whether they experience physical, sexual or emotional violence in the last 12 months by their partners. DHS classifies domestic violence categories (physical, sexual and emotional) with respect to World Health Organization (WHO) guidelines. Since emotional violence questions are not asked in the 2010/11 cycle, I use physical and sexual domestic violence in my analysis. Physical domestic violence consists of being pushed, shaken, thrown something at, slapped, kicked, dragged, strangled, burnt and threatened with a knife, gun or other weapon. In particular, kicked, dragged, strangled, burnt and threatened with a knife, gun or other weapon are classified as severe cases among the physical violence. Sexual domestic violence consists of physically forced into unwanted sex and perform sexual acts. I create multiple binary variables that takes the value of one if a partnered woman experienced physical or sexual domestic violence; sexual or severe physical domestic violence in the last 12 months.

According to data, 34% of women self-reported experiencing physical or sexual domestic violence in the past 12 months where 18% of women self-reported experiencing sexual or severe physical domestic violence. Only 2% of women reported currently being divorced before the law. Tables A2, A3, A4 and A5 provide summary statistics for dependent and demographic variables across different genocide intensities and cohorts using different data cycles. Domestic violence rates increases over time in Rwanda and thus, the DID results should be interpreted as "increased more" or "increased less".

DHS data do not include information on communes.[36] However, since the data cycles are georeferenced, I match a woman's current GPS location to the commune she was in at the time of

[36]Communes were replaced by districts and municipalities in 2002.

the marriage. This process is equivalent to matching the woman to the marriage market in which she was married. My sample includes ever-married women who married once after the genocide, totaling about 3,500 women for domestic violence outcomes and 11,500 for non-domestic violence outcomes.[37] When incorporating census data for divorce outcomes, the sample size expands to approximately 130,000 women.

4.3 Administrative Hospital Level Data on Domestic Violence and Post-Traumatic Stress Disorder

To provide evidence that the female-biased sex ratios is the underlying channel behind the variation in violent marriages, I also use confidential, administrative, geocoded data on the universe of public/district hospitals from the Rwandan Ministry of Health (MOH).[38] Rwandan Health Management Information System (HMIS) data is a monthly district hospital-level data on hospitalizations between January 2012 to July 2019.[39]

The data collects information on the number of individuals (both women and men) who show symptoms of physical and sexual violence for different age groups (10-18, older than 18). Unfortunately, the data does not provide information on the patient's marital status. To create a measure of domestic violence, I focus on the gender-based violence reports of individuals who are older than 18 years old. This is because approximately 80% of women over 18 are married in Rwanda.

I constructed a binary variable coded as 1 if a hospital had hospitalizations due to physical or sexual violence for women older than 18 in a month and 0 otherwise. This creates a non-self-reported measure of domestic violence. Table **??** provides descriptive statistics for the hospitals. 93% of the hospitals have hosted at least a domestic violence patient (GBV patient older than 18) in a given month. Majority of the cases were referred to the hospital by a police which suggests that women report severe domestic violence to authorities.

The data also collects information on the number of individuals (both women and men) who show symptoms of PTSD (aged 20-39, older than 40). Unfortunately, the data does not provide information on the patient's marital status. 86% (68%) of the women (husbands) in my main sample (from DHS) is aged between 20-39. Thus, PTSD hospitalizations for women and men aged 20-39 better capture the mental health of the individuals in my main sample compared to the hospitalizations for women and men aged 40 years and above. I have the mental health records

[37] My results are robust to excluding women who married after the law. This exercise is to check whether the law has an impact on the matching in the marriage market. It is less costly to marry a violent-type man after the law compared to marrying him before. After the law, in the case of domestic violence, the woman has a chance to leave her marriage without her husband's consent, which can make her less selective at the time of the marriage.

[38] There are, in total, 42 district hospitals in Rwanda.

[39] Since I have only post law hospitalizations, unfortunately, I am unable to do a pre and post law DID using the hospital records.

starting from 2016. Thus, I will focus on the years between 2016-2019 when I am using the monthly hospital records in my analysis.

I constructed a binary variable coded as 1 if a hospital had hospitalizations due to PTSD for women/men aged 20-39/older than 40 and 0 otherwise. 20% (40%) of the hospitals have hosted at least a 20-39 years old (40 years old or older) female PTSD patient in a given month. The rates are lower for men.

5 Empirical Specification

This section proposes the identification strategy to estimate the causal effect of the law on divorce and domestic violence and distinguish the role of social norms in the law's effectiveness. For the former, I use a difference-in-differences (DID) strategy that uses i) the spatial variation in genocide intensity which is a proxy for variation in where violent marriages are more likely to be located before the law and ii) the time variation created by the law (before-after the law's adoption). For the latter, I use multiple strategies that exploits the cohort variation. First, using the Demographic Health Surveys, I estimate i) the main DID specification where I estimate the DID for the younger and older cohorts separately and ii) a triple DID strategy where the third variation is the cohort variation. Then, using the 2012 Census (after the law), I estimate a DID event-study specification that exploits age at genocide and spatial variation. I use the minimum marriageable age in Rwanda as the event.[40]

5.1 The Effect of the Law on Divorce and Domestic Violence

In order to investigate the impact of the law on women's divorce and domestic violence outcomes, I estimate the specification below:

$$Y_{ict} = \beta_0 + \beta_1 Post_t + \beta_2 (GenocideIntensity_c \times Post_t) +$$

$$\mathbf{X_{ict}'}\phi + \mathbf{X_{c1991}'} \times Post_t \lambda + \alpha_c + \eta_k + \omega_m + \varepsilon_{ict}. \tag{21}$$

The dependent variable Y_{ict} is the outcome of interest of woman i, in commune c and at year t. $Post_t$ variable is a dummy for observations from the post-law data cycles. $GenocideIntensity_c$ is a commune level genocide intensity index which is a standardized continuous variable. Higher (lower) levels of the index is a proxy for where violent marriages are more (less) likely to be located before the law's adoption. I have two sets of control variables. The first is the set of individual controls, $\mathbf{X_{ict}}$, which includes information on religion, residence (rural/urban), socioeconomic

[40] The details of the DDD specification can be found in Section A2.2.

variables (e.g. having a cement floor), living in the catchment area of a coffee mill and whether the husband is living in the household.[41] The second is pre-genocide commune level characteristics, $\mathbf{X}'_{\mathbf{c1991}}$, which are the population density and the rate of Hutu males in 1991. I interact these variables with the *Post* variable and include them in the specification to ensure that pre-genocide commune level characteristics (e.g. ethnicity) are not driving the results. α_c is the commune fixed effects and controls for time-invariant local observable and unobservable factors that may be correlated with divorce and domestic violence, such as propensity for violence. Since the genocide intensity of a commune, $GenocideIntensity_c$, does not change over time in my data, it is captured by the commune fixed effect and is not included in the specification. η_k is the cohort fixed effects (in five-year intervals) and controls for factors that vary across age groups. As an example, compared to younger women, older women grew up when Rwanda did not enact pro-women laws, which may affect their propensity to adapt to legal changes related to gender roles and tolerance on domestic violence. ω_m is the year of marriage fixed effects that control for time-variant shocks to the marriage market after the genocide.

The main dependent variables for this specification are currently being divorced and experiencing domestic violence in the past 12 months. All outcomes are indicator variables. For example, currently being divorced variable takes the value 1 if the respondent's current marital status is being divorced and 0 otherwise. Domestic violence in the past 12 months variable takes the value 1 if a partnered woman experienced sexual or severe physical domestic violence in the past 12 months and 0 otherwise. As a reminder, severe physical domestic violence cases are the ones where the wife answered yes to whether the husband kicked or dragged, tried to strangle or burn, or threatened her with knife/gun or other weapon.[42] If the woman is currently divorced, she answers the question for the partner she has been divorced.

The coefficient of interest is β_2, which identifies the impact of the law in formerly genocide intense areas on the outcome variables relative to the areas that are formerly not genocide-intense. I cluster standard errors at the commune level (Bertrand et al., 2004).

5.2 The Role of Social Norms in the Law's Effectiveness

In order to study the role of divorce due to domestic violence becoming more acceptable (domestic violence becoming less acceptable) in the law's effectiveness, I estimate he specification below:

$$Y_{ica} = \beta_0 + \sum_{a=0}^{30} GenocideIntense_c \times \beta_a \mathbb{1}[\tau = a] + \mathbf{X}'_{\mathbf{ica}}\phi + \alpha_c + \sigma_a + \omega_m + \varepsilon_{ica}. \quad (22)$$

[41] I did not include a large set of control variables to avoid "bad control" problem given that genocide can affect many aspects of women's lives.

[42] As I will discuss further in the results section, the law is effective on sexual or severe physical domestic violence cases but ineffective on non-severe physical domestic violence.

The dependent variable, Y_{ica}, is woman i's current marital status being divorced in 2012, in commune c whose age at genocide is a. The dependent variable is an indicator variable where the current marital status being divorced for woman i take the value of 1 if she is currently divorced in 2012 and 0 otherwise. $GenocideIntense_c$ is a binary variable coded as 1, if the woman i is within a formerly genocide intense commune and zero otherwise. For this specification (for simplicity), I use a binary indicator to measure genocide intensity where the genocide intense commune is defined as the commune higher than the median genocide intensity in the sample.[43]

$GenocideIntense_c$ is interacted with age at genocide dummies, $\mathbb{1}[\tau = a]$, to investigate the dynamic impact of the onset of being on the marriage market during genocide; being a member of the older cohort who experienced female-biased sex ratios in the post-genocide marriage market. τ denotes the event-age. $\tau = 15$, represents the age when a woman starts to be on the marriage market. For ages $15 \leq m \leq 30$, $\tau = a$ represents the ages at the marriage market. For $a < 15$, $\tau = a$ represents the ages smaller than the marriageable age; being a member of the younger cohort who experienced relatively balanced female-biased sex ratios in the post-genocide marriage market. The omitted category is $\tau = 14$, which means that the dynamic impact of the being at the marriageable age during the genocide is estimated with respect to one age younger than the minimum marriageable age in Rwanda.[44] $\mathbf{X_{ica}}$ is the set of individual controls I used for the main specification. α_c the commune fixed effects. σ_a is the age at genocide fixed effects. ω_m is the year of marriage fixed effects. I cluster standard errors at the commune level.

6 Testing the Predictions with Data

6.1 Predictions 1 and 2: Divorce and Deterrent Effects of the Law

According to the **Prediction 1a and 1b: Divorce Effect**, the higher the male scarcity at the time of the marriage, the higher the increase in the divorce rates after the law. Additionally, the higher the male scarcity at the time of the marriage, the higher the decrease in domestic violence rates (among married women) after the law. This is due to the higher increase in the divorce rates. According to the **Prediction 2: Deterrent Effect**, the higher the male scarcity at the time of the marriage, the higher the decrease in domestic violence rates after the law. This is not dependent on the higher increase in the divorce rates. I test the predictions via estimating equation 21 where

[43] The results are similar when I use the continuous genocide intensity index.

[44] Under the Civil Code 1988 the minimum legal age of marriage is 21 years. However, under Article 171 of the Code, the Minister of Justice or his delegate may dispense with the minimum age requirement for serious reasons. Rwanda ratified the Convention on the Rights of the Child in 1991, which sets a minimum age of marriage of 18. There is a sufficient amount of married women who report age of their marriages as 15-18, thus I choose the onset age as 15. The number converges to zero for ages 10-15. Figure 3, right-hand graph, visualizes the histogram of age at first marriage among ever married women in Rwanda.

the genocide intensity index is the treatment variable and high intensity communes are the areas with male scarcity at the time of the marriage. Results suggest that among the women who married after the genocide, the ones who reside in the formerly genocide-intense areas are more likely to get divorced and less likely to experience domestic violence in the past 12 months after the law compared to the women who reside in not genocide-intense areas. This is consistent with the divorce effect.

Table 2 presents the results of estimating the impact of the law on women's probability of currently being divorced and self-reporting (sexual or severe physical) domestic violence in the past 12 months across different genocide intensities using women who married after the genocide. Columns 1, 2, and 4 represent estimating equation 21 when the sample consists of women who are either currently legally married or divorced at the time of the survey (ever married sample). Column 3 represents estimating equation 21 with married women only. Column 5 represents results based on cohabitating and recently separated couples (ever cohabitated sample).

The coefficient on $(GenocideIntensity_c \times Post_t)$, β_2, is statistically significant and positive when the dependent variable is being currently divorced for both the full and violence samples. Among women who ever married after the genocide and answered the domestic violence module, one standard deviation increase in the genocide intensity in a commune leads to 4 percentage points (p-value=0.004) increase in the divorce rate after the law. The estimated impact represents a 67% increase with respect to the sample mean (0.06). Among women who ever married after the genocide and answered the domestic violence module, one standard deviation increase in the genocide intensity in a commune leads to 4 percentage points (p-value=0.011) decrease in the sexual or severe physical domestic violence rate after the law. The estimated impact represents a 22% decrease with respect to the sample mean (0.19). The direction of the effects are in line with Prediction 1a and 1b. Moreover, the estimated effect is similar in magnitude if equation 21 is estimated among the ever married sample where the divorced women answer domestic violence questions for their former husbands. Nearly one-to-one relationship between the increase in the divorce and decrease in the domestic violence rates for multiple samples (married and ever married) further provides support for Prediction 1: Divorce Effect.

Divorce versus Criminalization Aspect of the Law. Although ever cohabitated couples are not subject to the divorce aspect of the law, they are subject to the criminalization aspect. Column 5 shows that the law does not affect ever cohabitated couples.[45] This suggests two key points. First, it further supports Prediction 1 that when there is a decrease in domestic violence rates, it is based on marital dissolution. Second, it suggests that enabling the wife to walk out of the partnership with assets and cut the ties with a violent-type husband is a key aspect of the the law. This is not the case

[45] I also did not find that they are more likely to be separated after the law.

Table 2: Effect of the Law on Women's Current Marital Status Being Divorced and Self-Reported (Sexual or Severe Physical) Domestic Violence in the Past 12 Months

	Currently Divorced (Ever Married)		Experienced Domestic Violence (Violence Sample)		
	(1) Full Sample	(2) Violence Sample	(3) Married	(4) Ever Married	(5) Ever Cohabitated
GenocideIntensity x Post	0.01**	0.04***	-0.04**	-0.05***	-0.02
	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)
Observations	11403	3454	3236	3450	2091
Dependent variable mean	0.07	0.06	0.18	0.18	0.18

Notes: This table reports the DID estimates of the effect of the law on women who married after the genocide, exploiting the interaction between i) the spatial variation in genocide intensity which is a proxy for variation in where violent marriages are more likely to be located before the law and ii) the time variation created by the law (before-after the law). $GenocideIntensity_c$ is a commune level genocide intensity index which is a standardized continuous variable. Rwandan Demographic Health Surveys are used. Domestic violence module questions are asked to a random subsample of the full sample and that is why the violence sample is always smaller compared to the full sample. Column 1, 2 and 4 represent estimating the DID when the sample consists of women who are either currently legally married or divorced at the time of the survey (ever married sample). Column 3 represents estimating the DID with married women only. Column 5 represents results based on ever cohabitated couples. In all samples, women who married more than once are excluded. All estimations include individual controls, cohort fixed effects, year of marriage fixed effects, commune fixed effects, pre-genocide commune level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for observations from the post-law data cycles. Domestic violence variables are measured for the past 12 months. Severe physical domestic violence cases are when the wife is kicked, dragged, strangled, burnt and threatened with a knife, gun or other weapon. Sexual domestic violence cases are physically forced into unwanted sex and perform sexual acts. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

for cohabitating women. Asset division upon separation for cohabitating couples are not protected by the law which provides less incentive for the cohabitating wife to leave an abusive relationship compared to a legally married wife. Moreover, if she reports his husband to the police, the amount of separation she will experience will be between 6 months to 2 years (due to the imprisonment of the husband) which can be one of the reasons why I do not detect an effect. Domestic violence questions are asked for the past 12 months and if the husband is jailed for 6 months only and the motivation behind the husband's violence is lack of self-control, the husband can continue to be violent after he gets out of jail.[46]

[46]Unfortunately, data on the social acceptability of reporting a violent husband to law enforcement is unavailable for Rwanda. As a result, I am unable to examine the relationship between the criminalization of domestic violence and social norms in Rwanda, as I do for Uganda.

6.2 Prediction 3: The Role of Social Norms in the Law's Effectiveness

Does the law deter domestic violence within intact marriages? If so, can the reduction in domestic violence be partially attributed to the increased social acceptability of divorce due to domestic violence after the law? According to **Prediction 3**, keeping male scarcity constant, the higher the wife's utility of being single, the higher the decrease in domestic violence rates after the law. This prediction emphasizes how social norms shape the effectiveness of domestic violence laws. Specifically, the utility of being single reflects the social cost associated with divorce due to domestic violence, thus indicating the level of social acceptability of violence within the household. In this subsection, I provide evidence in favor of this prediction via showing that the younger cohort's exposure to the older cohort's intolerance of domestic violence——demonstrated by the older cohort's use of divorce to exit violent marriages——deters violence within their own marriages. This highlights how social attitudes toward domestic violence shape the effectiveness of DV laws.

Table A6 presents the results of estimating the main specification by cohort. For the older cohort, the coefficient on $(GenocideIntensity_c \times Post_t)$, β_2, is statistically significant and positive when the dependent variable is being currently divorced. Among ever married older cohort women who married after the genocide and answered the domestic violence module, one standard deviation increase in the genocide intensity in a commune leads to 4 percentage points (p-value=0.032) increase in the divorce rate after the law. The estimated impact represents a 80% increase with respect to the sample mean (0.05). Among married older cohort women who married after the genocide, one standard deviation increase in the genocide intensity in a commune leads to 5 percentage points (p-value=0.062) decrease in the sexual or severe physical domestic violence rate after the law. The estimated impact represents a 26% decrease with respect to the sample mean (0.19). The direction of the effects are in line with Prediction 1: Divorce Effect.

Among ever married younger cohort women who married after the genocide and answered the domestic violence module, one standard deviation increase in the genocide intensity in a commune leads to no change in the divorce rate after the law. Among married older cohort women who married after the genocide, one standard deviation increase in the genocide intensity in a commune leads to 8 percentage points (p-value=0.097) decrease in the sexual or severe physical domestic violence rate after the law. The estimated impact represents a 47% decrease with respect to the sample mean (0.17). The direction of the effects are in line with Prediction 2: Deterrent Effect given that the decrease in the violence is not dependent on a change in the divorce rates.[47]

[47] I find no effect of the law on non-severe physical domestic violence. According to the law, if reported, sexual domestic violence cases are more severely punished compared to the physical domestic violence cases. Moreover, if physical domestic violence leads to the death of the spouse, the husband will get life imprisonment given that death is punished with life imprisonment in Rwandan Penal Code. This suggests that the law makes it more costly for husbands to commit sexual or severe physical domestic violence, which makes it plausible to observe an effect on these cases after the law.

Table 3: Heterogeneous Impact of the Law on Women's Current Marital Status Being Divorced and Self-Reported (Sexual or Severe Physical) Domestic Violence in the Past 12 Months by Cohort

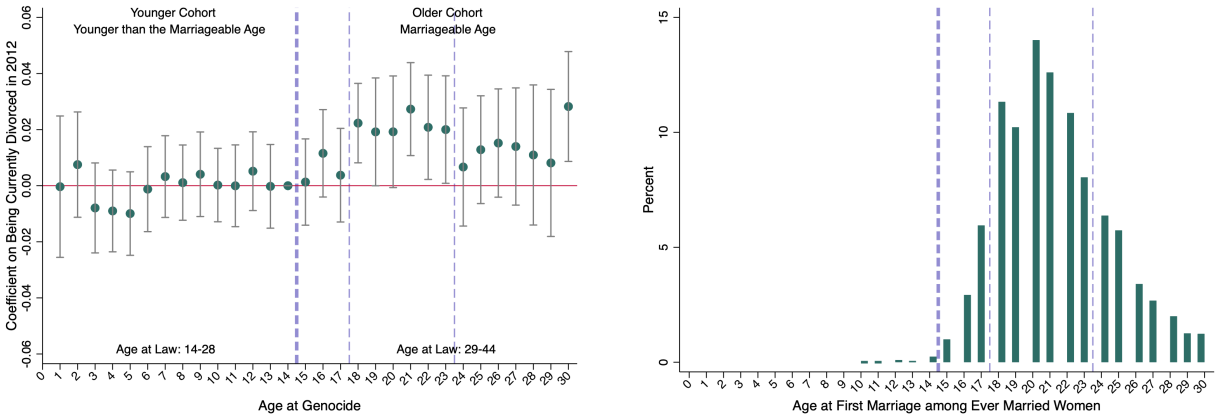
	Younger Cohort		Older Cohort	
	(1) Divorce	(2) Domestic Violence	(3) Divorce	(4) Domestic Violence
GenocideIntensity x Post	0.02	-0.08*	0.04**	-0.05*
	(0.02)	(0.04)	(0.02)	(0.03)
Observations	2377	2372	1730	1730
Dependent variable mean	0.06	0.17	0.05	0.19

Notes: This table reports the DID estimates of the effect of the law on women who married after the genocide by cohort, exploiting the interaction between i) the spatial variation in genocide intensity which is a proxy for variation in where violent marriages are more likely to be located before the law and ii) the time variation created by the law (before-after the law). $GenocideIntensity_c$ is a commune level genocide intensity index which is a standardized continuous variable. Rwandan Demographic Health Surveys are used. Domestic violence module questions are asked to a random subsample of the full sample (violence sample). All estimations use the violence sample and ever married women. Ever married women are either currently legally married or divorced at the time of the survey. Column 1, and 2 represent estimating the DID when the sample consists of women from the Younger Cohort: Age at Genocide is 0-14. Column 4 and 5 represent estimating the DID when the sample consists of women from the Older Cohort: Age at Genocide is 15-30. To maximize sample size, I also included the limited number of smaller than zero and bigger than thirty five years old women. In all samples, women who married more than once are excluded. All estimations include individual controls, cohort fixed effects, year of marriage fixed effects, commune fixed effects, pre-genocide commune level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for observations from the post-law data cycles. Domestic violence variables are measured for the past 12 months. Severe physical domestic violence cases are when the wife is kicked, dragged, strangled, burnt and threatened with a knife, gun or other weapon. Sexual domestic violence cases are physically forced into unwanted sex and perform sexual acts. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

I also use a triple difference-in-differences strategy to confirm that younger and older cohorts are statistically different from each other when the dependent variable is domestic violence (Table A7). Using the 2012 Census (approximately 130,000 women) and a DID event study design, I also find that a woman who was of marriageable age during the genocide in a genocide-intense commune is more likely to be divorced after the law compared to a woman who was one year younger than the minimum marriageable age during the genocide (Figure 3, Table A8). The effect is most pronounced (and statistically significant at the one percent level) at the median age of first marriage in Rwanda, 21.

Finding support for the divorce effect among the older cohort and support for the deterrent effect among the younger cohort distinguish the role of social norms related to domestic violence in the law's effectiveness (Prediction 3).

Figure 3: DID Event-Study Estimates on The Effect of a Woman Being at a Specific Age During the Genocide and Residing in a Genocide-Intense Commune on Her Current Marital Status Being Divorced After the Law (Compared to Residing in A Formerly Genocide Not-Intense Commune)



Notes: The left figure reports DID event-study estimates of the effect of being at a specific age during the genocide in genocide intense communes (compared to the genocide not-intense communes) on the probability of being divorced after the law. Ages on the right (left) hand side of the dashed line—the younger cohort as in the DHS results—represents the cohort that is (not) in the marriage market during the genocide. Those women did not experience female-biased sex ratios in their marriage markets where the older cohort women did. 2012 Census (128,889 ever married women) is used for this analysis. Robust standard errors clustered at the commune level. The same individual controls and year of marriage fixed effects are used as in the main specification. Mean divorce rate among the sample is 0.04. The right figure is an histogram for the age of first marriage among the sample.

Domestic Violence Becoming Less Acceptable and the Rise in Women's Bargaining Power. I analyzed attitudes towards domestic violence and women's household decisions to further support Prediction 3. If divorce due to domestic violence becomes more socially acceptable and a more credible threat, then the younger cohort should be less likely to justify domestic violence in their attitudes after the law. Moreover, their bargaining power should increase. Tables 4 and 5 report estimating the main specification for the younger cohort women using attitudes towards wife beating and women's household decisions as dependent variables. The younger cohort women in the formerly genocide intense areas less likely to report that wife beating is justified for all possible cases after the law.[48] In a later section, I also show that the decreased justification of domestic violence is prominent in places where women from both cohorts frequently interact, within the 4 km radius catchment area of a coffee mill that were built before the law and provide jobs to women.

After the law, younger cohort women are also more likely to make decisions on large household purchases and their own health by themselves or jointly with their husbands compared to their

[48]There is no change in attitudes toward wife beating among the husbands from the younger cohort (Table A11).

husbands or someone else in the family are deciding for them. These results indicate that, for the younger cohort in formerly genocide-intense areas, domestic violence has become less acceptable and their bargaining power has increased, supporting Prediction 3. As divorce due to domestic violence becomes more acceptable in the community (utility of being single increases), the divorce threat point (provided to women by the law) becomes more credible, thereby effectively deterring violence.

Table 4: Effect of the Law on Women's Attitudes Regarding When Wife Beating is Justified (Younger Cohort: Age at Genocide 0-14, Ever Married)

	Wife Beating is Justified When the Wife					
	(1) All Decisions	(2) Refuses Sex	(3) Argues with Him	(4) Burns Food	(5) Neglects Children	(6) Goes Out w/o Telling
GenocideIntensity x Post	-0.04*	-0.04	-0.06**	-0.08**	-0.04	-0.04
	(0.02)	(0.04)	(0.02)	(0.03)	(0.05)	(0.04)
Observations	7077	7035	7049	7055	7059	7053
Dependent variable mean	0.10	0.29	0.27	0.13	0.37	0.31

Notes: This table reports the DID estimates of the effect of the law on women who married after the genocide, exploiting the interaction between i) the spatial variation in genocide intensity which is a proxy for variation in where violent marriages are more likely to be located before the law and ii) the time variation created by the law (before-after the law). $GenocideIntensity_c$ is a commune level genocide intensity index which is a standardized continuous variable. Rwandan Demographic Health Surveys are used. Each column represents one dependent variable (attitude towards domestic violence). All estimations are among the currently legally married and divorced women and include individual controls, cohort fixed effects, year of marriage fixed effects, commune fixed effects, pre-genocide commune level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for observations from the post-law data cycles. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

One may argue that the change in the divorce rates is very short-lived and did not make divorce seem acceptable at all. To check this, I run the dynamic version of the main specification and analyze divorce rates by year. Table A9 reports the results and show that the probability of divorce after the law has a snowball effect where the rate increases over time. This suggests that divorce becomes seemingly more acceptable over time, after the law. Combined with the prior evidence, these suggest that local social attitudes toward domestic violence plays a role in the credibility of the divorce threat, thus, the effectiveness of the domestic violence laws.

The Role of Female Leaders and Public Services. One may argue that the rise in local-level female politicians in 2011 and increased access to public services are driving the results rather than

Table 5: Heterogeneous Impact of the Law on Women's Decision Making in the Household by Cohort: The Woman is Making the Decision Alone or Jointly with the Husband Relative to the Husband or Someone Else in the Family is Making the Decision for Her

	Younger Cohort			Older Cohort		
	(1) Large HH Purchases	(2) Own Health	(3) Family Visit	(4) Large HH Purchases	(5) Own Health	(6) Family Visit
GenocideIntensity x Post	0.07*	0.07*	0.04	-0.00	-0.01	-0.01
	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.02)
Observations	7377	7377	7377	4273	4273	4273
Dependent variable mean	0.75	0.80	0.86	0.74	0.79	0.86

Notes: This table reports the DID estimates of the effect of the law on women who married after the genocide by cohort, exploiting the interaction between i) the spatial variation in genocide intensity which is a proxy for variation in where violent marriages are more likely to be located before the law and ii) the time variation created by the law (before-after the law). $GenocideIntensity_c$ is a commune level genocide intensity index which is a standardized continuous variable. Rwandan Demographic Health Surveys are used. All estimations use currently legally married women at the time of the survey (within the full sample). Column 1, 2 and 3 represent estimating the DID when the sample consists of women from the Younger Cohort: Age at Genocide is 0-14. Column 4, 5 and 6 represent estimating the DID when the sample consists of women from the Older Cohort: Age at Genocide is 15-30. In all samples, women who married more than once are excluded. All estimations include individual controls, cohort fixed effects, year of marriage fixed effects, commune fixed effects, pre-genocide commune level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for observations from the post-law data cycles. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

the change in social norms. I do not see both as alternative channels, yet channels that amplifies the effect of being exposed to divorce due to domestic violence becoming more acceptable.

Using the universe of geocoded locations of district hospitals and 2011 election results at the local level, I find that women who reside close to the district hospitals (which provide health and legal services related to gender-based violence in Rwanda), as well as women who reside in areas with a high share of female local-level politicians, are more likely to get divorced in genocide-intense areas after the law. Tables A13 and A14 report the results respectively. I estimate the results running the main specification, equation 21, using different subsamples related to proximity to a hospital and residing in a locality with different shares of female local-level politicians.

The district hospitals are not built by the local-level politicians (hospitals were already built by the time the politicians are elected in 2011). Rogall and Zarate-Barrera (2020) finds that not only more women are elected as politicians in the genocide-intense areas, but the women who are elected are also more likely to be members of the National Women's Council (a government

organ responsible for advocacy, capacity building, and social mobilization regarding maintaining gender equality and supported by the Ministry of Gender and Family Promotion). These two points suggest the following. When women are more likely to have access to information on how they can benefit from the law and related public services, either via hospitals or female local-level politicians, the law gets practiced and women are more likely to benefit from the law.[49] Higher divorce rates decreases the social cost of using the law for women and deters domestic violence.

7 Female-Biased Sex Ratios or Alternative Channels?

The model argues that the male scarcity in the marriage market at the time of the marriage is the channel behind the likelihood of being in a violent marriage before the law. In this section, I test whether channels such as exposure to genocide (violence begets violence), post-traumatic stress disorder and women's economic opportunities drive the variation in violent marriages.

Exposure to Genocide (Violence Begets Violence?). It is possible that the divorce rates increased more in the genocide-intense regions after the law since former exposure to genocide makes men more violent in their marriages than those in the non-intense regions. To test this, I run my empirical specification on an alternative sample: women who married right before the genocide. Those women did not face a sex ratio distortion at the time of the marriage.[50] However, they were exposed to the genocide, as were their husbands. DHS 2005 asks women the number of years they lived in their current residence and 63% had lived in their place of residence since before the genocide. I take a sample of women who married between 1989 and 1994. If exposure to genocidal violence is the driver of the likelihood of violent marriages before the law, the divorce rates after the law should disproportionately increase in the genocide-intense areas. Running the main empirical specification using the sample of women married immediately before the genocide should lead to a statistically significant and positive coefficient on the interaction term, $GenocideIntensityPost$. The estimates are reported in Table A15. The coefficient of the interaction term is statistically insignificant and close to zero.[51] This provides support that the variation is not driven by exposure to genocide.[52]

[49] See Iyer et al. (2012), Anukriti et al. (2022) and Erten and Stern (2024) for the relationship between female political participation in various forms and violence against women and Sviatschi and Trako (2021) for the effects of improved access to public services related to gender based violence.

[50] I confirm this via calculating the male-to-female sex ratio by age across communes using Census 1991. Figure A3 shows that women at the marriageable age are exposed to a balanced male-to-female sex ratio right before 1994.

[51] I did not take a sample of women who married before 1989 since those women will be much older than women in my main sample. According to data, older women are less likely to divorce in Rwanda. It would not be possible to disentangle whether those women are not likely to get divorced after the law because they are married to non-violent types or due to their age.

[52] See HernandezdeBenito (2023) for the impacts of exposure to violent crime on intra-household resource alloca-

Male Scarcity in the Marriage Market at the Time of the Marriage. The model argues that female-biased sex ratios in the marriage market at the time of the marriage is the channel behind the likelihood of being in a violent marriage before the law. To test this, I exploit exogenous variation in radio reception of the state-sponsored station—Radio Télévision Libre des Mille Collines (RTLM)—that encouraged the genocide against the Tutsis (Yanagizawa-Drott, 2014). Yanagizawa-Drott (2014) finds that the communes with better radio reception experienced more killings during the genocide.[53] Rogall and Zarate-Barrera (2020) highlights that RTLM-induced killings were mostly women and children and documents that RTLM-induced violence led to a surplus of men.[54] Based on this evidence, if male scarcity is the channel behind the variation in where violent marriages are located, the divorce rates should not increase more after the law in the areas with better RTLM reception in 1994 as in the case of main results. I ran my main empirical specification with the treatment variable being RTLM reception in 1994 (at the commune level) from Yanagizawa-Drott (2014). Table A16 reports the results. As expected, the interaction term is not positive and statistically insignificant for the divorce outcome.[55] This provides supporting evidence in favor of the male scarcity channel.[56] Domestic violence estimates are also no longer negative and statistically significant. Main estimates are also robust to an instrumental variables strategy where I instrumented the 2002 commune level sex ratio (derived by the census) with the genocide intensity index.[57] This further provides evidence for the male scarcity channel (Table A17).

The model also highlights that the higher the male scarcity in the marriage market, the less selective women are (Observation 1). The observation is based on a reservation signal where higher the signal, the more likely the man is a violent type. Are there empirical evidence supporting that women are less selective in a male scarce marriage market? I test this using women whose age of first marriage were 15-30 (women in the marriage market in Rwanda). I use a difference-in-differences (DID) strategy to examine the effect of marrying after the genocide compared to before on marital matching across genocide intense and not intense regions.[58] Table A18 reports the results. I find that it is 13% more likely for a woman who married after the genocide with

tion and bargaining power where the violent crime do not alter the sex-ratio of the marriage market.

[53]There is exogenous variation in reception due to Rwanda's hilly topography.

[54]Rogall (2021) shows that armed-group violence, rather than local RTLM-induced violence, targeted adult men.

[55]Results are robust to including control variables used in Yanagizawa-Drott (2014).

[56]This mechanism check originates from Rogall and Zarate-Barrera (2020), which exploits the RTLM reception as a robustness check to support gender imbalance as behind the improvement in women's outcomes in 2010 and 2014 in Rwanda.

[57]See Angrist (2002), Chiappori et al. (2002), Abramitzky et al. (2011), Grosjean and Khattar (2019), Hussam (2020) for the effects of sex ratios on different outcomes.

[58]The sample approximates the ages when women are in the marriage market. I took women aged between 15-30 where most marriages occur in Rwanda.)

completed primary education to marry a man with less than primary education in the genocide-intense areas relative to women who married before the genocide.[59]

My theoretical and empirical analysis regarding the sex ratio in the marriage market and domestic violence are in line with Becker et al. (1977), which highlights that "*When one accepts an offer closer to the minimum acceptable offer, she generally accepts a greater "mismatch", a greater deviation between her actual and her "optimal" matching trait. An increase in search costs alone lowers one's minimum acceptable offer and widens the boundaries of her acceptable set of traits. Consequently, an increase in search costs can be said to increase the frequency of dissolution because it increases the incidence of mismatches.*"

Post-Traumatic Stress Disorder (PTSD). One can also argue that "exposure to genocide" can affect individuals not just through observing and learning violent behavior but also by affecting their mental health outcomes. Research suggests that the psychological effects of the 1994 Genocide against the Tutsi in Rwanda include PTSD (Rieder and Elbert, 2013). Exposure to violence in genocide-intense areas may lead to PTSD for either or each spouse, which in turn leads to escalation of violence in the household. This may be the underlying channel behind the higher increase in the divorce rates in the genocide intense areas after the law, rather than the male scarcity in the marriage market. Using the universe of monthly administrative records on domestic violence and PTSD, I test whether PTSD is the dominant mechanism behind the variation in violent marriages.

Every year, between April 7 and July 4, a national mourning to commemorate victims of the genocide occurs in Rwanda. Multiple ceremonies take place by government officials during the 100 days, which overlaps with the actual months of the genocide. Recent medical research suggests that the period triggers PTSD symptoms, including excessive anxiety and hypervigilance (Kayiteshonga et al., 2022). Using the specification below, I test whether the onset of the national mourning period leads to a (higher) increase in hospitalizations for domestic violence and PTSD concurrently in the genocide-intense areas. If that is not the case, then, this will suggest that PTSD is not the dominant mechanism behind the spatial variation in violent marriages, at least at the extensive margin (severe domestic violence and PTSD cases).

$$Y_{hdtm} = \beta_0 + \sum_{m=1}^{12} GenocideIntense_{hd} \times \beta_m \mathbb{1}[\tau = m] + \lambda_h + \alpha_d + \sigma_m + \gamma_{pt} + (\mathbf{X_d} \times t)\theta + \varepsilon_{hdtm}. \quad (23)$$

The dependent variable, Y_{hdtm}, is the monthly hospitalization outcome either due to domestic violence or PTSD in hospital h, in district d, in year t and at event-time m. $GenocideIntense_{hd}$ is

[59] Additionally, Figure A5 visualizes the education distribution of the married and recently divorced couples across genocide-intense and not-intense areas using the data cycles right before and after the law among the couples who married post-genocide only. A higher stock of uneducated ever married men in the genocide-intense areas is also in line with my model. See Abramitzky et al. (2011) for male scarcity and assortative matching in post-war France.

a binary variable coded as 1, if hospital h is within a formerly genocide intense district and zero otherwise. For this specification (for simplicity), I use a binary indicator to measure genocide intensity where the genocide intense district is defined as a district higher than the mean genocide intensity in the sample.

$GenocideIntense_{hd}$ is interacted with event-month dummies, $\mathbb{1}[\tau = m]$, to investigate the dynamic impact of the onset of the national mourning period that lasts for 100 days (April-July) and coincides with the 1994 Genocide against the Tutsi in Rwanda. τ denotes the event-month. $\tau = 4$, April, represents the month the mourning period begins. For $4 \leq m \leq 7$, April-July, $\tau = m$ represents the mourning months. For $m < 4$, $\tau = m$ represents the months before the mourning period. The omitted category is $\tau = -1$, March, which means that the dynamic impact of the mourning period is estimated with respect to one month prior to the onset of the national mourning. λ_h is the hospital fixed effects which control for any hospital-specific characteristic that is fixed over time including its location. α_d is the district fixed effects. The district is chosen for the level of geographical unit since the unit of observation is a district hospital. σ_m is the month fixed effects and controls for month-specific trends. γ_{dt} is the province-by-year fixed effects. I allow year fixed effects to differ by province, one unit higher than the district.[60] This way, I am comparing the hospitals who are in formerly genocide-intense areas to the ones that are not, within the same province. Hospitals who are not in genocide-intense areas within the same province constitute a more accurate control group. $\mathbf{X_d}$ is the vector of district-level baseline geographical variables that interacted with linear time trends. I cluster standard errors at the district level.

The main dependent variables for this specification are whether the hospital had hospitalizations due to gender-based violence for women older than 18 and hospitalizations due to mental health (PTSD) for women and men aged 20-39 years old and older than 40 years old. Women's gender-based violence hospitalizations older than 18 capture domestic violence. This is because, according to DHS and census data, the majority of the individuals who are older than 18 are married in Rwanda. 86% (68%) of the women (husbands) in my main sample (from DHS) is aged between 20-39. Thus, PTSD hospitalizations for women and men aged 20-39 better capture the mental health of the individuals in my main sample compared to the hospitalizations for women and men aged 40 years and above.[61]

Figure A4 plots the coefficient of the interaction terms for every month in a calendar year (β_m's). First, I find that it is *not* more likely for a hospital in a formerly genocide-intense area

[60] Unfortunately, there is not enough observations/hospitals to have district-by-year fixed effects. Adding district-by-year fixed effects mean comparing the hospitals in the catchment area of a mill to those not within the same district. Most of the districts have only one district hospital.

[61] All outcomes are indicator variables. For example, monthly hospitalizations due to gender-based violence for women older than 18 take the value of 1 if a hospital had a hospitalization due to gender-based violence for a female victim older than 18 in a given month and 0 otherwise. Dummy variables rather than the logarithm of hospitalizations are used since the number of hospitalizations for gender-based violence is low in a month (close to 1).

to have a domestic violence patient during the national mourning period compared to one month before the onset of the mourning, March. I find the same result for a female or male PTSD patient aged between 20-39 years old.

One may argue that it is possible for individuals to not go to the hospital for PTSD for a particular reason and that is why I am finding statistically insignificant results. Yet, I find that it is likely for a hospital in a formerly genocide-intense area to have a female PTSD patient aged older than 40 during the beginning of the national mourning period compared to one month before the onset of the mourning, March. This sample plausibly represents genocide widows based on statistics. There is no statistically significant change in PTSD hospitalizations during the mourning period for men aged older than 40.

No statistically significant changes in the domestic violence hospitalizations combined with statistically significant changes in PTSD hospitalizations only for women older than 40, not younger (aged 20-39), and no statistically significant changes in PTSD hospitalizations for men aged 20-39 suggest that PTSD is not the dominant driver behind the variation in violent marriages.

Economic Shocks During the Marriage: Expansion of the Coffee Mills in Rwanda. Sanin (2023) studies the government-induced rapid expansion of the coffee mills in Rwanda in the 2000s, which increased the value of coffee farmer couples' output and provided wage employment for women. She finds that a mill opening enabled the wife's transition to paid employment, increased the husband's earnings, and decreased domestic violence within its catchment area. After the law is in place, women's access to wage employment can also increase the divorce rates and decrease the domestic violence rates since it improves women's outside options (utility of being divorced). To test this, I run equation 21 only among couples who reside outside of a mill's catchment area. Table A19 reports the results. Estimates are very similar to the main results which suggests that the changes in women's economic opportunities do not drive the main estimates.

Catchment Area of a Mill as a Social Place. I also estimate equation 21 on domestic violence attitudes only among couples who reside within the catchment area of a mill since before the law. Table 6 reports the results and shows that women in the genocide intense areas are less likely to justify domestic violence after the law in a sizable magnitude. Based on my fieldwork experience in a coffee mill and its catchment area in Rwanda, these areas are social places where women from both cohorts frequently interact while working.[62] This exercise provides suggestive evidence that in a case where women's economic opportunities are fixed, women's social environment has

[62] 63% of the sample for this exercise is from the younger cohort. I did not report results on DID by cohort for this sample due to its small size, yet since the majority is from the younger cohort, the effects are plausibly driven by the younger cohort.

the power to shape their attitudes after a law, which in turn affects their own intra-household dynamics.[63]

Table 6: Effect of the Law on Women's Attitudes Regarding When Wife Beating is Justified among Women Residing in the Catchment Area of a Mill since Before the Law

	Wife Beating is Justified When the Wife					
	(1) All Decisions	(2) Refuses Sex	(3) Argues with Him	(4) Burns Food	(5) Neglects Children	(6) Goes Out w/o Telling
GenocideIntensity x Post	-0.05***	-0.14***	-0.09*	-0.09***	0.02	-0.11*
	(0.01)	(0.04)	(0.05)	(0.03)	(0.09)	(0.06)
Observations	2684	2667	2675	2678	2681	2672
Dependent variable mean	0.09	0.29	0.26	0.13	0.36	0.30

Notes: This table reports the DID estimates of the effect of the law on women who married after the genocide, exploiting the interaction between i) the spatial variation in genocide intensity which is a proxy for variation in where violent marriages are more likely to be located before the law and ii) the time variation created by the law (before-after the law). $GenocideIntensity_c$ is a commune level genocide intensity index which is a standardized continuous variable. Rwandan Demographic Health Surveys are used. Each column represents one dependent variable (attitude towards domestic violence). All estimations are among the currently legally married and divorced women among the women who were residing in the catchment area of a coffee mill since before the law. Catchment area is a buffer zone around the mill with a 4 km radius. All estimations include individual controls, cohort fixed effects, year of marriage fixed effects, commune fixed effects, pre-genocide commune level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for observations from the post-law data cycles. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

8 Robustness Checks

Placebo Difference-in-Differences. The key identifying assumption of the empirical strategy is that the average outcomes for the treatment and control groups (genocide intense and not intense areas respectively) would have parallel trends in the absence of the law. To test whether my results are driven by previous divorce patterns rather than the law, I estimate my main empirical specification using two pre-reform cycles, 2000 and 2005. I run the specification falsely assuming that the law took place between those two cycles. I find a statistically insignificant estimate for the interaction term in this placebo regression, which suggests that my results are not driven by previous

[63]It has been documented that a job holds psychosocial value (Hussam et al. 2022, Hussam et al. 2023). Yet, social interactions at the workplace can contribute to gender gaps in promotions (Cullen and Perez-Truglia, 2023). The findings from the coffee mills suggest that social interactions at work may positively influence women's position in the household via shaping attitudes.

divorce patterns. I report the results in Table A20 which provides support for the parallel trends assumption.

DID event-study estimates using the 2012 Census also constitute as a robustness check (Figure 3). The cohort of women who did not experience female-biased sex ratios in the marriage market after the genocide (left hand side of the figure) and reside in the genocide intense areas are not more likely to be divorced after the law.

Unfortunately, DHS 2000 does not include a domestic violence module. Thus, I cannot employ a placebo regression for domestic violence. However, I plot trends for education for women given that it affects their probability of experiencing domestic violence (Erten and Keskin 2018). Figure A6 shows the share of women who completed elementary school across different genocide intensities. I create nine groups using the genocide intensity index where each group represents a decile (10th–90th percentile). Most of the lines between 2000 and 2005 are parallel. Thus, the figure provides support for parallel trends in a women's characteristic that is relevant to the likelihood of experiencing domestic violence.

As a final note, given that the genocide intensity index is a historical variable and the law is at the national level, there is no variation in treatment timing. Thus, equation 21 is not a staggered twoway fixed effects difference-in-differences (TWFEDD). Thus, treatment effect heterogeneity is not a concern for the validity of the estimates and I do not perform robustness checks related to TWFEDD. To alleviate concern regarding the treatment variable being continuous (Callaway et al., 2024), I created a discrete measure of genocide intensity (a commune is genocide intense if the genocide intensity index is bigger than the median value and 0 otherwise) and estimate the main specification. Estimates are reported in Table A22 and in line with the main estimates.

Measuring Genocide Intensity. In Appendix A2.4.1, I perform robustness checks regarding measurement of genocide intensity.

9 External Validity: Domestic Violence Laws in Uganda

To test the role of social acceptance of leaving a violent marriage in the effectiveness of domestic violence laws in another context, I study a sequence of domestic violence laws in Uganda using Ugandan Demographic Health Surveys. In 2010, Uganda criminalized domestic violence where engaging in such behavior became punishable by a fine and/or imprisonment upto two years. There is no change in the cost of marital dissolution. In 2015, the Ugandan Supreme Court decided that the refund of the bride price upon marital dissolution is unconstitutional in customary marriages

which sizably decreases the direct cost of separation for women.[64] The landmark ruling highlighted that the decision was to ensure that women do not get trapped in violent marriages.[65]

Data suggests that reporting an abusive spouse to law enforcement agencies (a short term exit from a violent marriage) is not socially acceptable where marital separation is. According to the 2022 Afrobarometer Survey, 54% of Ugandan women report that domestic violence is a private matter that should be resolved within the family rather than a criminal matter whose resolution requires the involvement of law enforcement agencies. Moreover, although 81% of Ugandan women think it is somewhat/very likely for the police to take reported gender-based violence cases seriously, 55% women think that somewhat/very likely for a woman to be criticized, harassed, or shamed by others in their community for reporting gender-based violence. Based on the Ugandan Demographic Health Surveys, before the 2010 law, marital separation is socially acceptable given that the rate is not close to zero: 16% of ever married women are separated in 2006.

Based on the laws and the condition I propose for effective domestic violence laws, I should not detect an effect after the 2010 law, given that reporting a violent husband to law enforcement is not socially acceptable. Yet, after 2015, when marital dissolution becomes less financially costly and is already socially acceptable, domestic violence should decrease. To test this, I estimate the specification below:

$$Y_{idt} = \beta_0 + \beta_1 \sum_{2011,2016} Year_t + \beta_2 BridepriceRefund_d \times \sum_{2011,2016} Year_t + \mathbf{X}_{\mathbf{idt}}^{'}\phi + \alpha_d + \eta_k + \omega_m + \varepsilon_{idt}. \tag{24}$$

The dependent variable Y_{idt} is the outcome of interest of woman i, in district d and at year t. $Year_t$ variable is a categorical variable that takes the value of 2011 or 2016. The base year is 2006, before the domestic violence law and the supreme court's decision. $BridepriceRefund_d$ is a binary variable coded as 1 if woman i and at year t resides within a district where its local community (non-Baganda ethnic groups, Goitom 2015) requires bride price to be refunded in case of marital dissolution before the supreme court's decision and 0 otherwise.[66] I control for religion, residence (rural/urban), household wealth and women's and their husbands' education. η_k is the cohort fixed effects and controls for factors that vary across cohorts. ω_m is the year of marriage

[64] In Uganda, the cultural practice of bride price is the payment of a sum of money or property by the groom that is given to the parents of the bride prior to the customary marriage. It is an essential element in contracting a customary marriage and although the required amount changes from tribe to tribe, it is a non-negligible amount for most marriages. As an example, Acholi ethnic group put an upper limit to bride price, which is approximately equivalent to $1,000 (Kalokwera, 2021). Although the refund of bride price upon marital dissolution became unconstitutional in 2015, the marriage custom itself is constitutional. See Anderson (2007), Lowes and Nunn (2018), Ashraf et al. (2020), Corno et al. (2020), Khalifa (2021), Khalifa (2022) and Corno and Voena (2023) for how bride price affect individual and household decisions.

[65] The plaintiff, MIFUMI, the largest women's rights agency operating at grassroots level in Uganda, brought the case to the Supreme Court with the intention of protecting women from domestic violence.

[66] Baganda people live in the Buganda sub-region.

fixed effects. It controls for time-variant shocks to the marriage market. The main dependent variables for this specification are currently being separated and experiencing (physical or sexual) domestic violence in the past 12 months. Unfortunately, I am not able to differentiate whether married women are in customary, civil and/or religious (e.g. Muslim) marriages.[67] Thus, the sample of married women consists of both customary, civil and religious marriages and the results should be taken as less precise compared to the Rwandan case. However, given that customary marriages are most common in the rural areas, I dropped the capital, Kampala, from the sample.[68] The coefficients of interest are $\beta_{2,2011}$ and $\beta_{2,2016}$, which identifies the impact of the law and the supreme court's decision respectively on the ethnicities (based on where they live) where marital dissolution was costly before the legal changes relative to the ethnicities where the cost is lower. I cluster standard errors at the district level.

Table 7 reports the results. In line with my prediction, there is no effect after the 2010 law on both the probability of currently being separated and experiencing domestic violence in the past 12 months. Yet, after the supreme court's decision in 2015, among ever married women from the ethnic groups where the bride price was formerly a refundable gift upon marital dissolution, the probability of being currently separated increases. Among the married group, the probability of experiencing domestic violence in the past 12 month decreases. The change in rates of separation and domestic violence is close to one-to-one for the violence sample, which suggests that the supreme court's decision protected women via the dissolution of marriages as in the divorce effect in Rwanda. I do not detect a change in the divorce rates, partly due to the fact that the time difference between the court's decision and 2016 survey for most respondents are less than a year and it takes more than six months to be divorced in Uganda.

Based on the results, as of 2016, Ugandan domestic violence laws decrease domestic violence when women's decision to exit violent marriages is not constrained by social norms, where this decrease is driven by improved legal access and dissolution of violent marriages. I am looking forward to the release of the next Ugandan DHS cycle (UDHS 2022) to analyze the long-term effects and test whether the law deters domestic violence (in intact marriages) independently of an increase in separation rates.

The Ugandan case also supports the theoretical result in Acemoglu and Jackson (2017), which argues that a gradual tightening of a law, rather than imposing a law that strongly conflicts with prevailing norms, can be effective. In the supreme court case, although the plaintiff requested the practice of the bride price to be unconstitutional to decrease domestic violence in the country, the supreme court upheld the practice. Yet, the court decided that its refund is unconstitutional, which

[67] They are not mutually exclusive groups in the data and only post data cycles collect information on the marriage type.

[68] I also dropped Muslim women from my sample given that they are subject to different laws and customs in Uganda. See The Marriage and Divorce of Mohammedans Act (1906).

Table 7: Effect of Domestic Violence Laws on Women's Current Marital Status Being Separated and Self-Reported (Physical or Sexual) Domestic Violence in the Past 12 Months in Uganda.

	Currently Separated (Ever Married)		Domestic Violence (Violence Sample)
	(1) Full Sample	(2) Violence Sample	(3) Married
Bride Price Refund Ethnic Group District x 2011	0.04	-0.00	-0.05
	(0.04)	(0.07)	(0.08)
Bride Price Refund Ethnic Group District x 2016	0.15***	0.13**	-0.12*
	(0.03)	(0.05)	(0.07)
Observations	8570	3349	3139
Dependent variable mean	0.10	0.06	0.35

Notes: This table reports the DID estimates of the effect of the laws on women, exploiting the interaction between i) the spatial variation in where the ethnicities that do and do not require bride price to be refunded in case of marital dissolution before the supreme court's decision and ii) the time variation created by the laws (2011 is after the 2010 Domestic Violence Law and 2016 is after the Supreme Court's ruling). $BridepriceRefund_d$ is a binary variable coded as 1 if woman i and at year t resides within a district where its local community (non-Baganda ethnic groups) requires bride price to be refunded in case of marital dissolution before the supreme court's decision and 0 otherwise. Ugandan Demographic Health Surveys are used. Domestic violence module questions are asked to a random subsample of the full sample and that is why the violence sample is always smaller compared to the full sample. Column 1 and 2 represent estimating the DID when the sample consists of women who are either currently married or separated at the time of the survey (ever married sample). Column 3 represents estimating the DID with married women only. In all samples, women who married more than once, are Muslims or reside in Kampala are excluded. All estimations include individual controls, cohort fixed effects, year of marriage fixed effects and district fixed effects. Domestic violence variables are measured for the past 12 months. Standard errors are clustered at the district level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

was a gradual shift compared to prohibiting bride price. Given that marital separation was already acceptable, the law effectively increased the likelihood of women being separated and experience less domestic violence.

10 Conclusion

This paper provides evidence that domestic violence laws deter domestic violence when the social cost of exiting a violent marriage is low for women. I study the 2008 Rwandan domestic violence law, which enabled women to divorce abusive husbands unilaterally. To analyze the effects of the law, I use the geographical variation in the intensity of the 1994 Genocide against

the Tutsi in Rwanda, which created variation in where violent marriages were more likely to be located before the law. I find that couples in formerly genocide-intense regions——where male scarcity in the post-genocide marriage market led more women to marry violent men——are more likely to divorce and experience less domestic violence after the law. I show that the reduction in violence was driven by both changes in social norms and improved legal access to divorce. The younger cohort in the formerly genocide-intense regions, unaffected by the skewed sex ratios, exhibits a reduction in domestic violence without a rise in divorce rates after the law. I argue that the younger cohort's exposure to the older cohort's intolerance of domestic violence—demonstrated by the older cohort's use of divorce to exit violent marriages—deters violence within their own marriages. Consistent with this argument, the younger cohort in genocide-intense regions shows greater bargaining power and reduced justification of domestic violence compared to less intense regions, with a notable reduction in justification of domestic violence in areas where women from both cohorts frequently interact in confined workspaces. I also test the role of socially acceptability of leaving a violent marriage in the effectiveness of domestic violence laws using Ugandan domestic violence laws, suggesting external validity of my predictions and results.

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Online Appendix

for "When Do Domestic Violence Laws Work? The Role of Social Norms in Household Bargaining"

by Deniz Sanin

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A1 Additional Figures

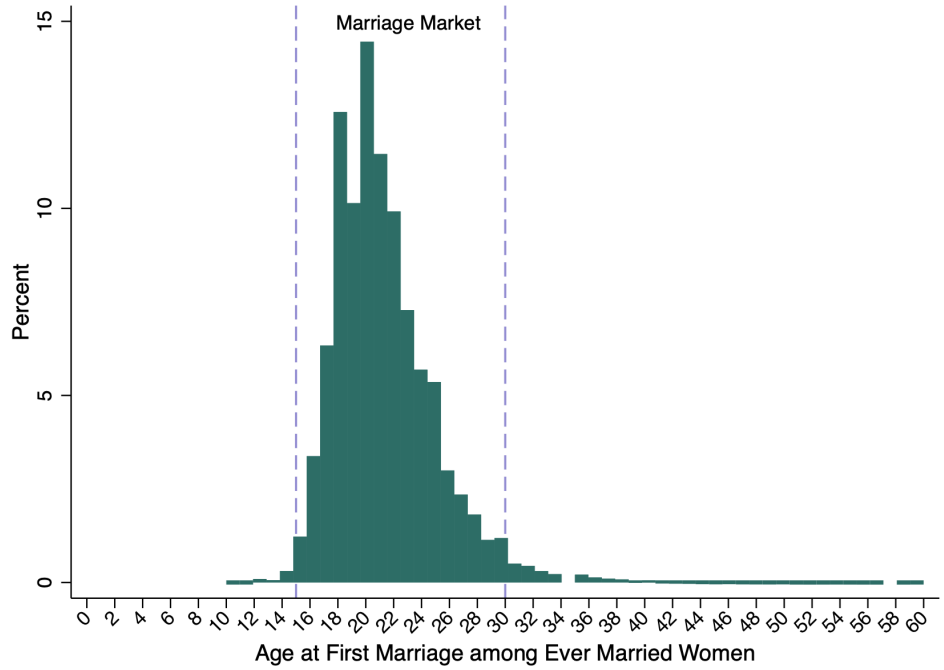
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Figure A1: Timeline of Events



A1.2 Additional Figures for Section 5: Empirical Specification

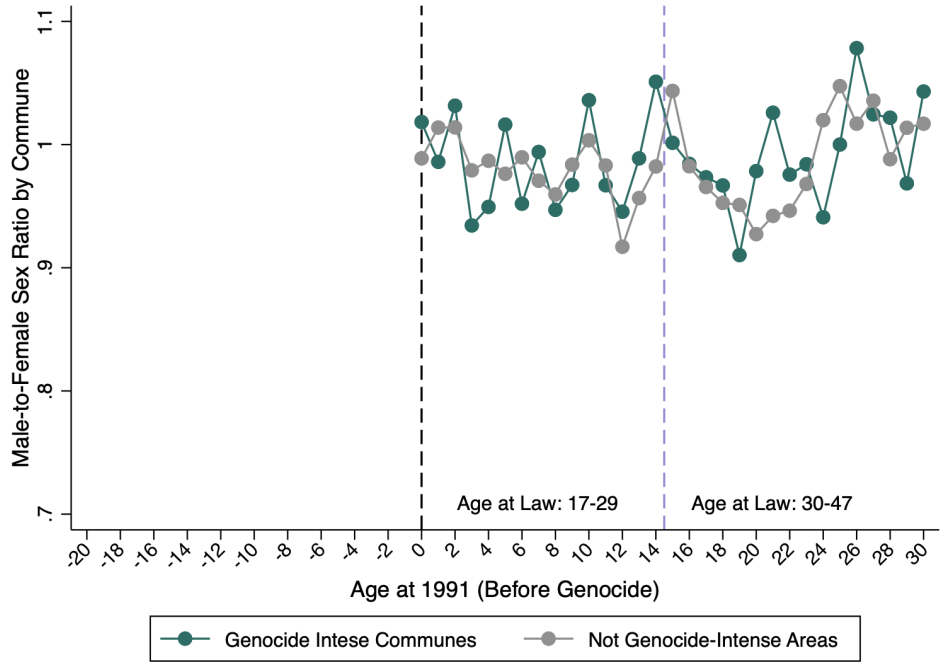
Figure A2: Histogram of Age at First Marriage among Ever Married Women



Notes: The figure visualizes the histogram for the age at first married among ever married women using Rwandan Population and Housing Census 2012.

A1.3 Additional Figures for Section 6: Testing the Predictions

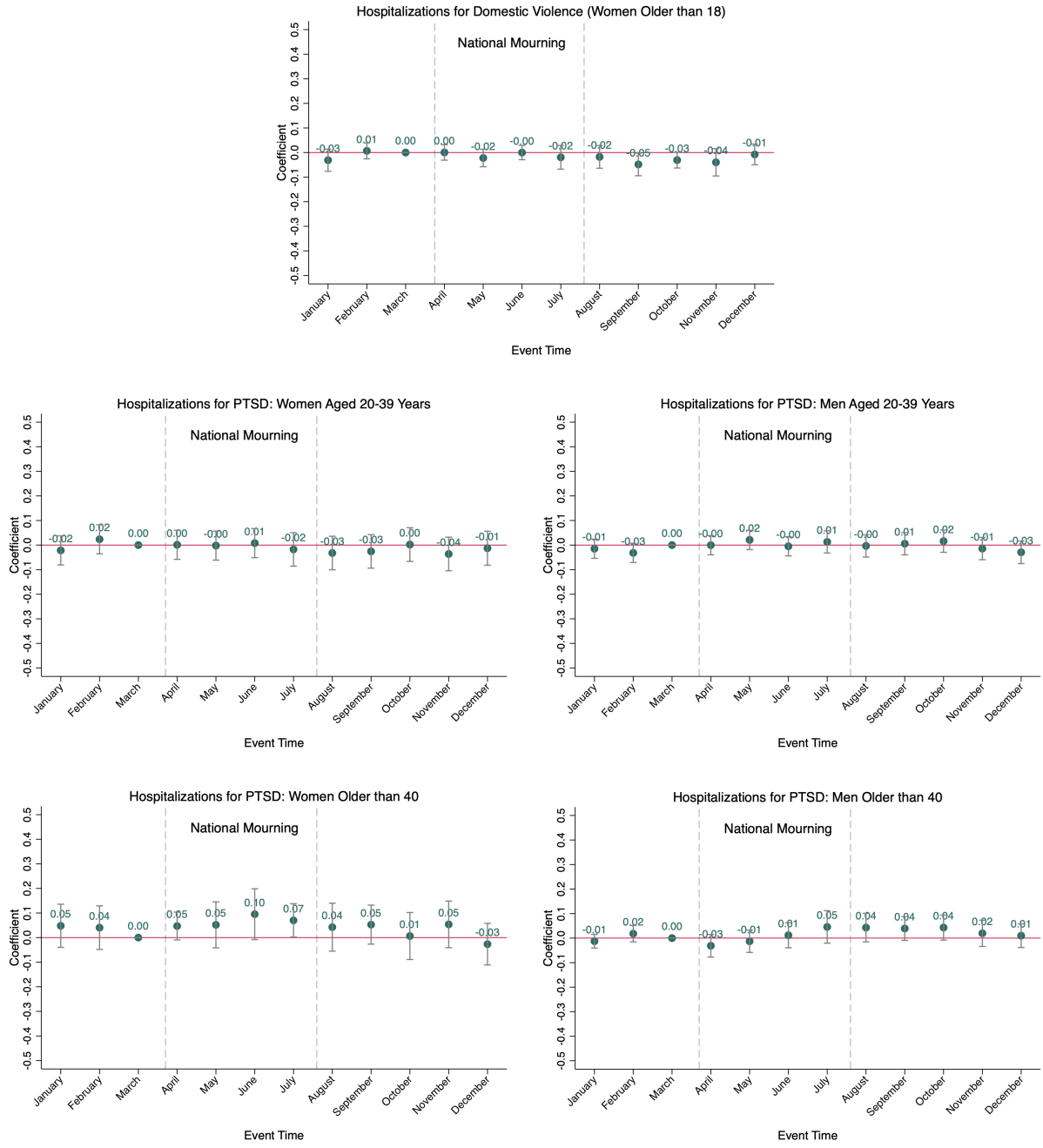
Figure A3: Male-to-Female Sex Ratio by Age across Different Genocide Intensities (Before the Genocide)



Notes: The figure documents the male-to-female sex ratio by age across genocide-intense and not-intense communes using Rwandan Population and Housing Census 1991 (Before the Genocide Census). Genocide intense communes are defined as the communes with an index higher than the 75th percentile value.

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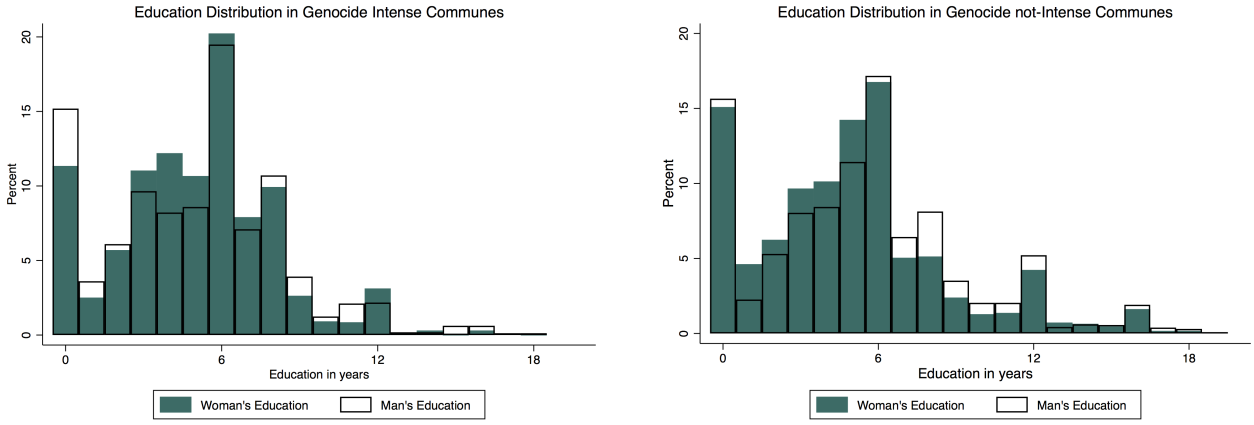
Figure A4: Dynamic Impact of the National Mourning Period on Hospitalizations for Domestic Violence (Women) and Post-Traumatic Stress Disorder (PTSD) among Women and Men



Notes: Robust standard errors clustered at the district level. Estimation include hospital controls, hospital fixed effects, district fixed effects and province-by-year fixed effects.

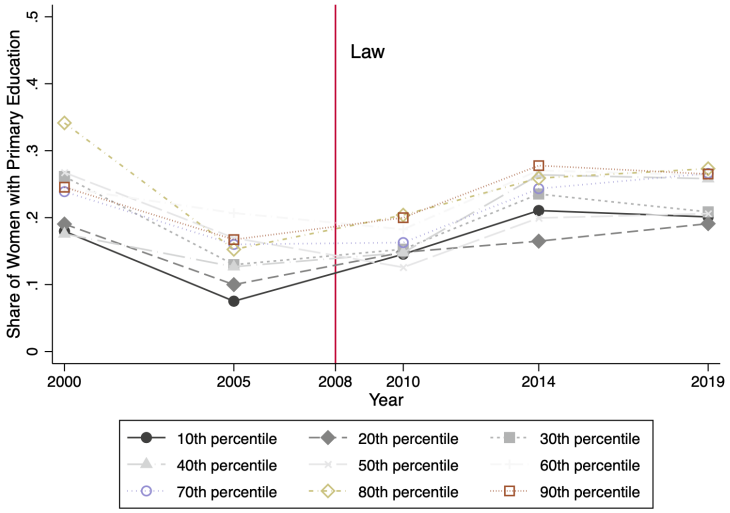
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Figure A5: Education Distribution of Ever Married Women and Men across Different Genocide Intensities



Notes: The figure visualizes the education distribution of ever married women and men across genocide-intense and not-intense communes using Rwandan Demographic Health Surveys.

Figure A6: Trends in the Rate of Women who Completed Primary Education across Different Genocide Intensities



Notes: The figure visualizes the trends in the share of women who completed primary education across different deciles of genocide intensity index using Rwandan Demographic Health Surveys.

A2 Additional Tables

A2.1 Additional Tables for Section 4: Data

Table A1: Summary Statistics of the Gacaca Court Records at the Commune Level

	Mean	SD
Panel A: Genocide Intensity Index and its Components		
Perpetrator Proxy: Category 1 (armed violence)	0.010	0.008
Perpetrator Proxy: Category 2 (civilian violence)	0.059	0.038
Perpetrator Proxy: Category 3 (civilian violence)	0.043	0.030
Survivor Proxy: Widowed	0.004	0.004
Survivor Proxy: Orphaned	0.011	0.009
Survivor Proxy: Disabled	0.002	0.002
Genocide Intensity Index (standardized)	0.000	1.000
Genocide Intensity Index based on armed violence (standardized)	-0.000	1.000
Panel B: Number of Perpetrators and Survivors		
Number of Perpetrators: Category 1 (armed violence)	565.0	503.3
Number of Perpetrators: Category 2 (civilian violence)	3196.7	2606.5
Number of Perpetrators: Category 3 (civilian violence)	2293.9	1929.4
Number of Survivors: Widowed	206.8	193.9
Number of Survivors: Orphaned	552.0	483.0
Number of Survivors: Disabled	89.6	106.4

Notes: Summary statistics of the genocide gacaca court records. Category 1 perpetrators are accused of planning, organizing or supervising the genocide, or committing sexual torture. Category 2 perpetrators are accused of killings or other serious physical assaults. Category 3 perpetrators are accused of looting or other offences against property. Genocide intensity index is the result of a principal component analysis (PCA) using the 6 proxies in Panel A (perpetrator and survivor proxies). Genocide intensity index based on armed violence is the result of a principal component analysis (PCA) using the 4 proxies in Panel A: perpetrator proxy which reflects armed violence and survivor proxies. For more details on the data and the proxies see Verpoorten (2012).

Table A2: Summary Statistics of the Key Dependent Variables across Different Genocide Intensities

	All		Genocide Not-Intense		Genocide Intense	
	Mean	SD	Mean	SD	Mean	SD
Panel A: Variables from the 2005 DHS, Pre-Law						
Marital status: Divorced	0.02	0.15	0.03	0.17	0.02	0.13
Physical or sexual domestic violence in the past 12 months	0.17	0.38	0.16	0.37	0.18	0.39
Physical domestic violence in the past 12 months	0.12	0.33	0.12	0.33	0.12	0.33
Sexual domestic violence in the past 12 months	0.08	0.28	0.07	0.25	0.10	0.31
Experienced severe physical or sexual in the past 12 months	0.09	0.28	0.07	0.26	0.10	0.31
Panel B: Variables from the 2010, 2014, 2019 DHS, Post-Law						
Marital status: Divorced	0.07	0.26	0.07	0.25	0.08	0.27
Physical or sexual domestic violence in the past 12 months	0.32	0.47	0.32	0.47	0.32	0.47
Physical domestic violence in the past 12 months	0.29	0.46	0.29	0.45	0.30	0.46
Sexual domestic violence in the past 12 months	0.11	0.32	0.11	0.32	0.12	0.32
Experienced severe physical or sexual in the past 12 months	0.19	0.39	0.18	0.39	0.19	0.39

Notes: This table reports the summary statistics for the key dependent variables. Column "All" represents the mean of the variable among all communes. Column "Genocide Not-Intense" represents the mean of the variable among communes with genocide intensity index lower than the median value. Column "Genocide Intense" represents the mean of the variable among communes with genocide intensity index higher than the median value. The sample consists of currently married and divorced women who married after the genocide. Women who married more than once are excluded.

Table A3: Summary Statistics of the Demographic Variables across Different Genocide Intensities: Before the Law

	All		Genocide Not-Intense		Genocide Intense	
	Mean	SD	Mean	SD	Mean	SD
Variables from the 2005 DHS						
Marital status: Married	0.98	0.2	0.97	0.2	0.98	0.1
The husband lives in the house	0.91	0.3	0.90	0.3	0.92	0.3
Christian	0.96	0.2	0.97	0.2	0.95	0.2
Type of residence: Rural	0.77	0.4	0.80	0.4	0.74	0.4
Lives in the catchment area of a mill	0.16	0.4	0.09	0.3	0.24	0.4
Age	27.42	4.1	26.93	3.9	27.92	4.2
Age at first marriage	21.31	3.5	20.78	3.3	21.87	3.5
Age at Genocide	16.75	4.1	16.27	3.9	17.25	4.2
Year of first marriage	1998.87	3.1	1998.82	3.1	1998.92	3.1
Years since marriage	5.48	3.1	5.55	3.1	5.41	3.1
Education in years	5.29	3.5	5.04	3.6	5.56	3.3
Occupation: Agricultural self-employed	0.84	0.4	0.82	0.4	0.86	0.3
Household's main floor material is cement	0.19	0.4	0.18	0.4	0.19	0.4
Household has a radio	0.59	0.5	0.58	0.5	0.59	0.5

Notes: This table reports the summary statistics for demographic variables of the women in the sample using the before the law data cycle. Column "All" represents the mean of the variable among all communes. Column "Genocide Not-Intense" represents the mean of the variable among communes with genocide intensity index lower than the median value. Column "Genocide Intense" represents the mean of the variable among communes with genocide intensity index higher than the median value. The sample consists of currently married and divorced women who married after the genocide. Women who married more than once are excluded.

Table A4: Summary Statistics of the Demographic Variables for the Younger Cohort Women (Age at Genocide: 0-14) across Different Genocide Intensities

	All		Genocide Not-Intense		Genocide Intense	
	Mean	SD	Mean	SD	Mean	SD
Variables from the 2005, 2010, 2014, 2019 DHS						
Marital status: Married	0.93	0.3	0.94	0.2	0.93	0.3
The husband lives in the house	0.84	0.4	0.84	0.4	0.84	0.4
Christian	0.97	0.2	0.97	0.2	0.97	0.2
Type of residence: Rural	0.80	0.4	0.82	0.4	0.78	0.4
Lives in the catchment area of a mill	0.32	0.5	0.26	0.4	0.39	0.5
Age	29.60	4.8	29.43	4.8	29.80	4.8
Age at first marriage	21.59	3.5	21.19	3.5	22.07	3.5
Age at Genocide	8.88	4.1	8.83	4.1	8.94	4.1
Year of first marriage	2007.05	5.2	2006.70	5.3	2007.45	5.1
Years since marriage	7.54	5.1	7.77	5.2	7.27	5.0
Education in years	5.19	3.9	4.93	3.8	5.48	3.9
Occupation: Agricultural self-employed	0.47	0.5	0.47	0.5	0.48	0.5
Household's main floor material is cement	0.26	0.4	0.22	0.4	0.31	0.5
Household has a radio	0.59	0.5	0.58	0.5	0.60	0.5
Observations	8371		4529		3842	

Notes: This table reports the summary statistics for demographic variables of Cohort I women in the sample using all Rwandan Demographic Health Survey cycles. Column "All" represents the mean of the variable among all communes. Column "Genocide Not-Intense" represents the mean of the variable among communes with genocide intensity index lower than the median value. Column "Genocide Intense" represents the mean of the variable among communes with genocide intensity index higher than the median value. The sample consists of currently married and divorced women who married after the genocide. Women who married more than once are excluded.

Table A5: Summary Statistics of the Demographic Variables for the Older Cohort Women (Age at Genocide: 15-30) across Different Genocide Intensities

	All		Genocide Not-Intense		Genocide Intense	
	Mean	SD	Mean	SD	Mean	SD
Variables from the 2005, 2010, 2014, 2019 DHS						
Marital status: Married	0.93	0.2	0.93	0.3	0.93	0.2
The husband lives in the house	0.84	0.4	0.84	0.4	0.84	0.4
Christian	0.97	0.2	0.97	0.2	0.97	0.2
Type of residence: Rural	0.77	0.4	0.78	0.4	0.77	0.4
Lives in the catchment area of a mill	0.31	0.5	0.25	0.4	0.37	0.5
Age	36.78	5.7	36.34	5.7	37.17	5.7
Age at first marriage	22.89	4.2	22.16	4.0	23.54	4.4
Age at Genocide	18.44	3.0	18.18	2.9	18.67	3.0
Year of first marriage	1998.78	4.1	1998.31	3.8	1999.19	4.4
Years since marriage	13.42	6.0	13.72	5.9	13.14	6.0
Education in years	5.89	4.0	5.70	4.2	6.07	3.8
Occupation: Agricultural self-employed	0.57	0.5	0.56	0.5	0.59	0.5
Household's main floor material is cement	0.28	0.4	0.27	0.4	0.29	0.5
Household has a radio	0.64	0.5	0.64	0.5	0.63	0.5
Observations	4620		2174		2446	

Notes: This table reports the summary statistics for demographic variables of the Cohort II women in the sample all Rwandan Demographic Health Survey cycles. Column "All" represents the mean of the variable among all communes. Column "Genocide Not-Intense" represents the mean of the variable among communes with genocide intensity index lower than the median value. Column "Genocide Intense" represents the mean of the variable among communes with genocide intensity index higher than the median value. The sample consists of currently married and divorced women who married after the genocide. Women who married more than once are excluded.

A2.2 Additional Tables for Section 6: Testing the Predictions

Table A6: Heterogeneous Impact of the Law on Women's Current Marital Status Being Divorced and Self-Reported (Sexual or Severe Physical) Domestic Violence in the Past 12 Months by Cohort

Younger Cohort (Age at Genocide 0-14): Balanced Sex Ratio in the Marriage Market Pre-Law & Exposure to Divorce due to Domestic Violence Post-Law

Older Cohort (Age at Genocide 15-30): Female-Biased Sex Ratio in the Marriage Market Pre-Law

	Younger Cohort			Older Cohort		
	(1) Divorce	(2) Domestic Violence (Married)	(3) Domestic Violence (Ever Married)	(4) Divorce	(5) Domestic Violence (Married)	(6) Domestic Violence (Ever Married)
GenocideIntensity x Post	0.017	-0.077*	-0.080*	0.043**	-0.048*	-0.047*
	(0.02)	(0.05)	(0.04)	(0.02)	(0.03)	(0.03)
Observations	2405	2259	2400	1730	1637	1730
Dependent variable mean	0.06	0.17	0.17	0.05	0.19	0.19

Notes: This table reports the DID estimates of the effect of the law on women who married after the genocide by cohort, exploiting the interaction between i) the spatial variation in genocide intensity which is a proxy for variation in where violent marriages are more likely to be located before the law and ii) the time variation created by the law (before-after the law). $GenocideIntensity_c$ is a commune level genocide intensity index which is a standardized continuous variable. Rwandan Demographic Health Surveys are used. Domestic violence module questions are asked to a random subsample of the full sample (violence sample). All estimations use the violence sample. Column 1, 2 and 3 represent estimating the DID when the sample consists of women from Younger Cohort: Age at Genocide is 0-14. Column 4, 5 and 6 represent estimating the DID when the sample consists of women from Older Cohort: Age at Genocide is 15-30. To maximize sample size, I also included the limited number of smaller than zero and bigger than thirty five years old women. Ever married women are either currently legally married or divorced at the time of the survey. In all samples, women who married more than once are excluded. All estimations include individual controls, cohort fixed effects, year of marriage fixed effects, commune fixed effects, pre-genocide commune level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for observations from the post-law data cycles. Domestic violence variables are measured for the past 12 months. Severe physical domestic violence cases are when the wife is kicked, dragged, strangled, burnt and threatened with a knife, gun or other weapon. Sexual domestic violence cases are physically forced into unwanted sex and perform sexual acts. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

Table A7: Heterogeneous Impact of the Law on Women's Self-Reported (Sexual or Severe Physical) Domestic Violence in the Past 12 Months using a Triple Difference in Difference Strategy

Younger Cohort (Age at Genocide 0-14): Balanced Sex Ratio in the Marriage Market Pre-Law & Exposure to Divorce due to Domestic Violence Post-Law

Older Cohort (Age at Genocide 15-30): Female-Biased Sex Ratio in the Marriage Market Pre-Law

	Experienced Domestic Violence
	(1)
	Ever Married
GenocideIntensity x Post x Younger Cohort	-0.13*
	(0.07)
GenocideIntensity x Post	-0.03*
	(0.02)
Observations	3921
Dependent variable mean	0.17

Notes: This table reports the triple difference in difference (DDD) estimates of the effect of the law on women who married after the genocide, exploiting the interaction between i) the spatial variation in genocide intensity which is a proxy for variation in where violent marriages are more likely to be located before the law and ii) the time variation created by the law (before-after the law) and iii) being from a specific cohort during the genocide. Younger Cohort (Age at Genocide is 0-14) is younger than the marriageable age during the genocide compared to the base cohort (Older Cohort: Age at Genocide is 15-30). They are exposed to a relatively balanced sex ratio in the marriage market before the law and exposed to divorce due to domestic violence after the law. For consistency with the DD results, I also included the limited number of smaller than zero and bigger than thirty five years old women. $GenocideIntensity_c$ is a commune level genocide intensity index which is a standardized continuous variable. Rwandan Demographic Health Surveys are used. Domestic violence module questions are asked to a random subsample of the full sample (violence sample). Women who married more than once are excluded. All estimations include individual controls, cohort fixed effects, year of marriage fixed effects, commune fixed effects, pre-genocide commune level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for observations from the post-law data cycles. Domestic violence variables are measured for the past 12 months. Severe physical domestic violence cases are when the wife is kicked, dragged, strangled, burnt and threatened with a knife, gun or other weapon. Sexual domestic violence cases are physically forced into unwanted sex and perform sexual acts. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

The DDD specification associated with the table is as follows.

$$Y_{ict} = \beta_0 + \beta_1 Post_t + \beta_2(GenocideIntensity_c \times Post_t) + \beta_3(GenocideIntensity_c \times Post_t \times YoungerCohort) +$$

$$+\beta_4(Post_t \times YoungerCohort) + \beta_5 YoungerCohort + \beta_6(YoungerCohort \times GenocideIntensity_c) + \mathbf{X_{ict}'}\phi +$$

$$\mathbf{X_{c1991}'} \times Post_t\lambda + \alpha_c + \eta_k + \omega_m + + \gamma_{ct} + \varepsilon_{ict}.$$

Table A8: DID Event-Study Estimates on The Effect of a Woman Being at a Specific Age During the Genocide and Residing in a Genocide-Intense Commune on Current Marital Status Being Divorced

	(1) Currently Divorced
Genocide Intense x Age at Genocide 13	-0.00 (0.01)
Genocide Intense x Age at Genocide 14	0.00 (.)
Genocide Intense x Age at Genocide 15	0.00 (0.01)
Genocide Intense x Age at Genocide 16	0.01 (0.01)
Genocide Intense x Age at Genocide 17	0.00 (0.01)
Genocide Intense x Age at Genocide 18	0.02*** (0.01)
Genocide Intense x Age at Genocide 19	0.02* (0.01)
Genocide Intense x Age at Genocide 20	0.02* (0.01)
Genocide Intense x Age at Genocide 21	0.03*** (0.01)
Genocide Intense x Age at Genocide 22	0.02** (0.01)
Genocide Intense x Age at Genocide 23	0.02** (0.01)
Genocide Intense x Age at Genocide 24	0.01 (0.01)
Genocide Intense x Age at Genocide 25	0.01 (0.01)
Genocide Intense x Age at Genocide 26	0.02 (0.01)
Genocide Intense x Age at Genocide 27	0.01 (0.01)
Genocide Intense x Age at Genocide 28	0.01 (0.01)
Genocide Intense x Age at Genocide 29	0.01 (0.01)
Genocide Intense x Age at Genocide 30	0.03*** (0.01)
Observations	128889
Dependent variable mean	0.04

Notes: This table reports the DID event-study estimates of the effect of the law on ever married women whose age at genocide is between 0 and 30, exploiting the interaction between i) the spatial variation in genocide intensity which is a proxy for variation in where violent marriages are more likely to be located before the law and ii) the age at genocide. The 2012 Census is used. Estimation includes individual controls, age at genocide fixed effects, year of marriage fixed effects, commune fixed effects. Post age at genocide 12 is reported. Age 14 is the omitted category. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1. *** p<.01, ** p<.05, * p<.1.

Table A9: Dynamic Effect of the Law on Women's Current Marital Status Being Divorced

	Currently Divorced (Ever Married)	
	(1) Full Sample	(2) Violence Sample
GenocideIntensity x 2010	0.01	0.04**
	(0.01)	(0.02)
GenocideIntensity x 2014	0.02*	0.04***
	(0.01)	(0.02)
GenocideIntensity x 2019	0.02**	0.06***
	(0.01)	(0.02)
Observations	11403	3454
Dependent variable mean	0.07	0.06

Notes: This table reports the DID estimates of the effect of the law on women who married after the genocide by year, exploiting the interaction between i) the spatial variation in genocide intensity which is a proxy for variation in where violent marriages are more likely to be located before the law and ii) the time variation created by the law (before-after the law year by year). $GenocideIntensity_c$ is a commune level genocide intensity index which is a standardized continuous variable. Rwandan Demographic Health Surveys are used. Domestic violence module questions are asked to a random subsample of the full sample and that is why the violence sample is smaller compared to the full sample. All estimations include individual controls, cohort fixed effects, year of marriage fixed effects, commune fixed effects, pre-genocide commune level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for observations from the post-law data cycles. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

Table A10: Effect of the Law on Women's Attitudes Regarding When Wife Beating is Justified (Full Sample, Ever Married)

	Wife Beating is Justified When the Wife					
	(1) All Decisions	(2) Refuses Sex	(3) Argues with Him	(4) Burns Food	(5) Neglects Children	(6) Goes Out w/o Telling
GenocideIntensity x Post	-0.02	-0.02	-0.04**	-0.04*	-0.01	-0.04*
	(0.01)	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)
Observations	11403	11336	11359	11365	11375	11366
Dependent variable mean	0.09	0.27	0.24	0.13	0.35	0.29

Notes: This table reports the DID estimates of the effect of the law on women who married after the genocide, exploiting the interaction between i) the spatial variation in genocide intensity which is a proxy for variation in where violent marriages are more likely to be located before the law and ii) the time variation created by the law (before-after the law). $GenocideIntensity_c$ is a commune level genocide intensity index which is a standardized continuous variable. Rwandan Demographic Health Surveys are used. Each column represents one dependent variable (attitude towards domestic violence). All estimations are among the currently legally married and divorced women and include individual controls, cohort fixed effects, year of marriage fixed effects, commune fixed effects, pre-genocide commune level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for observations from the post-law data cycles. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

Table A11: Effect of the Law on Husbands' Attitudes Regarding When Wife Beating is Justified (Husbands from the Younger Cohort: Age at Genocide 0-14, Ever Married)

	According to the Husband: Wife Beating is Justified When the Wife					
	(1) All Decisions	(2) Refuses Sex	(3) Argues with Him	(4) Burns Food	(5) Neglects Children	(6) Goes Out w/o Telling
GenocideIntensity x Post	-0.00	-0.03	0.03	0.02	0.03	-0.01
	(0.01)	(0.03)	(0.02)	(0.02)	(0.06)	(0.06)
Observations	1836	1827	1831	1834	1831	1833
Dependent variable mean	0.01	0.06	0.06	0.02	0.12	0.08

Notes: This table reports the DID estimates of the effect of the law on men who married after the genocide, exploiting the interaction between i) the spatial variation in genocide intensity which is a proxy for variation in where violent marriages are more likely to be located before the law and ii) the time variation created by the law (before-after the law). $GenocideIntensity_c$ is a commune level genocide intensity index which is a standardized continuous variable. Rwandan Demographic Health Surveys are used. Each column represents one dependent variable (attitude towards domestic violence). All estimations are among the currently legally married and divorced men and include individual controls, cohort fixed effects, year of marriage fixed effects, commune fixed effects, pre-genocide commune level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for observations from the post-law data cycles. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

Table A12: Effect of the Law on Women's Attitudes Regarding When Wife Beating is Justified (Older Cohort, Age at Genocide 15-30, Ever Married)

	Wife Beating is Justified When the Wife					
	(1) All Decisions	(2) Refuses Sex	(3) Argues with Him	(4) Burns Food	(5) Neglects Children	(6) Goes Out w/o Telling
GenocideIntensity x Post	0.00	0.00	-0.03	-0.01	0.01	-0.03
	(0.01)	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)
Observations	4098	4075	4082	4082	4089	4085
Dependent variable mean	0.07	0.24	0.21	0.11	0.33	0.26

Notes: This table reports the DID estimates of the effect of the law on women who married after the genocide, exploiting the interaction between i) the spatial variation in genocide intensity which is a proxy for variation in where violent marriages are more likely to be located before the law and ii) the time variation created by the law (before-after the law). $GenocideIntensity_c$ is a commune level genocide intensity index which is a standardized continuous variable. Rwandan Demographic Health Surveys are used. Each column represents one dependent variable (attitude towards domestic violence). All estimations are among the currently legally married and divorced women and include individual controls, cohort fixed effects, year of marriage fixed effects, commune fixed effects, pre-genocide commune level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for observations from the post-law data cycles. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

Table A13: Heterogeneous Impact of the Law with respect to Different Distance to Hospital Measures

	Currently Divorced wrt. Different Distance to Hospital Measures		
	(1) 5 km Buffer around Hospital	(2) 5-10 km Donut around Hospital	(3) 10-15 km Donut around Hospital
GenocideIntensity x Post	0.02***	0.02	0.01
	(0.01)	(0.01)	(0.01)
Observations	3019	4001	3026
Dependent variable mean	0.10	0.06	0.05

Notes: This table reports the DID estimates of the effect of the law on women who married after the genocide by distance to hospital, exploiting the interaction between i) the spatial variation in genocide intensity which is a proxy for variation in where violent marriages are more likely to be located before the law and ii) the time variation created by the law (before-after the law). $GenocideIntensity_c$ is a commune level genocide intensity index which is a standardized continuous variable. Rwandan Demographic Health Surveys are used. All estimations use ever married women who are either currently legally married or divorced at the time of the survey. Column 1 restricts the ever married women sample to women who reside within the 5 km radius buffer around a district hospital. Column 2 restricts the ever married women sample to women who reside within the donut area between 5 and 10 km from the district hospital. Column 3 restricts the ever married women sample to women who reside within the donut area between 10 and 15 km from the district hospital. In all samples, women who married more than once are excluded. All estimations include individual controls, cohort fixed effects, year of marriage fixed effects, commune fixed effects, pre-genocide commune level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for observations from the post-law data cycles. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

Table A14: Heterogeneous Impact of the Law with respect to Different Shares of Local-Level Women Politicians (Violence Sample)

	Currently Divorced wrt. Different Shares of Local-Level Women Politicians	
	(1) <50%	(2) ≥50%
GenocideIntensity x Post	0.01	0.07***
	(0.02)	(0.02)
Observations	1571	1883
Dependent variable mean	0.06	0.07

Notes: This table reports the DID estimates of the effect of the law on women who married after the genocide by share of local-level female politicians, exploiting the interaction between i) the spatial variation in genocide intensity which is a proxy for variation in where violent marriages are more likely to be located before the law and ii) the time variation created by the law (before-after the law). $GenocideIntensity_c$ is a commune level genocide intensity index which is a standardized continuous variable. Rwandan Demographic Health Surveys are used. Domestic violence module questions are asked to a random subsample of the full sample (violence sample). All estimations use the violence sample. All estimations use ever married women who are either currently legally married or divorced at the time of the survey. Column 1 restricts the ever married women sample to women who reside in a commune with a less than fifty percent share local-level women politicians. Column 2 restricts the ever married women sample to women who reside in a commune with a less than fifty percent share local-level women politicians. In all samples, women who married more than once are excluded. All estimations include individual controls, cohort fixed effects, year of marriage fixed effects, commune fixed effects, pre-genocide commune level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for observations from the post-law data cycles. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

A2.3 Additional Tables for Section 7: Female-Biased Sex Ratios or Alternative Channels?

Table A15: Effect of the Law on Women's Current Marital Status Being Divorced among Women who Married Right Before the Genocide

	Currently Divorced
	(1)
	Sample: Married within 5 Years Before the Genocide (1989-1994)
GenocideIntensity x Post	0.004
	(0.02)
Observations	1846
Dependent variable mean	0.07

Notes: This table reports the DID estimates of the effect of the law on women who married right before the genocide, exploiting the interaction between i) the spatial variation in genocide intensity which is a proxy for variation in where violent marriages are more likely to be located before the law and ii) the time variation created by the law (before-after the law). $GenocideIntensity_c$ is a commune level genocide intensity index which is a standardized continuous variable. Rwandan Demographic Health Surveys are used. Women who married more than once are excluded. Estimation includes individual controls, cohort fixed effects, year of marriage fixed effects, commune fixed effects, pre-genocide commune level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for observations from the post-law data cycles. Domestic violence estimate is not shown due to the very small sample size. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

Table A16: Effect of the Law on Women's Current Marital Status Being Divorced and Self-Reported (Sexual or Severe Physical) Domestic Violence in the Past 12 Months using RTLM Reception in 1994)

	Currently Divorced (Ever Married)		Domestic Violence (Violence Sample)	
	(1) Full Sample	(2) Violence Sample	(3) Married	(4) Ever Married
RTLM Reception in 1994 x Post	-0.01	-0.10	0.00	0.01
	(0.02)	(0.06)	(0.09)	(0.08)
Observations	11017	3389	3211	3387
Dependent variable mean	0.06	0.05	0.17	0.17

Notes: This table reports the DID estimates of the effect of the law on women who married after the genocide, exploiting the interaction between i) RTLM Reception in 1994 which is a proxy for variation in where violent marriages are less likely to be located before the law due to male surplus and ii) the time variation created by the law (before-after the law). $RTLM_c$ is a commune level index which is a standardized continuous variable. Rwandan Demographic Health Surveys are used. Domestic violence module questions are asked to a random subsample of the full sample and that is why the violence sample is always smaller compared to the full sample. Column 1, 2 and 4 represent estimating the DID when the sample consists of women who are either currently legally married or divorced at the time of the survey (ever married sample). Column 3 represents estimating the DID with married women only. In all samples, women who married more than once are excluded. All estimations include individual controls, cohort fixed effects, year of marriage fixed effects, commune fixed effects, pre-genocide commune level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for observations from the post-law data cycles. Domestic violence variables are measured for the past 12 months. Severe physical domestic violence cases are when the wife is kicked, dragged, strangled, burnt and threatened with a knife, gun or other weapon. Sexual domestic violence cases are physically forced into unwanted sex and perform sexual acts. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

Table A17: Effect of the Law on Women's Current Marital Status Being Divorced and Self-Reported (Sexual or Severe Physical) Domestic Violence in the Past 12 Months (2nd Stage of IV 2SLS Results)

	Currently Divorced (Ever Married)	Experienced Domestic Violence (Married)
	(1) Full Sample	(2) Violence Sample
Female-to-Male Sex Ratio in 2002 x Post	0.05*	-0.16**
	(0.03)	(0.07)
Observations	11403	3236
Dependent variable mean	0.07	0.18

Notes: This table reports the second stage of the IV 2SLS results of the DID estimates of the effect of the law on women who married after the genocide, exploiting the interaction between i) female-to-male sex ration in 2002 (sex ratio after the genocide but before the law) and ii) the time variation created by the law (before-after the law). $FemaletoMaleSexRatioin2002_c$ is a commune level continuous variable which is a measure of male scarcity in the commune. First-Stage F-stat associated with both columns are bigger than 10 (>230). Rwandan Demographic Health Surveys are used. Domestic violence module questions are asked to a random subsample of the full sample and that is why the violence sample is always smaller compared to the full sample. Column 1 represent estimating the DID when the sample consists of women who are either currently legally married or divorced at the time of the survey (ever married sample). Column 2 represents estimating the DID with married women only. In all samples, women who married more than once are excluded. All estimations include individual controls, cohort fixed effects, year of marriage fixed effects, commune fixed effects, pre-genocide commune level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for observations from the post-law data cycles. Domestic violence variables are measured for the past 12 months. Severe physical domestic violence cases are when the wife is kicked, dragged, strangled, burnt and threatened with a knife, gun or other weapon. Sexual domestic violence cases are physically forced into unwanted sex and perform sexual acts. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

Table A18: Effect of Being Married After the Genocide Compared to Before on Women's Marital Mismatch (Based on Education)

	Sample: Women whose Age of First Marriage was 15-30
	(1) Being Married to a Man with Incomplete Primary Education as a Woman with Primary Education
GenocideIntensity x Married After the Genocide	0.01*
	(0.01)
Observations	8796
Dependent variable mean	0.08

Notes: This table reports the DID estimates of the effect of being married after the genocide compared to before on women's marital mismatch, exploiting the interaction between i) the spatial variation in genocide intensity which is a proxy for a variation in female-biased sex ratios in the marriage market and ii) the time variation created by the genocide (before-after the genocide). $GenocideIntensity_c$ is a commune level genocide intensity index which is a standardized continuous variable. Rwandan Demographic Health Surveys are used. The sample consists of currently married and divorced women whose age of first marriage is between 15-30 years (the ages most marriages happen in Rwanda). The younger cohort women (married after the genocide but not at the marriageable age during genocide) who did not experience a sex ratio distortion after the genocide is excluded. Women who married more than once are excluded. Estimation includes individual controls, cohort fixed effects, year of marriage fixed effects, commune fixed effects, pre-genocide commune level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for marrying after the genocide. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

Table A19: Effect of the Law on Women's Current Marital Status Being Divorced and Self-Reported (Sexual or Severe Physical) Domestic Violence in the Past 12 Months: Outside of the Catchment Area of the Mills

	Currently Divorced (Ever Married)		Experienced Domestic Violence (Violence Sample)		
	(1) Full Sample	(2) Violence Sample	(3) Married	(4) Ever Married	(5) Ever Cohabitated
GenocideIntensity x Post	0.02***	0.05***	-0.07***	-0.08***	-0.02
	(0.01)	(0.02)	(0.02)	(0.02)	(0.04)
Observations	7737	2417	2251	2413	1609
Dependent variable mean	0.07	0.07	0.17	0.18	0.17

Notes: This table reports the DID estimates of the effect of the law on women who married after the genocide and live outside of the catchment area of a mill, exploiting the interaction between i) the spatial variation in genocide intensity which is a proxy for variation in where violent marriages are more likely to be located before the law and ii) the time variation created by the law (before-after the law). $GenocideIntensity_c$ is a commune level genocide intensity index which is a standardized continuous variable. Rwandan Demographic Health Surveys are used. Domestic violence module questions are asked to a random subsample of the full sample and that is why the violence sample is always smaller compared to the full sample. Column 1, 2 and 4 represent estimating the DID when the sample consists of women who are either currently legally married or divorced at the time of the survey (ever married sample). Column 3 represents estimating the DID with married women only. Column 5 represents results based on ever cohabitated. In all samples, women who married more than once are excluded. All estimations include individual controls, cohort fixed effects, year of marriage fixed effects, commune fixed effects, pre-genocide commune level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for observations from the post-law data cycles. Domestic violence variables are measured for the past 12 months. Severe physical domestic violence cases are when the wife is kicked, dragged, strangled, burnt and threatened with a knife, gun or other weapon. Sexual domestic violence cases are physically forced into unwanted sex and perform sexual acts. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

A2.4 Additional Tables for Section 8: Robustness Checks

Table A20: Placebo Difference in Differences using DHS 2000 and 2005

	(1) Currently Divorced
GenocideIntensity x Post	0.003
	(0.00)
Observations	1996
Dependent variable mean	0.02

Notes: This table reports the DID estimates of the effect of the law on women who married after the genocide, falsely assuming that the law took place between 2000 and 2005, exploiting the interaction between i) the spatial variation in genocide intensity which is a proxy for variation in where violent marriages are more likely to be located before the law and ii) the time variation created by the law (before-after the law). $GenocideIntensity_p$ is a province level genocide intensity index which is a standardized continuous variable. Province rather than commune is used for the geographical unit since the 2000 cycle is not geo-referenced and province (bigger than commune) is the only unit available for analysis. Rwandan Demographic Health Surveys are used. Women who married more than once are excluded. Estimation includes individual controls, cohort fixed effects, year of marriage fixed effects, province fixed effects, pre-genocide province level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for observations from the 2005 cycle. Domestic violence estimate is not estimated because the 2000 cycle did not collect domestic violence data. Standard errors are clustered at the province level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

A2.4.1 Measuring Genocide Intensity

Armed versus Civilian Violence. Rogall (2021) shows that armed-group violence targeted adult men and local, civilian violence induced by the RTLM radio station targeted women, children and elderly in the the 1994 Genocide against the Tutsi in Rwanda. Rogall and Zarate-Barrera (2020) shows that former type of genocidal violence resulted in male scarcity where the latter type resulted in male surplus in Rwanda. The paper argues that genocide-induced gender imbalances led to an improvement in women's outcomes in the long run. It shows that in the areas where armed genocide violence was intense, women are empowered both in 2010 and 2014.

LaMattina (2017) also investigates women's outcomes in 2010. She finds that the impact of the genocide on domestic violence is statistically insignificant in 2010, but woman's decision-making power is still negatively affected. This means that LaMattina (2017) and Rogall and Zarate-Barrera (2020) have opposite results for the long run impact of the genocide in 2010 although they use the same data sources.[1] Rogall and Zarate-Barrera (2020) argues that this may be due to the following reason. The genocide measure used in LaMattina (2017), the genocide intensity index, aggregates armed-group violence and local/civilian violence. Rogall and Zarate-Barrera (2020) argues that LaMattina (2017) may be picking up the impact of a weighted average of the two. Since this paper also uses the genocide intensity index LaMattina (2017) uses, I create a new index which differentiates the two types of violence as a robustness check.

The genocide intensity index is the result of a principal component analysis (PCA) of 6 proxies. The first three proxies are on genocide perpetrators and the remaining ones are on genocide survivors. Rogall (2021) highlights that the Category I perpetrators in the Gacaca Court Records, the category of perpetrators which is used to create the first proxy of the genocide intensity index, reflects armed violence in the 1994 Genocide against the Tutsi in Rwanda. Thus, the first proxy of my genocide intensity index is a proxy for armed violence where the remaining perpetrator proxies are for civilian violence (See Table A1 for all the proxies and information on the genocide data). I create a new genocide intensity index which is the result of a PCA of the armed violence proxy and proxies for survivors and run my main specification with it. This way, the index captures armed genocidal violence only—rather than armed and civilian violence combined—which is documented to result in male scarcity. Results are reported in Table A21 and in line with my main results. As a last point, both authors find that the results on variables related to women's position in the household can differ before and after 2005. This paper sheds light on why: the law.

[1] I also use the Gacaca Court Records and DHS like LaMattina (2017) and Rogall and Zarate-Barrera (2020).

Table A21: Effect of the Law on Women's Current Marital Status Being Divorced and Self-Reported (Sexual or Severe Physical) Domestic Violence in the Past 12 Months using a Genocide Intensity Index Based on Armed Violence Only

	Currently Divorced (Ever Married)		Experienced Domestic Violence (Violence Sample)		
	(1) Full Sample	(2) Violence Sample	(3) Married	(4) Ever Married	(5) Ever Cohabitated
GenocideIntensity x Post	0.01*	0.05***	-0.04**	-0.05**	-0.04
	(0.01)	(0.02)	(0.02)	(0.02)	(0.05)
Observations	8582	2728	2549	2724	1258
Dependent variable mean	0.07	0.06	0.20	0.20	0.21

Notes: This table reports the DID estimates of the effect of the law on women who married after the genocide, exploiting the interaction between i) the spatial variation in genocide intensity which is a proxy for variation in where violent marriages are more likely to be located before the law and ii) the time variation created by the law (before-after the law). $GenocideIntensity_c$ is a commune level genocide intensity index which is a standardized continuous variable. Only armed violence is used in the genocide intensity index. Rwandan Demographic Health Surveys are used. Domestic violence module questions are asked to a random subsample of the full sample and that is why the violence sample is always smaller compared to the full sample. Column 1, 2 and 4 represent estimating the DID when the sample consists of women who are either currently legally married or divorced at the time of the survey (ever married sample). Column 3 represents estimating the DID with married women only. Column 5 represents results based on ever cohabitated couples. In all samples, women who married more than once are excluded. All estimations include individual controls, cohort fixed effects, year of marriage fixed effects, commune fixed effects, pre-genocide commune level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for observations from the post-law data cycles. Domestic violence variables are measured for the past 12 months. Severe physical domestic violence cases are when the wife is kicked, dragged, strangled, burnt and threatened with a knife, gun or other weapon. Sexual domestic violence cases are physically forced into unwanted sex and perform sexual acts. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

Table A22: Effect of the Law on Women's Current Marital Status Being Divorced and (Sexual or Severe Physical) Self-Reported Domestic Violence in the Past 12 Months (Discrete Genocide Intensity Variable)

	Currently Divorced (Ever Married)		Experienced Domestic Violence (Violence Sample)		
	(1) Full Sample	(2) Violence Sample	(3) Married	(4) Ever Married	(5) Ever Cohabitated
GenocideIntense x Post	0.02**	0.04*	-0.07**	-0.08***	-0.06
	(0.01)	(0.03)	(0.03)	(0.03)	(0.05)
Observations	11403	3454	3236	3450	2091
Dependent variable mean	0.07	0.06	0.18	0.18	0.18

Notes: This table reports the DID estimates of the effect of the law on women who married after the genocide, exploiting the interaction between i) the spatial variation in genocide intensity which is a proxy for variation in where violent marriages are more likely to be located before the law and ii) the time variation created by the law (before-after the law). $GenocideIntense_c$ is a commune level dummy variable which takes the value of one if the genocide intensity index is higher than the median value. Rwandan Demographic Health Surveys are used. Domestic violence module questions are asked to a random subsample of the full sample and that is why the violence sample is always smaller compared to the full sample. Column 1, 2 and 4 represent estimating the DID when the sample consists of women who are either currently legally married or divorced at the time of the survey (ever married sample). Column 3 represents estimating the DID with married women only. Column 5 represents results based on ever cohabitated couples. In all samples, women who married more than once are excluded. All estimations include individual controls, cohort fixed effects, year of marriage fixed effects, commune fixed effects, pre-genocide commune level variables (population density and ethnicity) interacted with the *Post* variable which is a dummy for observations from the post-law data cycles. Domestic violence variables are measured for the past 12 months. Severe physical domestic violence cases are when the wife is kicked, dragged, strangled, burnt and threatened with a knife, gun or other weapon. Sexual domestic violence cases are physically forced into unwanted sex and perform sexual acts. Standard errors are clustered at the commune level. Robust standard errors are reported in parenthesis. *** p<.01, ** p<.05, * p<.1.

A3 Proofs

In the theoretical appendix, I provide the proofs of the observations and predictions in Section 3. Observations are outlined in 3.1, Prediction 1 is outlined in 3.2.1, Predictions 2 and 3 are outlined in 3.3.1. Throughout the proofs, an increase in the sex ratio, λ, means a decline in male-scarcity.

A3.1 Proof of Observation 1

The equality below characterize the solution to the maximization problem in Equation 3. $\sigma^*(\lambda, s_w)$ is the equilibrium reservation signal at which the woman is indifferent between accepting and rejecting a proposal as in

$$\underbrace{\frac{-\pi_{\sigma^*} + \mathbb{E}[\xi_w]}{1-\beta}}_{V_M(\sigma^*)} = \underbrace{\frac{s + \beta\lambda \int_0^{\sigma^*} \frac{-\pi_\sigma + \mathbb{E}[\xi_w]}{1-\beta} dF(\sigma)}{1-\beta[1-\lambda F(\sigma^*)]}}_{V_S(\sigma^*)}.$$

Given that σ^* is a function of λ and s_w, denote V_S as $V_S(\sigma^*, \lambda, s_w)$. According to law of total derivative,

$$\frac{\partial V_M(\sigma^*, \lambda, s_w)}{\partial \lambda} = \frac{\partial V_M(\sigma^*, \lambda, s_w)}{\partial \sigma^*(\lambda, s_w)} \frac{\partial \sigma^*(\lambda, s_w)}{\partial \lambda},$$

$$\frac{\partial V_S(\sigma^*, \lambda, s_w)}{\partial \lambda} = \frac{\partial V_S(\sigma^*, \lambda, s_w)}{\partial \lambda} + \frac{\partial V_S(\sigma^*, \lambda, s_w)}{\partial \sigma^*(\lambda, s_w)} \frac{\partial \sigma^*(\lambda, s_w)}{\partial \lambda}.$$

Since $V_M(\sigma^*) = V_S(\sigma^*)$ at σ^*, $\frac{\partial V_M(\sigma^*, \lambda, s_w)}{\partial \lambda} = \frac{\partial V_S(\sigma^*, \lambda, s_w)}{\partial \lambda}$. Thus,

$$\frac{\partial V_M(\sigma^*, \lambda, s_w)}{\partial \sigma^*(\lambda, s_w)} \frac{\partial \sigma^*(\lambda, s_w)}{\partial \lambda} = \frac{\partial V_S(\sigma^*, \lambda, s_w)}{\partial \lambda} + \frac{\partial V_S(\sigma^*, \lambda, s_w)}{\partial \sigma^*(\lambda, s_w)} \frac{\partial \sigma^*(\lambda, s_w)}{\partial \lambda}.$$

Rearranging gives,

$$\frac{\partial \sigma^*(\lambda, s_w)}{\lambda} = \frac{\overbrace{\frac{\partial V_S(\sigma^*, \lambda, s_w)}{\partial \lambda}}^{>0}}{\underbrace{\frac{\partial V_M(\sigma^*, \lambda, s_w)}{\partial \sigma^*(\lambda, s_w)}}_{<0} - \underbrace{\frac{\partial V_S(\sigma^*, \lambda, s_w)}{\partial \sigma^*(\lambda, s_w)}}_{0}} < 0.$$

The negativity of the left hand side of the denominator is due to MLRP. When σ^* increases, it is more likely for the woman to accept the proposal of a violent-type man. So, lifetime expected value of marrying today decreases. The right hand side of the denominator is equal to 0 since σ^* is the solution to the single woman's maximization problem. The numerator is positive after applying

chain rule to get the derivative and assuming that ξ_w is large enough.[2]

A3.2 Proof of Observation 2

Since $\frac{\partial V_M(\sigma^*,\lambda,s_w)}{\partial s_w} = \frac{\partial V_S(\sigma^*,\lambda,s_w)}{\partial s_w}$ and $\frac{\partial V_M(\sigma^*,\lambda,s_w)}{\partial s_w} = 0$, $\frac{\partial V_S(\sigma^*,\lambda,s_w)}{\partial s_w} = 0$. By the law of total derivative,

$$\frac{\partial V_S(\sigma^*,\lambda,s_w)}{\partial s_w} = \frac{\partial V_S(\sigma^*,\lambda,s_w)}{\partial s_w} + \frac{\partial V_S(\sigma^*,\lambda,s_w)}{\partial \sigma^*(\lambda,s_w)} \frac{\partial \sigma^*(\lambda,s_w)}{\partial s_w}.$$

Thus, $\frac{\partial V_M(\sigma^*,\lambda,s_w)}{\partial s_w} = \frac{\partial V_S(\sigma^*,\lambda,s_w)}{\partial s_w}$ yields to

$$0 = \frac{\partial V_S(\sigma^*,\lambda,s_w)}{\partial s_w} + \frac{\partial V_S(\sigma^*,\lambda,s_w)}{\partial \sigma^*(\lambda,s_w)} \frac{\partial \sigma^*(\lambda,s_w)}{\partial s_w}$$

Since I know that $\frac{\partial V_S(\sigma^*,\lambda,s_w)}{\partial \sigma^*(\lambda,s_w)} = 0$, I can rewrite it as $\frac{\partial V_S(\sigma^*,\lambda,s_w)}{\partial s_w}$ in the above expression as in

$$0 = \frac{\partial V_S(\sigma^*,\lambda,s_w)}{\partial s_w} + \frac{\partial V_S(\sigma^*,\lambda,s_w)}{\partial s_w} \frac{\partial \sigma^*(\lambda,s_w)}{\partial s_w}.$$

Thus,

$$\frac{\partial \sigma^*(\lambda,s_w)}{\partial s_w} = -1 < 0.$$

A3.3 Proof of Prediction 1

A3.3.1 Proof of Prediction 1a

$$\frac{\partial \Delta DivorceRate}{\partial \lambda} = \frac{\partial \int_0^{\sigma^*(\lambda,s_w)} \pi_\sigma Q(s_w+1) dF(\sigma)}{\partial \lambda}$$

$$= \pi_{\sigma^*} Q_w(s_w+1) \frac{\partial \sigma^*(\lambda,s_w)}{\partial \lambda} + \int_0^{\sigma^*(\lambda,s_w)} \frac{\partial \pi_\sigma Q_w(s_w+1)}{\partial \lambda} dF(\sigma) < 0$$

$\pi_{\sigma^*} Q_w(s_w+1) > 0$ and $\frac{\partial \sigma^*(\lambda,s_w)}{\partial \lambda} < 0$ due to Observation 1, which makes the left hand side of the summation negative. Since the right hand side of the summation is negative due to Observation 1, $\Delta DivorceRate$ decreases if λ increases. Negativity of $\frac{\partial \pi_{\sigma^*}}{\partial \lambda}$, which makes right hand side of the summation negative is coming from the fact that $\frac{\partial \sigma^*(\lambda,s_w)}{\partial \lambda} < 0$ due to Observation 1 and π_{σ^*} is an increasing function of $\sigma^*(\lambda,s_w)$.

[2] If ξ_w is very small, the single woman will not want to marry. I also exclude the case where s_w is so high that the woman does not want to get married. Both are plausible assumption for the Rwandan context. Non-monetary benefit of marriage is not low due to social norms and on average women's outside options are not very high due to low levels of female education.

A3.3.2 Proof of Prediction 1b

Since $\Delta DVRate = -\Delta DivorceRate$, the proof Prediction 1, $\frac{\partial \Delta DVRate}{\partial \lambda} > 0$, follows from the proof of Prediction 1a.

A3.4 Proof of Prediction 2

$$\frac{\partial \Delta DVRate}{\partial \lambda} = \frac{\partial \int_0^{\sigma^*(\lambda,s_w)} \pi_\sigma(\xi_w - s_w - 1)dF(\sigma)}{\partial \lambda}$$

$$= \pi_{\sigma^*}(\xi_w - s_w - 1)\frac{\partial \sigma^*(\lambda,s_w)}{\partial \lambda} + \int_0^{\sigma^*(\lambda,s_w)} \frac{\partial \pi_\sigma(\xi_w - s_w - 1)}{\partial \lambda} dF(\sigma) > 0$$

Left hand side of the summation is positive since $\pi_{\sigma^*} > 0$, $(\xi_w - s_w - 1) < 0$ and $\frac{\partial \sigma^*(\lambda,s_w)}{\partial \lambda} < 0$. Right hand side of the summation is positive since $\frac{\partial \pi_{\sigma^*}}{\partial \lambda} < 0$ and $(\xi_w - s_w - 1) < 0$. $(\xi_w - s_w - 1) < 0$ due to $(\xi_w - s_w) < 1$.

A3.5 Proof of Prediction 3

$$\frac{\partial \Delta DVRate}{\partial s_w} = \frac{\partial \int_0^{\sigma^*(\lambda,s_w)} \pi_\sigma(\xi_w - s_w - 1)dF(\sigma)}{\partial s_w}$$

$$= \pi_{\sigma^*}(\xi_w - s_w - 1)\frac{\partial \sigma^*(\lambda,s_w)}{\partial s_w} + \int_0^{\sigma^*(\lambda,s_w)} \frac{\partial \pi_\sigma(\xi_w - s_w - 1)}{\partial s_w} - \pi_{\sigma^*} dF(\sigma) < 0$$

for a high enough π_{σ^*}. Left hand side of the summation is positive since $\pi_{\sigma^*} > 0$, $(\xi_w - s_w - 1) < 0$ and $\frac{\partial \sigma^*(\lambda,s_w)}{\partial s_w} < 0$. Right hand side of the summation is negative since $\frac{\partial \pi_{\sigma^*}}{\partial s_w} < 0$ and $(\xi_w - s_w - 1) < 0$. $(\xi_w - s_w - 1) < 0$ due to $(\xi_w - s_w) < 1$.

A3.6 Divorce under the Choice Hypothesis

The divorce rate after the law is as follows:

$$DivorceRate = \int_0^{\sigma^*(\lambda,s_w)} \pi_\sigma Q_m(s_m - d^*_{Post}) Q_w(s_w + d^*_{Post}) dF(\sigma). \quad (1)$$

$Q_m(s_m - d^*_{Post})$ is probability of divorce of the violent man and $Q_w(s_w + d^*_{Post})$ is the probability of divorce of the woman where $d^*_{Post} = \xi_w - s_w$. Since there is no divorce before the law, $DivorceRate = \Delta DivorceRate$.

$$\frac{\partial \Delta DivorceRate}{\partial \lambda} = \frac{\int_0^{\sigma^*(\lambda,s_w)} \pi_\sigma Q_m(s_m - d^*_{Post}) Q_w(s_w + d^*_{Post}) dF(\sigma)}{\partial \lambda}$$

$$= \pi_{\sigma^*} Q_m(s_m - d^*_{Post}) Q_w(s_w + d^*_{Post}) \frac{\partial \sigma^*(\lambda, s_w)}{\partial \lambda} + \int_0^{\sigma^*(\lambda,s_w)} \frac{\partial \pi_\sigma Q_m(s_m - d^*_{Post}) Q_w(s_w + d^*_{Post})}{\partial \lambda} dF(\sigma) < 0$$

$\pi_{\sigma^*} Q_m(s_m - d^*_{Post}) Q_w(s_w + d^*_{Post}) > 0$ and $\frac{\partial \sigma^*(\lambda,s_w)}{\partial \lambda} < 0$ due to Observation 1, which makes the left hand side of the summation negative. Since the right hand side of the summation is negative due to Observation 1, $\Delta DivorceRate$ decreases if λ increases. Negativity of $\frac{\partial \pi_{\sigma^*}}{\partial \lambda}$, which makes right hand side of the summation negative is coming from the fact that $\frac{\partial \sigma^*(\lambda,s_w)}{\partial \lambda} < 0$ due to Observation 1 and π_{σ^*} is an increasing function of $\sigma^*(\lambda, s_w)$. Thus, the relationship between the $\Delta DivorceRate$ and the sex-ratio is again

$$\frac{\partial \Delta DivorceRate}{\partial \lambda} < 0.$$