Armed Conflict and Domestic Violence: Evidence from Rwanda

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Abstract

The 1994 Rwandan genocide deeply affected the structure of the population by decreasing the sex ratio, the relative number of men and women. In addition, those living in urban areas with an educated background were more likely to be killed during the mass slaying, which resulted in a loss of human capital (De Walque and Verwimp, 2010). This study uses data from the 2005 Rwanda Demographic and Health Survey and employs an empirical strategy similar to differences-in-differences to study how the demographic changes caused by the genocide affected domestic violence and other marriage outcomes. I find that women who got married after the genocide in provinces where the sex ratio decreased more were more likely to become victims of intimate partner violence. I also find that they married less educated husbands. The results are consistent with a one-sided spousal search model, where women lower their reservation values as a consequence of the scarcity of men and the deterioration of the quality of potential husbands caused by the genocide.
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1 Introduction

In 1994, between April 6 and July 17, about 800,000 of Rwanda's population of seven million were killed in a genocide. The genocide deeply affected the marriage market by changing the structure of the population. The sex ratio, the relative number of men and women, dramatically decreased for three reasons: more men than women were killed during the three months of violence; male groups of ex-soldiers and genocide perpetrators fled to neighboring countries, and thousands of men were imprisoned for crimes related to the genocide[1]. In addition, De Walque and Verwimp (2010) find that those in urban areas and with more educated backgrounds were more likely to be killed during the genocide. These facts indicate that the genocide created a scarcity of men and a deterioration of the pool of potential husbands for women of marriageable age.

This paper investigates how the genocide affected the probability that a woman becomes a victim of domestic violence using data from the 2005 Rwandan Demographic and Health survey. The empirical strategy employed is similar to a differences-in-differences estimation and relies on comparing women who married before and after the genocide in provinces that were differently affected by the genocide. My results indicate that women who married after the genocide in provinces where women outnumbered men more as a consequence of the mass slaying were more likely to have been victims of intimate partner violence at least once during their marriage. The results are robust to different specifications of the dependent variable and to numerous robustness checks.

I interpret the results in the framework of a spousal search model where women lower their reservation quality as a consequence of the scarcity of men and the deterioration of the quality of potential husbands caused by the genocide, leading to a lower quality of the matches formed after the genocide. Within this framework, I also consider a direct effect of the genocide on domestic violence through post-traumatic stress disorder of men who participated in the killings. The hypothesis that the genocide leads to a decrease in the match quality is supported by the fact that women who married after the genocide in provinces where the sex ratio decreased more are less likely to be matched to a spouse with higher educational attainment and more likely to marry a man with no education. I also find some weaker evidence that women who married after the genocide in provinces where the sex ratio decreased more are less likely to have decision power on purchase and to use contraception methods. I control for numerous measures of genocide intensity created by Verpoorten (2010) and do not find evidence that the results are driven by men's exposure to violence or post-traumatic stress disorder. The effect of the sex ratio decline on domestic violence seems to be stronger and more precise for literate women.

The contribution of this paper to the literature is twofold. This study is related to the literature that studies the consequences of the Rwandan genocide at the microeconomic level. Verpoorten and Berlage (2009) studied the effect of the genocide on income mobility. Akresh et al (2011) studied the impact of localized crop failure and armed conflict on the health status of children. They found that in poor and non-poor households, boys and girls born during the conflict in regions experiencing fighting are negatively impacted with height for age z-scores 1.05 standard deviations lower. Akresh and De Walque (2010) combined two cross-sectional household surveys collected before and after the genocide to examine the impact of the genocide on educational attainment of children and found a strong negative impact of the genocide on schooling. Schindler (2010, 2011) investigated the determinants of intra-household

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[1]http://www.jha.ac/greatlakes/b001.htm

time allocation in post-war Rwanda and the effect of the genocide on fertility. This paper adds to the literature by studying the effect of the genocide on match quality in the marriage market, as measured by the incidence of domestic violence and husband's education.

This study is also related to the recent strand of the literature that studies how the marriage market and the labor market affect domestic violence. Bloch et al. (2002) studied the relationship between dowries and domestic violence in India and showed that a woman who comes from a wealthy family is more likely to be beaten by her husband in an effort to extract higher transfers from her parents. Stevenson and Wolfers (2006) found that the introduction of unilateral divorce laws decreased domestic violence and spousal homicides in the United States. Aizer(2011) showed that reductions in the gender wage gap can account for the recent decline in domestic violence in California. This paper adds to this literature by showing that the scarcity of men along with the deterioration of the quality of potential husbands caused by the genocide increased intimate partner violence in households that formed after the genocide. These findings add to our understanding of the determinants of intimate partner violence, which is crucial to fight poverty because domestic violence has a negative effect on women and children and can contribute to create poverty traps (Aizer, 2010).

The results of this paper are important in the context of post-genocide Rwanda, where women's empowerment has long been considered the key to reconstructing the economy. The genocide had adverse consequences on the marriage prospects of younger women and increased their likelihood of being victims of domestic violence. The negative effect of intimate partner violence on the health of women and children can have long-lasting adverse consequences that go beyond the generation directly affected by the genocide.

2   Background

The event that triggered the massacres was the abatement of President Juvenal Habyarimana's plane on April 6, 1994. On that night, the killings of Tutsi and moderate Hutu began in the capital, Kigali city, and quickly spread throughout the country. Until the mid of May, young and adult men were the principal targets of the killings, while women, children and the elderly were often spared from death. Thousands of women were raped. By mid-May, the authorities ordered the final phase and the extermination of women and children began (des Forges, 1999). Although thousands of women were killed during the genocide, many more men were killed. This lead to a severe gender imbalance in the aftermath of the genocide, and a very high number of widows.

De Walque and Verwimp analyzed the distribution of excess mortality in 1994 using data from the siblings' mortality module of the 2000 Rwanda Demographic and Health Survey and found that the genocide dramatically affected the population composition of Rwanda. Adults, especially males, and individuals with an urban or educated background were more likely to die. Their research indicates that the genocide represented a huge negative shock for the human capital in Rwanda, since the more educated and urban groups of the population were more likely to be victims.

A few studies have investigated the effect of the genocide on the marriage market. Jayaraman et al. (2009) studied the effect of the genocide on age at marriage and age at first birth using data from the 2005 DHS. They found that women living in clusters accounting for a larger

proportion of sibling deaths in 1994 married at an older age and had children later compared to those living in clusters accounting for a lower proportion of sibling deaths. The authors suggest that this result could be driven by the disruption of social networks for women living in areas highly affected by the genocide or by a shortage of men. Schindler (2010) analyzed the effect of the genocide on time allocation within the household using data from the *Enquête Intégrale sur les Conditions de Vie de Ménage.* She found that local marriage markets, proxied by sex ratios at the province and cohort level had an impact on the division of labor. Schindler and Bruck (2011) investigated the effect of the genocide on fertility using the 1992, 2000 and 2005 waves of the Rwanda DHS. They found that fertility increased for the women who lost a son in the year of the genocide, suggesting a replacement effect.

Following Abramitzky et al., we then use province-level data from the 1991 and 2002 censuses and apply a differences-in-differences approach. Specifically, we estimate:

$$Y_{p,t} = \alpha + \beta \Delta SR_{p,t} * PG_t + \gamma PG_t + \delta_p + \epsilon \tag{1}$$

where $Y_{p,t}$ is the percentage of women of a particular marital status (married or single) in province p at time t. δ_p is a province dummy that captures time-invariant province level factors. PG_t is a post-genocide dummy that equals one if the observation $Y_{p,t}$ comes from the 2002 census and zero otherwise. $\Delta SR_{p,t}$ is the absolute level of the change in the sex ratio that occurred in province p between 1991 and 2002[2]. Since the sex ratio decreased in all provinces, the higher $\Delta SR_{p,t}$ the more the sex ratio decreased between 1991 and 2002. Equation 1 is estimated using an ordinary least square model.

The results are showed in Table 1. The fraction of married women age 30-44 decreased after the genocide.

3 Theoretical framework

The impact of the genocide on domestic violence can be interpreted in the framework of a simple one-sided search model (Mortensen, 1970). Consider a single woman who is willing to marry and is searching for a husband. Her information concerning the nature of existing single men is imperfect but she knows the quality distribution of the potential husbands. The quality of the potential husbands depends on numerous variables, such as their wage, educational level, how caring they are, and their propensity towards domestic violence. The higher a man's wage and educational attainment, the higher his quality as potential husband. The higher the man's propensity to domestic violence, the lower his quality as potential husband. In each period, the woman receives a marriage offer from a man with probability λ. Each man is characterized by quality q, drawn from a distribution F. If a marriage proposal arrives, the woman decides whether to accept it. If the woman rejects the offer the process repeats in the next period. The best strategy for a woman is to select a reservation quality q_R before an offer is received. As in standard in optimal stopping problems, the woman accepts a marriage proposal if and only if the offer quality exceeds her reservation level.

A woman's reservation quality depends on the average quality of the pool of potential husbands $\bar{q}$, the arrival rate of marriage proposals λ, and the value of being single b.

$$q_R = f(\bar{q}, \lambda, b) \tag{2}$$

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[2]The sex ratio is computed as described later in the paper

After an increase in the average quality of potential husbands, women become more selective and increase their reservation quality. An increase in the arrival rate of marriage proposals would also lead women to raise their standards. Similarly, an increase in the value of being single would make women more choosy by increasing the value of their outside option.

This paper considers four possible mechanisms through which the genocide could affect women's reservation quality in the context of a one-sided spousal search model:

1. **Scarcity of men** The relative number of men to women decreased after the genocide for various reasons: more men were killed than women; male genocide perpetrators and former soldiers fled to neighboring countries, and many more men than women were imprisoned for crimes related to the genocide. The sex ratio is a key determinant of the marriage prospects and distribution of the gains from marriage between men and women (Becker, 1981). A decrease in the sex ratio reduces the chances that a woman receives a marriage proposal in every period.

2. **Deterioration of the quality of men**. There is a concern that during the mass slaying the more violent men had a higher probability of surviving. Moreover, recent research by Verwimp and De Walque (2009) showed that young, educated men living in urban areas were the most likely to die. It could be the case that the men living in Rwanda after the genocide were positively selected with respect to their propensity towards violence. This would decrease the average quality of potential partners.

3. **Post-traumatic stress disorder for men.** Genocide perpetrators could suffer from post-traumatic stress disorder and become more prone to violence. If men were more prone to violence after the genocide, the average quality of potential grooms $\bar{q}$ would decrease.

4. **A decrease in the value of being single.** During the genocide women were often victims of rape. The increased vulnerability of women could lead them to value protection from men more after the genocide. The value of being single would decrease[3].

In summary, the genocide reduced the average quality of potential grooms, the arrival rate of marriage proposals and the value of being single. The model implies that women of marriageable age chose a lower reservation quality after the genocide and that the quality of the realized matches decreased. Holding all other variables that affect husband's quality constant, the model predicts that women who married after the genocide were more likely to be abused by their husbands and to marry men with lower educational attainment. If we allowed for post-marriage intra-household bargaining, we would expect women who get married when the marriage market is tighter to have lower decision-making power within the household.

The analysis of De Walque and Verwimp (2010) suggests that the sex ratio decreased more for more educated women. They find that adult male with an educated background were more likely to die. Since educated women tend to marry educated men, the genocide disproportionately impoverished the marriage market for more educated women (in the 1991 Census 37 percent of the population was married to someone with a different literacy status; in 2002 this percentage decreased to 34 percent of the population). Therefore we would expect the effect of the sex ratio on domestic violence to be stronger for literate women.

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[3]In a model with random matching and endogenous separation the genocide would lead to an increase in the threshold needed for separation.

The predictions of the model are also consistent with a story where most Tutsi men are killed, intermarriage between Tutsi women and Hutu men increased after the genocide and Hutu husbands maltreat their Tutsi wives more because of their ethnicity. This story would also be consistent with more educated women suffering more from the sex ratio decline if Tutsi were on average more educated. Unfortunately the data do not allow to directly investigate this mechanism: after the genocide, the Rwandan government prohibited gathering information about someone's ethnicity thus individual ethnicity is not available in the data. However, this mechanism is consistent with the model depicted above. The decrease in the sex ratio among Tutsi could lead Tutsi women to lower their reservation value and marry outside of their ethnicity, ending up in a lower quality marriage.

4   Data

The main data of interest come from the 2005 Demographic and Health survey in Rwanda. This is one cross-section of a nationally representative household survey that collected detailed information on health and nutrition. The survey contained a core questionnaire and a module about domestic violence. About 10,900 people between 15 and 63 years old received the core questionnaire, and 3,880 women between 15 and 49 years old received the domestic violence module. Multiple women in the household received the core questionnaire, but only one woman in each household was selected to receive the domestic violence module. In this way the inter-viewers could assure women that no one else in the household knew what had been discussed in the domestic violence module. Women were asked about the details of the relationship with their current or former partner. Regarding intimate partner violence, they were asked if they had ever been victim of some aggressive behaviors, such as pushing, shaking, throwing some-thing, slapping, twisting an arm, striking with a fist or with something that could hurt, kicking or dragging, trying to strangle or burn, threatening with a knife, gun, or other type of weapon, and attacking with a knife, gun, or other type of weapon. In addition, women were asked if they had ever been victims of sexual violence by their current or former partner. Women who reported having been victimized by their partners at least once were also asked how many times the violence had happened in the past year. I construct a variable that takes value one if a woman has ever been the victim of any form of violence by her current or former partner and zero otherwise.

The sample for my main analysis consists of women who received the domestic violence module and had been in only one union at the time of the interview. Since the survey provides information only about the timing of a woman's first marriage and identifying the time of marriage is crucial in my empirical strategy, I exclude from the sample women who had been in more than one union at the time of the interview. I exclude women who married in the four months during which the genocide occurred[4]. Anecdotal evidence suggests that during the genocide some women were forcedly married to militia men and some Tutsi women married Hutu men in order to escape slaughter. Since I do not want to pick up the effect of these anomalous marriages, I drop the unions that formed during the genocide[5]. I also exclude from the main sample women who were separated or divorced and women living in polygynous households, because separation and polygyny could be endogenous. In particular, severe domestic violence is considered an acceptable reason for marital separation. This leaves me with 1,687 women.

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[4]April, May, June and July of year 1994.
[5]The results are very similar when the observations are included.

Table 2 contains summary statistics for the variables used in the sample. On average, women who married after the genocide were less likely to have been victimized by their husbands. There are two possible reasons for this. First, women who married after the genocide have been in their marriage for 14 years less on average than women who married before the genocide. It could be the case that some women who married after the genocide had not been in their marriage long enough for the first episode of violence to occur. It is therefore important to control for years since marriage when I analyze the effect of the genocide on domestic violence by comparing women who married after the genocide to women who married before. Second, women who married after the genocide were on average younger. It could be the case that younger cohorts have a more modern view of gender roles and are less tolerant of domestic violence. As a consequence we I control for cohort fixed effects when I study the effect of the genocide on domestic violence.

The second source of data is the Rwandan Census of Population administered in 1991 and 2002[6]. I use the Census data to construct a measure of the sex ratio and a measure of the quality of potential husbands. Identifying the relevant marriage market is crucial for the analysis. In the DHS sample, the average age difference between husband and wife is five years, both before and after the genocide. I define the sex ratio as the number of men age 20-44 over the number of women age 15-39 living in a certain province in a given census year. The definition takes into account that the average age difference between husband and wife is 5 years. 98 percent of the women in the sample got married after age 15 and before age 40. The definition also takes into account the fact that people tend to marry locally. According to Census data, 85% of the population married someone who was born in the same province of birth. I assign to each woman in the DHS sample a measure of sex ratio in the province she is living in at the time of the survey. There might be a concern that the sex ratio was measured poorly because of interprovince migration. However, only 15% of the population in the census lived in a province different from their province of birth. Also the population displacement that occurred after the genocide should not invalidate the identification strategy, because most displaced individuals returned to their same province of birth (Akresh and De Walque, 2011). I also construct two variables that measure the quality of men in the marriage market: the percentage of men age 20-44 living in the province who are literate and male employment in the formal sector (for men age 20-44). The latter variable is a ratio of the men age 20-44 who are employers or employees over all the men age 20-44 in the active population.

Table 3 shows the sex ratios among non-institutionalized individuals at the province level in 1991 and 2002. In 1991 the sex ratio was lower than one in all provinces with the exception of the capital, Kigali city. The capital attracts primarily young men who move there for work reasons and students. In 2002, the sex ratio among non-institutionalized men was lower than one in all provinces, and in seven provinces out of 11 it dropped below 0.6. Table 4 also shows the correlation between the sex ratio in 2002 and measures of participation in the genocide at the province level reported by Friedman (2011). The correlation between the numbers of perpetrators from Gacaca and the sex ratio in 2002 is -0.515. The sex ratio in 2002 was lower in provinces where more people were accused of crimes related to the genocide[7].

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[6]Minnesota Population Center. *Integrated Public Use Microdata Series, International: Version 6:1* Machine-readable database]. Minneapolis: University of Minnesota, 2011. Original source: Rwanda National Institute of Statistics.

[7]The sex ratio outside of the city in 1991 might appear surprisingly low. The sex ratio is higher in levels in 1991 and 2002 when I measure it as the ratio of the number of males aged 15 to 44 to the number of females aged 15 to 44 (see Table A1 in the Appendix). However, the magnitude of the change in the sex ratio between

4.1 The effect of the genocide on domestic violence.

I study the effect of the genocide on match quality for unions that formed after the genocide. The first measure of match quality that I use is the incidence of intimate partner violence. I test the hypothesis that women who married after the genocide in provinces where the sex ratio decreased more were more likely to be victimized by their husbands. The empirical strategy utilized is similar to differences in difference. Using the 2005 wave of the Rwanda Demographic and Health survey I study how the changes in the population structure caused by the genocide affected the marriage outcomes for women who married after the genocide compared to women who married before[8]. So this paper uses a single cross section of data and utilizes individual differences in the timing of marriage to create variation over time. The analysis focuses on studying the effect of the genocide on the marriage market. One important determinant of marriage market outcomes is the sex ratio, the relative number of men and women. I think you should show that the sex ratio is strongly correlated with the genocide and the genocide was not correlated with marriage market outcomes.

This should go in the introduction/literature review(Previous studies have shown the impact of sex ratios on female labor force participation (Angrist, 2002), educational attainment of men and women (Lafortune, 2010), marriage and fertility (Brainerd, 2007; Kvasnicka and Bethmann, 2007), assortative matching (Abramitzky et al., 2010), and bargaining power (Porter, 2011; Francis, 2011). A couple of recent studies analyzed the effect of the change in the sex ratio caused by the Rwandan genocide on the division of labor within the household (Schindler, 2010) and on fertility (Schindler, 2011).

In general, studying the effect of a change in the sex ratio on marriage and family outcomes is difficult because the sex ratio may not be endogenous and the variation in the data is usually very low. Previous research has overcome this problem by using shocks in military mortality (Abramitzky et al., 2010; Brainerd, 2007), the fact that immigrants to the United States in the first half of the 20th century were mostly males together with a preference for endogamy among second-generation immigrants (Angrist, 2002; Lafortune, 2010; Schmierer, 2011), and higher incarceration rates for African American in the United States (Charles and Luoh, 2010; Mechoulan, 2011). I utilize the variation created by the genocide over time and across provinces in Rwanda to study how changes in local marriage market conditions affected the probability that a woman becomes a victim of domestic violence.)

Consider the specification:

$$Y_{i,p,t} = \alpha + \beta SR_{p,t} + \gamma PG_t + \delta_p + \pi X_{p,t} + \sigma X_i + \eta_c + \epsilon \tag{3}$$

where i is a woman, p is a province, t is the year of the marriage, c is the cohort of the woman. δ_p is a province dummy that captures time-invariant province-level factors such as local attitudes towards women and legal enforcement. PG_t is a post-genocide dummy variable that equals one if the marriage happened after the genocide. The independent variable of interest is the province-level sex ratio, $SR_{p,t}$. $X_{p,t}$ are province-level controls and X_i are household-level

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1991 and 2002 computed using this alternative measure is very similar to the one reported in Table 5. The ratio of the number of males aged 20 to 44 to the number of females aged 15 to 39 remains my preferred specification because it takes into account the average age difference between husband and wife.

[8]In order to address the potential endogeneity of the timing of marriage, I tried to use a different empirical strategy that relied on comparing women who were 19 (the average time at first marriage) after the genocide to women who were 19 before it. The results were very similar to the baseline specification

controls. Similarly to Abramitzky et al. (2010), the sex ratio is not measured at the time of the wedding but rather at the census year closest to the wedding. Marriages in the period from 1969 to March 1994 use the 1991 sex ratio, and marriages in the period from August 1994 to 2005 use the 2002 sex ratio. Therefore we could write:

$$\beta SR_{p,t} = \beta SR_{p,1991} * (1 - PG_t) + \beta SR_{p,2002} * PG_t \qquad (4)$$

$X_{p,t}$ includes the percent of literate men aged 20-44 in the province at the time of the wedding and the fraction of the male aged 20-44 who are employed in the formal sector. These variables are created using Census data and, similarly to the sex ratio, they are not measured at the time of the wedding, but rather at the census year closest to the wedding. These variables measure the quality of the pool of potential husbands in the province.

X_i includes characteristics of the woman, such as age at marriage, years of education, whether she is currently working and her occupation. X_i also includes years of education and occupation of the husband[9], an indicator for whether the marriage is informal, a dummy that equals one if the household lives in an urban area and zero otherwise, years since marriage entered as a cubic and dummies for quintiles of the distribution of a wealth index.

I estimate equation 3 with a linear probability model. Note that our measure of the sex ratio, $SR_{p,t}$, varies at the province level. In this case the error term includes a group component to allow for within group serial correlation. I cannot estimate the regression clustering the errors at the province level because the number of provinces - eleven - is too low. I use the two-step estimator suggested by Donald and Lang (2007). I first regress outcomes on all individual level variables X_i, a full set of province dummy variables δ_p and a full set of $PG_t*\delta_p$ interaction dummy variables, where PG_t is the post-genocide marriage dummy. Second, I take the estimated coefficients from these province indicators and from the $PG_t*\delta_p$ interaction terms (twenty-two estimated coefficients) and use them as the outcomes in a second stage regression. This second stage involves regressing the estimated coefficients on a post-genocide marriage indicator PG_t, the $Sexratio_{p,t}$ measure and a set of province indicators. The standard errors obtained from this second stage regression are calculated taking into account within-group correlation.

The results reported in Table 6 confirm the prediction of the spousal search model: women who married after the genocide in provinces where the sex ratio decreased more are more likely to be victims of domestic violence. The size of the effect is significantly large: the coefficient estimate in column 4 says that a one standard deviation decrease in the sex ratio increases the probability that a woman is victim of domestic violence at least once in their life by 65 percent. This in equivalent to a 23 percentage points decrease in the probability of being victim of intimate partner violence.

Age at marriage has a negative effect on the probability of being a victim of intimate partner violence: a one standard deviation increase in woman's age at marriage decreases the probability that she is abused by her husband by 14 percent; this is equivalent to a decrease in 5 percentage points. Being in an informal marriage increases the probability of domestic violence by 6.5 percent. Religion and wealth do not have any effect on the probability of intimate partner violence. The woman's education is negatively correlated with domestic violence, but the coefficient estimate is not statistically significant. Husband's education reduces the probability

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[9]Interestingly, all the husbands in the sample are currently working. Rwanda is a rural economy and virtually nobody is unemployed.

of domestic violence: an increase by one standard deviation in the husband's years of schooling reduces the probability of domestic violence by 10 percent, which is equivalent to a decrease of 3.5 percentage points. Living in an urban area reduces domestic violence but the result is not statistically significant at the standard level. The inclusion of the percent of literate men at the province level does not change the effect of the sex ratio on the probability of domestic violence. The coefficient on the sex ratio becomes less negative and the estimate becomes less significant when I add male employment in the formal sector. However, the effect of the sex ratio is still negative and statistically significant at the 10 percent level[10].

4.2   Robustness checks

I perform various robustness checks to test how the results change when I modify the sample. The results are reported in Table 7.

- During and after the genocide the country experienced large outflows of people. The majority of the refugees returned to Rwanda in 1996[11]. (Gourevitch, 1999). There may be a concern that the sex ratio is measuring the marriage market in an imprecise way for the unions that formed between April 1994 and December 1996. To address this concern I exclude all the marriages that formed in the years 1994, 1995 and 1996. The effect of the sex ratio is larger when I dropped the unions formed in the years 1994-1996 and still statistically significant.

- I excluded separated and divorced women from the main sample. The reason is that divorce and separation status are likely to be endogenous, as they are affected both by the marriage market and by the occurrence of domestic violence. As a robustness check I include in the sample women who were divorced or separated. The results are very similar to the baseline specification. There is a positive and significant correlation between being separated or divorced and having been abused by the last partner.

- I excluded polygynous households from the main sample. I include them as a robustness check. There is a positive and significant correlation between living in a polygynous household and having been a victim of domestic violence.

- Large migration flow would also result in the sex ratio to be a poorly measure of the marriage market. The durvey does not provide a full migration history but I observe for how many years the respondent has lived in the village, town, or city where she was interviewed.I drop the women who moved to the current place of residence after the genocide. Although this significantly reduces the sample size by more than a half, the results are very similar to the baseline specification.

These results show that women who married after the genocide in provinces where the sex ratio decreased more are more likely to be victimized by their husbands. The coefficient estimate on

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[10]The results are robust to using a sex ratio defined as the ratio of the number of males aged 15 to 44 to the number of females aged 15 to 44, though the coefficient on the sex ratio is slightly less precisely estimated. The descriptive statistics for this alternative measure of the sex ratio are reported in the Appendix.

[11]Following unrest in the eastern region of the Democratic Republic of Congo, more than 600,000 refugees returned to Rwanda in November 1996. This massive wave of repatriation was followed at the end of December 1996 by the return of another 500,000 from Tanzania (World Bank, 2003).

the sex ratio remains statistically significant after including a large set of individual controls and two alternative measures of the quality of the men available for marriage. This suggests that there is an effect of men scarcity on domestic violence that goes beyond the effect of the deterioration in the quality of the men. I know explore the effect of the sex ratio decline on other marriage outcomes.

4.3 Husband's education

I measure the effect of the decline in sex ratio and the deterioration of the quality of men on assortative matching along education. A decline in the sex ratio leads women to lower their reservation quality in terms of husband's educational attainment. The deterioration of the quality of the men, measured in terms of human capital, would have a similar effect. The sample used in this analysis is different from the sample used in the analysis of domestic violence, because I have information on husband's education for a larger number of women. Moreover, I can include in the sample all women who ever married, including widows and separated or divorced women. I still drop women living in polygynous households. The sample consists of roughly 5,300 observations. I use as dependent variables the difference in educational attainment between husband and women and a dummy variable that takes value one if the husband has no education and I estimate equation 3 using OLS. The results are reported in Table 6. The difference in education between husband and wife is lower for women who married after the genocide in provinces where the sex ratio decreased more. I also find that women who marry after the genocide in provinces where men were scarcer were more likely to marry a man with no education. These coefficient estimate on the sex ratio is statistically significant to controlling for the percentage of literate men in the province, but becomes insignificant when we use male employment in the formal sector as a measure of the quality of marriageable men. These results suggest that men "marry up" and women "marry down" after the genocide. The results are similar to the findings reported by Abramitzky (2010). However, I cannot disentangle whether the effect was driven only by the scarcity of the men and/or the deterioration of the quality of men in this case.

4.4 Bargaining power

The model described in section 3 is a search model in a non-transferable utility framework. The finding that women "marry down" and are more likely to be victimized after the genocide provides evidence for such model. In this section I examine the effect of the sex ratio decline on bargaining power of women. I estimate equation 3 using as dependent variable a dummy that takes value one if the woman has the final say on daily purchases and zero otherwise and a dummy variable that takes value one if the woman is currently using any contraceptive method[12]. I find some evidence that lower sex ratios are associated with lower decision-making power for women who married after the genocide. I find that women who married after the genocide in provinces where the sex ratio declined more are less likely to use a contraception method. I control for the number of children ever born and the number of children who died, because I want to partial out a "replacement effect"[13]. I find that women who married after the genocide

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[12]I also studied the effect of the decrease in the sex ratio on a dummy variable that takes value one if the woman has the final say on large purchases but found no effect.

[13]Schindler(2011) found that the demand for children increased for the women who lost a child in 1994.

in provinces where the sex ratio declined more are less likely to use a contraception method. I control for the number of children ever born and the number of children who died, because I want to partial out a "replacement effect"[14]. These results are interesting because previous research showed that income in the hands of a mother has a bigger effect on her family's health than income under the control of a father (Thomas, 1990), and that the ability to optimally time births with modern birth control methods results in improved outcomes for children (Do and Phung, 2010).

4.5 Heterogeneous effects

De Walque and Verwimp (2010) find that adult men with an educated background were more likely to be killed during the genocide. From the Census data we know that educated women were more likely to be married to educated men. The fact that men with an educated background were more likely to die and that educated women were significantly more likely to marry educated men means that the pool of marriageable men for literate women might have been severely depleted after the genocide. If the marriage market had a role in the effect of the genocide on domestic violence, we would expect the effect of the sex ratio to be stronger for educated women, because their marriage market has been more severely affected by the genocide. Table 8 shows the results when I run equation 3 separately for literate and illiterate women. The effect of the sex ratio on domestic violence seems to be driven mostly by literate women. The coefficient estimate on the sex ratio is statistically significant at 1 percent level for literate women and not statistically significant for illiterate women. In terms of magnitude, a one standard deviation decrease in the sex ratio increased the probability of becoming a victim of domestic violence by 31 percentage points for literate women and by 14 percentage points for illiterate women.

4.6 The effect of post-traumatic stress disorder of men who participated in the killings

In this section I investigate whether the results could be driven by the effect of direct exposure of men to the genocide. I include in the regression various indicators of genocide intensity that Verpoorten(2010) constructed using data from the Gacaca records and other sources. The Gacaca courts are part of the Rwandan transitional justice system. Verpoorten (2010) combined the information contained in the Gacaca records about the number of persons accused of being genocide perpetrators and the number of genocide survivors with various sources to construct the following variables at the sector level:

- Measures of genocide participation:
    1. **gp1** Category 1 suspects (% 1994 population)
    2. **gp2** Category 2 suspects (% 1994 population)
- Measures of genocide survivorship
    1. **gp4** Widowed genocide survivors (%1994 population)
    2. **gp5** Orphaned genocide survivors (%1994 population)

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[14]Schindler(2011) found that the demand for children increased for the women who lost a child in 1994.

- Measures of Genocide death toll: genocide death toll as a % of 1994 Tutsi population

    1. $gp7c - rem$ corrected for under-reporting of Tutsi and excluded anomalous values
    2. $gp7c - cen$ corrected for under-reporting of Tutsi and anomalous values censored to zero.

I aggregate all the variables at the province level and I interact them with the dummy variable for marrying after the genocide, PG_t. I include the interaction effect between each genocide indicator and PG_t in regression 3 one at the time, using as dependent variable the occurrence of domestic violence. Specifically, I estimate equation 5:

$$Y_{i,p,t} = \alpha + \beta SR_{p,t} + \varsigma gp * PG_t + \gamma PG_t + \delta_p + \pi X_{p,t} + \sigma X_i + \eta_c + \epsilon \qquad (5)$$

Where gp is the measure of genocide intensity. Table 9 report the results. The heading of the column says which genocide indicator was used in the regression. The coefficient estimates on the indicators of conflict intensity interacted with the marriage time dummy are never significant when the sex ratio is included [15] All these variables are highly correlated with the sex ratio (for example the correlation between the sex ratio and the gp2 indicator is -0.65). The coefficient estimate on the sex ratio stays statistically when I control for the indicators of genocide intensity. When I control for the quality of the available men, the coefficient on the sex ratio in column 2 becomes marginally insignificant. This indicator of genocide intensity used in column 2, *gp2*, represents the percentage of the population in the province that was accused of actively participating in the killings. It might measure post-traumatic stress disorder among men: men who participated in the killings and killed their neighbors and co-citizens are now traumatized and become more violent at home. This measure is highly correlated with the sex ratio (the correlation between the two variables in 0.65) and the data do not allow to estimate precisely the effect of two variables when they are both included in the regression. However, the coefficient estimate on gp2 is not statistically significant [16], suggesting that the effect of the decline in sex ratio on domestic violence is not likely to be driven by post-traumatic stress disorder among men.

De Walque and Verwimp (2010) found that adult men with an educated background were more likely to die. Their findings suggest that the effect of the sex ratio decline should be stronger for literate women, given that literate women were more likely to marry literate men. In panel B I estimate equation 5 for literate women only. The coefficient estimate of the sex ratio is always statistically significant. In particular, it stays significant when I include measures of the quality of men together with gp2*PG in the regression. On the other hand, the coefficient estimate on gp2*PG or other indicators of genocide intensity is not statistically significant when I control for the sex ratio[17]. These results provide further evidence that the effect of the genocide on domestic violence is likely to be driven by the decline in the sex ratio rather than post-traumatic stress disorder among men who participated in the killings. For completeness, I also estimate equation 5 for literate men only. The results are not statistically significant and they are reported in Panel C.

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[15]The estimated coefficients for the indicators of genocide intensity are reported only for the specification in Panel A. The estimated coefficients are not statistically significant in the specifications of Panels B and C

[16]gp2*PG is statistically significant when we do not control for the sex ratio

[17]These estimates are not reported in the table but they are available upon request.

4.7 Other mechanisms

4.7.1 Post traumatic stress disorder for women

(Note: these results are not reported but are available upon request). Following Schindler (2011) I use information about siblings' mortality and construct an indicator variable that takes value one if the woman lost a sibling in 1994 - the year of the genocide. I use this variable as a proxy for individual exposure for the genocide[18]. I interact this indicator with a dummy for getting married after the genocide. I test whether individual exposure to the genocide makes women more vulnerable to domestic violence. As mentioned before, one mechanism through which the genocide could affect domestic violence is by decreasing the value of being single. As a result of the extreme violence experienced during the mass slaying, women might value protection more after the genocide and thus lower their reservation value for a groom. I estimate the following specification:

$$Y_{i,p,t} = \alpha + \beta SR_{p,t} + \gamma PG_t + \lambda Sib_{Death1994} + \theta Sib_{Death1994} * PG_t + \delta_p + \pi X_{p,t} + \sigma X_i + \eta_c + \epsilon \quad (6)$$

Where $SR_{p,t} = SR_{p,1991} * (1 - PG_t) + \beta SR_{p,2002} * PG_t$ as in equation 4. The loss of a sibling in 1994 does not affect the probability that a woman becomes a victim of domestic violence. If anything, there seems to be a *negative* effect: direct exposure to the genocide decreases the likelihood that a woman is victimized by her husband, although the result is not statistically significant. The effect of the sex ratio is robust to controlling for the death of a sibling in 1994[19].

5 Conclusion

This paper studied the effect of changes in the population structure caused by the 1994 Rwandan genocide on domestic violence. I find that women who married after the genocide in provinces where the sex ratio decreased more were more likely to become victims of intimate partner violence. The size of the effect is big: a one standard deviation decrease in the sex ratio increased the probability that a woman is victimized by her partner by 23 percentage points. I provide some evidence that the effect is likely to be driven by the decrease in the sex ratio rather than by a decrease in the quality of the men due to selection in the killings or to post-traumatic stress disorder that would make all men more violent. The results are consistent with the predictions of a spousal search model where women lower their reservation quality as a consequence of the genocide. I also find that women "marry down" in terms of education in provinces where the sex ratio decreased more. These results shed new light on the long-term consequences of the Rwandan genocide at the household level.

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[18]See Schindler (2011) for detailed explanation about this variable and De Walque and Verwimp for detailed explanation about the siblings' mortality module and the distribution of excess mortality among siblings in the Rwanda Demographic and Health Survey.

[19]I tried to use various measures to proxy for direct exposure to the genocide, such as the death of a brother in 1994, the death of a sister in 1994 and the death of a younger sibling in 1994, but the results were not statistically significant. I also studied the effect of individual exposure to the genocide, as measured by having lost a sibling in 1994, on the probability of domestic violence without controlling for the sex ratio. The results were not statistically significant.

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Table 1: Marital status

	(1) % married women age14-29	(2) % single women age14-29	(3) % widow women age14-29	(4) % married women age30-44	(5) % single women age30-44	(6) % widow women age30-44
Change_SR_PG	-0.245	0.0935	-0.0211	-0.625**	0.154	0.393
	[0.297]	[0.321]	[0.0540]	[0.256]	[0.106]	[0.263]
Observations	22	22	22	22	22	22
R^2	0.940	0.911	0.729	0.967	0.956	0.944

Standard errors in brackets

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 2: Summary statistics

Variable	Whole sample	Married before	Married after
Ever domestic violence (mean)	.333	.384	.294
(st. dev.)	(.471)	(.487)	(.456)
Year of marriage	1993	1985	1999
	(8.220)	(5.642)	(.456)
Age at first marriage	20.284	19.953	20.536
	(3.271)	(3.241)	(3.272)
Years since marriage	11.921	19.853	5.876
	(8.220)	(5.642)	(3.206)
Cohabitation	.337	.176	.460
	(8.220)	(.382)	(.499)
Protestant	.478	.424	.518
	(.500)	(.495)	(.500)
Catholic	.498	.547	.461
	(.500)	(.498)	(.499)
Woman years of education	3.905	3.423	4.273
	(3.294)	(3.423)	(3.146)
Husband years of education	4.385	3.903	4.752
	(3.653)	(3.647)	(3.617)
Born 1965-1975	.312	.473	.190
	(.464)	(.500)	(.392)
Born 1975-1989	.471	.030	.808
	(.499)	(.171)	(.394)
Urban	.131	.109	.148
	(.338)	(.312)	(.355)
Wealthy	.501	.482	.516
	(.500)	(.500)	(.500)
Sex ratio	.692	.790	.617
	(.114)	(.072)	(.078)
% literate men	.673	.678	.670
	(.049)	(.044)	(.052)
Male employment in formal sector	.126	.141	.115
	(.123)	(.115)	(.127)
Separated	.091	.082	.099
	(.288)	(.275)	.(298)
Polygyny	.099	.131	.074
	(.298)	(.337)	(.261)

Source: 2005 Rwanda Demographic and health Survey

*Source: 1991 and 2002 Census of Rwanda

Table 3: Sex ratio among non-institutionalized individuals

Province	Sex ratio 1991	Sex ratio 2002	Change in Sex ratio (1991-2002)	Perpetrators from Gacaca
City of kigali	1.152	0.898	-0.254	5629
Kigali ngali	0.821	0.585	-0.236	87433
Gitarama	0.778	0.593	-0.185	91461
Butare	0.780	0.581	-0.199	78037
Gikongoro	0.770	0.629	-0.141	42366
Cyangugu	0.794	0.616	-0.177	39395
Kibuye	0.756	0.569	-0.187	57279
Gisenyi	0.764	0.572	-0.193	26835
Ruhengeri	0.736	0.583	-0.153	14477
Byumba	0.775	0.633	-0.142	17217
Kibungo	0.795	0.580	-0.216	59547
Correlation with sex ratio in 2002				-0.515

Data from the Rwandan Census of Population and Friedman (2011)

The sex ratio is defined as the ratio of the number of males aged

20 to 44 to the number of females aged 15 to 39

Table 4: Domestic violence

	(1)	(2)	(3)	(4)
Dependent variable: Ever victim of domestic violence				
		Include quality measure	Include quality measure	Additional controls
$SexRatio_{p,t}$	-2.086***	-2.088***	-1.613**	-1.911***
	[0.462]	[0.486]	[0.608]	[0.491]
% Literate Men		-0.251		-0.280
		[0.706]		[0.713]
% Male employment in formal sector			-0.752	
			[0.644]	
Married after the genocide	-0.442***	-0.446***	-0.387***	-0.426***
	[0.089]	[0.094]	[0.099]	[0.095]
Age at first marriage	-0.016***	-0.016***	-0.016***	-0.016***
	[0.006]	[0.006]	[0.006]	[0.006]
Cohabitation	0.053*	0.053*	0.053*	0.051*
	[0.029]	[0.029]	[0.029]	[0.029]
Protestant	0.026	0.026	0.026	0.017
	[0.074]	[0.074]	[0.074]	[0.075]
Catholic	0.063	0.063	0.063	0.052
	[0.075]	[0.075]	[0.075]	[0.076]
Woman's years of school	0.004	0.004	0.004	0.003
	[0.005]	[0.005]	[0.005]	[0.005]
Husband's years of school	-0.013***	-0.013***	-0.013***	-0.011***
	[0.004]	[0.004]	[0.004]	[0.004]
Urban	-0.010	-0.010	-0.010	0.005
	[0.042]	[0.042]	[0.042]	[0.044]
Wealthy	-0.011	-0.011	-0.011	-0.012
	[0.028]	[0.028]	[0.028]	[0.028]
Observations	1,687	1,687	1,687	1,656
R^2	0.378	0.378	0.378	0.378

Standard errors in brackets *** p<0.01, ** p<0.05, * p<0.1

The following variables are included as controls: years since marriage entered as a cubic; dummies for the woman's occupation if she is working and dummies for the husband's occupation (Colums 4 only); dummies for quintiles of the distribution of a wealth index; province fixed effects.

Table 5: Robustness checks

VARIABLES	(1) Drop unions 1994-1996	(2) Drop movers	(3) Keep separated	(4) Keep polygineous
Control for the % of literate men				
$SexRatio_{p,t}$	-2.332***	-2.522**	-1.665**	-2.107***
	[0.477]	[0.957]	[0.502]	[0.552]
% literate men	-0.045	-2.212	-0.760	-0.130
	[0.693]	[1.391]	[0.729]	[0.802]
separated			0.269***	
			[0.046]	
polig				0.184***
				[0.048]
R^2	0.406	0.457	0.426	0.400
Control for male employment in the formal sector				
$SexRatio_{p,t}$	-1.920**	-2.808*	-1.501*	-1.719**
	[0.601]	[1.465]	[0.713]	[0.713]
Male employment in formal sector	-0.654	0.473	-0.253	-0.615
	[0.637]	[1.551]	[0.755]	[0.755]
separated			0.269***	
			[0.046]	
polig				0.184***
				[0.048]
R^2	0.406	0.457	0.426	0.400
Observations	1,542	761	2,016	1,855

Standard errors in brackets *** p<0.01, ** p<0.05, * p<0.1

The following variables are included as controls: years since marriage entered as a cubic; dummies for the

woman's occupation if she is working and dummies for the husband's occupation (Colums 4 only);

dummies for quintiles of the distribution of a wealth index; province fixed effects.

Table 6: Assortative matching - Husband's education

	(1)	(2)	(3)	(4)	(5)	(6)
	Difference in educational attainment			Husband has no education		
$SexRatio_{p,t}$	1.892*	1.902**	1.024	-0.589*	-0.591**	-0.511
	[0.892]	[0.820]	[1.183]	[0.265]	[0.248]	[0.375]
% Literate Men		1.936			-0.544	
		[1.192]			[0.361]	
% Male employment in formal sector			1.377			-0.124
			[1.253]			[0.397]
Married after the genocide	0.385*	0.413**	0.285	-0.132**	-0.140**	-0.123*
	[0.171]	[0.158]	[0.192]	[0.051]	[0.048]	[0.061]
Protestant	-0.003	-0.003	-0.003	-0.038	-0.038	-0.038
	[0.084]	[0.084]	[0.084]	[0.035]	[0.035]	[0.035]
Catholic	0.022	0.022	0.022	-0.043	-0.043	-0.043
	[0.084]	[0.084]	[0.084]	[0.035]	[0.035]	[0.035]
Urban	0.291***	0.291***	0.291***	-0.043**	-0.043**	-0.043**
	[0.049]	[0.049]	[0.049]	[0.018]	[0.018]	[0.018]
Widow	0.031	0.031	0.031	0.066**	0.066**	0.066**
	[0.057]	[0.057]	[0.057]	[0.026]	[0.026]	[0.026]
Separated	-0.132***	-0.132***	-0.132***	0.115***	0.115***	0.115***
	[0.042]	[0.042]	[0.042]	[0.019]	[0.019]	[0.019]
Woman education Incomplete primary	-0.702***	-0.702***	-0.702***	-0.150***	-0.150***	-0.150***
	[0.030]	[0.030]	[0.030]	[0.016]	[0.016]	[0.016]
Woman education Primary or more	-1.542***	-1.542***	-1.542***	-0.249***	-0.249***	-0.249***
	[0.043]	[0.043]	[0.043]	[0.018]	[0.018]	[0.018]
Observations	5,276	5,276	5,276	5,381	5,381	5,381
R^2	0.267	0.267	0.267	0.335	0.335	0.335

Standard errors in brackets *** p<0.01, ** p<0.05, * p<0.1

The following variables are included as controls: years since marriage entered as a cubic; province fixed effects.

Table 7: Bargaining and Fertility

	(1)	(2)	(3)	(4)	(5)	(6)
	Final say daily purchases			Contraception current use		
$Sexratio_{p,t}$	0.744	0.742	1.548*	0.419	0.417	0.995**
	[0.590]	[0.619]	[0.724]	[0.338]	[0.336]	[0.372]
% Literate Men		-0.373			-0.515	
		[0.900]			[0.488]	
% Male employment formal sector			-1.275			-0.913**
			[0.767]			[0.394]
Married after the genocide	0.108	0.103	0.201	0.103	0.095	0.169**
	[0.113]	[0.119]	[0.117]	[0.065]	[0.065]	[0.060]
Age at first marriage	0.002	0.002	0.002	-0.004	-0.004	-0.004
	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
Cohabitation	-0.001	-0.001	-0.001	-0.034**	-0.034**	-0.034**
	[0.018]	[0.018]	[0.018]	[0.014]	[0.014]	[0.014]
Protestant	0.045	0.045	0.045	-0.041	-0.041	-0.041
	[0.041]	[0.041]	[0.041]	[0.039]	[0.039]	[0.039]
Catholic	0.015	0.015	0.015	-0.005	-0.005	-0.005
	[0.041]	[0.041]	[0.041]	[0.040]	[0.040]	[0.040]
Woman's years of school	0.009***	0.009***	0.009***	0.014***	0.014***	0.014***
	[0.003]	[0.003]	[0.003]	[0.002]	[0.002]	[0.002]
Husband's years of school	0.002	0.002	0.002	0.008***	0.008***	0.008***
	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]
Urban	0.056**	0.056**	0.056**	0.039*	0.039*	0.039*
	[0.025]	[0.025]	[0.025]	[0.023]	[0.023]	[0.023]
Wealthy	0.022	0.022	0.022	0.041***	0.041***	0.041***
	[0.016]	[0.016]	[0.016]	[0.014]	[0.014]	[0.014]
Observations	4,081	4,081	4,081	3,865	3,865	3,865
R^2	0.371	0.371	0.371	0.273	0.273	0.273

Standard errors in brackets *** p<0.01, ** p<0.05, * p<0.1

The following variables are included as controls: years since marriage entered as a cubic;

dummies for quintiles of the distribution of a wealth index; province fixed effects.

Table 8: Heterogeneous effects

VARIABLES	(1) ever dv literate	(2) ever dv illiterate	(3) educ dif literate	(4) hus no educ literate	(5) educ dif illiterate	(6) hus no educ illiterate
$Sexratio_{p,t}$	-2.630***	-1.812	2.044*	-0.616	2.087*	-1.104
	[0.650]	[1.031]	[1.023]	[0.350]	[1.057]	[0.635]
married_after_genocide	-0.467***	-0.439*	0.375*	-0.115	0.420*	-0.228*
	[0.124]	[0.198]	[0.196]	[0.067]	[0.203]	[0.122]
marriage1age	-0.022***	-0.013				
	[0.007]	[0.009]				
liv_tog	0.064*	0.052				
	[0.037]	[0.046]				
protestant	0.024	-0.024	-0.112	-0.010	0.110	-0.067
	[0.089]	[0.122]	[0.125]	[0.040]	[0.110]	[0.062]
catholic	0.081	-0.021	-0.072	-0.011	0.122	-0.080
	[0.090]	[0.123]	[0.124]	[0.040]	[0.110]	[0.063]
educ_yrs	0.010	0.005				
	[0.007]	[0.014]				
hus_educ_yrs	-0.021***	0.005				
	[0.005]	[0.008]				
urban	-0.014	0.020	0.311***	-0.028	0.219***	-0.062*
	[0.050]	[0.072]	[0.063]	[0.021]	[0.079]	[0.036]
wealthy	-0.023	-0.010				
	[0.034]	[0.045]				
widow			0.156*	0.033	-0.093	0.101**
			[0.085]	[0.033]	[0.075]	[0.041]
separated			-0.099	0.114***	-0.164***	0.115***
			[0.066]	[0.026]	[0.051]	[0.029]
Observations	1,008	679	3,002	3,058	2,274	2,323
R^2	0.391	0.400	0.205	0.239	0.375	0.405

Standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

The following variables are included as controls: years since marriage

entered as a cubic; dummies for the woman's occupation

if she is working; dummies for the husband's occupation

if he is working; dummies for quintiles of the distribution of a wealth index; province fixed effects.

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Table 9: Control for genocide intensity

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Ever victim of Domestic violence					
Panel A all women	**gp1**	**gp2**	**gp4**	**gp5**	$gp7c-rem$	$gp7c-cen$
Genocide intensity*PG_t	1.819	0.501	3.894	2.527	0.209	0.240
	[2.108]	[0.444]	[4.890]	[2.012]	[0.176]	[0.158]
$SexRatio$	-1.188**	-1.066*	-1.254**	-1.159**	-1.478***	-1.422***
	[0.438]	[0.458]	[0.416]	[0.405]	[0.392]	[0.363]
$SexRatio$	-1.121*	-0.954	-1.227**	-1.105**	-1.487**	-1.423**
	[0.498]	[0.527]	[0.460]	[0.446]	[0.424]	[0.393]
% Literate men	0.235	0.306	0.144	0.244	-0.109	-0.023
	[0.608]	[0.575]	[0.580]	[0.537]	[0.490]	[0.468]
$SexRatio$	-1.353*	-1.171	-1.414*	-1.212*	-1.626***	-1.543***
	[0.684]	[0.679]	[0.585]	[0.580]	[0.438]	[0.413]
Male employment FS	0.327	0.192	0.383	0.117	0.525	0.437
	[0.987]	[0.853]	[0.915]	[0.848]	[0.626]	[0.611]
Observations	1,687	1,687	1,687	1,687	1,687	1,687
Panel B Literate women						
$SexRatio$	-2.886**	-2.945**	-2.914**	-2.967**	-2.970**	-2.830**
	[0.985]	[1.066]	[0.910]	[0.940]	[0.868]	[0.854]
$SexRatio$	-2.265**	-2.173*	-2.586**	-2.579**	-2.835***	-2.729***
	[0.877]	[0.974]	[0.834]	[0.868]	[0.745]	[0.699]
% Literate men	2.157*	2.116*	1.763	1.757	1.630	1.767*
	[1.069]	[1.063]	[1.052]	[1.045]	[0.861]	[0.833]
$SexRatio$	-3.225*	-3.195*	-3.341**	-3.373**	-2.941**	-2.767**
	[1.542]	[1.580]	[1.270]	[1.325]	[1.024]	[1.010]
Male employment FS	0.673	0.456	1.023	0.902	-0.104	-0.229
	[2.226]	[1.985]	[1.987]	[1.936]	[1.463]	[1.495]
Observations	1,008	1,008	1,008	1,008	1,008	1,008
Panel C Illiterate women						
$SexRatio$	0.328	0.413	0.176	0.306	0.042	0.035
	[0.740]	[0.804]	[0.717]	[0.715]	[0.723]	[0.696]
$SexRatio$	0.019	0.018	-0.039	0.087	-0.051	-0.027
	[0.774]	[0.855]	[0.703]	[0.727]	[0.677]	[0.655]
% Literate men	-1.074	-1.083	-1.160	-0.992	-1.120	-1.089
	[0.943]	[0.933]	[0.886]	[0.876]	[0.783]	[0.781]
$SexRatio$	-0.389	-0.295	-0.522	-0.235	-0.328	-0.322
	[1.096]	[1.120]	[0.926]	[0.971]	[0.767]	[0.746]
Male employment FS	1.420	1.293	1.672	1.199	1.309	1.282
	[1.582]	[1.407]	[1.448]	[1.418]	[1.096]	[1.104]
Observations	679	679	679	679	679	679

Standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Appendix
Table A1: Sex ratio among non-institutionalized individuals

Province	Sex ratio 1991	Sex ratio 2002	Change in Sex ratio (1991-2002)	Perpetrators from Gacaca
City of kigali	1.300	1.098	-0.202	5629
Kigali ngali	0.994	0.798	-0.196	87433
Gitarama	0.947	0.786	-0.161	91461
Butare	0.924	0.772	-0.152	78037
Gikongoro	0.931	0.808	-0.123	42366
Cyangugu	0.945	0.828	-0.117	39395
Kibuye	0.939	0.772	-0.167	57279
Gisenyi	0.928	0.771	-0.157	26835
Ruhengeri	0.900	0.802	-0.098	14477
Byumba	0.953	0.824	-0.129	17217
Kibungo	0.965	0.778	-0.187	59547
Correlation with sex ratio in 2002				-0.532

Data from the Rwandan Census of Population and Friedman (2011)

The sex ratio is defined as the ratio of the number of males aged

20 to 44 to the number of females aged 20 to 44