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Women's Agency in Conflict Settings: Evidence from Peace Agreements*

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Abstract

Women's agency continues to be disproportionately threatened in conflict settings, derailing significant progress made by nations to address gender equality. Moreover, the limitations of women's participation in peace processes and decision-making compounds their insecure positions during and in the post-conflict phase. This study examines the association between peace agreements and women's agency in conflict settings by creating a gender bias score (higher score indicating female bias) from the language used in peace agreements spanning the past three decades. We also explore associations between the gender bias score and women's agency. The preliminary results indicate that the gendered language in the peace agreements has a somewhat positive association with women's agency, suggesting that the frameworks may be more gender-sensitive than gender-transformative. We also find that this association is stronger in countries with longer duration of peace processes. We believe that the findings from this study can contribute further to the dialogue surrounding women's agency in conflict settings.

Key words: conflict, peace agreements, agency, gender, women's welfare

JEL classification: F51, F53, K38

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1 Introduction

Although evidence exists on conflicts' associations with state-building and better technologies during the postwar phase (Morris, 2014; Tilly, 1985; Olson, 1982; Organski and Kugler, 1977; Alesina et al., 2020), the overwhelming sentiment is that conflicts, in general, have adverse economic and social consequences that persist for many years after. Conflicts are associated with loss of lives, destruction of infrastructure, delayed human capital accumulation, severe food shortages, health risks, inequality and poverty (Thies and Baum, 2020). In turn, lower economic development carries the risk of an increase in conflicts, and countries often find themselves caught in the conflict trap. Unfortunately conflicts are also associated with different gendered impacts, with women being disproportionately affected. Women's role in conflict settings continues to be undermined and more often than not is relegated to "the victim" role or grouped under vulnerable with children, rather than underscoring their contributions in combat during conflict and in nation-building post-conflict (Loken and Matfess, 2024).

Women's agency is the ability to make choices and decisions that matter to them and to participate in the economy at individual, household, community and national levels (Kabeer, 1999; Sen, 1999). Agency provides women with the ability to operate in both private (homes) and public spaces (work and politics). Increased agency for a woman, such as having the ability to attend school, having access to resources, having the ability to make decisions regarding their sexual and reproductive health can lead to improvements in women's welfare and that of their children (Donald et al., 2020). According to several studies, women with greater autonomous decision-making in their households have more bargaining powers when it comes to their health choices and children's education (Rizkianti et al., 2020; Seidu et al., 2021; Luz and Agadjanian, 2015). When a woman loses the ability to make autonomous choices and decisions about her welfare, she is disempowered and this can have adverse effects on her well-being and on economic development.

Unfortunately, women's agency is seriously threatened during periods of conflicts, derailing significant progress made by nations to address women's welfare, which can unfortunately extend beyond conflict if reforms drafted at peace negotiations' stages are not gender specific (Haeri and Puechguirbal, 2010; Yadav, 2021). Women's precarious positions in conflict settings are exacerbated by the limitations of women's participation in peace processes, securitisation and decision-making in the post-conflict phase. To date, numerous resolutions have been drafted affording protection and support to women and girls in conflict settings. Examples include the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) (1979), Beijing Platform for Action (1995), the UN Security Council Resolution 1325 (2000), the six "Women, Peace and Security" (WPS) resolutions passed by the UN Security Council, and several other resolutions in between culminating in the latest Resolution 2467 (2019), all with language pertaining to addressing gender inequality, promoting the rights of women and preventing or ending sexual violence in conflicts. These resolutions include commitments to promoting women's welfare in conflict resolution and peacebuilding, and including them in post-conflict reconstruction (Goetz and Jenkins, 2018). The UN Security Council has also called on member countries to pay more attention to the role of women's leadership, to support women's engagement in decision-making, and to focus on women's empowerment in peacebuilding.

Despite these legal frameworks and progress on the policy front, evidence to date suggests that

we still face challenges in promoting women's welfare in conflict settings, particularly on the implementation/operational front. Such gender-transformative' delays bring into question the efficacy of international interventions, especially at the peace negotiations and drafting of peace agreements stages. According to Bell and Badanjak (2019) a peace agreement is a formal, publicly available document, produced after discussion with conflict protagonists and mutually agreed to by some or all of them, addressing conflict with a view to ending it.

While numerous studies exist that discuss the causes and consequences of conflict, an emerging literature that focuses on women's agency during and post-conflict is starting to gain momentum and receive more attention by scholars (Yadav, 2021). However, within this literature, we find a gap in evidence linking women's agency to peace processes. We exploit this gap by conducting an exploratory study on the language used in peace agreements and how it could affect women's agency in conflict settings. Our contribution is mainly methodological in utilising machine-learning to create a gender bias score (a higher score indicating female bias relative to male bias) from the text in peace agreements. With this score, we examine the nature of language in the peace agreements, and also explore the score's association with gender indices (i.e. measures that capture aspects of women's agency) in conflict-affected countries with peace agreements. The gender bias score analyses the gender and women-focused language in 2500 peace agreements over the period 1990 to 2023. This period covers most of the major conflicts that have taken place or are ongoing globally, such as in Europe (e.g. Kosovo, Russia, Ukraine, etc.), the Middle East (e.g. Iraq, Syria, Palestine, Yemen, Lebanon, etc.) and Africa (e.g. Central African Republic, Democratic Republic of Congo, Rwanda, Ethiopia, Eritrea, Sudan, Nigeria, Liberia, Sierra Leone, Libya, etc.). Moreover, the use of machine-learning analysis, while popular in statistics and data sciences' fields of study, is still a relatively underutilised methodological tool in economics research. This study, while exploratory, can provide new avenues for examining research questions using this type of analytical tool.

We argue that conflicts can lead to structural change in a country in terms of destabilising institutions, such as gender norms. In such an environment, women's agency can either deteriorate or improve. We further posit that interventions, such as peace agreements, though undertaken with good intentions, may not necessarily have the desired returns for women, especially if the language pertaining to gender is ambiguous. Indeed evidence suggests that the language in National Action Plans for Kenya, Liberia, Nigeria and Uganda may have resulted in mixed messages related to women's identity, participation and protection (Hudson, 2017). Moreover, the language in some peace agreements tends to instigate more sexual violence in conflicts (Binningsbø and Nordås, 2022), which in turn can lower women's agency post-conflict.

The study contributes to the dialogue surrounding women's welfare during and post-conflict. The study also contributes to the discussion on the effectiveness of international interventions, such as peace agreements, in conflict countries, particularly highlighting a possible realisation that those at the negotiating tables can also be the obstacles to change. While such topics may present an uncomfortable discussion, the reality is that progress for women in conflict-affected countries is still sorely lacking, such as access to political spheres, access to health, access to legal recourse related to sexual violence during conflict, or debunking cultural and social stigmas that surround women in conflict settings Rehn and Johnson-Sirleaf (2002). In pursuing this research we hope that the findings will at least serve as a platform for pathways of change and bring awareness to

the language used in policy documents.

2 Related literature

Improving women's agency is a key component for the empowerment of women. A woman's ability to make autonomous choices and decisions related to her health, wealth and participation in society empowers her and can have significant effects on reducing gender gaps. According to Kabeer (1999), women's agency is framed around the "ability to define one's goals and act upon them". Donald et al. (2020) further reiterates that agency is not only about defining goals that are aligned with one's values and acting on those goals, but it also requires having a perceived sense of control and ability to be able to exercise agency. For example, an individual needs to believe that when they make a decision and take action, they will achieve an outcome. In an utopian society, women should be able to exercise this agency in any spheres of their lives, be it economic, social or political. Unfortunately complex dynamics that play out in society can have adverse effects on women's agency, such as patriarchal structures, violence, early marriages, poor access to financial resources or limited ownership of assets. These dynamics are compounded in conflict-affected countries. Conflicts destroy the environment in which women can exercise their agency freely. While the current environment may be hostile or not as conducive for women agency, conflicts simply make that environment even more hostile to the extent that it is no longer safe for women to operate.

During times of armed conflicts, women are often disproportionately vulnerable to genocide, trafficking and slavery, which can impact their welfare (Soroptimist, 2020; Rehn and Johnson-Sirleaf, 2002). Moreover, conflict can indirectly impinge on women's socio-economic welfare through food insecurity which affects their livelihoods and deteriorating public health infrastructure which increases their health risks. According to reports by Rehn and Johnson-Sirleaf (2002) and Bendavid et al. (2021), armed conflicts indirectly increase mortality risks for women through malnutrition, infectious diseases, poor mental health and poor sexual and reproductive health. Bendavid et al. (2021) also finds that women of reproductive ages living near high intensity conflict areas have three times higher mortality rates than do women in peaceful settings.

Conflicts are also associated with the nonlethal violence perpetrated on civilians, such as sexual violence. Sexual violence during armed conflicts can have devastating long-term effects on women's welfare through lower human capital from physical trauma, psychological trauma (mental illness), unwanted pregnancies to other health-related issues (such as sexually transmitted infections (STIs) or HIV) which can negatively affect women's productivity and economic development (Binningsbø and Nordås, 2022; Koos and Lindsey, 2022). For example, Hanson (1990) and Amone-P'Olak et al. (2015) highlight that victims of sexual violence are more likely to suffer from depression, while Rehn and Johnson-Sirleaf (2002) provide evidence of alarming infection rates of STIs and HIV due to sexual violence during conflicts.

International organisations have played a key role in trying to mitigate the severity of conflicts globally, specifically the introduction of United Nations Peacekeeping Officers (PKOs) in conflict-affected areas. However, the efficiency of international interventions has been met with skepticism with some evidence suggesting positive outcomes in reducing conflicts and others observing negative outcomes. According to Hultman et al. (2013, 2014), peacekeepers' humanitarian role

in conflicts has increased over time as they find evidence that peacekeepers protect civilians against one-sided violence. In addition, increased intervention by PKOs in organising intergroup dialogues or mediations in war-torn countries helps to reduce the severity of violence (Beardsley et al., 2019; Smidt, 2020), while larger UN troop deployments shorten war duration to negotiated resolutions (Kathman and Benson, 2019). In contrast, Diehl et al. (1996); Costalli (2014) find that UN intervention has no effect on the occurrence, timing or severity of conflicts in the long run. In addition, Johansson and Hultman (2019) find that stronger mandates on protection of civilians and when the conflict actors exercise a high level of control over their armed forces are not sufficient to improve the performance of UN missions in reducing sexual violence. Unfortunately, the ambiguity from the role of international organisations can also undermine women's agency during peacekeeping operations. For example, many victims of sexual violence during armed conflicts find themselves having to share the same spaces (i.e. at work, school, in the community) with their perpetrators post-conflict due to impunitive resolutions enacted at peace negotiations, which reinforces the trauma and the continuity of unsafe spaces for women to live and operate (Mannergren Selimovic et al., 2012).

Although conflict can be destructive, it can also be state-building. Evidence suggests that conflicts create space for women to make autonomous decisions as they have to step into the roles of the absent men that have gone to war (Haeri and Puechguirbal, 2010; Webster et al., 2019; Yadav, 2021). More often than not, women become more resilient during conflicts as they have to take on new responsibilities, such as providing for their families by seeking employment outside the home or becoming involved in the political sphere (Yadav, 2021). Evidence suggests that although conflicts create vulnerable situations for women, it can also be a channel through which women become empowered through exposure to new opportunities and the public space (Rehn and Johnson-Sirleaf, 2002; Mannergren Selimovic et al., 2012; Asaf, 2017; Andrabi, 2019). Furthermore, Berry (2018) argues that war can break down gender boundaries through women's involvement in combat roles, which can increase the likelihood of women participating in politics. For example, the conflict in Nepal created opportunities for women to enter various economic, social and political areas where they were able to transform social norms surrounding gender structures. Yadav (2021) documents how the conflict in Nepal allowed women to enter a male-dominated space and become public transport drivers so as to be able to earn incomes to support their families. Evidence from the same study also shows how leadership roles that were mainly occupied by men became more accessible to women in Nepal after the conflict in 2008. In another study, Tripp (2015) similarly finds a positive association between war and women's political participation in Africa. Not only can conflict act as a catalyst for change for women, but once women are empowered, evidence shows that they can become agents of change by acting as role models for young women and updating cultural attitudes related to women's roles in society (Yadav, 2021).

Unfortunately this newfound women's agency during conflict can be reversed by returning to "normalcy" post-conflict. Studies highlight how women who have gained space to exercise their agency during conflict tend to be marginalised and disempowered in post-conflict processes as gendered stereotypes resurface (Mannergren Selimovic et al., 2012; Lukatela et al., 2012; Weber, 2011; Hedström and Senarathna, 2015), mainly because women are excluded in the peace negotiations or drafting of peace agreements. For example, women's roles in conflict and peacebuilding in Afghanistan have often been overlooked at peace negotiations to the detriment of women's agency post-conflict during the Taliban regime (Hedström and Senarathna, 2015). More often

than not, while the vulnerabilities faced by women during conflicts are not overlooked, refusing to acknowledge their agency during conflicts means the decisions taken at peace negotiations ignore or overlook their security and access to resources post-conflict. For example, women's needs and dignity during menstruation was not considered until the ICRC conducted a survey of women living in refugee camps (Haeri and Puechguirbal, 2010). Another example highlights that women's inputs are critical in humanitarian assistance as women are more likely to know the food requirements of their families, as well as determining safe locations for distribution of water and food, which do not expose them to additional risks, such as kidnapping, sexual violence or death (Haeri and Puechguirbal, 2010).

Nascent evidence on the association between peace agreements and women's agency highlights the positive impact women can have on the durability and quality of peace post-conflict (Jana Krause and Bränfors, 2018). Women's perspectives and priorities differ from those of men, therefore involving them in peace negotiations can ensure that conflict resolutions are inclusive and practical. Evidence suggests that peace negotiations create an opportunity for increasing women's political participation, as highlighted in Rwanda where women in public office post-genocide introduced parliamentary quotas that ensured the continuity of women's presence in the political space (Brown et al., 1996). Furthermore, Tripp (2015) finds higher rates of women's representation in the legislature and a faster rate of adopting women's rights in post-conflict countries than in non-post-conflict countries in Africa. Not only does a higher proportion of women in national legislation prolong peace post-conflict (Shair-Rosenfield and Wood, 2017), but Kikuta (2025) also finds that women's legislators can influence military spending and deployment through veto powers. According to Jana Krause and Bränfors (2018), women's involvement in peace negotiations, particularly as signatories on peace agreements, strengthens the design and implementation of gender-transformative programmes because the women signatories act as representatives of women civil society groups at local level. For example, women in Liberia mobilised extensively during the 2003 peace talks in Ghana to support the Mano River Women's Peace Network and the Women in Peacebuilding Network (WIPNET) whose delegates were involved in the peace negotiations. The Liberian women's advocacy for immediate ceasefire and insistence that the peace talks be kept on track culminated in the formulation of more women representation in the legislative assembly and played a key role in the presidential election of Ellen Johnson-Sirleaf (Adams, 2008; Tripp, 2015). Another example involves El Salvador, where women's inclusion in the peace agreements allowed them to identify gender discrimination in the post-accord negotiations, which resulted in women ex-combatants and civilian women being included in the reintegration and land transfer programs (Conaway et al., 2004).

Unfortunately, Jana Krause and Bränfors (2018) find that the number of women who signed peace agreements has not increased substantially since the adoption of the UNSCR 1325 article in 2000, implying that to date women are still being sidelined in critical conflict resolution processes. Research into women's agency has argued that the end of conflict does not necessarily translate into improved security and welfare for women. A study in Hedström and Senarathna (2015) illustrates the case of Myanmmar's conflict where the exclusion of women from the peace talks highlights gender biases which undermine the security issues faced by women, such as continued gender-based violence post-conflict. In fact, evidence from Cohen and Nordås (2014) finds that violence committed by state troops against women lasts an average of five years after the conflict.

While women's participation in armed conflicts could be voluntary, we also recognise that in some cases, women are forcibly recruited or participate as a means of escape from oppression (e.g. abuse at home, forced marriages). As such, gender-based blindness in peace agreements that often exclude women in the disarmament, demobilisation and reintegration (DDR) processes compromises their rehabilitation to society post-conflict as they are not provided with the necessary interventions normally afforded to male combatants (Hedström and Senarathna, 2015). Evidence by Palik et al. (2025) shows that out of 128 peace agreements reviewed between 1970 and 2021 with at least one DDR component, only 2 mention women and 9 reference both women and children. The exclusion of women in these mandates goes against the UN's frameworks to provide support for all parties involved in the conflict, including women ex-combatants (IDDRS, 2019).

Within the literature on peace agreements, more evidence is emerging that highlights a serious gap between the language in international resolutions and how the mandates are put into action. The gender mainstreaming language that is used in peace agreements to describe women as "damsels in distress" or associating them with children disregards their experience as combatants, peacemakers and leaders (Gaufman, 2023). Conflict-affected countries with patriarchal structures may often neglect to include women in peace processes and if women are included, it is more window-dressing than transformative reforms (Mannergren Selimovic et al., 2012). Gender is usually included as an afterthought in policy documents and comes in the form of "increasing numbers of women in leadership roles". According to Gaufman (2023), the absence of gender in peacebuilding frameworks perpetuates the role of gender silencing that maintains gender insecurity, e.g. framing women as victims automatically places them at the bottom of the gender hierarchy of a post-conflict society. Moreover, Binningsbø and Nordås (2022) find that amnesties signal impunity and permissiveness of sexual violence which can either perpetuate or instigate more sexual violence by rebels, in comparison to trials that signal punishment of war crimes and increase the costs of committing violence. This depiction of women as passive actors during conflict is disempowering, deprives them of their agency and can seriously affect the efficacy of conflict resolutions. We contribute to this relatively new and underexplored body of evidence by examining the language in international peace agreements and how that translates into women's agency.

3 Data

Our main variable of interest is a measure of gender bias towards women in peace process agreement documents. In addition to the agreements we also use metadata about the peace processes as documented by Bell and Badanjak (2019). These include the duration of a peace process in months, whether the conflict is within a country or between countries, and whether the conflict ended in a ceasefire; all of which are obtained and created from the Peace Agreements Database (PA-X) (https://pax.peaceagreements.org/) (Bell and Badanjak, 2019). This database contains 2055 peace agreements for more than 150 peace processes from 1990 to 2023. The database also includes agreements with provisions that refer to women, gender or sexual violence.

To obtain our measure, we first extract the text as data from PDF files. Thereafter, we run the text through Genbit, an algorithm that helps determine if gender is uniformly distributed across data by measuring the strength of association between a pre-defined list of gender definition words

and other words in the corpus via co-occurrence statistics. From this we obtain two metrics, first is the proportion of female words to male words, and second is the overall gender bias (proportion of all gender words).

We combine these two measures and obtain the following:

$$gender = \left(\frac{\sum_1^n(word|female)}{\sum_1^n(word|male)} - 1\right) \times s^{\text{genbit}}) \tag{1}$$

In this equation, $\sum_1^n(\text{word}|\text{female})$ represents the summation of word associations conditioned on a female context over n words, while $\sum_1^n(\text{word}|\text{male})$ represents the summation of word associations conditioned on a male context over n words. The ratio of these two summations provides a measure of the relative bias of word associations between female and male contexts. We center around zero by subtracting one (-1) to standardize the direction of the bias, ensuring consistency in interpretation. Finally, s^{genbit} is a scaling factor based on the generalization score (genbit), which adjusts the bias measure for contextual variability. This is done to emphasize the relative importance of gender bias within a document.

Finally, we define our change in gender bias as the difference between the start of the peace process and the end of the peace process:

$$bias = gender_t - gender_1 \tag{2}$$

where gender_t represents the value of the gender bias measure at time t, and gender_1 refers to a baseline value of the gender bias measure at the initial time point. The $\text{gender}_t - \text{gender}_1$, captures the deviation of the gender bias at time t from the initial baseline.

The intuition of this approach is that if we first assign a direction to the bias (positive for female and negative for male) and then weigh it by how relevant the gender bias is in the document, we obtain a relevant measure for gender bias. The more relevant, the stronger the weighting. In this case, a large positive value for both indicates that a document speaks about women and that it is relevant to the agreement. When overall gender bias is low, then gendered words are not used often, and therefore the peace agreement focuses less on gendered outcomes.

Our research question centres around the improvement in women agency given increased language towards women in peace agreements. As such, we use the Women, Business and the Law index (*wbl*) obtained from the World Bank as our key variable of interest to measure women's agency. While we acknowledge that there are several indices related to women's agency, such as the Gender Equality Index (GEI), the Gender Development Index (GDI), the Women's Empowerment in Agriculture Index (WEAI), the Female Empowerment Index (FEMI), the Women Peace and Security Index (WPS), to name a few, we choose the *wbl* index because it is aligned with the focus of our paper on gender language in peace agreements.

Peace agreements serve as international frameworks for conflict resolutions that are expected to be inclusive of all people in the affected country. Similarly, Women, Business and the Law serves as an international legal framework that governments and civil society can use to identify and remove barriers to women's social and economic success and improve their economic empowerment. As

such, the index captures laws in 190 countries that restrict women's economic inclusion in key areas of their lives where they can exercise their agency to make economic decisions. The index is created from eight indicators that identify where in the world and in what areas women continue to face legal inequalities: workplace, pay, mobility, marriage, parenthood, entrepreneurship, assets and pension.[1]. The index ranges from 0 (high presence of legal inequality for a woman in the areas measured) to 100 (absence of legal inequality for a woman in the areas measured).

The current report on *wbl* index that assesses the gap between legal reforms and actual outcomes for women globally finds a significant implementation gap (WorldBank, 2024). The analysis reveals that although laws on paper imply that women enjoy better legal rights than men, less than 40% of the systems needed for full implementation have been established in countries. For example, 98 countries have enacted legislation mandating equal pay for women for work of equal value, but only 35 countries (i.e. less than one out of every five) have adopted pay-transparency measures or enforcement mechanisms to address the gender pay gap (WorldBank, 2024). This implementation gap in women's legal rights follows a similar trend highlighted in peace agreements where the language does not necessarily translate into action in conflict-affected countries. We therefore expect the gender bias in favour of women in peace agreements to be positively associated with *wbl* or legal equality in conflict-affected countries. The *wbl* index also covers a longer time period from 1970 to 2023 in comparison to the other women's agency measures.

As a robustness check, we use the gender inequality index (*gii*) indicator obtained from the United Nations Development Programme, which we invert to represent better outcomes for women (i.e. 0 (high gender inequality to 1 (low gender inequality)). The *gii* measure covers 154 countries from 1990 to 2020. It reflects gender-based disadvantages in three dimensions — female reproductive health (composed of maternal mortality ratio and adolescent birth rates), female empowerment (composed of female and male population with at least secondary education, as well as female and male shares of parliamentary seats), and the labour market (made up of female and labour force participation rates). These components capture women's agency (i.e. ability to make autonomous decisions) in key areas of their lives, mainly health, education, employment and political participation.

For both, we create a percentage change measure for the difference between the value at the start of the peace process and the end of the process:

$$\Delta wbl = \frac{wbl_t - wbl_1}{wbl_1} * 100 \tag{3}$$

where Δwbl represents the percentage change in *wbl*. wbl_1 is the Women, Business and the Law index at the start of the peace process, and wbl_t is the score at the end. We apply the same methods for *gii*:

$$\Delta gii = \frac{gii_t - gii_1}{gii_1} * 100 \tag{4}$$

[1]Please see https://wbl.worldbank.org for data and methodology used to create the *wbl* index

We also include the control variables that have been linked to women's agency. We account for the existing gender institutions in the countries by including the women, business and law index at the start of the peace process. We expect convergence to occur where countries that start with an initial low presence of legal equality for women will gain positive returns in institutional reforms faster. We include GDP per capita at 2015 US$ constant prices obtained from the World Development Indicators. We also create a percentage change measure for the difference in GDP per capita between the value at the start of the peace process and the end of the process:

$$gdpgr = \frac{gdp_t - gdp_1}{gdp_1} * 100 \tag{5}$$

where $gdpgr$ is our measurement for growth over the respective periods for each peace process. Evidence suggests that economic development can reduce inequality between men and women by reducing poverty constraints in households and improving economic opportunities for women in the labour market (Duflo, 2012). The remaining control variables are obtained from the PA-X database (Bell and Badanjak, 2019). We include the duration of the peace processes measured in months. Violence ceases during peace negotiations. According to Webster et al. (2019), prolonged peace can undermine existing social hierarchies, such as patriarchal structures and create a window of opportunity for gender-based reforms that can improve women's agency post-conflict. We also include a ceasefire measure that contains agreements which provide for a ceasefire, demobilisation of troops, or an agreement that provides a monitoring arrangement for, or extension, of a ceasefire. Studies show that ceasefires tend to exclude women because they are seen as preliminary agreements that are more to stop the fighting than to discuss post-conflict reforms (Barsa et al., 2016; Menon, 2021). We therefore expect a negative association between ceasefires and women's agency. Finally, we include dummy indicators for the nature of the conflict, whether it is an interstate conflict (i.e. peace treaty relating to interstate conflict), intrastate conflict (i.e. agreement relating to intrastate conflict which refers mainly to conflicts within a state's borders), an intralocal conflict (i.e. agreement aimed at resolving local issues in local conflict with less than 25 battle-related deaths rather than what is perceived as a conflict-wide issue) and whether it is an interstate/intrastate mixed conflict (i.e. agreement that is interstate in nature but whose major components originate within existing (de-facto or legal) state borders). Our base for the dummy is interstate conflicts. We expect conflicts in general to be negatively associated with women's agency (Webster et al., 2019). However the adverse effects on women's agency may differ in magnitudes according to the nature of the conflict.

4 Methodology

Our model takes the following specification:

$$\begin{aligned}\Delta wbl_i = \alpha_i + \delta_i bias_i + \beta_i gdpgr_i + \beta_i peace_i + \beta_i intrastate_i \\ +\beta_i intralocal_i + \beta_i interintra_i + \beta_i cease_i + \beta_i wbl_{1i} + \epsilon_i\end{aligned} \tag{6}$$

For each peace process i, Δwbl_i represents our measurement for changes in women agency, α_i our constant, $bias_i$ is the gender bias score we created from the peace agreements (higher score

indicating female bias relative to male bias in the language), $gdpgr_i$ is our measure for GDP per capita percentage change, $peace_i$ is the duration of peace process in months, $intrastate_i$ is the dummy indicator for intrastate conflict, $intralocal_i$ is the dummy indicator for intrastate local conflict, $interintra_i$ is the dummy indicator for interstate/intrastate mixed conflicts, $cease_i$ captures peace agreements that ended in ceasefires, and wbl_i captures the pre-existing conditions of gender institutions in the countries at the start of peace process. ϵ is our error term. The equation remains the same for gii, where we only replace Δwbl with Δgii. We end up with 147 observations after merging the datasets because first, not all countries in the world are conflict-affected and/or involved in peace agreements, particularly countries with on-going conflicts. Second, we were unable to extract information from some of the peace agreements due to not being machine-readable, and OCR did not work consistently. Third, some peace processes only had a single document, which we excluded from the analysis. Finally, there were some ad-hoc issues with joining Δwbl to the regressors, where some had missing values. We exclude all of these values through all the stepwise regressions to get a consistent result.

We use ordinary least squares (OLS) which is specifically suited for large cross-sectional. We also use robust standard errors to deal with the potential presence of heteroskedasticity and serial correlation which can bias estimates and inferences. We acknowledge that reverse causality may be a potential issue, for example, conflict-affected countries with patriarchal institutions (i.e. low women's agency) may end up with peace agreements that are not necessarily gender-transformative, such as in Afghanistan under the Taliban rule (Leclerc and Shreeves, 2024), or may end up with poor economic growth (Duflo, 2012). Therefore, we attempt to minimise the potential endogeneity issues by accounting for initial gender institutions prevalent in the country at the start of the peace process, as well as the level of economic development during the peace process. While it may be difficult to determine causal order in such an exploratory study, we maintain that understanding how the language in peace agreements can potentially spillover onto women's agency can provide us with pathways to advocating for less ambiguous and more inclusive gender language, while at the same time ensuring the execution of the negotiated terms in the agreements.

5 Results and discussion

Our preliminary analysis explores the correlations between the gender bias score that we created and the outcome variable, for which we mainly use descriptive methods. The overview of the data picks up on the heterogeneity that is present in the sample. The measures for women's agency highlight significant differences between countries with the Women, Business and the Law index ranging between 26 and 94. In addition, we observe that while the mean of the gender bias score is positive (i.e., biased towards words associated with female), it is quite low close to zero, suggesting that the language in the peace agreements in the sample may have a limited focus on gendered outcomes or may be gender-neutral where the framing tries to be inclusive of everyone but ignores the gendered differences in opportunities and resource allocation. This is corroborated in the density plot for the gender bias score in Figure 1. The distribution of the graph is clustered close to zero.

5.1 Descriptive Statistics

Table 1: Descriptive Statistics

	Δwbl	wbl_1	Δgii	gii_1	$gdpgr$	$bias$	$peace$	$intrastate$	$intralocal$	$interintra$	$cease$
count	147	147	108	120	153	153	153	153	153	153	153
mean	10.120	54.830	10.565	0.445	30.002	0.009	94.118	0.647	0.150	0.092	0.163
std	16.432	14.171	17.411	0.150	82.088	0.154	105.521	0.479	0.359	0.289	0.371
min	-7.143	26.250	-16.413	0.205	-35.147	-0.590	0	0	0	0	0
max	91.803	94.375	78.378	0.858	797.456	0.624	380	1	1	1	1

Figure 1: Gender Bias Density Plot

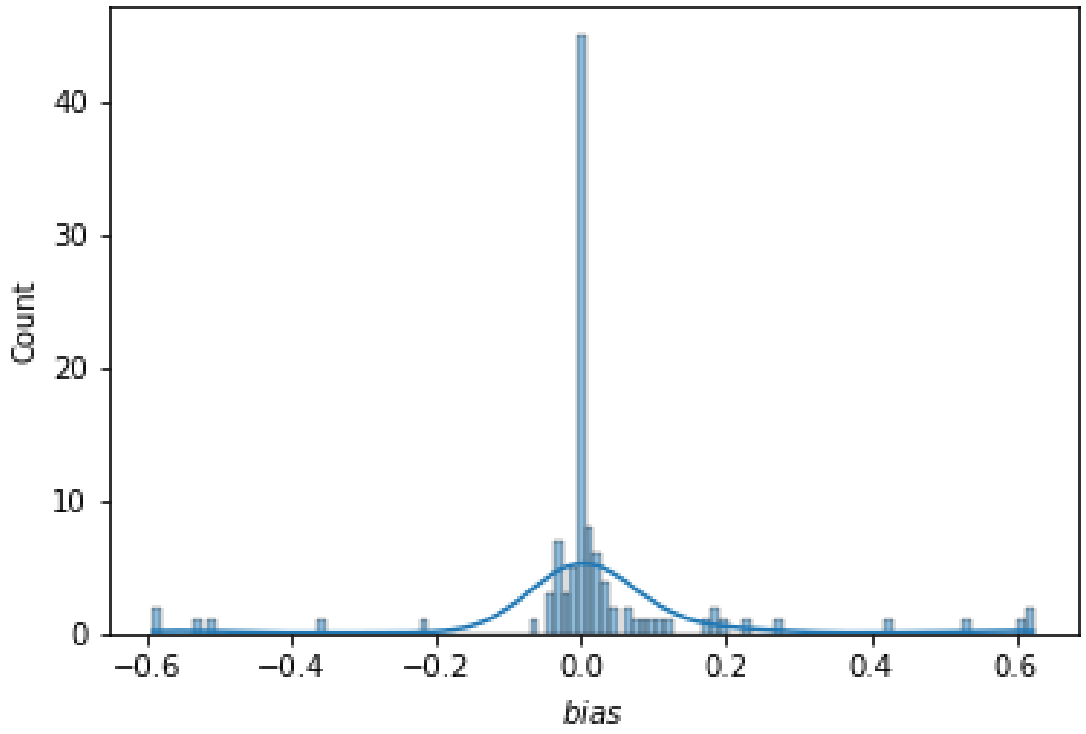


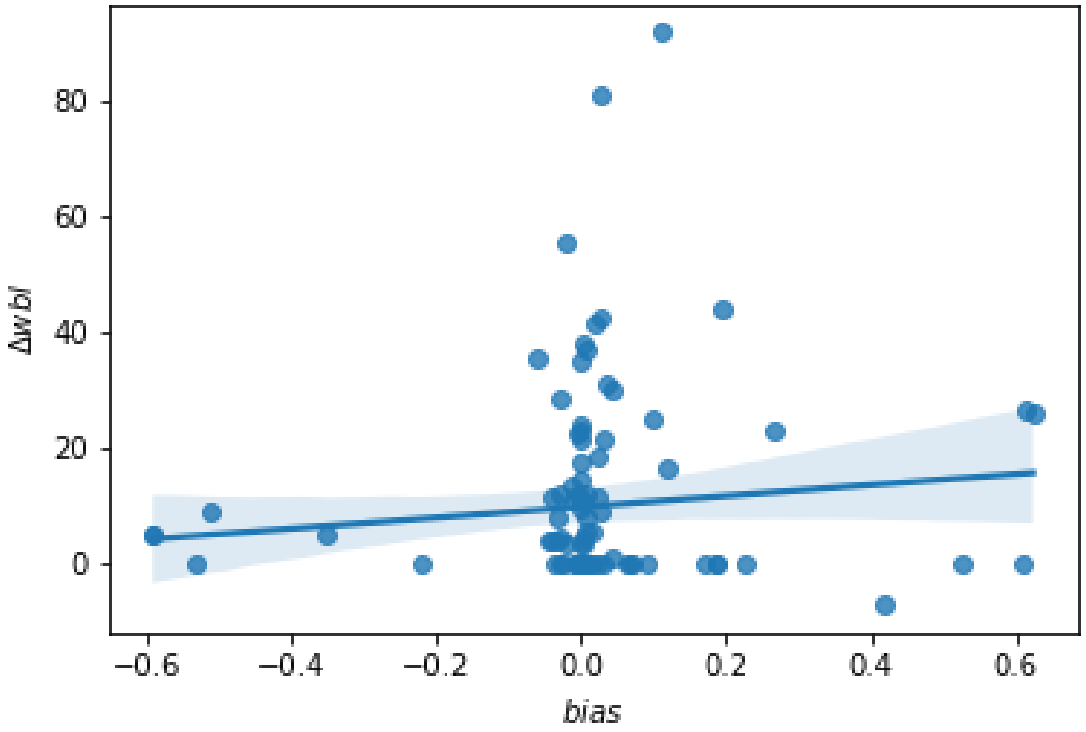
Table 2 shows the correlations between our variables, which are in line with a priori expectations. While the correlations between the duration of peace processes and women agency variable are relatively high compared to the other explanatory variables, we do not find the presence of multicollinearity using the variance inflation (VIF) scores (see Table A1 in the Appendix). The VIF scores are mostly between 1 and 5 highlighting that the variables have low correlations with the outcome variable.

Table 2: Correlation Matrix

	Δwbl	wbl_1	Δgii	gii_1	$gdpgr$	$bias$	$peace$	$intrastate$	$intralocal$	$interintra$
wbl_1	-0.18									
Δgii	0.63***	-0.18								
gii_1	-0.12	0.43***	-0.26**							
$gdpgr$	0.46***	-0.03	0.65***	-0.07						
$bisa$	0.1	0.02	0.12	-0.22*	0.13					
$peace$	0.63***	-0.03	0.67***	0.01	0.62***	0.16				
$intrastate$	0.02	0.04	0.04	-0.06	-0.06	0.04	0.07			
$intralocal$	-0.04	-0.0	-0.06	-0.14	-0.16	-0.12	-0.17	-0.61***		
$interintra$	0.02	-0.06	-0.14	0.25**	-0.08	-0.01	0.01	-0.43***	-0.11	
$cease$	-0.07	0.08	-0.09	0.32***	-0.1	-0.29**	-0.04	0.08	0.0	-0.0

We begin our analysis by examining the association between our gender bias score and the women's agency measure captured by the Women, Business and the Law index. The correlation graph in Figure 2 shows a weak positive association between gendered language in peace agreements and the outcome variable capturing change in women's agency during peace agreements. As indicated earlier in Figure 1, the gender bias score is clustered around zero suggesting a limited focus on gendered outcomes. However, the relatively positive association in Figure 2, coupled with the positive mean gender bias score, may imply that the language used in the sampled peace agreements may be more gender-sensitive than gender-neutral. In this case, gender-sensitive framing acknowledges the problem with gender inequality and makes provision for it in the wording, but does not really address the problem. For example, peace agreements advocate for increased women's political participation, yet no quotas are mentioned in the policy and thus related laws remain unenforced.

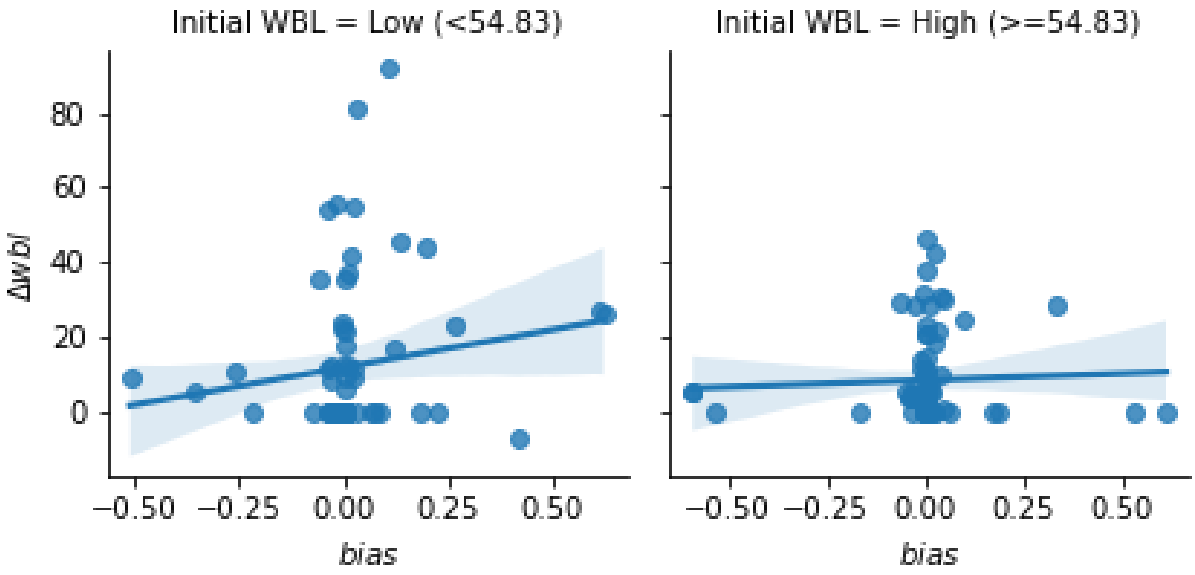
Figure 2: Gender Bias vs WBL Scatter Plot



Interestingly in Figure 3, we observe that the association between the gender bias score and women's agency is different when we split the sample between countries that already have progressive gender institutions in place versus countries that have low equality rights for women. We use the mean of the *wbl* measure as the cutoff. The linear direction is not evident in countries with high levels of women's rights suggesting that these countries may already have frameworks or policies in place that are in favour of improving women's agency such that the gendered language in the peace agreements may have but marginal effects on reinforcing these progressive gender institutions. According to Gizelis (2009), in societies where women have equal rights, they can express their opinions during peace processes and set agendas that prioritise women's welfare and bring about broader domestic participation of women.

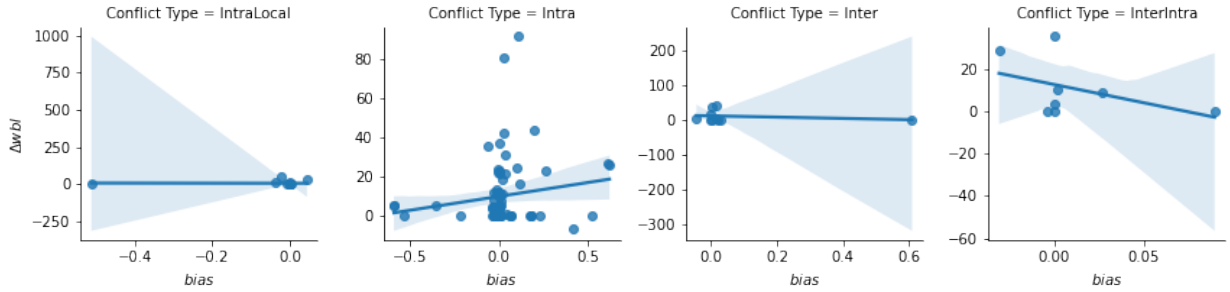
On the other hand, the positive trend for countries with low levels of women's rights suggests that peace agreements can have significant positive returns for women's agency during peace processes in conflict-affected countries. The result implies that the gendered language in peace agreements has the potential to change women's outcomes for the better.

Figure 3: Gender Bias vs WBL Scatter Plot for Low and High Initial Gender Bias



We also examine the association between gender bias score and women's agency by type of conflict in Figure 4. We find that peace agreements from intrastate conflicts are positively correlated with change in women's agency. Evidence suggests that conflicts can disrupt gender hierarchies and create opportunities for women to enter traditionally male-dominated roles (Berry, 2018; Wood and Ramirez, 2018). For example, Liberia's intrastate conflict led to the introduction of women's rights provisions in the peace agreement and legislative reform affecting women in the country (Webster et al., 2019). In contrast, peace agreements from interstate/intrastate mixed conflicts are negatively correlated with women's agency. Unfortunately, external threats associated with interstate conflicts can work to entrench traditional gender norms through increased militarisation which puts emphasis on the role of men in conflicts (MacKenzie and Foster, 2017; Tir and Bailey, 2018).

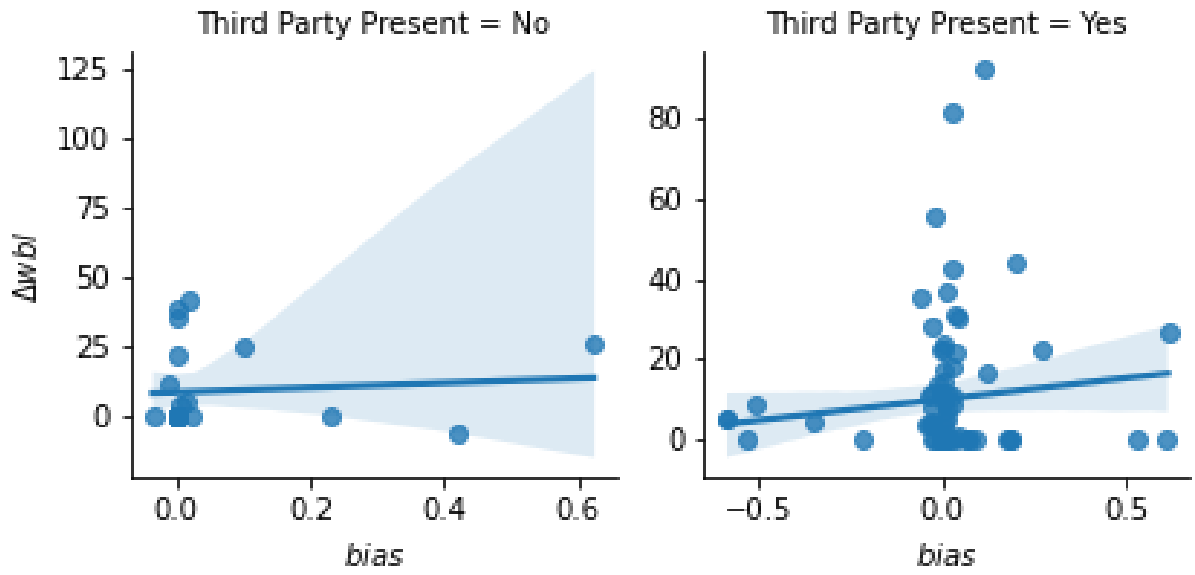
Figure 4: Gender Bias vs WBL Scatter Plot by Type of Conflict



Evidence in existing literature suggests that third parties can play a significant and influential role in peace negotiations. For example, the severity of violence is reduced and peace lasts longer when international personnel are deployed (Beardsley et al., 2019; Smidt, 2020). Moreover, the inclusion of civil society representatives brings local context-specific knowledge and improves the legitimacy of the agreements reached, thus undermining support for continued violence and reducing commitment problems (Nilsson, 2012). We therefore examine the association between gender bias score and women's agency in the absence versus presence of third parties to the peace agreements. While we do not find much statistical difference in Figure 5 between peace agreements that involve third parties and those that do not, we believe that the gender of the third parties involved may be relevant in this case. Women's participation in peace negotiations has been found to increase the durability of peace and to improve the quality of peace (Mannergren Selimovic et al., 2012). According to Jana Krause and Bränfors (2018), agreements signed by women show a significantly higher number of peace agreement provisions aimed at political and women's rights reform. The author argues that collaboration between women signatories and women civil society groups contributes to knowledge and better content of peace agreements with higher implementation rates. Unfortunately, we are unable to explore this variation in the sampled peace agreements as it is difficult to identify the gender of the signatories.

In summary, the correlation graphs show that there is a positive association between gendered language in peace agreements and change in women's agency, particularly for countries with low initial women's rights, as well as for intrastate conflicts. However, the weak positive associations that we observe between the gender bias score and the outcome variable suggest that the language in these peace agreements is simply gender-sensitive thus the effectiveness of the policies may be marginal in return for change in women's agency.

Figure 5: Gender Bias vs WBL Scatter Plot by Presence of Third Party



5.2 OLS Results

In Table 3, we check how our gender bias score holds up in a model. We report the results from our OLS specification. The positive coefficients for the gender bias score corroborate the findings from the correlation graph in Figure 2. The inclusion of the control variables however minimises the statistical significance of the gender bias score. The negative and statistically significant coefficient for women's legal rights at the start of the peace process indicates convergence taking place. Countries with low initial women's rights at the start of the peace process are associated with faster growth in gender policy reform. This finding corroborates the results from Figure 3 where we split the sample of countries by high versus low levels of women's rights. According to Hughes and Tripp (2015), women's movement into national legislatures follows a much faster trajectory of social change in countries exiting armed conflict. A higher representation of women in political, economic and social environments contributes to positive changes in women's empowerment (Webster et al., 2019; Hughes and Tripp, 2015).

While we do not find any statistically significant results for GDP growth, ceasefires and types of conflicts, we do however observe that the coefficient for the duration of peace processes is consistently positive and statistically significant. The finding suggests that changes in women's agency are associated with longer peace processes. This finding is supported by Figure 6 when we split the sample between countries characterised by short peace process (i.e. peace processes that lasts less than 12 months) versus those with longer peace process (i.e. peace process that is longer than 12 months). We find that the gender bias score in countries involved in short duration of peace processes is negatively associated with changes in women's agency outcomes, but in countries with longer duration of peace processes, the gender bias score is positively associated with changes in women's agency. This finding is quite interesting because it implies that peace negotiations which provide a respite from the violence can open up possible pathways for positive

change in women's agency. First, the peacebuilding phase can bring security from violence for women in an unstable environment (Mannergren Selimovic et al., 2012). For example, Sener (2025) finds that participation of armed actors in peace negotiations is associated with fewer civilian causalities immediately before the international talks. Second, evidence by Webster et al. (2019) highlights that peace processes provide an opportunity for replacing traditional gender norms with more gender-progressive policies. Third, peace negotiations where women are given a place at the table more often than not result in agreements with strong advocacy for women's rights and changes in gender institutions (Jana Krause and Bränfors, 2018).

Table 3: Changes in women's agency and gender bias language in peace agreements

Δwbl	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$bias$	12.235*	12.873*	9.907	3.874	3.963	4.448	4.699	3.731
wbl_1		-0.21**	-0.216***	-0.176***	-0.175**	-0.175**	-0.166**	-0.164**
$gdpgr$			0.082*	0.016	0.015	0.016	0.019	0.019
$peace$				0.09***	0.091***	0.091***	0.09***	0.09***
$intrastate$					-0.835	0.08	2.7	2.996
$intralocal$						2.123	4.789	5.263
$interintra$							6.122	6.257
$cease$								-2.059
R^2	0.01	0.05	0.22	0.44	0.44	0.44	0.44	0.45
R^2 Adj.	0.01	0.03	0.20	0.42	0.42	0.41	0.42	0.41
N. Obs	147	147	147	147	147	147	147	147

Notes: The table presents regression results. Statistical significance is denoted as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. N. Obs refers to the number of observations.

As a robustness check, we use the gender inequality index as the main explanatory variable. We invert the index such that a higher score indicates gender equality. We find consistent results in Table 4 with our previous findings. The gender bias score, although not statistically significant, is positively associated with gender equality. The control variables are in line with the previous results in Table 3.

Figure 6: Gender Bias vs WBL Scatter Plot for Long and Short Peace Processes

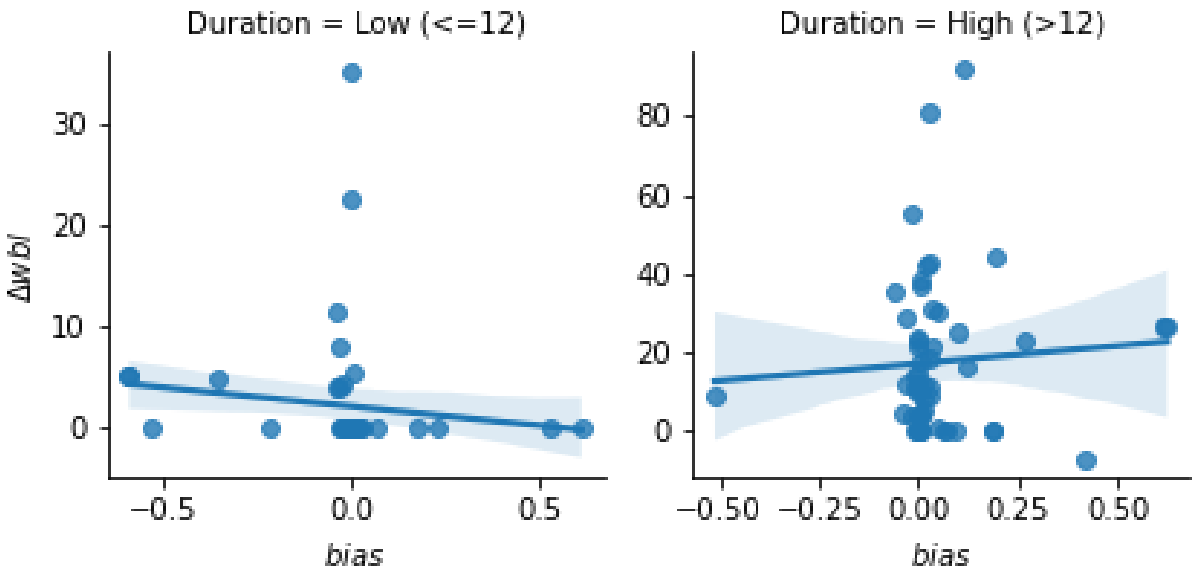


Table 4: Changes in gender equality and gender bias language in peace agreements

Δgii	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
bias	11.639	6.284	-1.029	-5.294	-5.317	-4.353	-4.427	-3.861
gii_1		-29.112**	-25.54***	-29.668***	-29.553***	-27.457***	-27.046***	-27.983***
gdpgr			0.251***	0.138**	0.139**	0.146**	0.141**	0.141**
peace				0.088**	0.087*	0.087*	0.088*	0.088*
intrastate					0.505	2.457	1.17	0.986
intralocal						4.13	2.825	2.652
interintra							-2.713	-2.727
cease								1.388
R^2	0.01	0.07	0.47	0.60	0.60	0.60	0.60	0.60
R^2 Adj.	0	0.06	0.45	0.58	0.58	0.58	0.57	0.57
N. Obs	108	108	108	108	108	108	108	108

Notes: The table presents regression results. Statistical significance is denoted as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. N. Obs refers to the number of observations.

6 Conclusion

The intersection between gender equality, women's agency and peace can be transformative for a conflict-affected country. Gender equality (i.e. institutions that promote equality) allows women to be empowered which in turn can result in achieving sustainable peace (Mannergren Selimovic et al., 2012). Unfortunately, opportunities to promote gender equality can be lost due to frameworks and policies that are gender-neutral. In this study, we create a gender bias score from the language used in peace agreements. We use this score to examine its association with women's agency.

We argue that conflicts can disrupt social institutions and increase women's agency through mechanisms related to role shifts across society and political shifts catalysed by conflict. As such peace agreements provide an opportunity for reform in policies related to promoting gender equality.

We find that the gendered language in the peace agreements sampled in the study has a somewhat positive bias for women, suggesting that the frameworks may be gender-sensitive. However, while gender-sensitive language may consider gender differences, it does not necessarily consider the consequences of the existing inequalities between genders, thus acknowledging the problem without actually providing solutions. We also find that the gender bias score is positively associated with change in women's agency, in particular for countries with low levels of women's rights, as well as countries involved in longer peace processes.

The findings from our study reveal three implications. The weak association between our gender bias score and the change in women's agency may signify the weakness in the gendered language which is more ambiguous rather than being gender-specific with intentional laws that target women's agency. For example, a UN Women's report by Menon (2021) raises concern about the weak language pertaining to violence in ceasefire agreements and calls for clearly stated consequences for non-compliance with such violence. A second implication is that the duration of peace processes matters for gender policy reform. Peace processes buy time for proper formulation and effective implementation of gender-specific frameworks, such as including strong enforcement mechanisms, or a system for monitoring and evaluating gender-related policies. Reforming institutions and mainstreaming gender during peace processes have important legacies for gender power relations in post-conflict societies. Finally, our findings highlight the importance of language used in policy documents, especially in peace agreements where nation-building and transformation are the core focus. Gender-specific language is necessary to avoid the existing gap between gender policies on paper that are simply lip service and gender-transformative policies that are put into action. Furthermore, the findings may provide us with a window of opportunity for gender-transformative policy reforms that come close to meeting the 2030 SDGs 5 and 16 targets of gender equality and empowering all women and girls, while simultaneously reducing violence across the world to promote peaceful and inclusive societies.

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7 Appendix

Table 5: Stepwise VIF Scores for main regression

Predictor	VIF	VIF	VIF	VIF	VIF	VIF	VIF
$bias$	1	1.01	1.02	1.02	1.04	1.04	1.09
wbl_1	1	1.13	1.74	3.09	4.61	6.08	6.08
$gdpgr$		1.13	1.73	1.75	1.79	1.84	1.84
$peace$			2.65	2.74	2.75	2.83	2.84
$intrastate$				2.73	3.70	4.81	4.90
$intralocal$					1.61	1.85	1.91
$interintra$						1.41	1.41
$cease$							1.29

7.1 Genbit: A Tool for Measuring Gender Bias in Text

GenBit (or Gender Bias Tool), a tool to measure gender bias in text data. The main goal of GenBit is to analyze your corpora and compute metrics that give insights into the gender bias present in a corpus. The computations in this tool are based primarily on ideas from Bordia and Bowman (2019).

GenBit helps determine if gender is uniformly distributed across data by measuring the strength of association between a pre-defined list of gender definition words and other words in the corpus via co-occurrence statistics. The key metric it produces gives an estimate of the strength of association, on average, of any word in the corpus with a male and female (repository also includes non-binary, transgender (trans), and cisgender (cis) gender definition words but are excluded). The metrics that it provides can be used to identify gender bias in a data set to enable the production and use of more balanced datasets for training, tuning and evaluating machine learning models. However, it can also be used as a standalone corpus analysis tool.