Master's thesis

NTNU
Norwegian University of Science and Technology
Faculty of Social and Educational Sciences
Department of Sociology and Political Science

Hanna Stangebye Arnesen

Creating Safe Spaces?

The Effect of Local Peacekeeping on Sexual Violence in Armed Conflict, Africa 1994-2009

Master's thesis in Political Science
Supervisor: Ole Magnus Theisen and Ingrid Vik Bakken
July 2020

NTNU
Norwegian University of
Science and Technology

Hanna Stangebye Arnesen

Creating Safe Spaces?

The Effect of Local Peacekeeping on Sexual Violence in Armed Conflict, Africa 1994-2009

Master's thesis in Political Science
Supervisor: Ole Magnus Theisen and Ingrid Vik Bakken
July 2020

Norwegian University of Science and Technology
Faculty of Social and Educational Sciences
Department of Sociology and Political Science

NTNU
Norwegian University of
Science and Technology

Abstract

This thesis expands the current literature on sexual violence by analysing the local prevalence of sexual violence in armed conflict and the deployment patterns by United Nation (UN) peacekeeping operations in Africa between 1994 and 2009. I argue that the effect of peacekeepers has local mechanisms, which are better explained in a local-level analysis. I suggest that peacekeeping operations reduce sexual violence by affecting the motivation for individuals, groups and strategically perpetrating sexual violence, and by changing the opportunity to commit sexual violence. Peacekeeping operations do so by acting as deterrents and creating physical barriers between the conflict actors and the local population. These mechanisms require a close proximity between peacekeeping forces and locals. This will therefore need to be addressed at a local-level. Further, I argue that these mechanisms affect government and rebel groups differently.

Using the geocoded Sexual Violence in Armed Conflict dataset (GEO-SVAC), which has not been used in a published analysis to date, combined with the newly published geocoded Peacekeeping Operations dataset 1.2 (GEO-PKO) allows for exploring new questions about peacekeeping operations and their effects at the subnational level (Bahgat, Nordås, & Østby, 2016; Cil, Fjelde, Hultman, & Nilsson, 2019). By means of the matching techniques and fixed effects estimators to account for possible non-random deployment of peacekeeping operations, the analysis shows that the presence of peacekeepers reduces the likelihood of sexual violence being perpetrated. I also find that peacekeepers are able to reduce prevalence of sexual violence perpetrated by rebel groups, although it is unclear whether peacekeepers are more effective at reducing rebel perpetrated sexual violence then government perpetrated sexual violence. When analysing the effect of troop strength, the effects found in this thesis were very small and where not statistically significant.

Sammendrag

Denne masteroppgaven utvider den nåværende forskningslitteraturen om seksuell vold ved å analysere den lokale utbredelsen av seksuell vold i væpnet konflikt og utplasseringsmønstrene til FNs fredsbevarende operasjoner i Afrika mellom 1994 og 2009. Jeg argumenterer for at effekten av de fredsbevarende operasjonene består av lokale mekanismer som dermed lar seg bedre forklare i en analyse på lokalt nivå. Fredsbevarende operasjoner kan redusere seksuell vold i konflikt på to måter. For det første, gjennom å påvirke motivasjonen til individer eller grupper, samt strategisk utført seksuell vold. For de andre, gjennom om å endre muligheten til å utføre seksuell vold. Fredsbevarende operasjoner gjør dette ved å fungere som et avskrekkende middel og ved å skape fysiske barrierer mellom konfliktaktører og lokalbefolkningen. Jeg argumenterer for at disse mekanismene krever en nærhet mellom de fredsbevarende styrkende og lokalbefolkningen. Derfor må dette undersøkes på lokalt nivå. Videre argumenterer jeg for at disse mekanismene påvirker regjeringsstyrker og opprørsgrupper på ulik måte.

Ved å bruke det geokodede datasettet Sexual Violence in Armed Conflict dataset (GEO-SVAC), er det mulig å oppgi både omtrent hvor, hvilken alvorlighetsgrad, og hvilken konfliktaktør som har utført den seksuelle volden (Bahgat, Nordås, & Østby, 2016). Dette geokodede datasettet har hittil ikke blitt brukt i publiserte studier, mens det orginale SVAC-datasettet er hyppig brukt i studier av seksuell vold i konflikt. Datasettet er kombinert med det nylig publiserte geokodede Peacekeeping Operations dataset 1.2 (GEO-PKO), som er det mest omfattende datasettet av sitt slag, og gjør det mulig å undersøke nye spørsmål om fredsbevarende operasjoner og deres effekt på et subnasjonalt nivå (Cil, Fjelde, Hultman, & Nilsson, 2019). Ved å bruke såkalte *matching*-teknikker og *fixed effects*-estimatoerer til å kontrollere for mulig ikke-tilfeldig utplassering av fredsbevarende styrker, viser denne analysen at tilstedeværelse av fredsbevarende styrker reduserer sannsynligheten for at seksuell vold blir utført. Jeg finner også at fredsbevarende styrker reduserer seksuell vold utført av opprørsgrupper, men det er uklart hvorvidt de fredsbevarende styrkene er mer effektive når det kommer til å redusere seksuell vold utført av opprørsgrupper sammenliknet med den som er utført av regjeringsstyrker. Effekten av størrelsen på troppene er svært svak, og synes ikke å ha noen signifikant effekt i denne analysen.

Acknowledgements

First, to my brilliant advisors Ole Magnus Theisen and Ingrid Vik Bakken, thank you for your time, patience, comments and encouragement. To my partner Nils Arne, I can think of no one I would rather be stuck in a tiny apartment with, especially when you started baking bread. To my friends, particularly Eirin and Thea, thank you for your friendship and the coffee. Lastly, to my family, so long and thanks for all the fish.

All errors are my own.

Table of Contents

Maps

Figures

Tables

Appendix

1 Introduction

Sexual violence occurring in armed conflict is nothing new. Leatherman (2011) in her book *Sexual Violence and Armed Conflict* points out that references to sexual violence are found in the earliest documents of recorded history and in early texts such as in Homer's *Iliad* and the Old and New Testaments of the Bible (Leatherman, 2011, p. 1). Sexual violence is, however, not inevitable in conflict-affected areas. Research shows that sexual violence severity varies within groups, over time and between conflicts (Kirschner & Miller, 2019). In the same conflict some parties resort to sexual violence while others abstain (Leatherman, 2011, p. 12). Previous research points to sexual violence being distinct from other forms of physical violence.

This thesis expands the current literature on sexual violence by analysing the local prevalence of sexual violence in armed conflict and the deployment patterns by United Nation (UN) peacekeeping operations in Africa between 1994 and 2009. Gaining a more nuanced understanding of the effect of peacekeepers on prevalence of sexual violence locally will broaden our comprehension of peacekeeping in general and its effect on sexual violence specifically. The research question is, *does a local presence of peacekeepers reduce prevalence of sexual violence in active armed, state-based conflict in Africa?*

According to Johansson and Hultman (2019) peacekeepers may be less equipped in handling sexual violence compared to other forms of violence; "in fact, it is not uncommon that operations report a decrease in other types of violence while sexual violence consistently remains a security issue" (Johansson & Hultman, 2019). Penalisation of sexual violence is not always included in ceasefire and peace agreements, which lowers the cost of sexual violence compared to other forms of violence (Johansson & Hultman, 2019).

Research on the effect of peacekeeping on conflict-related sexual violence has increased in line with the broader field of peacekeeping research, and recent studies have addressed the effectiveness of peacekeeping related to the reduction of sexual violence (Salvatore & Ruggeri, 2017). Are peacekeeping operations able to reduce the prevalence of sexual violence in armed conflict? There are large subnational variations where the peacekeepers are operating and this variation extends to how successful they are at curbing conflict and violence on the ground (Fjelde, Hultman, & Nilsson, 2019).

Although with varying confidence, previous research indicates that peacekeepers are to some extent successful in reducing sexual violence. Again, this is only tested at a national-level.

I argue that the effect of peacekeepers has local mechanisms, which are better explained in a local-level analysis. I posit that peacekeeping operations reduce sexual violence in conflict areas in two ways. First, by affecting the motivation for individuals, groups and strategically perpetrating sexual violence. Second, by changing the opportunity to commit sexual violence. Peacekeeping operations do so by acting as deterrents and creating physical barriers between the conflict actors and the local population. I argue that these mechanisms require a close proximity between peacekeeping forces and locals. This will therefore need to be addressed at a local-level. Further, I argue that these mechanisms affect government and rebel groups differently.

Using the geocoded Sexual Violence in Armed Conflict dataset (GEO-SVAC), it is possible to state approximately where and to what severity sexual violence is perpetrated and by which conflict-actors (Bahgat, Nordås, & Østby, 2016). This geocoded dataset has not been used in a published analysis to date, while the original SVAC dataset is commonly used in studies addressing sexual violence in conflict. This dataset is combined with the newly published geocoded Peacekeeping Operations dataset 1.2 (GEO-PKO), which is the most comprehensive dataset of its kind and allows for exploring new questions about peacekeeping operations and their effects at the subnational level (Cil, Fjelde, Hultman, & Nilsson, 2019).

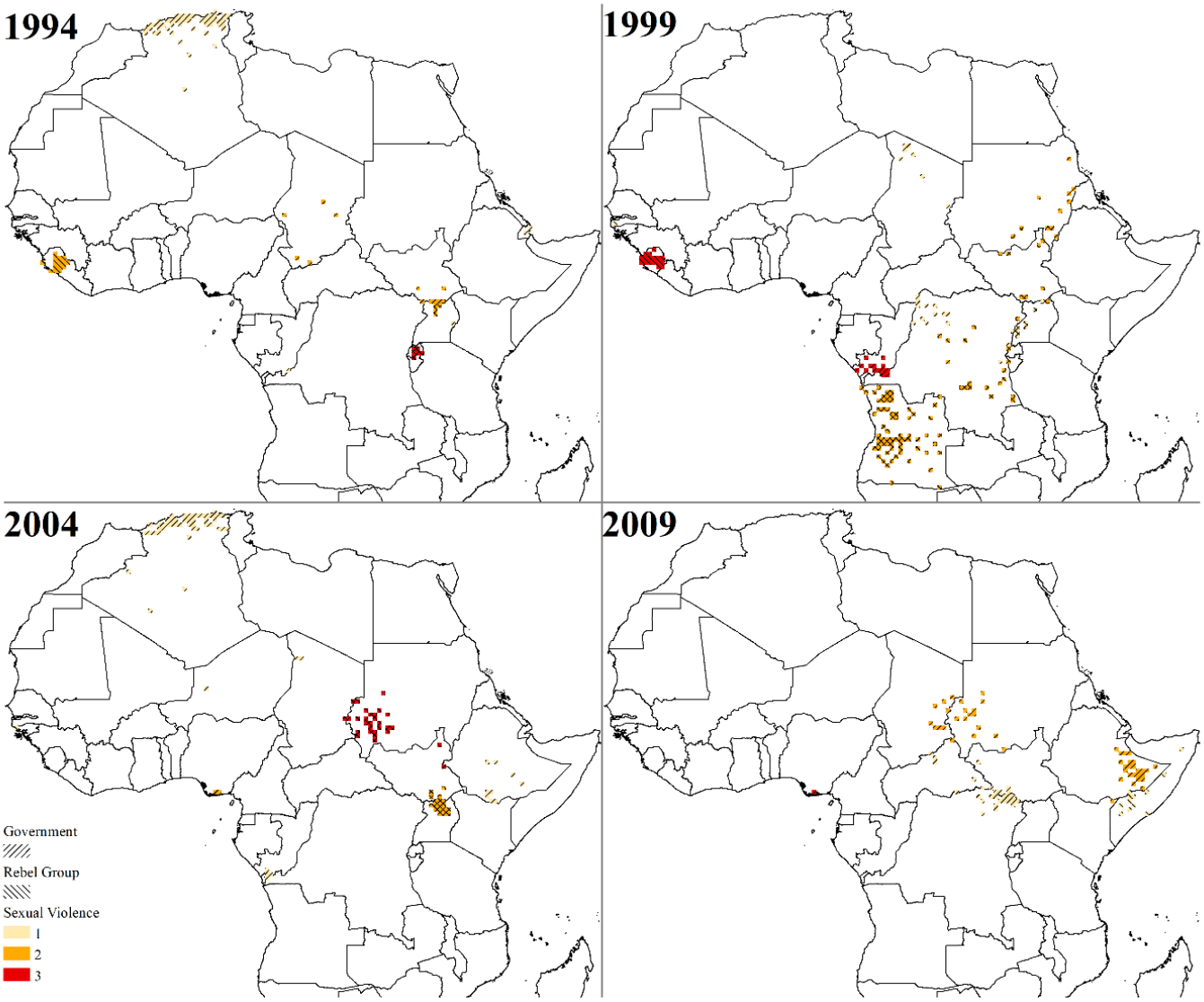
I hypothesise that the presence of peacekeepers reduces prevalence of sexual violence in conflict. Further, that this effect is stronger for rebel groups than government. Additionally, I hypothesise that the strength of the peacekeeping operations reduces prevalence of sexual violence. Using matching techniques and fixed effects estimators to account for possible non-random deployment of peacekeeping operations, the analysis shows that the presence of peacekeepers reduces the likelihood of sexual violence being perpetrated. I also find that peacekeepers are able to reduce prevalence of sexual violence perpetrated by rebel groups, although it is unclear whether peacekeepers are more effective at reducing rebel perpetrated sexual violence then government perpetrated sexual violence. When analysing the effect of troop strength, the effects found in this thesis were very small and where not statistically significant.

The rest of the introduction chapter is structured as follows: I first present the relevance and contribution of this thesis, followed by definitions of the key concepts. The chapter ends with an outline of the structure of the thesis.

1.1 Relevance and Contribution

Cross national studies have shown that peacekeepers, under certain conditions, are able to reduce the prevalence of sexual violence (Johansson & Hultman, 2019; Kirschner & Miller, 2019). Yet, there are no local-level studies comparing more than one country's prevalence of sexual violence in armed conflict. This is an issue when the effects of peacekeeping presence have local-level mechanisms. A local-level analysis of how a peacekeeping presence affects sexual violence in conflict is my contribution to the peacekeeping literature.

Map 1 Sexual violence perpetrated by government and rebel forces in armed conflict, 1994, 1999, 2004, 2009. Made in ArcMAP 10.7 using the GEO-SVAC dataset (Bahgat et al., 2016).



Map 1 visualises the prevalence of sexual violence in armed conflict and demonstrates that the prevalence of sexual violence changes over time and is not static at a local-level. Most countries have specific regions where conflict cumulates, and also where prevalence of sexual violence is high. This map shows which regions are particularly affected by sexual violence, for example large parts of Sierra Leone in 1999 and western parts of Sudan in 2004. This map demonstrates the variation of sexual violence within countries. This variation is partially lost in a national-level analysis, this is another reason for why this should be studied at a local-level.

Addressing the proximity of peacekeepers to the local population and the effect of this proximity on daily interactions between the two is necessary to properly understand effective peacekeeping (Bove & Ruggeri, 2019, p. 1650; Ruggeri, Dorussen, & Gizelis, 2017). A local perspective on peacekeeping adds nuance to questions already addressed by researchers. The size and type of peacekeeping deployed, intensity of violence, terrain and infrastructure are all examples of factors that varies within a country (Hultman & Tidblad-Lundholm, 2019). When peacekeeping is analysed at a national level, the nuances of these local factors are lost. By accounting for the local variation of these factors, the analysis in this thesis gets closer to the mechanisms by which peacekeeping affects the prevalence of sexual violence. Subnational data on the location and characteristics of peacekeeping deployment allows for this analysis of the local presence and subsequent violence prevention, and whether peacekeepers may also deter violence in surrounding areas or just displace violence to these locations. How peacekeepers interact with the local population is an important and until recently overlooked aspect of analysing the effectiveness of peacekeeping. The increased availability and quality of disaggregated data on peacekeeping deployment has resulted in increased attention to trickle-up peacekeeping, differences between peacebuilding nationally and locally, as well as the effect of decentralised actions of peacekeepers on the ground (Autesserre, 2014, p. 492). Peace achieved nationally and internationally is not assumed to automatically trickle down (Autesserre, 2014). In light of this, it is necessary to study the local dimensions of international interventions and in particular the actual impact of peacekeeping efforts on the ground.

Researching peacekeeping and sexual violence has been difficult due to complications of obtaining within-country data for peacekeeping operations and the propensity of sexual violence particularly. This is a challenge when the phenomenon of interest here is sexual violence and peacekeeping, which varies substantially within countries.

1.2 Key Concepts

1.2.1 Sexual Violence in Armed Conflict

This thesis investigates the prevalence of sexual violence in armed conflict, sometimes referred to as conflict-related sexual violence. In short, conflict-related sexual violence can be defined as sexualised violence perpetrated by any armed actor during armed conflict (World Health Organisation, 2002). Armed actors include both state forces and non-state actors such as rebel forces or militia organisations, including peacekeeping forces (Wood, 2018, p. 515). An armed conflict is an irreconcilability between a government of a state resulting in at least 25 battle-related deaths in one calendar year (Högbladh, 2019; Sundberg & Melander, 2013). The definition of sexual violence used in the GEO-SVAC dataset is adopted from the International Criminal Court (ICC): "Sexual violence refers to rape, sexual slavery, enforced prostitution, forced pregnancy, enforced sterilization, or any other form of sexual violence of comparable gravity" (Koos, 2017; Nordås & Cohen, 2011). The definition used in this thesis does not exclude the existence of male victims and female perpetrators Men are also a target for sexual violence; this may be on their own bodies, or they may be forced to commit sexual acts on their family members or witness it being done to emasculate them. Sexual violence is a crime faced by both genders, although women and girls are most often the direct object of assault and exploitation (Leatherman, 2011, p. 9).

Sexual violence is also committed by peacekeepers. Sexual violence by peacekeepers will be referred to as sexual exploitation and abuse. Nordås and Rustad defines sexual exploitation and abuse as:

> any 'actual or attempted abuse of a position of vulnerability, differential power, or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another,' and abuse is 'the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions'. (Nordås & Rustad, 2013, p. 512)

1.2.2 United Nations Peacekeeping

Peacekeeping has become one of the main methods used by the international community to resolve conflict (Ruggeri et al., 2017). In this thesis, peacekeeping operations are defined broadly including traditional and multidimensional peacekeeping operations, peace enforcement operations and all-civilian peace operations deployed by the UN (Bromley, 2018). These can be regional or sub-regional organisations as well as ad hoc groupings. Peacekeeping operations addressed in this thesis have mandates and an in-country presence. Further,

peacekeepers are understood as all staff – military or civilian, international or locally contracted that are attached to a peace operation (Bromley, 2018). The UN states that "peacekeepers protect civilians, actively prevent conflict, reduce violence, strengthen security and empower national authorities to assume these responsibilities" (UN, 2020). The UN Security Council, which has the primary responsibility for the maintenance of international peace and security, determines when and where peacekeeping operations should be deployed (UN, 2020). A peacekeeping operation is established by adopting a UN Security Council resolution, this resolution defines the specific operation's mandate and size. The UN Security Council monitors the operations through reports from the Secretary-General and through dedicated sessions. On the basis of these reports and sessions, they may extend, alter or end operation mandates as they see fit (UN, 2020).

Ruggeri et al. (2016) indicate that peacekeepers are deployed to where the conflict is located. Their study suggests that there is a two-step process to deployment. As a first step, the UN Security Council authorises a peacekeeping operation. The second stage takes place when a UN representative in the receiving country decides if and where peacekeepers are deployed based on the local conditions (Ruggeri, Dorussen, & Gizelis, 2016, p. 1006).

The subnational variation of UN deployment is visualised in Map 2. The map shows deployment of peacekeepers in Africa with four-year intervals from 1994-2009. As seen in the map, peacekeeping operations vary across time and space. Some deployments cluster in sub-regions of a country where large areas in the country have significant distances between them and the closest peacekeeping operation. An example of this is Democratic Republic of the Congo in 2004. Other deployments are dispersed quite evenly throughout the country, as seen in Mozambique in 1994.

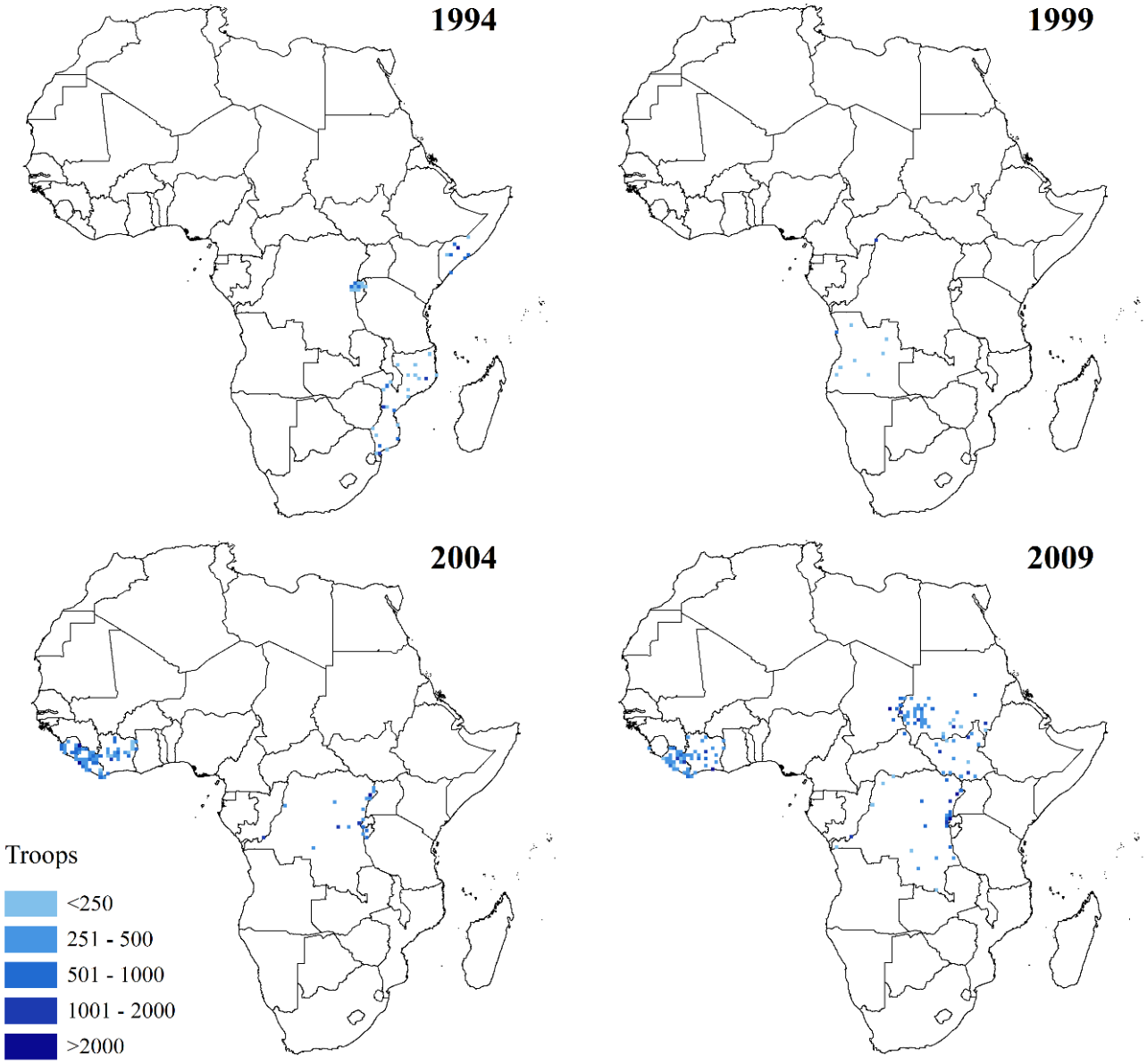
Peacekeeping operations are deployed on the basis of mandates formed in the UN Security Council. The range of mandates given to peacekeeping operations has expanded in response to the changing variety of conflict (UN). The mandates also reflect resolutions passed in the UN Security Council. The resolutions demonstrate the changing role of peacekeepers from observers to active participants. On October 31, 2000, UN Security Council Resolution 1325 (UNSCR 1325) was adopted as the first in a series of UN Security Council Resolutions to address women in conflict. Commonly known as Resolution 1325 on Women, Peace, and Security, it recognises that women were "not only inordinately affected by war but were also an important resource for peace-building and post conflict reconstruction" (de Jonge Oudraat, 2013, p. 612). The resolution refers to the necessity to protect women during and after conflict,

and the equal participation and full inclusion of women in the peacekeeping process as a way to secure and maintain peace (Charlesworth, 2008, p. 350). From 2009 and onwards, peacekeeping operations were formally mandated to protect civilians from sexual violence (Kirschner & Miller, 2019). The change towards stricter mandates to protect civilians, particularly against sexual violence reflects a strong overall trend within UN peacekeeping toward making civilian protection a key priority (Fjelde et al., 2019, p. 103).

In what de Coning (2017) refers to as "classical peacekeeping", the use of force was only permissible when used in situation of self-defence. These classical peacekeeping operations were primarily concerned with observing and were, as mentioned, not allowed to use force beyond self-defence. Since these operations were largely unarmed, they would likely have been unable to use self-defence (Sloan, 2014). Later, evolving from classical peacekeeping, the use of force in self-defence was normalised. As Sloan (2014) addresses, the concept of "self" included the personnel in the peacekeeping operation as well as protection of the mandate the operation was charged with completing. Importantly, peacekeepers are only permitted to use the minimum force necessary to protect themselves, those they are mandated to protect as well as the operation's ability to achieve its mandate (de Coning, 2017).

Even though the UN has deployed more peacekeeping operations than any other organisation, it is not the only organisation deploying operations (Fortna & Howard, 2008, p. 291). Compared to UN peacekeeping, research on non-UN peacekeeping is not as common (Bara & Hultman, 2020). This is likely due to lack of data. In this thesis, peacekeeping is understood as UN peacekeeping, mainly due to data limitations.

Map 2 Distribution of the number of peacekeepers in Africa 1994, 1999, 2004, 2009 (made in ArcMAP 10.7 with the GEO-PKO 1.2 dataset)



1.3 Structure of Thesis

The following is an outline of the chapters in this thesis. Chapter 2 Literature Review is divided into four parts: studies on sexual violence in armed conflict, studies on peacekeeping reducing sexual violence, studies on the conflict and violence reducing effects of peacekeeping, and studies on the effect of local peacekeeping on locals and conflict. In Chapter 3, I outline the theoretical foundation where the motivation and opportunity for perpetrating sexual violence are outlined. The hypotheses are summarised at the end of Chapter 3. Chapter 4 introduces the

dataset used in this thesis as well as the operationalisation of all variables, including an introduction of the GIS work undertaken. Also, in Chapter 4, the empirical strategy is presented where the choices of matching technique and estimators are explained. In Chapter 5 the results of the matching and models are presented. I discuss the results and their implications in Chapter 6.

2 Literature Review

The literature review outlines the current research on conflict-related sexual violence and peacekeeping's effect on sexual violence as well as the relevant literature on the effect of peacekeepers on conflict and violence. This section is divided into four parts. First, I present the main finding in the sexual violence in armed conflict literature. This is to give some insight into how sexual violence might be different from other forms of violence and how researchers address it as such. Secondly, I outline the relevant literature on how the prevalence of sexual violence is affected by peacekeeping. This is literature is central to the arguments in this thesis. Here I also address the gap this thesis fills in the literature. Third, the effect of peacekeeping on conflict level and violence is presented. This is to bridge the national-level studies that have been done on violence and conflict, with the local-level analysis on the same topic. Lastly, I present the literature on peacekeepers effect on conflict and violence *locally*. The literature on the local effect of peacekeeping is central to this thesis.

2.1 Studies on Sexual Violence in Armed Conflict

Much of the research on sexual violence in armed conflict starts by pointing out that sexual violence in conflict is not inevitable, it varies over time, between conflicts, conflict actors and individuals (Koos, 2017, p. 1935). Campbell et al. (2019) point out that the early literature on conflict-related sexual violence describes sexual violence as an 'exceptional experience', removing it from both its peacetime context of 'conventional' violence against women (and men) and its wartime context of the wider gendered dynamics of organised violence. This literature has often focused on factors that increase the risk of sexual violence in war, emphasising aspects related to the type of conflict, actor characteristics, and individual incentives (Johansson & Sarwari, 2019, p. 470). The literature has also differed in focus. Nordås and Cohen (2011) state that some studies address rape, others focus on intentional physical injuries or non-physical acts such as sexual harassment.

The literature on sexual violence in armed conflict is largely based on case studies of areas where there has been a particularly high prevalence of sexual violence (Johansson & Hultman, 2019; Kirschner & Miller, 2019). For this reason, qualitative studies have tended to address sexual violence in the Democratic Republic of Congo (DRC), as this is one of the countries commonly cited to have high prevalence of sexual violence. Examples of these studies are Banwell (2014) and Meger (2010). Banwell's article analyses sexual violence from a

feminist perspective (Banwell, 2014). Meger approaches the issue in a similar fashion, arguing that the use of rape must be seen in relation to constructs of masculinity and exploitation (Meger, 2010). Both of these studies are qualitative concept-building approaches that have laid a groundwork for further studies on sexual violence.

Two examples of local-level quantitative studies on the effects natural resources have on levels of sexual violence are Whitaker, Walsh and Conrad (2019), and Rustad, Østby and Nordås (2016). Both studies analyse natural resources and severity of sexual violence albeit from different angles. In their study Rustad, Østby and Nordås (2016) explore how artisanal mining and sexual violence are related in Eastern DRC. Their results indicate that women living in close proximity to artisanal and small-scale mining are more likely to experience sexual violence both from their partner and non-partner (Rustad, Østby, & Nordås, 2016). Whitaker, Walsh and Conrad (2019) find that sexual violence perpetrated by rebel groups is influenced by how they fund their operations. One of the more important results in the study show that, rebel groups that generate funds through the extortion of natural resource production are more likely to engage in sexual violence. Further, rebels that rely on foreigners to profit from natural resources and thus are less dependent on the local population, will be more likely to engage in sexual violence (Whitaker, Walsh, & Conrad, 2019). Dependency on the local population lowers the incentives of the rebel groups to use sexual violence. High levels of sexual violence are therefore addressed as a strategic calculation in the article (Whitaker et al., 2019).

Campbell, Demir and O'Reilly's (2019) study of the 'everyday' experience of conflict-related sexual violence uses witness testimonies to highlight the complexities of the everyday lives of individuals who are living in an area of armed conflict. The study submits witness testimonies as significant sources of knowledge on conflict-related sexual violence. In the study, the broad spectrum of violence that victims experience is demonstrated. The study further addresses the importance of both "exceptional" and "ordinary" forms of violence described by the witnesses, placing acts of sexual violence on a spectrum spanning public and private spheres and wartime and peacetime settings (Campbell, Demir, & O'Reilly, 2019). Addressing the importance of witness testimonies in understanding how sexual violence works in practice, Baaz and Stern's study on why soldiers rape is unique in the literature (Baaz & Stern, 2009). Their study is an analysis of the discourses about sexual violence and masculinity within one of the main perpetrators itself in the DRC. Spesifically, the study discusses how the soldiers distinguish between "lust rapes" and "evil rapes", and argues that their explanations of rape must be understood in relation to notions of different masculinities (Baaz & Stern, 2009). The

purpose and usefulness of this study is an increased understanding of why individuals commit sexual violence in conflict. In this context it is helpful to understand how peacekeepers might mitigate this.

2.2 Studies on Peacekeeping Reducing Sexual Violence

Sexual violence is seen as a distinct form of violence against civilians that occurs in all stages of conflict (Benson & Gizelis, 2020). As Johansson and Hultman (2019) reflect, "peacekeeping was not primarily designed to deal with the challenge of sexual violence by organised actors" (p.1675). The effect of peacekeepers on sexual violence is far more limited in scope and magnitude compared to the reduction of battle deaths (Gizelis & Benson, 2019, p. 1598). The literature on the effectiveness of peacekeeping has largely used battle-related deaths and one-sided violence as measures for efficiency and not sexual violence.

According to Benson and Gizelis (2020), a high prevalence of sexual violence has an independent impact on the number of UN Security Council resolutions. Thy find that high levels of sexual violence increases probability of UN attention to a conflict. This impact is also seen when there are other factors present, such as a high number of battle-related deaths (Benson & Gizelis, 2020). This finding is consequensial for others studies and non-random deployment of peacekeepers has to be accounted for.

Recent research has contributed to a broadening of the understanding of effective peacekeeping by including sexual violence (Johansson & Hultman, 2019; Kirschner & Miller, 2019). Both studies have attempted to identify the necessary conditions for peacekeepers to effectively reduce the prevalence of sexual violence in active armed conflict. These studies have somewhat diverging conclusions on whether peacekeeping is effective at reducing sexual violence. In their study, Kirschner and Miller (2019) find that UN troops reduce sexual violence. Johansson and Hultman (2019), in their study, are more cautious in their conclusion. Kirschner and Miller (2019) suggest that peacekeepers raise the cost of sexual violence and increase institutional and cultural changes which in turn will reduce sexual violence. Further, they find that governments curtail sexual violence more quickly compared to rebels in response to military contingents; rebels are especially responsive when operations include large civilian components (Kirschner & Miller, 2019). Johansson and Hultman (2019) find that the ability of peacekeepers to reduce sexual violence is generally weak. Only police with explicit protection mandates reduce the risk of sexual violence by rebel forces. They specifically compare conflict

actors with strong and weak control over their combatant and conclude that the number of peacekeepers is to some extent associated with a lower risk of sexual violence by both the government and the rebel conflict actors. In other words, the conflict actors responses to peacekeeping is related to the group's organisational strength (Johansson & Hultman, 2019). Johansson and Hultman (2019) have concluded that sexual violence is reduced most successfully when they are dealing with conflict actors with higher organisational capacity and control.

Johansson and Sarwari (2019) concludes that rebel groups are more likely to perpetrate sexual violence when the government receives more troop support. Likewise, government forces are more susceptible to committing sexual violence when they are challenged by troops supporting the rebel group. Therefore, foreign actors can reduce the prevalence of sexual violence perpetrated by the group they are advocating, while having the reverse effect on their adversary (Johansson & Sarwari, 2019). Although Johansson and Sarwari's study addresses interventions by individual states and not UN peacekeeping, it highlights how an unequal distribution of capabilities across conflict actors (as a result of peacekeeping operations) can influence conflict actors' willingness to use sexual violence against civilians (Johansson & Sarwari, 2019).

The findings from Johansson and Hultman (2019) and Kirschner and Miller (2019), contribute to our understanding of the ways which peacekeeping operations could be evaluated. Also addressing the capability to use force and the importance of operation size as determinants of effectiveness. These contributions are particularly important to this thesis. Since there is limited literature on how peacekeeping affects sexual violence in armed conflict, I draw on the literature on peacekeeping's effect on conflict levels, battle-related deaths and one-sided violence. In broad terms, studies on peacekeeping have looked at battle-related deaths and one-sided violence as the mark of effective peacekeeping[1].

2.3 Studies on the Conflict-Reducing Effects of Peacekeeping

Currently, there is no quantitative cross-national research on the effects of a local presence of peacekeepers on sexual violence. Dye to this gap, it is necessary to build on research on violence more broadly.

[1] One sided violence is defined as being "the use of armed force by the government of a state or by a formally organised group against civilians" (Eck & Hultman, 2007, p. 235).

The previous decade has seen a considerable growth in research on peacekeeping. Scholars agree that peacekeeping "is in general good at achieving what it was designed to do", which is keeping the peace between warring actors (Fjelde et al., 2019). Recent studies consider the difficulty of the operation's task and consistently find that peacekeeping works (Autesserre, 2014; Fjelde et al., 2019; Fortna, 2004; Fortna & Howard, 2008; Hegre, Hultman, & Nygård, 2019, p. 217). In light of this consensus, research has turned to focus on the degrees of an operation's success or effectiveness, and the characteristics of the most successful operations.

What is considered to be the most accurate measure of effectiveness has diversified. Kirschner and Miller (2019) describes the field of peacekeeping as either looking at what they consider the core function of a peacekeeping operation, (does peace last?) or emphasising the humanitarian results, such as effectively protecting civilians against violence. These studies usually look at within-operation factors to compare the success of different peacekeeping operations (Kirschner & Miller, 2019, p. 2045). In these cases, different aspects of peacekeeping operations have been under review, with efforts being made to operationalise troop quality (Haass & Ansorg, 2018); analysis of the effects of different troop-contributing countries (Kathman & Melin, 2016, p. 160); and measuring the distance between peacekeepers and the locals (Bove & Ruggeri, 2015). A majority of these studies consider a reduction of one-sided violence as a measurement of effectiveness (Bove & Ruggeri, 2015; Eck & Hultman, 2007; Fjelde & Hultman, 2014; Fjelde et al., 2019; Haass & Ansorg, 2018; Hultman, 2010; Ottmann, 2017). The consensus is that UN operations are able to reduce one-sided violence. Hultman, Kathman and Megan (2013) find that Operations are more effective at protecting civilians when they have larger military troop and police contingents. They also find that fewer civilians are targeted with violence when the UN commits more military personnel (Hultman, Kathman, & Megan, 2013).

The studies presented in this sub-chapter all conclude, with varying degrees of confidence, that peacekeeping help protect civilian lives (Ruggeri et al., 2017). A central question becomes, do national-level studies on the effect of peacekeeping operations have the same results as local-level studies? In the next chapter I present relevant literature on the local effects of peacekeeping and conclude that the results of these studies point to the same conclusions, but the mechanisms that are analysed are different.

2.4 Studies on the Local Effects of Peacekeeping

So far in this chapter, I have presented national-level studies on the effects of peacekeeping both on violence in general and sexual violence specifically. In the following subchapter, I outline relevant studies on the local effects of peacekeeping. The first studies presented here are qualitative works focusing on the interactions between peacekeepers and the local population. However, most of the studies presented in this subchapter are quantitative studies and guide the analysis in this thesis.

Jennings (2016) argues that 'peacekeeping-as-enterprise' is a fitting term for how many experiences the presence of peacekeepers. She further argues that the transactional nature of the relationship between the peacekeeper and the peacekept has negative consequences, describing the transactional relationship as having a contributing factor to a loss of legitimacy amongst locals. Jennings devised the term 'peacekeeping economy' to describe this relationship (Jennings, 2016, p. 307). She describes a peacekeeping economy as an activity that would not happen (or would do so at a fraction of the scale and pay-rate) without the peacekeepers presence. It is in both formal and informal activities that link the peacekeepers and the peacekept (Jennings, 2016, p. 306; Jennings & Bøås, 2015, p. 281).

Considering a peacekeeping economy, the main issue in question is the trickle-down effect of the spending by peacekeepers which alters the local economy (Beber, Gilligan, Guardado, & Karim, 2019, p. 364). Scholars find that there is a growth in the service sector and increases in the overall prices of goods and service in the presence of peacekeepers (Bell, Flynn, & Machain, 2018; Henry, 2015; Jennings, 2014). Further, the escalating housing demands by peacekeepers in areas where they are concentrated, and their willingness to pay market rates, raised the cost of housing far beyond what most Liberians could afford (Aning & Edu-Afful, 2013, p. 22). Aning and Edu-Afful (2013) also point out that there are two parallel economies in these regions. Although research on peacekeeping economies clearly focus on the economic relationship, it provides important insight into the daily interaction between the peacekeepers and the peacekept and is therefore highly relevant when looking at the effects of peacekeeping locally. Jennings (2018) points out that peacekeeping operations have impacts that extends beyond their signalling or deterrence effects. They shape a large part of the societal structure in a conflict area (Jennings, 2018; Jennings & Bøås, 2015, p. 283).

Peacekeeping operations have to contend with the issue of security (Jennings, 2016, p. 307). This is echoed in Duursma's study on the obstruction and intimidation of peacekeepers

(Duursma, 2019, p. 234). Duursma (2019) highlights the importance of peacekeeping operations establishing and effectively managing their own security to enable them to work effectively to fulfil their mandates. Jennings and Bøås add that usually peacekeepers are effectively separated from those they are supposed to protect (Jennings & Bøås, 2015, p. 291). They argue that the unmediated interaction by peacekeepers with the local population should be limited, both for security and to limit possible misconduct directed at the local population.

> In such a heavily securitized environment, where the peacekeeping bubble is not just a function of peacekeepers' greater material resources vis-à-vis the local but an outgrowth of peacekeeping's 'responsibility to protect' [itself], bypassing is almost unavoidable. (Jennings, 2016, p. 311)

Bove and Ruggeri's analysis of cultural and social distance and peacekeeping effectiveness demonstrates the usefulness of analysing local peacekeeping effects (Bove & Ruggeri, 2019). Pointing out that during a peacekeeping operation, peacekeepers interact with a range of political and social actors, combatants, and otherwise, Bove and Ruggeri (2019) state that the diversity of these interactions are missed in previous studies in the conflict literature. These daily interactions and practices between peacekeepers and locals have been studied in qualitative research, as outlined above. However, this has been markedly neglected in the quantitative literature. Bove and Ruggeri use a measurement of one-sided violence and battlefield violence to measure peacekeeping effectiveness and they theorise that cultural distance could lead to biased intervention, while social distance could lead to a lack of commitment (Bove & Ruggeri, 2019, p. 1650). They conclude that cultural proximity increases the level of protection of civilians and reduces the number of battlefield casualties. Also, distances in economic development and democracy are associated with enhanced operational capacities for civilian protection (Bove & Ruggeri, 2019). Importantly, they state that studying distance and the effects of these distances on daily interactions between peacekeepers and locals is necessary to properly understand effective peacekeeping. This study is example of where local mechanisms and interactions have to be studied in a local-level analysis.

UN peacekeeping operations increasingly engage with local communities to support peace processes in conflict areas. A study by Smidt (2020) investigates how peacekeepers 'community-based intergroup dialogue activities' influence level of violence. According to the study, to relieve intergroup coordination and negative biases between groups, facilitating dialogue between these actors reduces the risks of escalating violence (Smidt, 2020). Further observations by Fjelde, Hultman and Nilsson (2019) demonstrate that peacekeepers deploy to areas with a recent history of violence against civilians, particularly where rebel actors operate

(Fjelde et al., 2019). Similarly, Ruggeri, Dorussen and Gizelis (2016) find that peacekeepers are deployed on the frontline and they go where conflict occurs, albeit a notable delay in their deployment. This manifests at a *local*-level (Ruggeri et al., 2017, p. 165). Fjelde and Hultman's (2014) study finds that conflict actors are likely to engage in more violence against civilians in areas inhabited by the enemy's ethnic constituency (Fjelde & Hultman, 2014). Since peacekeepers are deployed to areas with high levels of violence, it is therefore possible to underestimate the effect of peacekeepers is this is not taken into account (Ruggeri et al., 2017, p. 165).

Having established that peacekeepers are depolyed to areas where conflict takes place Ruggeri, Dorussen and Gizelis (2017), demonstrate that conflicts last for briefer periods of time when peacekeepers are deployed to conflict-prone areas. This is also the case for smaller deployments. They suggest that this reduction in conflict can be because peacekeepers fill a power vacuum, left by the lack of control by central authorities. They stress that peacekeeping operations are unable to stop local conflict completely, adding that they are only able to prevent conflict from continuing unhindered (Ruggeri et al., 2017). This is a significant contribution to the literature. Although, as mentioned in Chapter 2.3, it was generally accepted that peacekeeping reduced violence and levels of conflict, this study found that peacekeepers also *have* this effect when tested int a local-level analysis.

Fjelde, Hultman and Nilsson (2019) in their study on UN peacekeeping and civilian targeting, argue that peacekeepers increase the cost for conflict actors to target civilians. They evaluate the extent to which peacekeeping is successful in protecting civilians at the subnational level. The results of the study suggest that a local presence of peacekeepers is mainly effective when used to impose cost on rebel groups and much less so on government actors (Fjelde et al., 2019). Peacekeeping operations struggle to protect civilians against government perpetrated violence. They interpret their finding as the effect of a reliance on government consent, which hinders effective peacekeeping. It may also be because the UN is less willing to impose political and military cost on government actors in comparison to rebel forces (Fjelde et al., 2019).

Hultman and Tidblad-Lundholm (2019) discuss the possible relocation effect peacekeepers might have on violence and conflict. In their study on the effects of the presence of UN troops and local levels of violence, Peitz and Reisch (2019) find that the presence of peacekeepers in one location may disperse violence to nearby areas. They state that peacekeepers reduce the local level of violence in the areas where they are stationed (Peitz & Reisch, 2019). These findings are contrary to the findings in Fjelde, Hultman and Nilsson's

(2019) study. In their study, the concern that peacekeepers diffuse violence to other locations are addressed by examining the impact of number of troops in neighbouring areas. They also examine whether the number of troops in one location will increase the risk of violence in the neighbouring areas. The results of these inquires do not indicate a violence relocation effect (Fjelde et al., 2019). Hultman and Tidblad-Lundholm (2019) connect this to Di Salvatore's (2018) findings that the presence of peacekeepers in neighbouring chiefdoms is associated with lover levels of violence (Di Salvatore, 2018; Hultman & Tidblad-Lundholm, 2019).

From the state of the arts in the peacekeeping literature, I draw the following conclusion: there is an increasing motivation to disaggregate the level of peacekeeping analysed. When the mechanisms are subnational the level of analysis should also be so. This thesis contributes to filling the gap in the literature presented in this chapter. To date there has been no local-level analysis of the effect peacekeepers has on sexual violence. Addressing the effect of local peacekeeping on sexual violence is a relevant continuation of the current literature as demonstrated by the increase interest and recognition of local peacekeeping as an important aspect of peacekeeping. Ruggeri, Dorussen and Gizelis (2017) and Fjelde, Hultman and Nilsson (2019) developed the understanding of peacekeeping and level of conflict locally. This thesis seeks to do the same by expanding on the work done by Johansson and Hultman (2019) and Kirschner and Miller (2019), to test whether peacekeepers are able to reduce prevalence of sexual violence at a local level.

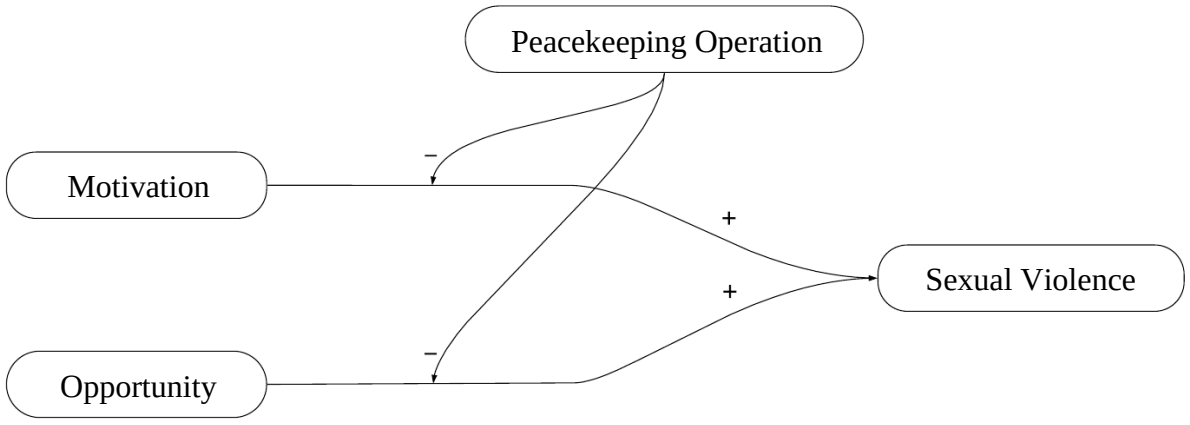
3 Theoretical Foundation

This chapter presents the theoretical framework of the thesis. I propose arguments that explain how peacekeeping operations reduce prevalence of sexual violence in armed conflict. The motivation and opportunity for armed actors to perpetrate sexual violence and how peacekeepers affect these are outlined in this chapter. Sexual violence in conflict has similar roots to sexual violence during peacetime, however, conflict-related sexual violence is intensified, which increases the occurrence and brutality (Koos, 2017, p. 1936; Wood, 2006, p. 325). Under what conditions is high prevalence of sexual violence likely to occur with significant frequency? Studies on sexual violence have categorised these mechanisms differently, but in general, it can be divided into four:

(1) Individual motives; personal gain or gratification (Koos, 2017).
(2) Intragroup norms and dynamics; the absence of penalties or norms that prohibits sexual violence within a group (Koos, 2017).
(3) Purpose and strategic motives; the idea of using rape to punish groups of people based on certain characteristics, or as a "weapon of war" (Kirschner & Miller, 2019; Koos, 2017).
(4) Contextual conditions and opportunity structures; instability and insecurity providing conditions for large-scale sexual violence (Koos, 2017).

These mechanisms are outlined in the following sub-chapters.

Figure 1 Causal Diagram



By building an argument for how peacekeepers affect the areas where they are deployed, this theory section suggests ways peacekeepers change the motivation and opportunity for sexual violence. The effect peacekeepers have on motivation and opportunity explains why we should see a reduction in sexual violence where peacekeepers are deployed locally. This effect is important to determine if the local presence of peacekeepers reduce the prevalence of sexual violence in active conflict. Figure 1 displays the theorised relationship between a peacekeeping operation and reduced levels of sexual violence. I hypothesise that a peacekeeping operation's presence reduces the level of sexual violence perpetrated by conflict actors in the vicinity through deterrence and physical barriers. This reduction is thought to be stronger for rebel groups than the government. Furthermore, the strength of the peacekeeping operations is thought to be positively associated with an increased reduction in sexual violence. This effect is theorised to be stronger for rebel groups. The reasoning behind these hypotheses are presented in 3.2 and 3.3. At the end of the chapter is a short summary of the hypotheses presented.

3.1.1 Individual Motive

There is not much research on the motives of individual perpetrators for committing sexual violence. This is due to the difficulty and cost of attaining data. Although this is a micro level approach to explain sexual violence, it is still important, albeit difficult to study, especially quantitatively. The few existing studies on individuals' motives related to sexual violence suggest that hypermasculinity and the lack of embeddedness into family and community life are key in explaining behaviours of sexual violence (Koos, 2017, p. 1939). The individual motive should be seen as the individual's private preference, their response to social dynamics and compliance to the commander's authority (Wood, 2018, p. 520). As mentioned in Chapter 2.1, Baaz and Stern conducted interviews with soldiers in order to ascertain the motive behind sexual violence. They differentiated between 'good rape' and 'bad rape' (Baaz & Stern, 2009). 'Good rape' is essentially sexual, driven by the male libido. 'Bad rape' is not about sexual desires but is instead an expression of anger and rage. Baaz and Stern found that the soldiers they interviewed described 'good rape' as morally defendable and socially acceptable. 'Bad rape' was described as 'evil' and unacceptable, yet still 'understandable' (Baaz & Stern, 2009). Both forms of sexual violence are driven by hypermasculinity and what is perceived as the male's right to have sex (Koos, 2017, p. 1939; Meger, 2010). The aforementioned motivation is not static, it is moulded and altered by norms and beliefs concerning the appropriateness of

sexual violence (Wood, 2009, p. 137). These, in turn are likely to be moulded and altered by the norms of the group they belong to.

3.1.2 Intragroup Norms and Dynamics

Perpetrators in groups lacking explicit and consistently enforced prohibition are more likely to use sexual violence (Johansson & Hultman, 2019). There are also indications that sexual violence can serve specific purposes in war, including promoting cohesion among abducted fighters and coercing compliance among civilians (Cohen, 2013). To build an operative armed group, recruits have to be moulded into combatants through training and socialisation (Wood, 2009, p. 138). For example, gang rape is far more prevalent in wartime than in peacetime (Koos, 2017, p. 1941). Studies have shown that gang rape can generate ties amongst combatants in social groups and may provide benefits to the perpetrators by improving feelings of power (Cohen, 2013, p. 463; Koos, 2017, p. 1941). The goal is to break the ties to existing family units, creating new one where the combat group becomes the new unit. Although sexual violence can be used to promote cohesion in the group, it can also have the opposite result, increasing risk of fragmentation and disillusionment within the group (Nagel & Doctor, 2020, p. 1). This can be a part of a larger strategy, which is discussed in the next chapter. However, the purpose of this socialisation is not external, but internal. The focus is the groups cohesion, not on the overall strategic goal in the conflict.

Wood (2018) argues that for sexual violence to be widespread in a group there needs to be a tolerance by one or more commanders, a preference for rape amongst the combatants or a social dynamic that generates participation (Wood, 2018, p. 523). Perpetrators are more likely to use sexual violence in groups lacking explicit and consistently enforced prohibition (Johansson & Hultman, 2019; Koos, 2017). In these cases, the absence of penalties and norms barring sexual violence make opportunistic and not strategic or tactical sexual violence more likely (Koos, 2017, p. 1949). Whether these conditions are met depends on the preferences, beliefs, and norms concerning aggression, sexuality, and gender held by combatants and also those held by the commander (Wood, 2018, p. 523).

3.1.3 Strategy

Strategy is referred to as sexual violence adopted by an armed organisation in pursuit of military objectives (Wood, 2018). This differs from intragroup norms and dynamics. Intragroup norms

and dynamics have a focus inward, how the group operates and how individuals work within the social group. Strategy is the tactics used by the group; this is an external focus. Strategy can be defined as using forms of sexual violence to punish groups of people based on certain characteristics, which is also referred to a "weapon of war" (Kirschner & Miller, 2019). Allowing sexual violence involves a strategic calculation based on the extent the rebel group interacts with the local population to sustain their funding and support (Whitaker et al., 2019, p. 709). Rebels that seek to govern a civilian population, for example, may restrain sexual violence when they are dependent on civilians for support, material or otherwise (Whitaker et al., 2019, p. 702). Consequently, when support for the government increases, rebel groups could be more likely to perpetrate sexual violence (Johansson & Sarwari, 2019, p. 470). Sexual violence could be used to improve conflict actors' bargaining position (Ruggeri et al., 2017, p. 166). The use of sexual violence signals, to both civilians and combatants, a willingness to inflict pain on others in pursuit of their aims (Chu & Braithwaite, 2017). There are difficulties when using strategy as an explanation of sexual violence, one of them being that there is rarely any clear evidence of orders being given to strategically use sexual violence. This is not to say that sexual violence has not been used by armed actors in in conflict, but without evidence of such orders, conclusions are based only on interpretation (Koos, 2017, p. 1937). An example of such an interpretation could be of the patterns of indiscriminate rape which could be argued as an indicator of sexual violence as a strategy.

3.1.4 Opportunity

According to Koos, strategy, group dynamic and individual motives are not enough for explaining sexual violence alone and requires a breakdown of societal norms in the aftermath of instability and insecurity (Koos, 2017, p. 1938). Conflict and displacement ultimately weaken many of the social and political structures designed to protect and promote the human rights of the civilian population (Kent, 2005, p. 87). The absence of functioning institutions means that the little protection afforded to civilians against sexual abuse is weakened, which could result in more sexual violence at those times (Koos, 2017, p. 1939; Wood, 2006).

3.2 Presence of Peacekeeping Operation

Leatherman argues that there are patterns emerging in conflict areas, cumulating in a loss of safe space for women, both inside and outside the home, at the same time as the pressure

increases for women to be sole providers for the household (Leatherman, 2011). This is while opportunities to provide for a household are scarce, coupled with a loss of safe havens, such as churches, clinics, schools, refugee camps and UN bases (Fjelde et al., 2019; Leatherman, 2011, p. 3). These safe havens are places within the local communities where civilians seek protection from violence (Fjelde et al., 2019, p. 108).

A peacekeeping operation decreases the opportunity and motivation to perpetrate sexual violence through two mechanisms; physical barriers and deterrence, this can be surmised from the peacekeeping literature (Fjelde et al., 2019; Fortna & Howard, 2008; Hultman et al., 2013; Ruggeri et al., 2017). Deterrence works by signalling to conflict actors a willingness to punish sexual violence, how effective this is rests on four factors. First, deploying large military contingents (Salvatore & Ruggeri, 2017); second, a strong mandate to focus on the protection of the civilian population (Johansson & Hultman, 2019); third, a perceived willingness to use force; fourth, by supporting institutional and cultural shifts that discourage violence (Kirschner & Miller, 2019, p. 2044). Through these factors raise the perceived cost of violence in general they are likely to have similar effects on sexual violence also.

Peacekeepers, as outlined in Chapter 2.4, form an infrastructure to which both peacekeepers and the local population must relate. This infrastructure includes roadblocks, security walls, barbed wire, bollards, and gates (Jennings & Bøås, 2015, p. 287). This is both to secure the local population and the peacekeepers themselves. Peacekeeping operations physically separate conflict actors from each other, making violence more challenging to commit and increasing the chance of detection (Fortna & Howard, 2008; Hultman et al., 2013; Kirschner & Miller, 2019, p. 2048). Effectiveness in creating physical barriers is determined by quality, operation size, capacity to use force and mandates, amongst other things (Kirschner & Miller, 2019). An example of this is separation of adversaries which can make it harder for violence to occur, while also increasing the chance of detection (Kirschner & Miller, 2019, p. 2048). The safe spaces created by peacekeepers significantly increases the cost of any attempt to target civilians within those spaces. These safe spaces are often religious compounds such as churches or mosques, refugee camps, schools, or UN bases (Fjelde et al., 2019, p. 108). Peacekeepers are often stationed in these locations. As Fjelde et al. writes: “when peacekeepers regularly patrol areas where armed actors operate or where civilians seek refuge, the peacekeeping force de facto becomes an additional contender for armed actors who consider civilian targeting” (Fjelde et al., 2019, p. 108). However, peacekeeping operations struggle to cover all areas where civilians are at risk (Fjelde et al., 2019). Some operations have been

criticised for its limited presence beyond headquarters and an inability to patrol the region. This is a challenge for all peacekeeping operations and is likely affected by conflict level, local infrastructure and permission from the host country. Fjelde points out that most operation mandates include a caution specifying that the peacekeepers should protect civilians "within capabilities and areas of deployment." (Fjelde et al., 2019, p. 104).

Peacekeepers separate civilians and combatants and enforcing civilian protection by policing, monitoring and patrolling (Hultman, Kathman, & Megan, 2013, p. 877). An example of this is the separation of actors making it harder for violence to occur, it also increases the chance of detection (Kirschner & Miller, 2019). Peacekeeping operations monitor and report ongoing violations, which increases the cost of targeting civilians (Fjelde et al., 2019). The first hypothesis is:

H1a: Areas where peacekeeping operations are deployed have a lower prevalence of sexual violence.

Past studies have shown that both government forces and rebel groups are prone to committing sexual violence. The extent to which they commit these offences varies between and within conflicts (Johansson & Sarwari, 2019, p. 471; Ruggeri et al., 2017, p. 165). Studies on peacekeeping and one-sided violence have shown that this is accurate (Fjelde et al., 2019, p. 109). Fjelde et al. highlights one major difference between rebel and government actors; host governments have de facto power to veto access to particular areas within their borders (Fjelde et al., 2019, p. 109). Consent is one of the key principles of peacekeeping. Although consent has been given nationally, it "does not necessarily imply or guarantee that there will also be consent at the local level" (Fjelde et al., 2019, p. 109). Drawing on the literature on peacekeeping and sexual violence, it is not clear what effect peacekeepers have on reducing sexual violence perpetrated by rebels and government forces respectively. In Chapter 2.2 I addressed two national-level studies on peacekeeping and sexual violence. These have varying conclusions pertaining to the effect's peacekeepers have on the government versus rebel groups. Kirschner and Miller (2019) found that governments curtail sexual violence more quickly than rebels do in response to peacekeeping operations with military contingents, while rebels were more responsive to large civilian components. Johansson and Hultman (2019) find that the effect is weak in general. Although Fjelde et al.'s study addresses one-sided violence and not sexual violence, it is likely to have the same impact on the mechanisms of sexual violence at a local-level. Peacekeeping protection hinges critically on access to local populations, yet their ability to reach all parts of the country will be contingent on the government's permission. Past

studies have found that peacekeepers are less effective in discouraging government one-sided violence. It is possible that the dependence on government consent makes peacekeepers' less effective and less willing to impose military and political costs on government actors where they are deployed locally (Fjelde et al., 2019). In other words, the peacekeepers deterrence effect is hindered by the need for consent. This consent also requires peacekeepers to engage more often, and more cooperatively with governments and central authorities (Clayton et al., 2017). The second hypothesis is:

H1b: Peacekeeping presence will reduce sexual violence perpetrated by rebel forces more effectively than by government forces.

3.3 Strength of Peacekeeping Operation

Most research on the effectiveness of peacekeeping concludes that the number of troops deployed matters (Hegre et al., 2019, p. 218; Hultman et al., 2013; Kathman & Melin, 2016; Ruggeri, Gizelis, & Dorussen, 2012; Salvatore & Ruggeri, 2017). Although empirically separating the effects of physical barriers and deterrence is not possible, both are expected to be positively associated with the number of peacekeeping troops deployed (Fjelde et al., 2019, p. 109; Ruggeri et al., 2012, p. 389). The UN's ability to execute its mandate depends upon the size and personnel composition of the force deployment (Hultman, Kathman, & Megan, 2013). The size of the operation affects not only the area it can cover but also its ability to deter conflict actors from sexual violence and physically separate combatants and civilians. Hultman et al. (2013) show that the more armed personnel that are deployed to UN operations, the better they are in reducing violence between the combatants. Stronger operations have also been shown to enhance cooperation by the conflict parties and increase the chance of overall success (Ruggeri et al., 2012). In summary, larger operations are better at protecting civilians during and after conflict. The presence of larger numbers of peacekeepers increases the chances of sexual violence being detected and then punished, they reduce the conflict actor's capacity to coerce and threaten potential victims, creating safe spaces (Kirschner & Miller, 2019). The third hypothesis is:

H2a: Areas where there are larger number of troops will have a lower prevalence of sexual violence.

Clayton et al. (2017) found that that relatively weak rebel groups, compared to the central government, are more cooperative towards larger peacekeeping operation, possibly

because they offer effective protection. Both protection from the government and protection of the civil population from the rebels. Fjelde et al.'s study further found that the higher the number of peacekeeping forces deployed to a location, the less likely that rebel groups will carry out attacks in these areas (Fjelde et al., 2019, p. 104). They do not find the same results of the effect for government actors. The last hypothesis is therefore:

> *H2b: Number of troops will reduce sexual violence perpetrated by rebel forces more effectively than by government forces.*

3.4 Sexual Exploitation and Abuse by Peacekeepers

Although *not* the focus of this thesis, it is important to address the possible counterproductive aspects of sexual exploitation and abuse by peacekeepers. The occurrence of sexual exploitation and abuse is common, one study found that nearly one-fourth of adult women under 30 surveyed in Monrovia have had transactional sex with peacekeepers (Moncrief, 2017, p. 716). The UN has reported that sexual exploitation and abuse by peacekeepers is 'the most significant risk' to public legitimacy of UN operations. This damage can hinder the establishment of effective institutions and significantly influence public perception of that adoption of international human rights norms is optional (Kolbe, 2015, p. 2).

The economic disparity between peacekeepers and local population creates challenges, one being an increase in sex-trade (Aning & Edu-Afful, 2013, p. 23). The limited opportunities in some of the areas where peacekeepers deploy reinforces this. Although not all sex-work is forced, the increased marked for prostitution can increase cases of human trafficking to meet a demand for more prostitutes (Bell et al., 2018, p. 645; Grady, 2010, p. 220; Westendorf & Searle, 2017, p. 375). This is consistent with cross-national research finding that the presence of peacekeepers increases the probability that the host state is a destination for sex-trafficking (Bell et al., 2018, p. 653). Further, this research has found that longer duration peacekeeping operations are more likely to lead to increases in sex trafficking. This research suggests that the mitigating effects of peacekeeping on sexual violence that earlier studies have suggested, may be progressively compromised in long term peacekeeping (Bell et al., 2018, p. 653). It was not until 2003 that the UN Secretary-General announced a zero-tolerance policy that barred peacekeepers from exchanging money, food, help, or anything of value for sex. In 2006 the UN Department of Peacekeeping Operations established the Conduct and Discipline Team to train peacekeepers about the policy, to enforce it, and to investigate violations. In 2007 the policy was extended to all UN personnel and the Conduct and Discipline Team within UN DPKO

became the Conduct and Discipline Unit within the UN's Department of Field Support (Karim & Beardsley, 2016, p. 101).

3.5 Summary of Hypotheses

In sum, a local presence of peacekeepers is expected to be positively associated with a reduction in the likelihood of sexual violence being perpetrated in proximity to the deployment. The effect is believed to be strongest on rebel forces. Lastly, I theorise that larger deployment of troops will decrease sexual violence more effectively. The effect of larger number of troops will be more impactful on rebel groups than government forces. Table 1 is an overview of the hypotheses presented in this chapter.

Table 1 Summary of Hypotheses

Presence of peacekeeping operation	*H1a: Areas where peacekeeping operations are deployed have a lower prevalence of sexual violence.*
Presence of peacekeeping operation, effect on rebel perpetrators vs. government perpetrators	*H1b: Peacekeeping presence will reduce sexual violence perpetrated by rebel forces more effectively than by government forces.*
Number troops	*H2a: Areas where there are larger number of troops will have a lower prevalence of sexual violence.*
Number of troops effect on rebel perpetrators vs. government perpetrators	*H2b: Number of troops will reduce sexual violence perpetrated by rebel forces more effectively than by government forces.*

4 Research Design

The following chapter introduces the data used to test the four hypotheses presented in Chapter 3. This thesis uses quantitative analysis, with geo-coded data covering all active conflict cells in Africa from 1994 to 2009. This chapter begins with an introduction to the dataset used later in the analysis which mainly consists of the GEO-PKO dataset and a geocoded geo-SVAC dataset. Then, the structure of the datasets with the subsequent recoding of variables is presented. Following the described operationalisation of the dependent variable and the independent variables is an overview of the operationalisation of the control variables. This chapter also presents the empirical strategy for answering the research question: does the local presence of peacekeepers reduce the prevalence of sexual violence in active, armed, state-based conflict in Africa? Deploying peacekeeping operations is not random. As previously discussed, this is the case both nationally and locally. To account for this, a matching technique is used as well as fixed effects.

4.1 Data

In order to determine if the local presence of peacekeepers reduces sexual violence in active armed state-based conflict, spatially disaggregated data on sexual violence and local deployment of peacekeepers is used. Both include data for state based conflict. GEO-SVAC, which is the geocoded version of the SVAC dataset, is a subset of the UCDP Georeferenced Event Dataset (GED), containing state-based conflicts for the years 1989 to 2009 (Bahgat et al., 2016; Sundberg & Melander, 2013). The GEO-SVAC, as opposed to SVAC, only contains information on sexual violence in active conflict areas. It is therefore not possible to compare sexual violence in active conflict with sexual violence before and after the outbreak of a conflict with the current data. The original SVAC dataset has been used in most studies on sexual violence in armed conflict and is therefore considered to be of high reliability.

The data on peacekeeping deployment is from the recently updated GEO-PKO 1.2 dataset originally from 2019 and updated in 2020 (Cil et al., 2019). The data in the GEO-PKO dataset is based on information from UN deployment maps. This dataset covers subnational deployments of all UN peacekeeping operations to Africa from 1994 to 2018. In total, this makes 27 operations in 15 countries[2]. The dataset is organised around deployment locations in a month (Cil et al., 2019).

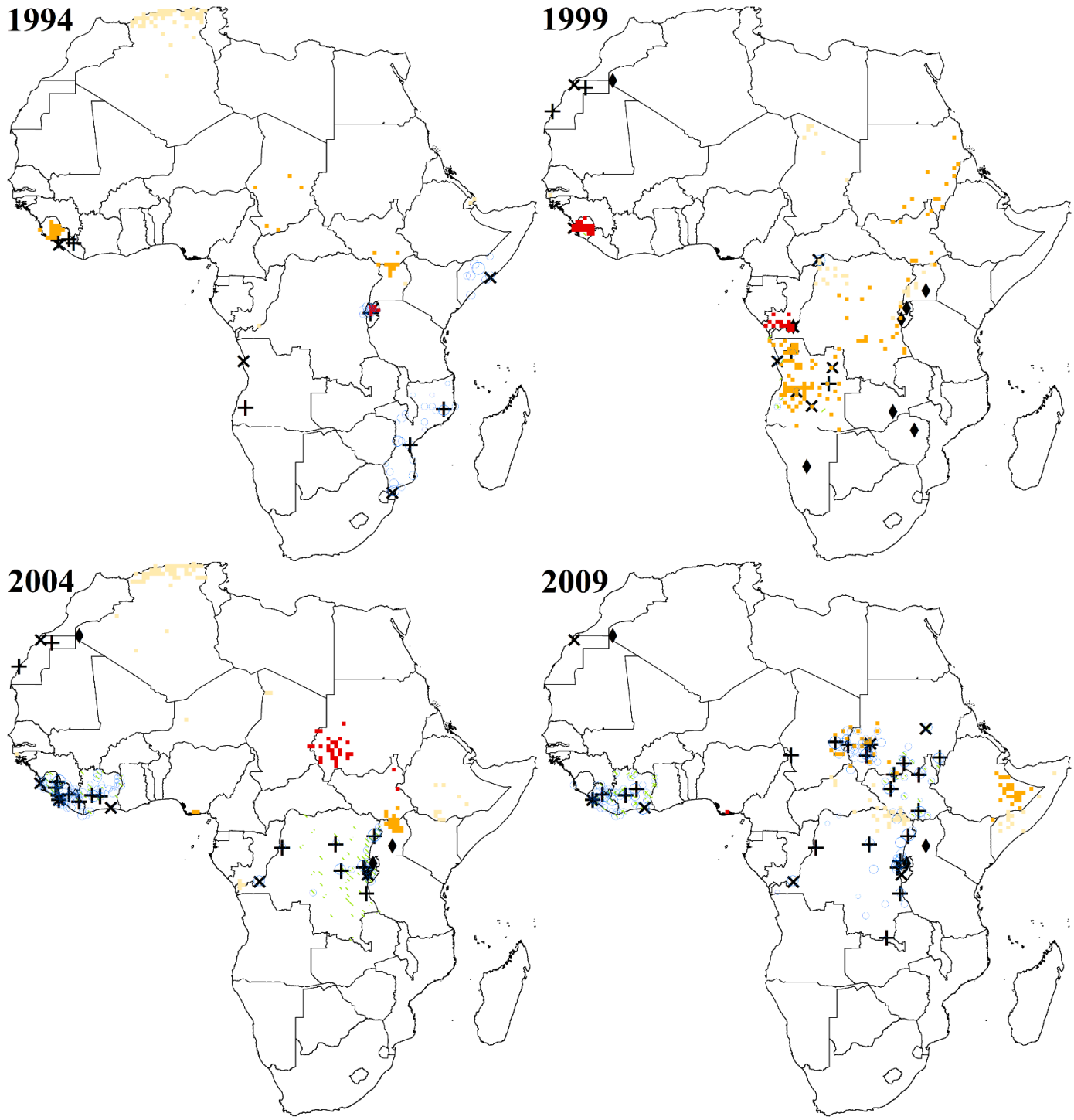
[2] Three operations are excluded from the dataset UNOMUR, UNASOG, and UNMEE; these were deployed in intrastate conflicts and militarised disputes (Cil et al., 2019).

The dataset includes all active conflict cells in Africa from 1994 until 2009. The geographic unit of analysis is a grid cell of 0.5×0.5 decimal degrees with year as temporal unit. The construction of the unit of analysis is a spatial grid structure that divides all countries into cells that are 0.5×0.5 degrees, approximately 55×55 km at the equator (Tollefsen, Strand, & Buhaug, 2012). This structure, called PRIO-GRID, is in effect a two-dimensional spatial matrix with no overlapping cells (Tollefsen et al., 2012, p. 368). This high spatial resolution allows for an analysis of the effect of peacekeeping presence on the prevalence of sexual violence in their areas of deployment. In contrast to, for example, conflict zones, the grid structure provides a unit of observation that is not itself endogenous to conflict processes (Tollefsen et al., 2012, p. 368). To summarise, this analysis uses grid-cell years as the unit of analysis.

Map 3 is an illustration of the dataset with a partial grid structure, it is a representation of number of troops and features of the peacekeeping operation in the dataset in 1994, 1999, 2004 and 2009. The data on the deployment location of peacekeepers is from GEO-PKO (Cil et al., 2019). The GEO-SVAC dataset is used to identify the severity of sexual violence committed by armed actors in each cell where there is active conflict (Bahgat et al., 2016). Sexual violence is represented in the grid structure, where a light orange implies low sexual violence and red indicates high. As shown in the map, sexual violence and peacekeeping presence is concentrated in the Sub-Saharan region of Africa.

Africa has experienced the most severe use of sexual violence during conflict in the period covered in this thesis where 28% of conflict events in Africa record a high prevalence of sexual violence, comparing this to other continents, the second highest is Asia, which is at 7% (Bahgat et al., 2016). There has been some degree of sexual violence in nearly all conflicts across Africa (Bahgat et al., 2016). The large differences in prevalence decreases the external validity of this analysis.

Map 3 Sexual violence and peacekeeping operation features in Africa



4.1.1 Dependent Variable – Prevalence of Sexual Violence

To measure sexual violence, I rely on the GEO-SVAC dataset. The data is a collection of yearly prevalence estimates for every warring party during active conflict. The SVAC data is based on reports from Amnesty, US State Department, and Human Rights Watch. Prevalence of sexual violence is measured in an ordinal scale from 0 to 3 (Cohen & Nordås, 2014). In the SVAC dataset a prevalence of three either implies or explicitly states a count of 1000 or more reports of sexual violence. A prevalence of 2, did not meet the requirements for a 3 coding, the count of sexual violence is estimated between 25-999. Prevalence 1 are occurrences of sexual violence are isolated events; it indicates less than 25 incidents but more than none. When the prevalence is coded as 0 there are no reports of rape or other sexual violence related to the conflict. There is some missing data for some country-years, but rarely in all three sources in the same country-year observation (Bahgat et al., 2016; Cohen & Nordås, 2019). Importantly, the prevalence score is a measurement of the highest reported use of sexual violence by implicated actors in the year of the event. Because of this restriction, I have to make an assumption: conflict actors reported to commit sexual violence do so in all areas where they are documented to be involved in the specific conflict.

GEO-SVAC, the disaggregated version of SVAC used in this thesis, presents a small subset of variables containing basic information about each conflict event, taken directly from the UCDP Georeferenced Event Dataset (GED). Importantly, the dataset includes a PRIO-GRID ID, compatible with PRIO-GRID (Bahgat et al., 2016). To ensure that the sexual violence is a conflict-related phenomenon, the data is only included when it can be attributed specifically to armed actors during the conflict period (Nordås & Cohen, 2011, p. 7). To get an event-specific measure of sexual violence, each GED event was assigned actor-specific information from the SVAC dataset. SVAC gives a separate score for each conflict that actor has engaged with each year, meaning that an actor could have used sexual violence in one conflict and not in another. The assumption addressed previously is still important, since it is not known which PRIO-GRID cell the sexual violence was perpetrated (or not perpetrated).

To code the prevalence measurement for the analysis in this thesis, I collapse the three sources using the maximum reported prevalence of sexual violence for each source variable. Since the next stage of recoding is conservative, using the maximum value from the tree sources was done to not exacerbate under-reporting further. The prevalence of sexual violence measurement is then dichotomised to be used in the analysis; the result of this recoding is presented in Table 2. Following Johansson and Hultman (2019) and Kirschner and Miller

(2019) the variable is dichotomised so a prevalence of 0 or 1 is 0 and 2 or 3 is 1. A value of zero should not be interpreted as no occurrence of sexual violence, but instead as relatively lower levels of reported sexual violence. A value of one signifies only the occurrences where prevalence of sexual violence is widespread (Johansson & Hultman, 2019, p. 1664).

As seen in Table 2 there are very few instances where prevalence of sexual violence is three. Rebel groups only have a score of 3 in 2.26% of the cells they are in active conflict. Government forces have nearly double that, with a prevalence score 3 in 4.78% of cells where they engage in active conflict. After recoding, the number of cells where rebel and government forces have a prevalence of 1 are distinctly similar (16.77, 16.75%). Interestingly when combining sexual violence committed by both government and rebels, 29.63% of cells have a prevalence score of 1. This suggest that in most cells, sexual violence is committed by only one of the conflict actors.

Table 2 Coding prevalence of sexual violence

	All (%)	Government (%)	Rebel (%)
	Before recoding		
0	881 (33.42)	1031 (39.11)	1732 (66.39)
1	974 (36.95)	1163 (44.12)	440 (16.86)
2	600 (22.76)	316 (11.99)	378 (14.49)
3	181 (6.87)	126 (4.78)	59 (2.26)
Total	2636	2636	2609
	After recoding		
0	1855 (70.37)	2194 (83.23)	2172 (83.25)
1	781 (29.63)	442 (16.77)	437 (16.75)
Total	2636	2636	2609

For a less conservative estimate of prevalence of sexual violence recoding 1, 2 and 3 as 1 would result in 1 being 1,755 or 66.58% of the observations while 0 would be 881 making up 33.42% of the observations. However, a potential risk with a less conservative approach would be aggravating problems of overreporting and overstating the prevalence of sexual violence. Using the more conservative coding of the prevalence measurement further ensures that the sexual violence captured by the coding is conflict-related. To repeat, a value of one indicates only the incidences where prevalence of sexual violence is widespread.

The degree of under-reporting is also likely to vary between different forms of sexual violence. Conditions for reporting sexual violence varies across conflicts and regions, as does resources and incentives to do so (Wood, 2009, p. 133). Research on conflict-related sexual violence often treats estimates of prevalence as conservative. This is based on an assumption that many victims are unable or unwilling to report rape or other forms of sexual violence. Under-reporting will be, to some extent, accounted for through the triangulation of sources (Nordås & Cohen, 2011, p. 7).

A conflict-context might increase reporting. The stigma felt by victims of sexual violence might be less as traditional norms may loosen. In some cases, access to health services may increase because of the influx of humanitarian aid. The human rights groups and organisations can get more funding to investigate areas with active conflict areas which would otherwise not be the case (Wood, 2006). Incidents of sexual violence are more likely to be reported when they occur in urban areas, or in regions that are accessible to organisations recording sexual violence (Wood 2006). The cases mentioned above are mitigated by the fact that, in this thesis, sexual violence perpetrated in conflict areas is *not* compared to sexual violence perpetrated in areas with no conflict. As Wood (2006) points out, evidence for peacetime variation comes from studies drawing on two very different methodologies. This thesis compares sexual violence between and within conflicts, making over-reporting biases less problematic. Conflict actors may strategically over-report, sexual violence committed against their constituents for political reasons (Nordås & Cohen, 2011).

The reason for creating an ordinal scale of the average prevalence in the GEO-SVAC dataset is that a specific estimate of a global number of victims, perpetrators, or individual sexual violence events is likely inaccurate and more vulnerable to over or under reporting (Nordås & Cohen, 2011). Further, coarsening prevalence of sexual violence by dichotomising the variable, reduces under and overreporting biases to some extent (Johansson & Hultman, 2019).

4.1.2 Independent Variables – Presence and Size of Peacekeeping Operation

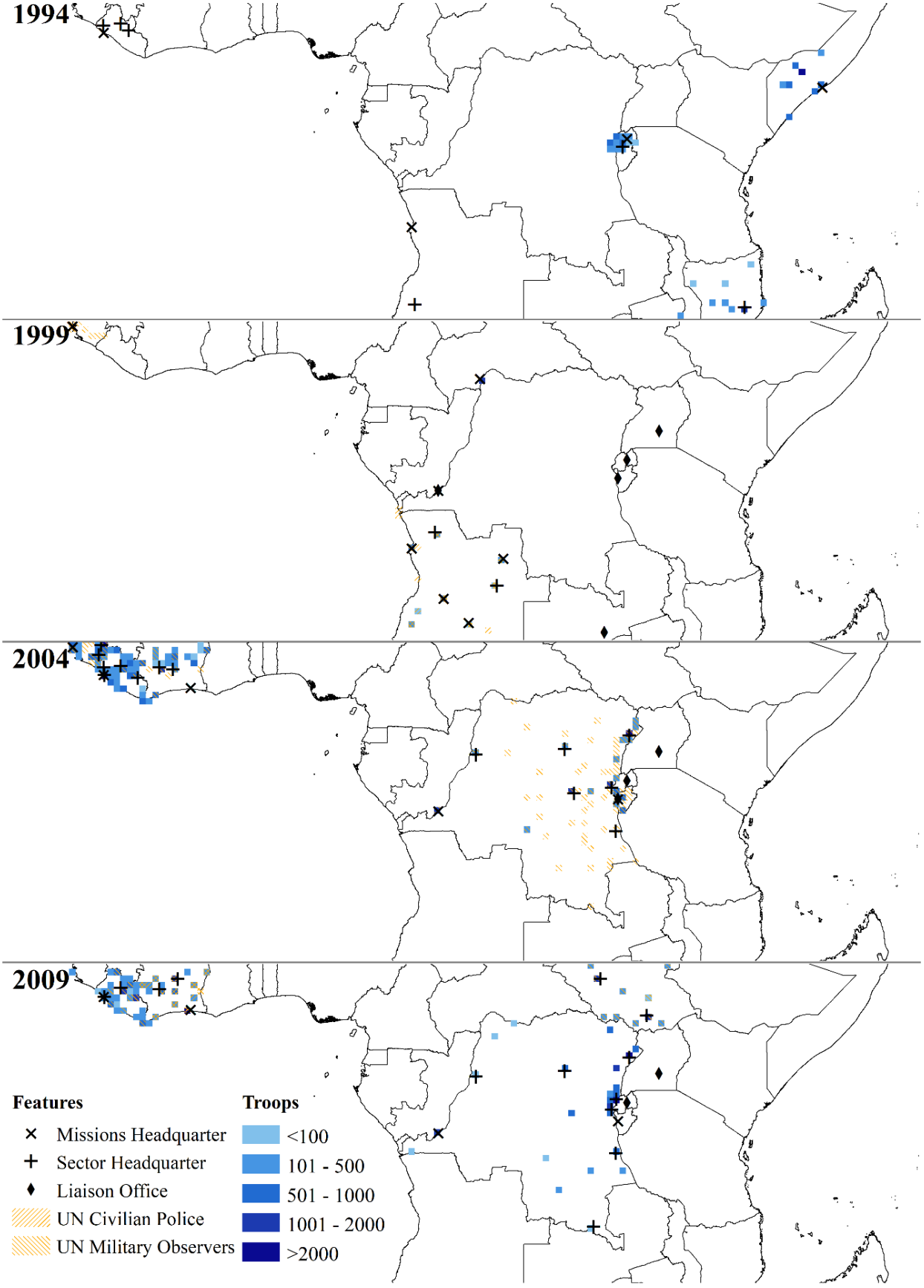
The main independent variables in the analysis are connect to the locations of peacekeeping deployment. The GEO-PKO dataset includes key information on several dimensions of peacekeeping presence at a local level and the location and number of troops deployed is recorded. The number of troops in the dataset is estimated by multiplying the type of unit, with

the standard size of that type of unit yielding an estimated total number of troops in a cell (Cil et al., 2019). The dataset includes information of type of headquarter, distinguishing between an operation, sector, or troop-contributing country headquarter. Further, it includes the type of peacekeeping units deployed in each location as a series of binary variables. Unit types include troops, police units, civilian police units, and military observer unit (Cil et al., 2019). Since the temporal unit of this analysis is in years, I collapse all units from this dataset to maximum presence in a cell in the given year. Only data from 1994 to 2009 are kept in the dataset.

To address hypotheses H1a and H1b I construct two measures, a first and second order neighbour to a PKO cell. Peacekeeping presence refers to the presence of any peacekeeping feature included in the GEO-PKO dataset. All PRIO-GRID cells have a unique ID, which allows for a measure of the distance of each cell to the peacekeepers for all sixteen years in the dataset. The distance measurements are constructed in ArcMap 10.7. The distance measurement is generated by calculating a distance measure (in kilometres) for each cell border to the closest border of a peacekeeping cell using the 'near' function in ArcMap. As a result, all cells immediately surrounding a cell with peacekeepers has a value of 0 while the cells not adjoining a peacekeeping-cell is assigned the actual kilometre distance from that cell. This is done for each of the sixteen years in the dataset, to ensure that the distance is measured for each year with no overlap. The results are exported from ArcGIS to Stata and merged into one dataset. The data exported includes both a distance measurement and a cell ID for the nearest peacekeeping cell.

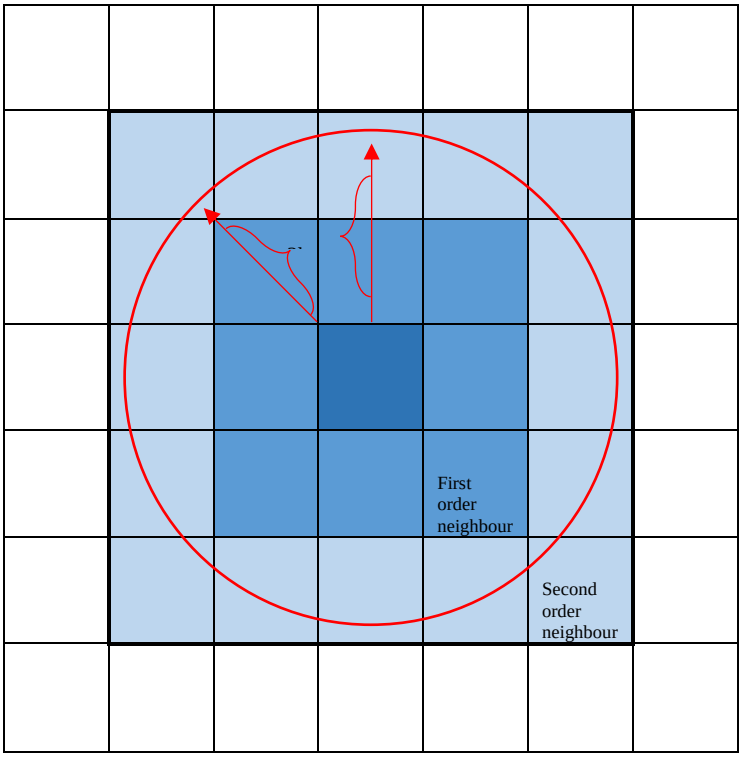
Map 4 illustrates the grid structure with number of troops as well as all peacekeeping operation features included in the GEO-PKO dataset. The darker shades indicate where there are higher number of troops present in the cell.

Map 4 Distribution of the peacekeeping features and troops in Africa 1994, 1999, 2004, 2009 (made in ArcMAP 10.7 with the GEO-PKO 1.2 dataset)



The distance measurement extracted from ArcGIS does not take national borders into account, therefore, some distance measurements are from a peacekeeping cell in another country. To only include the distance to peacekeepers within the respective country, the cell ID for the nearest peacekeeping cell was used to ensure that the peacekeeping measurement measured the closest distance within the country. The cell ID for the closest peacekeeping feature is manually checked for being in the same country as the observation in question in Stata. It was judged to be more accurate to remove measurements from a different country, and risk not measuring second order neighbour, than to leave the measurement as is.

Figure 2 Dichotomising presence of peacekeepers (grid size 55x55km at the equator)



First order neighbour = 0 km distance to cell with a peacekeeping feature

Second order neighbour = all cells within 83km distance to cell with a peacekeeping feature

Since the grid used in this analysis is an analytical tool and the peacekeeping operation may be stationed along the border of a cell, and rarely at the centroid, I construct two dichotomous variables *PKO presence 1* and *PKO presence 2*, based on the first and second order neighbour measurements. This is an operationalisation of peacekeeping presence in a cell.

To code *PKO presence 1,* all cells with a distance measurement of 0 is assigned a value of 1 while the rest is 0. This is represented as the darkest blue in Figure 2. To code *PKO presence 2* is more complicated. First, it was important to determine the kilometre interval which would include all cells connected to a neighbouring cell of a peacekeeping cell. This is illustrated in Figure 2 with the red circle. Accounting for the changes in distance away from the equator and differences in measuring horizontal and diagonal distance, the furthest and closest distance within the second order neighbour, approximately 78km and 89km respectively, makes 83km distance a safe benchmark for indicating the second order neighbours. All cells with distance to nearest peacekeeping cell 83km or less are coded as 1 whereas above is coded as 0. The descriptive statistics are in Table 6 in Chapter 5.1.

There are many ways to empirically separate peacekeeping operation features (Johansson & Hultman, 2019). Considering their different tasks and ability to influence prevalence of sexual violence, the main single feature of interest in this analysis is troop size. To test hypotheses H2a and H2b, the troop size variable in the GEO-PKO dataset is recoded. The variable is a count of troops deployed in each cell. The first and second order neighbour variables used to code *PKO presence* is also used to code this variable. To code the variable, a second dataset is created containing only the number of troops, year and cell ID. In the original dataset, the ID for the nearest peacekeeping cell is used to merge the number of troops from the second dataset. To account for a reduced strength when the distance from the peacekeeping cell increases, number of troops are reduced by 33% for the first order neighbour and reduced 66% for the second order neighbour. For ease of interpreting the model coefficients, the number of troops were divided by 100. This results in the third independent variable *troop size*; descriptive statistics are in Table 7 in Chapter 5.1.

Coding the independent variables was done while all grid cells in Africa were still in the dataset, approximately 170,000 observations. Once the coding of peacekeeping distance and troop size was done, all cells without active conflict were dropped. The dataset is left with only cells in active conflict during the given year. This leaves 2,636 observations in the dataset. The descriptive statistics for the independent variables *PKO presence 1 and PKO presence* 2 are presented in Table 3 while the descriptive statistics for number of troops is presented in Table 4. This table includes the descriptive statistics after matching, which is discussed in Chapter 4.6.

4.1.3 Control Variables

To determine if there is a relationship between the dependent variable and independent variables, it is necessary to control for factors that are expected to influence both. In choosing these controls there are trade-offs. Ideally there should be a balance between overfitting the model; too many variables, and underfitting the model; too few parameters which are unable to capture the indications correctly (Claeskens & Hjort, 2008). If the model is underfitted resulting in omitted variable bias, some unmeasured factor could be causing the correlation. When there is not much research on the subject, it is difficult to know how to find a balance between too many and too few. Therefore, I draw on the one-sided violence and conflict literature for local peacekeeping as well as the national-level studies on the effects of peacekeepers on sexual violence (Fjelde et al., 2019; Johansson & Hultman, 2019; Kirschner & Miller, 2019; Ruggeri et al., 2017).

To account for the increase in awareness of sexual violence and the introduction of reducing sexual violence as a specific mandate for UN peacekeepers, this is accounted for by introducing a dichotomous variable called *Post UNSCR1325*. Since this resolution is partially aimed at drawing attention to sexual violence, this resolution could influence the way which the UN addresses sexual violence and therefore also how effectively peacekeepers affect its prevalence (Johansson & Hultman, 2019). Johansson and Hultman (2019) found that strong mandates alone are not sufficient to improve the performance of UN operations in reducing sexual violence. This is a dichotomous variable coded as 0 for years before passing the resolution in the year 2000 and 1 for all years from 2001 to 2009.

Battle-related deaths is an estimate of the total fatalities in a cell during one year (Bahgat et al., 2016; Högbladh, 2019). This variable accounts for the possibility that the results reflect a general decline in overall violence battle-related deaths have been found to affect level of sexual violence in previous studies (Cohen 2013, 72). One way to explain the absence of sexual violence against civilians by an armed actor is that the actors involved perpetrate little violence of any kind. The absence of sexual violence could signal an overall unwillingness to target civilians (Wood, 2009, p. 134). The variable c*ivilian deaths* is an estimate of dead civilians due to conflict in the cell each year. This variable already available in the GEO-SVAC dataset (Bahgat et al., 2016).

Conflict actors may act differently using sexual violence in their "ethnic home territory" or constituency than in others (Fjelde & Hultman, 2014). The support base of a rebel group, made up of allegiances and cleavages within and between ethnic groups, can have substantial

impacts on violence. This support base, or rebel constituents, impact the incentives to engage or refrain from violence (Ottmann, 2017). In general, ethnic war is a frequently cited setting for extreme violence, including sexual violence (Cohen, 2013, p. 462). *Excluded* variable is a count of the number of excluded groups (discriminated or powerless) as defined in the geocoded Ethnic Power Relation data on the status and location of politically relevant ethnic groups settled in the grid cell for the given year, derived from the GeoEPR/EPR 2014 (Vogt et al., 2015).

One obvious explanation for the absence of sexual violence against civilians is the absence of civilians (Wood, 2009, p. 134). Sexual violence, like other forms of violence, may also be more likely with larger populations. Therefore, the log of the size of the population is included. The variable *Population* is a measure of population size, taken from the Gridded Population of the World version 3. Population estimates are available for 1990, 1995, 2000, and 2005 (Tollefsen, Bahgat, Nordkvelle, & Buhaug, 2016). The original pixel value is number of persons (Center for International Earth Science Information Network & Centro Internacional de Agricultura Tropical, 2005). A measure of population size is also available from the History Database of the Global Environment (HYDE) version 3.1. Yet this estimate is only available for 1950, 1960, 1970, 1980, 1990, 2000, and 2005 (Goldewijk, Beusen, de Vos, & Drecht, 2011; Goldewijk, Beusen, & Janssen, 2010). Since the estimate taken from the Gridded Population of the World version 3. Includes 1995, it is judged to be the best alternative for the analysis. *Night lights* is a measure of the average night-time light emission from the DMSP-OLS Night-time Lights Time Series Version 4 (Image and data processing by NOAA's National Geophysical Data Center. DMSP data collected by US Air Force Weather Agency). This measurement is calibrated to account for intersatellite differences and interannual sensor decay using calibration values making this measurement suitable for timeseries analysis. Values are standardised to be between 0 and 1, where 1 is the highest observed value in the time-series, and 0 is the lowest (Elvidge, Hsu, Baugh, & Ghosh, 2014; Tollefsen et al., 2016).

Infant mortality rate gives the average infant mortality rate within the grid cell. This is based on based on raster data from the SEDAC Global Poverty Mapping project. The original pixel value is the number of children per 10,000 live births that die before reaching their first birthday (Tollefsen et al., 2016). This indicator is a snapshot for the year 2000 only (C. Center for International Earth Science Information Network, 2005; Storeygard, Balk, Levy, & Deane, 2008). The variable is added as a proxy for social and economic development (Ruggeri et al., 2017).

Terrain and geographical distances are likely to influence the effectiveness of a peacekeeping operation (Ruggeri et al., 2017). The areas where peacekeepers deploy tend to be near major urban areas (Ruggeri et al., 2016). *Average travel time* is an estimate of the travel time to the nearest major city, derived from a global high-resolution raster map of accessibility developed for the EU (Tollefsen et al., 2016). The original indicator is a result of network analysis using a combination of several sources (Uchida & Nelson, 2009). The original pixel value is the estimated travel time in minutes by land transportation from the pixel to the nearest major city with more than 50,000 inhabitants. The variable is the average original pixel value within each cell (Uchida & Nelson, 2009). *Distance to border* gives the spherical distance, in kilometres, from the cell centroid to the border of the nearest neighbouring country. This is regardless of whether the nearest country is located across international water (Tollefsen et al., 2016; Weidmann, Kuse, & Gleditsch, 2010). *Distance to capital* gives the spherical distance in kilometres from the cell centroid to the national capital city in the corresponding country (Tollefsen et al., 2016; Weidmann et al., 2010). Using ArcGIS to generate a measure of road density and convert the data to a format suitable for analysis.

The variable *road* is included as a control variable to account for the effect an increased infrastructure might have on peacekeepers' reach. This was generated using the "Spatial Join" tool to intersect the PRIO-GRID and a simplified map of roads in Africa (from ArcGIS database). In practice, this tool places layers on top of each other resulting in a value for road density in each cell, which means the higher the value the higher the road density. The value refers to the number of primary, secondary and divided highways. These types of roads are not differentiated in this analysis. My expectation is that road density has an effect on peacekeeping operations' ability to affect prevalence of sexual violence. To control for the effects that accessibility and terrain can have on the reach of peacekeepers, a measurement of mountains is used. *Mountains* is measured as the average share of mountainous terrain within the cell based on elevation and slope, taken from a high-resolution mountain raster developed for UNEP's Mountain Watch Report (Tollefsen et al., 2016). The original pixel values are binary, and capture whether the pixel is a mountain pixel or not, based on the seven different categories of mountainous terrain in the report (Blyth, Groombridge, Lysenko, Miles, & Newton, 2002).

Sexual exploitation and abuse by peacekeepers may inadvertently increase sexual violence in a location by contributing to the problem they are mandated to reduce. It was not until 2008 that the UN started tracking allegations of misconduct in UN peacekeeping operations and an electronic system was put in place. Some data has been inputted from 2007,

but all files from previous to 2007 are only stored in physical files making it impossible to use in this thesis. There are other data-source options such Nordås and Rustad's abuse by peacekeepers (SEAP) dataset from 2013 (Nordås & Rustad, 2013). This dataset is based on information from UN, Non-Governmental Organisation reports, media sources, and academic studies. The dataset does not include frequency of occurrence, neither in operation or in year, nor does it include the severity of the allegation. The data includes active conflicts in the years 1999–2010, reducing the years in the analysis by five years. Due to restrictions in the data, sexual exploitation and abuse by peacekeepers will not be controlled for in this thesis.

Table 3 shows the descriptive statistics for the control variables presented above.

Table 3 Descriptive statistics for control variables

Statistic	N	Mean	St. Dev.	Min	Max
		Before Matched			
Excluded	2,403	0.646	0.662	0	4
Battle-related deaths	2,636	69.19	1,153	0	48,183
Civilian deaths	2,636	2.428	20.66	0	800
Roads	2,636	16.02	12.80	0	140
Distance to border	2,636	165.7	135.4	0.329	647.0
Distance to capital	2,636	507.6	396.0	3.986	1,911
Night lights	2,636	0.052	0.048	0.014	0.433
Average travel time	2,636	384.0	364.6	33.64	5,004
Infant mortality	2,505	989.7	456.2	294.0	1,858
Mountains	2,621	0.304	0.332	0	1
Post UNSCR1325	2,636	0.591	0.492	0	1
Population	2,636	6.895	1.958	-0.981	13.14

4.2 Empirical Strategy

This chapter presents the empirical strategy for answering the research question: does a local presence of peacekeepers reduce the prevalence of sexual violence in active, armed, state-based conflict in Africa? The empirical material builds on a gridded time-series dataset of the active conflict cells of the African continent. As outlined above, the depended variable in the analysis is a geo-referenced binary indicator of prevalence of sexual violence. Above, I outlined the three alternative operationalisations of peacekeeping presence. The first two are binary presence measurements (Presence 1 and 2) and the last is a continuous variable of number of troops present in a cell (Troops). Prevalence of sexual violence is estimated through logit and fixed effects ordinary least squares (OLS) regression.

4.2.1 Coarsened Exact Matching

Peacekeeping deployment is not distributed at random and the possible selection effects may confound an analysis of the effects of peacekeeping. Although it is not clear if severity of sexual violence is a significant driver of peacekeeping deployment, it cannot be ruled out. To estimate unbiased causal effects, the control group has to match the treated group as much as possible on covariates that may predict deployment. Such that the actual treatment is the main factor that differs between the samples. In this thesis, the treated group are active conflict cells where peacekeepers are deployed, and the control group are cells where there is active conflict but no peacekeeping deployment. I use Coarsened Exact Matching (CEM) presented by Blackwell Iacus, King and Porro (2009). CEM is an imbalance-reducing matching method that accounts for potentially confounding influence of pre-treatment factors (Iacus, King, & Porro, 2011).

Matching in general has become an increasingly popular method for pre-processing data to improve causal inferences in observational data (King & Nielsen, 2019, p. 8). The goal when using this technique is to reduce the imbalance in the distribution of the pre-treatment covariates between the treated and control groups. Reducing this imbalance results in lower model dependence in the estimation of causal effects and because of this it also reduces possible biases (King & Nielsen, 2019, p. 8). Propensity score matching (PSM) is the most commonly used method of matching, importantly, King and Nielsen (2019) have addressed several issues with this method. They demonstrate that PSM commonly increases "imbalance, inefficiency, model dependence, research discretion, and statistical bias at some point in both real data and in data generated to meet the requirements of PSM theory" (King & Nielsen, 2019, p. 8). One of the issues with many matching methods is meeting the congruence principle, meaning that they operate on a metric different from the original data. To meet the congruence principle the data space and the analysis space have to be equivalent (Blackwell, Iacus, King, & Porro, 2009). In contrast to PSM, CEM meets this principle.

The Coarsened Exact Matching (CEM) is a tool that can be used to approximate a fully blocked experiment. In short, the idea of CEM is to coarsen each pre-selected variable so that practically indistinguishable values are grouped and assigned the same numerical value (Blackwell et al., 2009). This coarsening can be done both automatically and by choice. In cases where there are clear groups or intervals the covariate can be coarsened to it is preferred to do so. A 'exact matching' algorithm is applied to this coarsened data to determine the matches and to prune unmatched units. Exact matching works by first sorting all the observations into strata. All observations in the same strata have identical values for all the coarsened pre-treatment

covariates. Observations in a stratum without at least one observation for each unique value of the treatment variable is discarded (Blackwell et al., 2009). When this is done, the coarsened data is discarded and the uncoarsened values of the matched data are kept (Iacus, King, & Porro, 2019). The original values are used in the analysis to estimate the causal effect (Blackwell et al., 2009). After the data has been matched, the weights from CEM are used to estimate the sample average treatment effect on the treated using logistic regression.

The treatment variable *treated* has a value of 1 for peacekeeping presence (treatment group) and 0 for no peacekeeping presence (control group). The key outcome variable is the prevalence of sexual violence. The analytical goal in the models using matched data is to estimate a specific version of a causal effect: the sample average treatment effect on the treated, the 'SATT' (Iacus et al., 2019).

Treatment effect for treated observation i=

$$TE_i = Y_i(1) - Y_i(0)$$

Treatment Effect = Observed – Unobserved

Estimates $Y_i(0)$ with Y_j with a matched ($X_i \approx X_j$) control

As mentioned, since deployment of peacekeeping operations does not happen at random, a set of pre-treatment covariates are used as controls using the CEM algorithm. The pre-treatment variables include mountains, roads, average travel time, average distance to capital, average distance to border, population and infant mortality rate. These are chosen based on past studies of the local effect of peacekeepers on violence and conflict reduction (Fjelde et al., 2019; Ruggeri et al., 2017). Exact matching on country codes could be used in order to account for possible systematic differences between countries in the likelihood of sexual violence being perpetrated. There are, however, very few differences in the results when this was applied. The only notable consequence is a reduction in the number of matches. There are too few observations in the data to use this as a covariate. There are benefits to choosing the coarsening of each covariate based on prior knowledge of natural breaks. It is, however, not necessary to do so when there are no feasible natural breaks.

As a default, the CEM logarithm uses the maximum information available. This means that each stratum may include different numbers of treated and control units. To compensate

for the differences in the stratum sizes, running the CEM logarithm returns weights to be used in analysis. Although it is possible to select a 'k-to-k' option to keep the same number of treated and control units in a stratum. This is only plausible when there are more than enough observations, as this will reduce number of observations significantly. Since the data used in this thesis have limited observations, it is not considered prudent to use the 'k-to-k' option, as not using it is considered the best option (Blackwell et al., 2009, p. 9). The results of the matching are presented in Chapter 5.1

4.3 Empirical Estimator

The dataset used in this thesis is structured as panel data which is, simply put, repeated observations of the same unit over time (Skog, 2004, p. 324). In this instance, the cells of the PRIO-GRID are the units. Panel data means that it is possible to examine changes over time, which provides a better data foundation compared to a cross-section approach. There are many benefits for using panel data. Skog (2004) argues for time-series data being more appropriate for explaining causal relationships compared to cross sectional data, since hypotheses are usually related to change. By using time series data, the data used contain these changes over time. One other major advantage of using panel data is the ability to control for unobserved explanatory variables (Petersen, 2004). These could be things such as cultural and institutional differences, which are otherwise difficult to measure.

The dataset is unbalanced, which means that not all cells have observations for all of the sixteen years in the dataset. There is a logical reason for this since only cells with an active armed conflict during the year are included in the dataset. Cells where there is no longer a conflict, or the conflict has not yet broken out are not included. Most cells do not have an active conflict for the entire duration of the scope of this thesis. Having an unbalanced dataset is not a problem and it is possible to run all the same statistical models as a balanced dataset (Longhi & Nandi, 2015, p. 6; Mehmetoglu & Jakobsen, 2017, p. 229). An unbalanced dataset is mostly an issue when the goal is to draw more generalised conclusions beyond the scope of the data in the analysis. As mentioned, there are several advantages when using panel data, but there are also disadvantages. Using an OLS analysis on panel data is called pooled OLS. With Pooled OLS, the time factors in the data are accounted for. One of the assumptions of a OLS regression is the absence of autocorrelation and homoskedasticity (Mehmetoglu & Jakobsen, 2017). In a

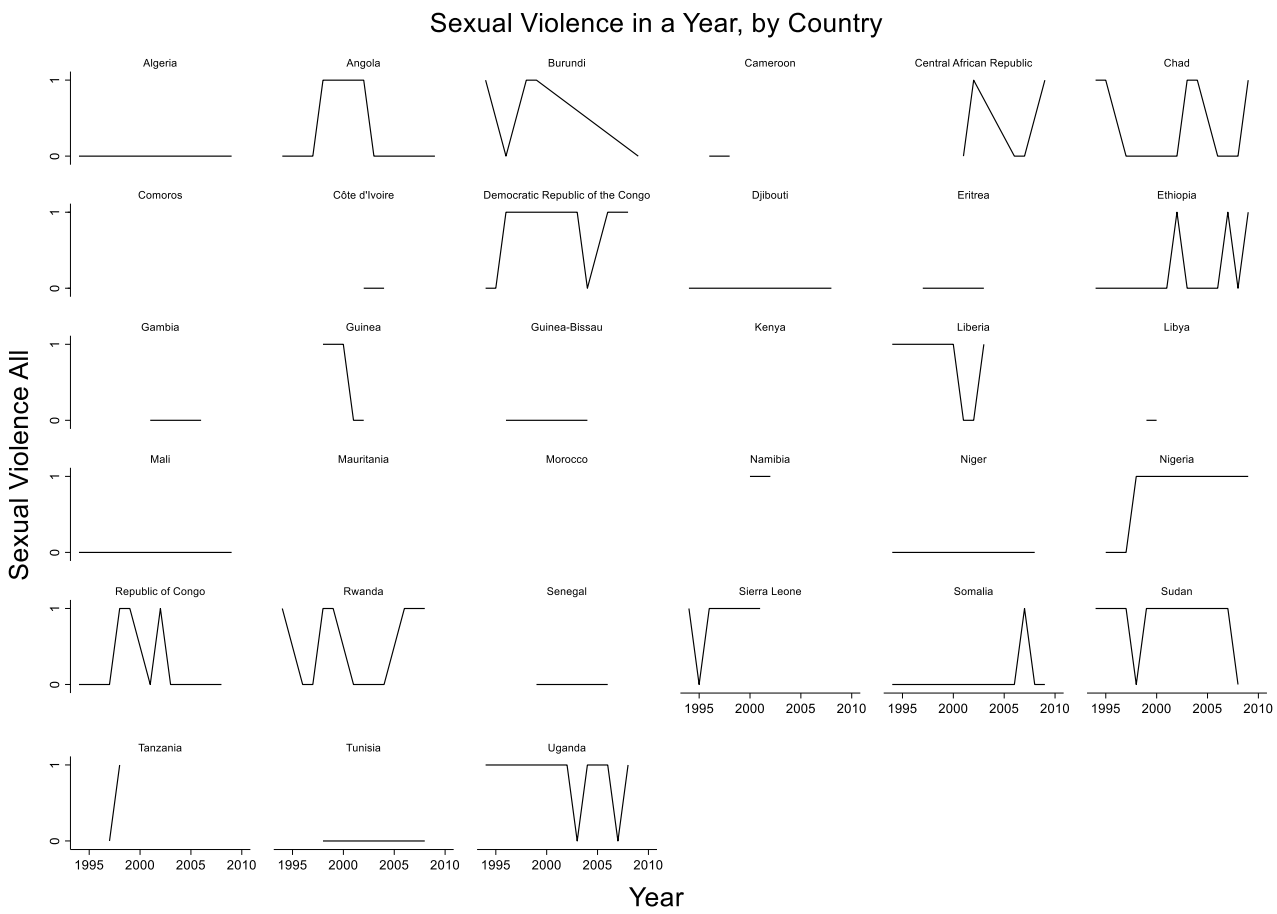
panel dataset, these assumptions are likely to be broken when using OLS since each year measured in a cell is measured as an independent observation.

Modelling assumptions are much less consequential when using matched data since CEM binds the level of model dependence (Iacus et al., 2019). As it is possible to use any ordinary estimation to model the matched data, a logistic regression estimator is chosen.

In this study I am also interested in analysing the impact of variables that change over time. Since it is the change to a presence of peacekeepers effect on sexual violence I am interested in testing, a FE estimator is appropriate. A fixed effects (FE) estimator takes the group structure of the data into account by including a dummy variable for each cell, and demonstrating how the independent variable affects the prevalence of sexual violence within the cells (Mehmetoglu & Jakobsen, 2017). One of the drawbacks of a FE estimator is the inability to analyse variables that do not change over time. Therefore, the fixed-effects estimator should be applied with caution, in particular in settings with a binary dependent variable, as any unit without variation on dependent variable is excluded by design. This is often problematic as the excluded cases may have avoided conflict precisely because of the attributes on the explanatory variables (Cederman, Buhaug, & Rød, 2009, p. 519). This is, however, not a significant problem in this analysis since the research question addresses whether the presence of peacekeepers affects the prevalence of sexual violence. Adding a dummy variable for each year will catch the unobserved effects varying with time independently from the cells (Mehmetoglu & Jakobsen, 2017). This way, it is possible to address the increased international interest in sexual violence.

Many of the variables included in the overall analysis do not vary or vary very little over time. All variables included in the FE models vary over time, some observations are dropped. Figure 3 shows the variation in sexual violence aggregated to a national-level. For practical reasons I have not added a graph for each cell (there are over 800 cells in the dataset). I have collapsed the dataset used in this analysis by country, year. This figure shows that all countries where sexual violence has been present in a cell during the year, also have years where there are no cells with reports of sexual violence during the period covered in this thesis. Countries where there is no line in the graph, for example Kenya, there are no consecutive years of conflict cells. Map 4 in Chapter 4.1.2 visualises some of the same changes as Figure 3. This is also the case for the dependent variable, prevalence of sexual violence as visualised in Map 1. Since the control variables in the FE models also have to vary over time, only non-stationary variables are included.

Figure 3 Variation in sexual violence by country, Africa 1994-2009 (Bahgat et al., 2016).



In order to reduce problems with reverse causality I include a twin model for all FE models. Importantly, a causal framework by design which excludes within-year connections between presence of peacekeepers and sexual violence will be incompatible with some of the theoretical arguments made in the previous chapters. In Chapter 3 I emphasise the theoretical importance of the interactions between peacekeepers and locals. The results from these twin models, the FE models with time lags, are documented in the Appendix. In these models there are time lags on all variables except the dependent variable.

5 Results

In this chapter I present the results of the statistical analysis. First, I present the result of CEM followed by the results of the logit analysis using matched data. Then the pooled OLS FE models are presented. In Chapter 3.2 four hypotheses were introduced. To test the proposed hypotheses H1a and H1b, which both consider the presence of a peacekeeping operations, I use the 1 and 2 PKO presence operationalisations. To test hypothesis H2a and H2b, the operationalisation of troop size is used. The chapter is concluded with a summary of the robustness of the models and the steps taken to ensure more robust inference regarding the causal impact of peacekeeping on the local prevalence of sexual violence.

5.1 Results of CEM

There are two versions of the treatment variable in this thesis, namely the two operationalisations of peacekeeping presence, *PKO presence 1* and *PKO presence 2*. When the aforementioned treatment variables were used, it resulted in 558 matches for *PKO presence 1* and 583 matches for *PKO presence 2*. It was expected for *PKO presence 2* to have more matches since it encompasses a larger geographic area and therefore also more cell.

A perfect global balance is indicated by L1 = 0. Larger values indicate a larger imbalance between groups up to L1 = 1, which indicates complete separation (Blackwell et al., 2009, p. 9). By comparing the imbalance in the L1 distance before matching and the L1 distance after matching in Table 4, it is clear that CEM has reduced the imbalance in the means, the marginal and the joint distribution of the data (Blackwell et al., 2009). It seems that the *PKO presence 1* has a better match on all covariates except infant mortality rate. In all, matching has reduced the imbalance in the dataset for both versions of the treatment variable.

Table 4 Similarity of matched and unmatched samples on key characteristics – L1 distances

	PKO presence 1		PKO presence 2	
	L1 Distance before matching	L1 Distance after matching	L1 Distance before matching	L1 Distance after matching
Mountains	.144	.009	.141	.014
Roads	.195	.008	.183	.014
Average travel time	.147	.019	.215	.029

Average distance to capital	.193	.009	.231	.017
Average distance to border	.193	.006	.173	.009
Population	.182	.066	.228	.123
Infant mortality rate	.522	.007	.547	.005
Global L1 distance	.892	.204	.889	.277

As expected, the number of observations in the dataset has dropped significantly after matching. This is shown in Table 5, where the descriptive statistics of the dependent variable is displayed. In Table 6 descriptive statistics for the matched data are presented. The matched descriptive statistics for the control variables are in Appendix 1. Before matching there were in total 2,636 observations in the dataset. There are some fewer observations for sexual violence perpetrated by rebel forces. This is due to some missing values in the dataset for this variable. The number of observations is reduced to 558 observations after matching.

Table 5 Descriptive statistics for matched dependent variable

	All (%)	Government (%)	Rebel (%)
	Before Matched		
0	1855 (70.37)	2194 (83.23)	2172 (83.25)
1	781 (29.63)	442 (16.77)	437 (16.75)
Total	2636	2636	2609
	After Matched; PKO presence 1		
0	278 (49.82)	429 (76.88)	354 (65.19)
1	280 (50.18)	129 (23.12)	189 (34.81)
Total	558	558	543
	After Matched; PKO presence 2		
0	291 (49.91)	441 (75.64)	337 (66.37)
1	292 (50.09)	142 (24.36)	191 (33.63)
Total	583	583	568

Table 6 Descriptive statistics for matched peacekeeping presence

	PKO presence 1 (%)	PKO presence 2 (%)
	Before matched	
0	2309 (87.59)	2189 (83.04)
1	327 (12.41)	447 (16.96)
Total	2636	2636
	After matched	
0	320 (57.35)	313 (53.69)
1	238 (42.65)	270 (46.31)
Total	558	583

Table 7 Descriptive statistics; before and after matched number of troops/100

Troops	N	mean	sd	min	max
Before matching	2,636	.2980	2.053	0	0.507
After matched; PKO presence 1	558	.9741	3.749	0	0.507
After matched; PKO presence 2	583	.9184	3.626	0	0.507

As shown in Figure 4 and Figure 5, the differences between the distributions in the displayed covariates on the matched data are much smaller than in the unmatched data.

Figure 4 Impact of CEM on distribution of traveling time and population (PKO presence 1)

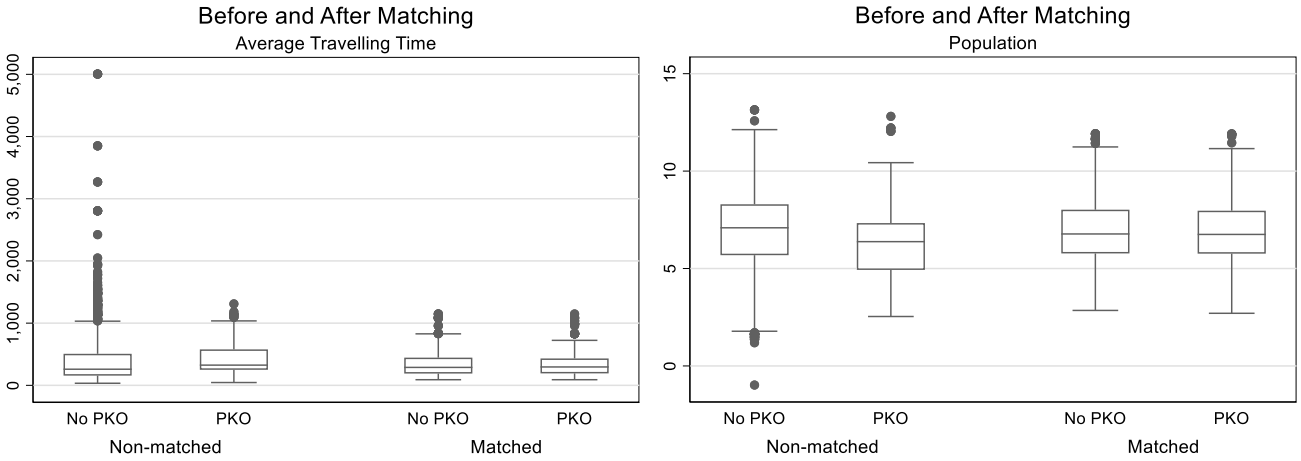
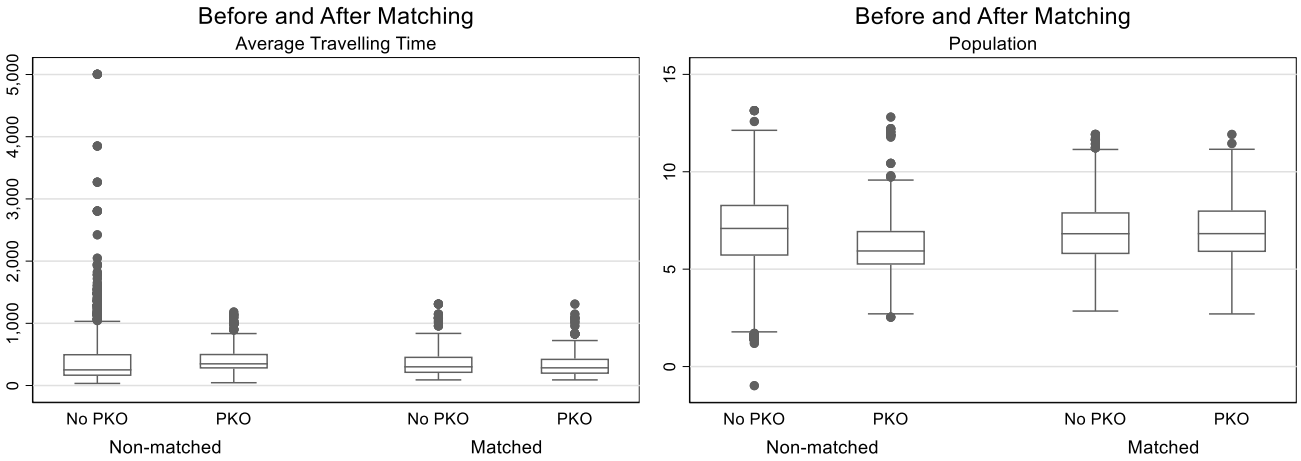


Figure 5 Impact of CEM on distribution of traveling time and population (PKO presence 2)



To ensure that the matching would not affect the dependent variables differently, the matching was tested in three separate datasets where only one of the dependent variables was included. The L1 distance remained the same, which was as expected.

5.2 Models using Logistic Regression on Matched Data

Table 8 and Table 9 present the results of the analysis using matched data. The first table, Table 8, is the baseline model for the analysis of the matched data using a logistic regression. Table 9 is the main results from the analysis including control variables with the matched data.

Table 8 Baseline model of the effects of PKO presence on the prevalence of SV; logit, matched data

VARIABLES	(1) SV all	(2) SV all	(3) SV government	(4) SV government	(5) SV rebel group	(6) SV rebel group
PKO presence 1	-0.183		-0.437*		-0.260	
		0.021		-0.459**		-0.038
PKO presence 2	(0.201)	(0.197)	(0.238)	(0.229)	(0.210)	(0.205)
Constant	-0.019	0.023	-1.075***	-0.904***	-0.616***	-0.672***
	(0.153)	(0.155)	(0.168)	(0.172)	(0.155)	(0.159)
Observations	558	583	558	583	543	568
Year dummy	NO	NO	NO	NO	NO	NO
Pseudo R-squared	0.001	0.002	0.007	0.008	0.003	0.006
Log Likelihood	-385.5	-404.0	-293.9	-324.5	-344.5	-364.9

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In Model 1 and 2, I test if presence of peacekeepers affects the prevalence of sexual violence committed by all conflict actors. We see that these results are not statistically significant and indicate two separate effects. In Model 3 and 4 we see a statistically significant effect of peacekeeping presence, both 1 and 2, in reducing government perpetrated sexual violence. This effect is not seen in Model 5 and 6, where the effect of peacekeeping presence, although also negative, is not statistically significant.

When exact matching without coarsening is used, the model only needs to include the treatment variable. The resulting model coefficient is the average treatment effect on the treated cells (SATT). Since coarsening *is* used in this thesis there are still some imbalances remaining in the matched data. This imbalance is bounded by the level of coarsening and the solution to

this is to adjust for the remaining imbalance by using a statistical model with added control variables (Iacus et al., 2019).

Table 9 The effects of PKO presence on the prevalence of SV; logit, matched data

VARIABLES	(7) SV all	(8) SV all	(9) SV government	(10) SV government	(11) SV rebel group	(12) SV rebel group
PKO presence 1	-0.361		0.483		-1.553***	
	(0.302)		(0.406)		(0.448)	
PKO presence 2		-0.347		-0.014		-1.526***
		(0.302)		(0.405)		(0.438)
Battle-related deaths	0.000	0.001	0.002	0.002	0.001	0.001
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)
Civilian deaths	0.007	0.006	0.011	0.009	-0.011	-0.001
	(0.011)	(0.010)	(0.014)	(0.011)	(0.014)	(0.009)
Excluded	-0.227	-0.209	0.608	0.595*	-0.755*	-1.069***
	(0.255)	(0.235)	(0.470)	(0.341)	(0.440)	(0.364)
Night lights	-11.086**	-8.117**	17.320***	15.042***	-7.902	-3.329
	(5.154)	(4.089)	(6.708)	(5.701)	(6.225)	(6.592)
Average travel time	-0.002***	-0.002**	0.001	-0.001	-0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Infant mortality	-0.001	-0.001	-0.007***	-0.006***	0.007***	0.008***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Mountains	-1.350***	-1.158**	2.230***	1.887**	-2.410***	-2.115***
	(0.477)	(0.475)	(0.834)	(0.783)	(0.621)	(0.628)
Population (log)	0.122	0.060	-0.171	-0.373**	0.409***	0.583***
	(0.115)	(0.103)	(0.135)	(0.155)	(0.154)	(0.189)
Constant	0.598	1.366	4.955**	7.312***	-12.737***	-16.115***
	(1.358)	(1.292)	(2.166)	(2.207)	(2.504)	(3.088)
Observations	497	512	433	441	368	371
Year dummy	YES	YES	YES	YES	YES	YES
Pseudo R-squared	0.421	0.350	0.598	0.555	0.496	0.506
Log Likelihood	-205.9	-237.6	-101.5	-118.3	-128.7	-127.2

Robust standard errors in parentheses

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

What is evident from Model 7 and Model 8 is that having a peacekeeping operation in a neighbouring cell is associated with a reduction in sexual violence, but the association is not statistically significant at the 90 % level. This supports H1a: *Areas where peacekeeping operations are deployed have a lower prevalence of sexual violence*, however it is not statistically significant and can therefore not be used to draw any conclusions. Still, the negative coefficient suggests that the presence of peacekeepers is associated with a reduced likelihood of prevalence of sexual violence.

The presence of peacekeepers has little to no effect on sexual violence perpetrated by the government. This is shown in Model 9 and 10, where none of the coefficients are significant. The directions change between the two operationalisations of peacekeeping presence. This is contrary to the results in Models 3 and 4 where the effects were statistically significant and negative.

Sexual violence perpetrated by rebel groups are evidently affected by peacekeeping presence. Considering H1b: *peacekeeping presence will reduce sexual violence perpetrated by rebel forces more effectively than by government forces*, Model 11 and 12 indicate that peacekeeping presence will reduce sexual violence perpetrated by rebel forces more effectively than by government forces. Although it is not possible to discern a conclusion to the effects of peacekeepers on government forces, it is clear that the presence of peacekeepers reduces the likelihood of sexual violence being perpetrated by rebel groups in the cells where they are present. At least when the control variables are included in the model. In the baseline models 5 and 6 the result was again contrary to the controlled model. This may be due to the remaining model imbalances which were not bounded in the baseline models. The control variables included in these models are intended to compensate for the coarsening in the matching pre-possessing and should be seen with that in mind.

The matching procedure means that considerable shares of non-treated as well as treated observations are excluded due to differences in pre-treatment characteristics. Although the matching by design accounts for core contextual determents for prevalence of sexual violence, the models presented in the subsequent chapter control for the possible changes caused by the altered data.

5.3 Peacekeeping Presence and Prevalence of Sexual Violence: Fixed Effects

A concern when using a matching technique is that it only takes into account observable variations in determining non-random assignment of the treatment variable, which in this thesis is peacekeeping presence. To address this, and for more robustness in the findings, the following chapter provides an alternative estimator. The Models in Table 10, 11, 12, and 13 are estimated using OLS with fixed effects at the cell level, using unmatched data. Models in table 11 and 13 have robust standard errors clustered at the cell level to reduce autocorrelation and year dummies are also included for all models. The coefficients of the FE models show how much the prevalence of sexual violence changes on average within the cells when the value of the dependent variable changes.

In Table 10 the results from a baseline analysis of the relationship between peacekeeping operation presence in cell and prevalence of sexual violence is presented. This model shows the results from an OLS (FE) regression with prevalence of all perpetrated sexual violence, government, and rebel group as dependent variable. *PKO presence 1* is the independent variable. The coefficients are statistically significant for all three dependent variables, all signifying a reduction of sexual violence with a peacekeeping presence 1.

Table 10 Baseline model of the PKO presence 1 and prevalence of SV; OLS fixed effects, unmatched data

	(13)	(14)	(15)
VARIABLES	SV all	SV government	SV rebel group
PKO presence1	-0.126**	-0.085**	-0.138***
	(0.055)	(0.034)	(0.052)
Constant	0.312***	0.178***	0.185***
	(0.007)	(0.004)	(0.007)
Observations	2,636	2,636	2,609
R-squared	0.008	0.005	0.016
Number of cells	953	953	948
Year dummy	NO	NO	NO
Log Likelihood	-489.1	-131.9	153.8

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 11 is an expansion of the baseline model where control variables are included. First, the coefficient for *PKO presence 1* is negative and statistically significant in Model 16,

17 and 18. *PKO presence 1* has a statistically significant effect on reducing prevalence of sexual violence when present in the cell or in the neighbouring cell. Evaluating H1b, Model 17 and 18 show that the distinction between the effect on government perpetrators and rebel groups are less clear compared to the models in Table 10. these results show that peacekeeping presence has a slightly stronger effect on reducing rebel perpetrated sexual violence, but this is not conclusive enough to validate H1b. The results in these models suggest that peacekeeping presence reduces sexual violence perpetrated by both the government and rebel groups.

Table 11 PKO presence 1 and prevalence of SV; OLS fixed effects, unmatched data

	(16)	(17)	(18)
	SV	SV	SV
VARIABLES	all	government	rebel group
PKO presence 1	-0.125**	-0.086***	-0.145***
	(0.050)	(0.032)	(0.049)
Post UNSCR1325	0.261***	0.140**	0.140***
	(0.071)	(0.058)	(0.053)
Battle-related deaths	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Civilian deaths	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Excluded	-0.069	-0.010	-0.122*
	(0.086)	(0.076)	(0.064)
Night lights	1.096*	2.046***	-0.142
	(0.664)	(0.567)	(0.749)
Constant	0.195***	0.081	0.113**
	(0.064)	(0.053)	(0.056)
Observations	2,403	2,403	2,379
R-squared	0.155	0.172	0.137
Number of cells	828	828	824
Year dummy	YES	YES	YES
Log Likelihood	-243.2	141.3	253.9

Robust standard errors in parentheses

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

I find that peacekeeping operations reduce sexual violence even when other determinants of violence and peacekeeping effectiveness are accounted for. Not surprisingly,

Post UNSCR1325 is a strong predictor for of sexual violence. Night lights correlates with increased sexual violence perpetrated in total and government. Battle-related deaths, Civilian deaths are also controlled for, but the effects are so small, the coefficients are indistinguishable and not statistically significant.

The *PKO presence 1* and *PKO presence 2* operationalisations were added to test the effect of peacekeepers distance to the local population on prevalence of sexual violence. In Table 12 and 13 the results of an OLS FE regression on *PKO presence 2* are presented. The *PKO presence 2* variable includes a larger area around the peacekeeping operation deployed. This means that there are more observations in the dataset with a *PKO presence 2* coding of 1, compared to the *PKO presence 1* coding. In Table 12, all presence coefficients are negative, however, the effect is only statistically significant on sexual violence by the government.

Table 12 Baseline model of PKO presence 2 and prevalence of SV; OLS fixed effects, unmatched data

	(19)	(20)	(21)
VARIABLES	SV all	SV government	SV rebel group
PKO presence 2	-0.073	-0.109***	-0.077
	(0.054)	(0.033)	(0.051)
Constant	0.309***	0.186***	0.181***
	(0.009)	(0.006)	(0.009)
Observations	2,636	2,636	2,609
R-squared	0.003	0.009	0.005
Number of cells	953	953	948
Year dummy	NO	NO	NO
Log Likelihood	-496.1	-126.7	139.8

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 12 presents the results of the analysis using *PKO presence 2* with control variables. This independent variable casts a slightly larger net by including more cells considered to have a peacekeeping presence. The results of these analyses are very similar to the ones in Table 11. There is still support for H1a: a*reas where peacekeeping operations are deployed have a lower prevalence of sexual violence*, in this model with a statistically significant negative effect on all sexual violence perpetrated when there are peacekeepers in the cell. H1b: *peacekeeping presence will reduce sexual violence perpetrated by rebel forces more*

effectively than by government forces is, not supported by the results in Model 13. In this model, peacekeeping presence has a stronger negative effect on government perpetrated sexual violence than sexual violence perpetrated by rebel groups these results are also statistically significant.

Table 13 PKO presence 2 and prevalence of SV; OLS fixed effects, unmatched data

	(22)	(23)	(24)
	SV	SV	SV
VARIABLES	all	government	rebel group
PKO presence 2	-0.109**	-0.130***	-0.095**
	(0.048)	(0.030)	(0.047)
Post UNSCR1325	0.245***	0.137**	0.117**
	(0.068)	(0.056)	(0.049)
Battle-related deaths	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Civilian deaths	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Excluded	-0.077	-0.023	-0.127**
	(0.085)	(0.074)	(0.064)
Night lights	1.162*	2.126***	-0.079
	(0.652)	(0.587)	(0.718)
Constant	0.212***	0.105*	0.127**
	(0.063)	(0.054)	(0.054)
Observations	2,403	2,403	2,379
R-squared	0.154	0.179	0.129
Number of cells	828	828	824
Year dummy	YES	YES	YES
Log Likelihood	-245.5	151.3	242.1

Robust standard errors in parentheses

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

5.4 Troop Size and Prevalence of Sexual Violence: OLS (FE)

In Table 14 and 15, the results from the analysis of the relationship between troop size and the prevalence of sexual violence are presented. These models, similarly to the models in subchapter 5.3, show the results from an OLS FE regression with the prevalence of sexual violence all, government and rebel group as dependent variables. *Troop size* is the independent

variable. Robust standard errors are clustered at the cell level and year dummies are included for all models in table 15. The initial expectation was a negative regression coefficient, Table 14 and 15 shows the expected direction but it is not significant. This means that there is no sufficient support for H2a and H2b in these models.

Table 14 PKO troop size and prevalence of SV; OLS fixed effects, unmatched data

	(25)	(26)	(27)
VARIABLES	SV all	SV government	SV rebel group
Troops	-0.003	-0.004	-0.002
	(0.005)	(0.005)	(0.003)
Constant	0.297***	0.169***	0.168***
	(0.001)	(0.001)	(0.001)
Observations	2,636	2,636	2,609
R-squared	0.000	0.001	0.000
Number of cells	953	953	948
Year dummy	NO	NO	NO
Log Likelihood	-499.7	-137.8	133.3

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 15 PKO troop size and prevalence of SV; OLS fixed effects, unmatched data

VARIABLES	(28) SV all	(29) SV government	(30) SV rebel group
Troop size	-0.011	-0.011	-0.005
	(0.000)	(0.000)	(0.000)
Post UNSCR1325	0.244***	0.133**	0.110**
	(0.066)	(0.056)	(0.046)
Battle-related deaths	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Civilian deaths	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Excluded	-0.062	-0.005	-0.114*
	(0.084)	(0.075)	(0.062)
Night lights	1.096*	2.047***	-0.130
	(0.608)	(0.531)	(0.676)
Constant	0.188***	0.076	0.107**
	(0.063)	(0.052)	(0.053)
Observations	2,403	2,403	2,379
R-squared	0.150	0.171	0.122
Number of cells	828	828	824
Year dummy	YES	YES	YES
Log Likelihood	-250.3	139.7	233.4

Robust standard errors in parentheses

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

5.5 Robustness

Checking the robustness of the findings in important for ensuring validity. A possible concern is that matching techniques take into account only observables in determining non-random assignment of the treatment, in our case peacekeepers. This is however mitigated by also using other estimation techniques to ensure robust inferences. Civilian protection has become a key part of UN peacekeeping, there is an increase in mandates authorising peacekeepers to act against potential threats to civilians, this signals an increasing willingness to use force (Fjelde et al., 2019). Time is explicitly modelled to ensure that the results are driven by a general trend or shocks in either increased awareness and reporting or a change in level of conflict. The fact that most models give the same support to the hypotheses suggest that the models are quite robust and that some inferences can be drawn. I lag all independent variables in Model a, to i

in the Appendix. This choice is based on the potential explanation that the presence of peacekeepers may need time to affect the level of sexual violence (for example). The results in these models are inconclusive and largely not statistically significant. The models with the dependent variable *Troop size*, in the appendix, address if the effects of peacekeeping presences effect take time to affect sexual violence. Contrary to the results in the previous chapter, it is the lagged models that are statistically significant. These models have a different direction of the coefficient to what was thought. There is no support of neither H2a nor H2b in the lagged models.

As an additional test, DRC was removed from the dataset. As mentioned in Chapter 2, DRC is commonly used in case studies on sexual violence. To ensure that DRC did not have a defining effect on the results in the analysis, DRC was removed from the dataset and an OLS FE analysis was done on the unmatched data. The resulting models are in the appendix. The results in these models are similar to those from the original dataset. PKO presence 1 and PKO presence 2 have differing indications on the effect of peacekeepers on sexual violence by government versus rebel groups. This is the same indication which was present the original models. Furthermore, troops have seemingly little to no effect on prevalence of sexual violence also when excluding DRC from the data.

5.6 Summary of Results

Table 16 Summary of results

	Matched data Logit			Unmatched data FE OLS		
Variables	SV all	SV government	SV rebel group	SV all	SV government	SV rebel group
PKO presence 1	-0.361	0.483	-1.553***	-0.125**	-0.086***	-0.145***
PKO presence 2	-0.347	-0.014	-1.526***	-0.109**	-0.130***	-0.095**
Troop size				-0.011	-0.011	-0.005

6 Discussion

This thesis set out to answer the research question: does the local presence of peacekeepers reduce the prevalence of sexual violence in active, armed, state-based conflict in Africa? In this Chapter I discuss the results presented in Chapter 5 in light of the proposed theoretical expectations. This Chapter starts by discussing the effect of peacekeeping presence on sexual violence, followed by a comparison of the effect peacekeepers have on governments versus rebel groups. Then I discuss the effect troop strength has on sexual violence. Lastly, I conclude with my contribution and suggestions for future studies.

The effects of a peacekeeping operations presence on sexual violence is the central question asked in this thesis. Literature on the local effect of peacekeepers on violence in conflict have argue that peacekeepers increase the cost for conflict actors to target civilians (Fjelde et al., 2019). In the results there is support for H1a: *areas where peacekeeping operations are deployed have a lower prevalence of sexual violence.* This is seen in both Model 16 and in Model 19. Support for H1a suggests that conflict areas where peacekeeping operations are deployed have a lower likelihood of sexual violence when peacekeeper are deployed to that area. The fact that most models give similar support to the hypotheses suggest that the models are quite robust and that some inferences can be drawn. One interpretation, addressed by Fjelde et al. (2019), peacekeepers ability to curb violence primarily works through political pressure and a national or regional level. Fjelde et al. call this strategic deterrence over monitoring and tactical deterrence. However, as stated in the introduction, the daily interactions between peacekeepers and locals is necessary to properly understand effective peacekeeping (Bove & Ruggeri, 2019, p. 1650; Ruggeri et al., 2017). The daily work and practices of peacekeeping is constrained by social and cultural barriers between the operation's forces and the local population (Bove & Ruggeri, 2019). Theoretically, peacekeepers form infrastructures where they are deployed, to which both peacekeepers and the peacekept must relate. This infrastructure creates the physical barriers separating conflict actors from each other, from peacekeepers and from the local population in close proximity to the deployment (Fortna & Howard, 2008; Hultman et al., 2013; Kirschner & Miller, 2019, p. 2048).

The individual's private preference is difficult to analyse quantitatively. This preference is not static and is altered by norms and beliefs (Wood, 2009, p. 137). Although conflict-intensity controls such as *Battle-related deaths* and *Civilian deaths* were included in the models, some of the sexual violence reduction is likely connected to the conflict levels. Sexual violence

has specific purposes in socialising combatants. Since it has already been established that peacekeepers to some extent reduce conflict levels, the reduction seen in sexual violence might be attributed to a reduced need to socialise new combatants. A reduction of sexual violence categorised as a strategy might be reduced as a direct result of peacekeepers presence. This is because of the theorised deterrence and physical barriers separating the perpetrators and the peacekept. The deterrence effect of peacekeepers works by signalling to conflict actors a willingness to punish sexual violence by use of force. This has been increasingly possible for peacekeepers to do, as their mandate to use force has liberalised in recent decades.

There are possible relocation effects, where perpetrators of sexual violence may relocate to areas where are no peacekeeping deployments. Studies on this have not reached a consensus, where Peitz and Reisch (2019) do find a relocation effect while Fjelde, Hultman and Nilsson's (2019) do not. The focus of this thesis has not been to assess the possible relocation effects of peacekeeping. In this thesis, proximity to peacekeepers has been in focus. The two operationalisations of *PKO prevalence 1* and *PKO prevalence 2* can give some indication of whether peacekeepers are effective across greater distances or only in the near proximity of the peacekept. Generally, when comparing the two dependent variables *PKO prevalence 1* has a slightly stronger effect. When discarding or confirming a hypothesis, there is always a risk of Type 1 or Type 2 error. A Type 1 error is to discard a tru hyportheis, while Type 2 error is to confirm an untrue hypotesis (Ringdal, 2018, s.351). Since the findings in support of H1a are evident across different models and robustness tests, I keep H1a. Although I comfirm this hypothesis there are still some uncertainties, the results are not statistically significant when I apply the matched data. This may be due to a wrongly specified coersening.

Past studies have concluded that both government and rebel groups commit sexual violence (Johansson & Sarwari, 2019, p. 471; Ruggeri et al., 2017, p. 165). In line with the theoretical argument, I find that the presence of peacekeepers has little to no effect on sexual violence perpetrated by the government, in the matched logit models Model 9 and 10. None of the coefficients are statistically significant and there is a change in the direction of the effect from other models. However, in the FE models the effect of peacekeeping presence on prevalence of sexual violence by the government it has a significant negative coefficient. This is seen in model 17 and 21. Sexual violence perpetrated by rebel groups are evidently affected by peacekeeping presence. This is visible in models 11, 12, 18, and 24. Considering H1b: *peacekeeping presence will reduce sexual violence perpetrated by rebel forces more effectively than by government forces*, I cannot confirm the hypothesis, since the results concerning

government forces are so varied. Nor can I discard it. There is no conclusive indication of whether rebel groups curtailed use of sexual violence more than the government in response to peacekeeping presence or troops. One possible interpretation of this is that the ability of peacekeepers to curb violence is primarily related to political pressure at the national or regional level (Fjelde et al. 2019. This can be called strategic deterrence over monitoring and tactical deterrence.

Local-level research on peacekeeping has found that peacekeepers are more successful in reducing violence by rebel forces than by the government (Fjelde et al., 2019). There is one major difference between rebel and government actors in their relation to peacekeeping operations; host governments have de facto power to veto access to particular areas within their borders (Fjelde et al., 2019, p. 109). Consent is one of the key principles of peacekeeping. This consent can be withdrawn in certain regions. This may impact the peacekeepers ability to deploy to areas where government forces have committed sexual violence. The deterrence effect and physical barriers created by peacekeepers hinge on access to the local population, this access is to some extent dependent on the government's permission. Furthermore, it is also possible that the UN is less willing to impose political or military costs on government actors, this weakens the effect of deterrence and physical barriers.

Some studies suggest the effect of increasing troop size varies with local conditions. Cil et al. (2019) in fact, find no general effect of the number of troops on the number of battle-related fatalities; however, troops do reduce violence in areas with high road density, which facilitates accessibility to violence-prone areas (Peitz & Reisch, 2019). Although it was expected that the effects of peacekeeping presence differ with force projection capabilities of troop deployments there was little in the results of the analysis to support this.

The deterrence of sexual violence rest partially on deploying large military contingents according to Salvatore and Ruggeri (2017). Research on the effectiveness of peacekeeping have concluded that number of troops deployed matters. Larger troop deployments have, according to Ruggeri et al. (2012), been able to increase cooperation between the conflicting parties. Furthermore, larger presence of troos are theorised to increase the chances of sexual violence beeing detected and punished. This may decrease the propensity of sexual violence. It may also increase number of reports of sexual violence due to increased capacity. I hypothesised that *areas where there are larger number of troops will have a lower prevalence of sexual violence* and that the *number of troops will reduce sexual violence perpetrated by rebel forces more*

effectively than by government forces. The models in Table 14 and 15 shows the expected direction but it is not statistically significant.

The weak effects of troop size seem in line with the comparatively modest size of peacekeeping deployment, especially given the amount of territory that the peacekeepers are expected to control. Peacekeeping operations often lack the capacity to effectively patrol their entire area of operations, thereby leaving opportunities for violence by conflict actors (Ruggeri et al., 2017). The effects found in this thesis were very small and where not statistically significant. I do not find sufficient support for H2a or H2b in this analysis. It is however not possible to discard these hypotheses either, since I cannot draw conclusions based on the lack of statistical significance.

This test of the effect of peacekeepers on the propensity of sexual violence in conflict, does not give an answer to whether peacekeeping is effective against sexual violence in non-active conflict areas. The mechanisms for how peacekeeping affect sexual violence in peaceful grid cells was beyond the scope of this study.

6.1 Conlusion

Does the local presence of peacekeepers reduce the prevalence of sexual violence in active, armed, state-based conflict in Africa? There are several reasons for why peacekeeping at the local level matters (Ruggeri et al.). In this study I have analysed the local prevalence of sexual violence in armed conflict and the deployment of the UN peacekeeping operations in Africa between 1994 and 2009. One reason for why these matters are the size of peacekeeping deployments, intensity of violence, terrain and infrastructure all vary locally.

Several studies address peacekeepers effect on *local* levels of violence and conflict. To date there has been no analysis of the effect of *local* presence of peacekeeping operations on sexual violence in armed conflict. They do not account for where the sexual violence occurs and where the peacekeepers are *within* a country in a cross-national analysis. In this thesis, I test if peacekeeping operations reduce the prevalence of sexual violence in active armed conflict using geo-coded data from GEO-SVAS and GEO-PKO 1.2. Testing if peacekeeping operations reduce prevalence of sexual violence locally is a continuation of the existing literature.

The deployment of peacekeeping operations is not random. To account for this, a matching technique is used with a logit regression, this is complemented by using fixed effects

regression on the unmatched data. Results of the study show that peacekeepers are able to reduce total prevalence in of sexual violence. I find that peacekeepers are able to reduce prevalence of sexual violence perpetrated by rebel groups, but it is unclear whether peacekeepers are more effective at reducing rebel perpetrated sexual violence then government perpetrated sexual violence. When analysing the effect of troop strength, the effects found in this thesis were very small and where not statistically significant.

It is useful to see this thesis in connection to the previous research on peacekeeper's effect on violence in general and sexual violence spesifically. This study has shown that local-level analisys of peacekeeping operations are nessessary when the mechanisms studied are local. This is the first study which addresses the effect of peacekeepers on sexual violence locally.

With the current available data, future research could distinguish between different conflict types, focusing more on in which conflict types peacekeepers are effective, and importantly, which conflicts are more prone to sexual violence. Another possibility is to look at the background of the peacekeeping troops and which constellations of cultures are the most successful at reducing sexual violence. These are just two examples of studies that are possible with the data available currently. With an accumulation of new data, a more detailed analysis could be made possible.

7 References

Aning, K., & Edu-Afful, F. (2013). Unintended Impacts and the Gendered Consequences of Peacekeeping Economies in Liberia. *International Peacekeeping, 20*(1), 17-32.

Autesserre, S. (2014). Going Micro: Emerging and Future Peacekeeping Research. *International Peacekeeping, 21*(4), 492-500. doi:10.1080/13533312.2014.950884

Baaz, M. E., & Stern, M. (2009). Why Do Soldiers Rape? Masculinity, Violence, and Sexuality in the Armed Forces in the Congo (DRC). *International Studies Quarterly, 53*, 495-518.

Bahgat, K., Nordås, R., & Østby, G. (2016). Geocoded SVAC Dataset (GEO-SVAC) version 1.0. *Peace Research Institute Oslo (PRIO)*.

Banwell, S. (2014). Rape and sexual violence in the Democratic Republic of Congo: a case study of gender-based violence. *Journal of Gender Studies, 23*(1), 45-58. doi:10.1080/09589236.2012.726603

Bara, C., & Hultman, L. (2020). Just Different Hats? Comparing UN and Non-UN Peacekeeping. *International Peacekeeping, 27*(3), 341-368. doi:10.1080/13533312.2020.1737023

Beber, B., Gilligan, M. J., Guardado, J., & Karim, S. (2019). The Promise and Peril of Peacekeeping Economies. *International Studies Quarterly, 63*(2), 364-379. doi:10.1093/isq/sqz012

Bell, S. R., Flynn, M. E., & Machain, C. M. (2018). U.N. Peacekeeping Forces and the Demand for Sex Trafficking. *International Studies Quarterly, 62*(3), 643-655. doi:10.1093/isq/sqy017

Benson, M., & Gizelis, T.-I. (2020). A Gendered Imperative: Does Sexual Violence Attract UN Attention in Civil Wars? *Journal of Conflict Resolution, 64*(1), 167-198. doi:10.1177/0022002719841125

Blackwell, M., Iacus, S., King, G., & Porro, G. (2009). cem: Coarsened exact matching in Stata. *Stata Journal, 9*(4), 524-546.

Blyth, S., Groombridge, B., Lysenko, I., Miles, L., & Newton, A. (2002). Mountain Watch: environmental change & sustainable development in mountains. *UNEP-WCMC Biodiversity Series 12*.

Bove, V., & Ruggeri, A. (2015). Kinds of Blue: Diversity in UN Peacekeeping Missions and Civilian Protection. *British Journal of Political Science, 46*(3), 681-700.

Bove, V., & Ruggeri, A. (2019). Peacekeeping Effectiveness and Blue Helmets' Distance from Locals. *Journal of Conflict Resolution, 63*(7), 1630-1655.

Bromley, S. L. (2018). Introducing the UCDP Peacemakers at Risk dataset, sub-Saharan Africa, 1989–2009. *Journal of Peace Research, 55*(1), 122-131. doi:10.1177/0022343317735882

Campbell, K., Demir, E., & O'Reilly, M. (2019). Understanding conflictrelated sexual violence and the 'everyday' experience of conflict through witness testimonies. *Cooperation and Conflict, 54*(2), 254-277.

Cederman, L.-E., Buhaug, H., & Rød, J. K. (2009). Ethno-Nationalist Dyads and Civil War: A GIS-Based Analysis. *Journal of Conflict Resolution, 53*(4), 496-525. doi:10.1177/0022002709336455

Center for International Earth Science Information Network, & Centro Internacional de Agricultura Tropical. (2005). *Gridded Population of theWorld. Version 3 (GPWv3)*. Palisades, NY: Population Count Grid.

Center for International Earth Science Information Network, C. (2005). *Poverty Mapping Project: Global Subnational Infant Mortality Rates*. Palisades, NY: NASA Socioeconomic Data and Applications Center (SEDAC).

Charlesworth, H. (2008). Are Women Peaceful? Reflections on the Role of Women in Peace-Building. *Feminist Legal Studies, 16*(3), 347-361. doi:10.1007/s10691-008-9101-6

Chu, T. S., & Braithwaite, J. M. (2017). The effect of sexual violence on negotiated outcomes in civil conflicts. *Conflict Management and Peace Science, 35*(3), 233-247. doi:10.1177/0738894217693595

Cil, D., Fjelde, H., Hultman, L., & Nilsson, D. (2019). Mapping blue helmets: Introducing the Geocoded Peacekeeping Operations (Geo-PKO) dataset. *Journal of Peace Research, 0*(0), 0022343319871978. doi:10.1177/0022343319871978

Claeskens, G., & Hjort, N. L. (2008). Model selection: data examples and introduction. In *Model Selection and Model Averaging* (pp. 1-21). Cambridge: Cambridge University Press.

Clayton, G., Kathman, J., Beardsley, K., Gizelis, T. I., Olsson, L., Bove, V., . . . Goodness, C. (2017). The known knowns and known unknowns of peacekeeping data. *International Peacekeeping, 24*(1), 1-62. doi:10.1080/13533312.2016.1226768

Cohen, D. (2013). Explaining Rape during Civil War: Cross-National Evidence (1980-2009). *The American Political Science Review, 107*(3), 461-477. doi:10.1017/S0003055413000221

Cohen, D., & Nordås, R. (2019). Sexual Violence in Armed Conflict Data Project (SVAC) 2.0, 1989-2015 Codebook and Instruction Manual. In PRIO (Ed.), (pp. 1-17).

de Coning, C. (2017). Peace enforcement in Africa: Doctrinal distinctions between the African Union and United Nations. *Contemporary Security Policy, 38*(1), 145-160. doi:10.1080/13523260.2017.1283108

de Jonge Oudraat, C. (2013). UNSCR 1325—Conundrums and Opportunities. *International Interactions, 39*(4), 612-619. doi:10.1080/03050629.2013.805328

Di Salvatore, J. (2018). Obstacle to Peace? Ethnic Geography and Effectiveness of Peacekeeping. *British Journal of Political Science*, 1-21. doi:10.1017/S0007123418000200

Duursma, A. (2019). Obstruction and intimidation of peacekeepers: How armed actors undermine civilian protection efforts. *Journal of Peace Research, 56*(2), 234-248. doi:10.1177/0022343318800522

Eck, K., & Hultman, L. (2007). One-Sided Violence Against Civilians in War:Insights from New Fatality Data. *Journal of Peace Research, 44*(2), 233-246. doi:10.1177/0022343307075124

Elvidge, C. D., Hsu, F.-C., Baugh, K. E., & Ghosh, T. (2014). *National Trends in Satellite Observed Lighting: 1992-2012*: CRC Press.

Fjelde, H., & Hultman, L. (2014). Weakening the Enemy:A Disaggregated Study of Violence against Civilians in Africa. *Journal of Conflict Resolution, 58*(7), 1230-1257. doi:10.1177/0022002713492648

Fjelde, H., Hultman, L., & Nilsson, D. (2019). Protection Through Presence: UN Peacekeeping and the Costs of Targeting Civilians. *International Organization, 73*(1), 103-131. doi:10.1017/S0020818318000346

Fortna, V. P. (2004). Does Peacekeeping Keep Peace? International Intervention and the Duration of Peace After Civil War. *International Studies Quarterly, 48*(2), 269-292. doi:10.1111/j.0020-8833.2004.00301.x

Fortna, V. P., & Howard, L. M. (2008). Pitfalls and Prospects in the Peacekeeping Literature. *11*(1), 283-301. doi:10.1146/annurev.polisci.9.041205.103022

Gizelis, T.-I., & Benson, M. (2019). Advancing the Frontier of Peacekeeping Research. *Journal of Conflict Resolution, 63*(7), 1595-1600. doi:10.1177/0022002718821709

Goldewijk, K., Beusen, A., de Vos, M., & Drecht, G. v. (2011). The HYDE 3.1 spatially explicit database of human induced land use change over the past 12,000 years. *Global Ecology and Biogeography, 20*(1), 73-86.

Goldewijk, K., Beusen, A., & Janssen, P. (2010). Long term dynamic modeling of global population and built-up area in a spatially explicit way, HYDE 3.1. . *The Holocene, 20*(4), 565-573.

Grady, K. (2010). Sexual Exploitation and Abuse by UN Peacekeepers: A Threat to Impartiality. *International Peacekeeping, 17*(2), 215-228. doi:10.1080/13533311003625100

Haass, F., & Ansorg, N. (2018). Better peacekeepers, better protection? Troop quality of United Nations peace operations and violence against civilians. *Journal of Peace Research, 55*(6), 742-758.

Hegre, H., Hultman, L., & Nygård, H. (2019). Evaluating the Conflict-Reducing Effect of UN Peacekeeping Operations. *Journal of Politics, 81*(1), 215-232.

Henry, M. (2015). Parades, Parties and Pests: Contradictions of Everyday Life in Peacekeeping Economies. *Journal of Intervention and Statebuilding, 9*(3), 372-390. doi:10.1080/17502977.2015.1070021

Hultman, L. (2010). Keeping Peace or Spurring Violence Unintended Effects of Peace Operations on Violence against Civilians. *Civil Wars, 12*(1-2), 29-46.

Hultman, L., Kathman, J., & Megan, S. (2013). United Nations Peacekeeping and Civilian Protection in Civil War. *American Journal of Political Science 57*(4), 875-891.

Hultman, L., & Tidblad-Lundholm, K. (2019). "What Do We Really Know about Local Peacekeeping Effects?". *Zeitschrift für Friedens- und Konfliktforschung*. doi:10.1007/s42597-019-00020-1

Högbladh, S. (2019). UCDP GED Codebook version 19.1. *Department of Peace and Conflict Research, Uppsala University*.

Iacus, S. M., King, G., & Porro, G. (2011). Causal Inference Without Balance Checking: Coarsened Exact Matching. *Political Analysis, 20*(1), 1-24. Retrieved from https://www.cambridge.org/core/journals/political-analysis/article/causal-inference-without-balance-checking-coarsened-exact-matching/5ABCF5B3FC3089A87FD59CECBB3465C0

Iacus, S. M., King, G., & Porro, G. (2019). A Theory of Statistical Inference for Matching Methods in Causal Research. *Political Analysis, 27*(1), 46-68. doi:10.1017/pan.2018.29

Jennings, K. M. (2014). Service, sex, and security: Gendered peacekeeping economies in Liberia and the Democratic Republic of the Congo. *Security Dialogue, 45*(4), 313-330. doi:10.1177/0967010614537330

Jennings, K. M. (2016). Blue Helmet Havens: Peacekeeping as Bypassing in Liberia and the Democratic Republic of the Congo. *International Peacekeeping, 23*(2), 302-325. doi:10.1080/13533312.2016.1141055

Jennings, K. M. (2018). Peacekeeping as Enterprise: Transaction, Consumption, and the Political Economy of Peace and Peacekeeping. *Civil Wars, 20*(2), 238-261.

Jennings, K. M., & Bøås, M. (2015). Transactions and Interactions: Everyday Life in the Peacekeeping Economy. *Journal of Intervention and Statebuilding, 9*(3), 281-295. doi:10.1080/17502977.2015.1070022

Johansson, K., & Hultman, L. (2019). UN Peacekeeping and Protection from Sexual Violence *Journal of Conflict Resolution, 68*(7), 1656-1681.

Johansson, K., & Sarwari, M. (2019). Sexual violence and biased military interventions in civil conflict. *Conflict Management and Peace Science, 36*(5), 469-493.

Karim, S., & Beardsley, K. (2016). Explaining sexual exploitation and abuse in peacekeeping missions:The role of female peacekeepers and gender equality in contributing countries. *Journal of Peace Research, 53*(1), 100-115. doi:10.1177/0022343315615506

Kathman, J. D., & Melin, M. M. (2016). Who Keeps the Peace? Understanding State Contributions to UN Peacekeeping Operations. *International Studies Quarterly, 61*(1), 150-162. doi:10.1093/isq/sqw041

Kent, V. L. (2005). Peacekeepers as Perpetrators of Abuse. *African Security Studies, 14*(2), 85-92. doi:10.1080/10246029.2005.9627358

King, G., & Nielsen, R. (2019). Why Propensity Scores Should Not Be Used for Matching *Cambridge University Press*(Political Analysis (2019)).

Kirschner, S., & Miller, A. (2019). Does Peacekeeping Really Bring Peace? Peacekeepers and Combatant-perpetrated Sexual Violence in Civil Wars. *Journal of Conflict Resolution, 63*(9), 2043-2070.

Kolbe, A. R. (2015). 'It's Not a Gift When It Comes with Price': A Qualitative Study of Transactional Sex between UN Peacekeepers and Haitian Citizens.(Research article)(Report). *Stability: International Journal of Security and Development, 4*(1). doi:10.5334/sta.gf

Koos, C. (2017). Sexual violence in armed conflicts: research progress and remaining gaps. *Third World Quarterly, 38*(9), 1935-1951. doi:10.1080/01436597.2017.1322461

Leatherman, J. L. (2011). *Sexual Violence and Armed Conflict*. Cambridge Polity.

Longhi, S., & Nandi, A. (2015). *A Practical Guide to Using Panel Data*.

Meger, S. (2010). Rape of the Congo: Understanding sexual violence in the conflict in the Democratic Republic of Congo. *Journal of Contemporary African Studies, 28*(2), 119-135. doi:10.1080/02589001003736728

Mehmetoglu, M., & Jakobsen, T. G. (2017). *Applied Statistics Using Stata: A guide for the social sciences* Los Angeles: SAGE Publications

Moncrief, S. (2017). Military socialization, disciplinary culture, and sexual violence in UN peacekeeping operations. *Journal of Peace Research, 54*(5), 715-730. doi:10.1177/0022343317716784

Nagel, R. U., & Doctor, A. C. (2020). Conflict-related Sexual Violence and Rebel Group Fragmentation. *Journal of Conflict Resolution, 28*(1).

Nordås, R., & Cohen, D. (2011). *Wartime Sexual Violence: Challenges and Opportunities for Data Collection and Analysis*. Retrieved from

Nordås, R., & Rustad, S. C. A. (2013). Sexual Exploitation and Abuse by Peacekeepers: Understanding Variation. *International Interactions, 39*(4), 511-534. doi:10.1080/03050629.2013.805128

Ottmann, M. (2017). Rebel constituencies and rebel violence against civilians in civil conflicts. *Conflict Management and Peace Science, 34*(1), 27-51. doi:10.1177/0738894215570428

Peitz, L., & Reisch, G. (2019). Violence reduction or relocation?: Effects of United Nations troops presence on local levels of violence. *Zeitschrift für Friedens- und Konfliktforschung, 8*. doi:10.1007/s42597-019-00009-w

Ringdal, K. (2018). Enhet og mangfold : samfunnsvitenskapelig forskning og kvantitativ metode (4. utg.). Bergen: Fagbokforlaget.

Ruggeri, A., Dorussen, H., & Gizelis, T.-I. (2016). On the Frontline Every Day? Subnational Deployment of United Nations Peacekeepers. *British Journal of Political Science, 48*, 1005-1025.

Ruggeri, A., Dorussen, H., & Gizelis, T.-I. (2017). Winning the Peace Locally: UN Peacekeeping and Local Conflict. *International Organization, 71*, 162-185.

Ruggeri, A., Gizelis, T. I., & Dorussen, H. (2012). Managing Mistrust: An Analysis of Cooperation with UN Peacekeeping in Africa. *Journal of Conflict Resolution, 57*(3), 387-409.

Rustad, S. C. A., Østby, G., & Nordås, R. (2016). Artisanal mining, conflict, and sexual violence in Eastern DRC. *The Extractive Industries and Society, 3*, 475-484.

Salvatore, J. D., & Ruggeri, A. (2017). Effectiveness of Peacekeeping Operations. *Contentious Politics and Political Violence, World Politics*, 1-29.

Skog, O.-J. (2004). Å forklare sosiale fenomener : en regresjonsbasert tilnærming (2. utg.). Oslo: Gyldendal akademisk.

Sloan, J. (2014). The Evolution of the Use of Force in UN Peacekeeping. *Journal of Strategic Studies, 37*(5), 674-702. doi:10.1080/01402390.2014.921853

Smidt, H. M. (2020). United Nations Peacekeeping Locally: Enabling Conflict Resolution, Reducing Communal Violence. *Journal of Conflict Resolution, 64*(2-3), 344-372. doi:10.1177/0022002719859631

Storeygard, A., Balk, D., Levy, M., & Deane, G. (2008). The global distribution of infant mortality: A subnational spatial view. Population, Space and Place. *14*(3), 209-229.

Sundberg, R., & Melander, E. (2013). Introducing the UCDP Georeferenced Event Dataset. *Journal of Peace Research, 50*(4), 523-532

Tollefsen, A. F., Bahgat, K., Nordkvelle, J., & Buhaug, H. (2016). PRIO-GRID v.2.0 Codebook. *Peace Research Institute Oslo*.

Tollefsen, A. F., Strand, H., & Buhaug, H. (2012). PRIO-GRID: A unified spatial data structure. *Journal of Peace Research, 49*(2), 363-374. doi:10.1177/0022343311431287

Uchida, H., & Nelson, A. (2009). Agglomeration Index: Towards a New Measure of Urban Concentration. *Background paper for the World Bank's World Development Report 2009*.

UN, D. (2020). Mandates and the Legal Basis for Peacekeeping. Retrieved from https://peacekeeping.un.org/en/mandates-and-legal-basis-peacekeeping

UN, D. (2020). Role of Security Council. Retrieved from https://peacekeeping.un.org/en/role-of-security-council

Vogt, M., Bormann, N.-C., Rüegger, S., Cederman, L.-E., Hunziker, P., & Girardin, L. (2015). Integrating Data on Ethnicity, Geography, and Conflict: The Ethnic Power Relations Dataset Family. *Journal of Conflict Resolution, 59*(7), 1327-1342.

Weidmann, N. B., Kuse, D., & Gleditsch, K. S. (2010). The geography of the international system: The CShapes Dataset. . *International Interactions, 36*(1), 86-106.

Westendorf, J.-K., & Searle, L. (2017). Sexual exploitation and abuse in peace operations: trends, policy responses and future directions. *International Affairs, 93*(2), 365-387. doi:10.1093/ia/iix001

Whitaker, B. E., Walsh, J. I., & Conrad, J. (2019). Natural Resource Exploitation and Sexual Violence Rebel Groups. *The Journal of Politics 81*(2).

Wood, E. (2006). Variation in Sexual Violence during War. *Politics & Society 34*(3), 307-341.

Wood, E. (2009). Armed Groups and Sexual Violence: When Is Wartime Rape Rare? *Politics & Society, 37*(1), 131-162.

Wood, E. (2018). Rape as a Practice of War: Toward a Typology of Political Violence. *Politics & Society, 46*(4), 513-537.

8 Appendix

Appendix 1 Descriptive statistics for control variables after matching

Statistic	N	Mean	St. Dev.	Min	Max
After Matched (PKO presence 1)					
Excluded	505	0.691	0.617	0	3
Battle-related deaths	558	51.14	173.1	0	3,000
Civilian deaths	558	3.871	13.08	0	150
Roads	558	21.07	16.64	0	140
Distance to border	558	165.5	157.0	0.329	544.7
Distance to capital	558	582.8	481.5	3.986	1,792
Night lights	558	0.038	0.033	0.014	0.279
Average travel time	558	354.9	227.4	90.76	1,148
Infant mortality	550	1,360	344.4	593	1,858
Mountains	558	0.253	0.326	0	0.998
Post UNSCR1325	558	0.434	0.496	0	1
Population	558	7.040	1.828	2.702	11.92
After Matched (PKO presence 2)					
Excluded	520	0.744	0.693	0	4
Battle-related deaths	583	50.75	169.2	0	3,000
Civilian deaths	583	3.921	13.48	0	150
Roads	583	19.18	12.91	0	64
Distance to border	583	152.4	148.4	0.329	544.7
Distance to capital	583	571.3	478.8	3.986	1,792
Night lights	583	0.038	0.032	0.014	0.279
Average travel time	583	362.9	237.6	90.76	1,310
Infant mortality	575	1,332	333.8	593	1,858
Mountains	583	0.225	0.306	0	0.998
Post UNSCR1325	583	0.482	0.500	0	1
Population	583	7.033	1.801	2.702	11.92

Appendix 2 Lagged PKO presence 1 and prevalence of SV; OLS fixed effects, unmatched data

VARIABLES	(a) SV all	(b) SV government	(c) SV rebel group
PKO presence 1 (t-1)	0.016	-0.041	-0.084
	(0.085)	(0.067)	(0.084)
Post UNSCR1325 (t-1)	0.541***	0.254***	0.349***
	(0.106)	(0.078)	(0.072)
Battle-related deaths (t-1)	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)
Civilian deaths (t-1)	0.001***	0.001***	0.000
	(0.000)	(0.000)	(0.000)
Excluded (t-1)	0.175	0.028	0.093
	(0.116)	(0.101)	(0.089)
Night lights (t-1)	-3.714***	-0.644	-3.464***
	(0.941)	(0.446)	(0.889)
Constant	0.126*	0.100**	0.071
	(0.068)	(0.050)	(0.066)
Observations	1,023	1,023	1,013
R-squared	0.201	0.209	0.135
Number of cells	321	321	317
Year dummy	YES	YES	YES
Log Likelihood	-2.882	120.1	184.8

Robust standard errors in parentheses

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

Appendix 3 Lagged PKO presence 2 and prevalence of SV; OLS fixed effects, unmatched data

VARIABLES	(d) SV all	(e) SV government	(f) SV rebel group
PKO presence 2 (t-1)	-0.119	-0.024	-0.116
	(0.079)	(0.065)	(0.079)
Post UNSCR1325 (t-1)	0.557***	0.250***	0.347***
	(0.104)	(0.076)	(0.070)
Battle-related deaths (t-1)	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)
Civilian deaths (t-1)	0.001***	0.001***	0.000
	(0.000)	(0.000)	(0.000)
Excluded (t-1)	0.140	0.024	0.062
	(0.106)	(0.098)	(0.091)
Night lights (t-1)	-3.834***	-0.610	-3.452***
	(0.948)	(0.431)	(0.875)
Constant	0.165**	0.103**	0.099
	(0.066)	(0.050)	(0.071)
Observations	1,023	1,023	1,013
R-squared	0.206	0.208	0.139
Number of cells	321	321	317
Year dummy	YES	YES	YES
Log Likelihood	0.259	119.8	242.1

Robust standard errors in parentheses

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

Appendix 4 Lagged PKO troop size and prevalence of SV; OLS fixed effects, unmatched data

VARIABLES	(g) SV all	(h) SV government	(i) SV Rebel group
Troop size (t-1)	0.016**	0.030***	-0.041***
	(0.000)	(0.000)	(0.000)
Post UNSCR1325 (t-1)	0.539***	0.238***	0.345***
	(0.101)	(0.075)	(0.068)
Battle-related deaths (t-1)	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)
Civilian deaths (t-1)	0.001***	0.001***	0.000
	(0.000)	(0.000)	(0.000)
Excluded (t-1)	0.173	0.027	0.102
	(0.116)	(0.101)	(0.087)
Night lights (t-1)	-3.749***	-0.617	-3.311***
	(0.919)	(0.433)	(0.830)
Constant	0.129*	0.098**	0.058
	(0.068)	(0.049)	(0.062)
Observations	1,023	1,023	1,013
R-squared	0.203	0.215	0.147
Number of cells	321	321	317
Year dummy	YES	YES	YES
Log Likelihood	-1.867	124.3	191.7

Robust standard errors in parentheses

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

Appendix 5 Without DRC, PKO presence 1 and prevalence of SV; OLS fixed effects, unmatched data

VARIABLES	(j) SV all	(k) SV government	(l) SV rebel group
PKO presence 1	-0.119**	-0.092***	-0.122**
	(0.052)	(0.030)	(0.053)
Post UNSCR1325	0.326***	0.200***	0.152***
	(0.071)	(0.056)	(0.052)
Battle-related deaths	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Civilian deaths	-0.001	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Excluded	-0.009	0.108*	-0.094
	(0.078)	(0.057)	(0.066)
Night lights	1.070	1.940***	-0.018
	(0.658)	(0.563)	(0.723)
Constant	0.144**	-0.003	0.086
	(0.061)	(0.044)	(0.056)
Observations	2,209	2,209	2,189
R-squared	0.187	0.198	0.139
Number of cells	720	720	716
Year dummy	YES	YES	YES
Log Likelihood	-165.3	237.2	265.5

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix 6 Without DRC, PKO presence 2 and prevalence of SV; OLS fixed effects, unmatched data

VARIABLES	(m) SV all	(n) SV government	(o) SV rebel group
PKO presence 2	-0.104**	-0.136***	-0.081
	(0.052)	(0.029)	(0.052)
Post UNSCR1325	0.310***	0.191***	0.133***
	(0.067)	(0.055)	(0.048)
Battle-related deaths	-0.000*	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Civilian deaths	-0.001	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Excluded	-0.021	0.096*	-0.105
	(0.076)	(0.054)	(0.066)
Night lights	1.144*	2.027***	0.048
	(0.644)	(0.581)	(0.696)
Constant	0.163***	0.020	0.101*
	(0.059)	(0.045)	(0.054)
Observations	2,209	2,209	2,189
R-squared	0.186	0.206	0.133
Number of cells	720	720	716
Year dummy	YES	YES	YES
Log Likelihood	-167.0	247.6	258.3

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix 7 Without DRC, PKO troop size and prevalence of SV; OLS fixed effects, unmatched data

VARIABLES	(q) SV all	(r) SV government	(s) SV rebel group
Troops	0.001	-0.004	-0.000
	(0.008)	(0.009)	(0.005)
Post UNSCR1325	0.302***	0.184***	0.126***
	(0.066)	(0.055)	(0.045)
Battle-related deaths	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Civilian deaths	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Excluded	-0.017	0.103*	-0.100
	(0.074)	(0.056)	(0.063)
Night lights	1.088*	1.957***	0.011
	(0.601)	(0.523)	(0.662)
Constant	0.148**	-0.001	0.089*
	(0.057)	(0.042)	(0.052)
Observations	2,209	2,209	2,189
R-squared	0.181	0.193	0.128
Number of cells	720	720	716
Year dummy	YES	YES	YES
Log Likelihood	-174.3	230.2	252.1

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

NTNU

Norwegian University of
Science and Technology