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Weapons on the Weak

The impact of Small Arms and Major Conventional Weapons Imports on the Intentional Targeting of Civilians in Intrastate Conflicts

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Abstract

Academics and practitioners often assume that arms and violence against civilians are positively correlated. Existing research on small arms and light weapons (SALW) and major conventional weapons (MCW) imports, however, find that arms are a weak explanatory factor for intrastate violence. When the focus is on arms imports' impact on the level of one-sided violence (OSV) specifically, earlier studies' findings suggest that the comparative organisational size of armed actors is an important conditioning variable that influences the direction and magnitude of the impact arms imports have on rebel and government perpetrated OSV. Using OLS regression models, this thesis finds that increasing SALW imports are linked to no increase in the level of rebel perpetrated OSV and a marginal decrease for the level of OSV perpetrated by large government forces. MCW imports have a negative correlation for large rebel groups and governments, but no impact for small rebel groups or government forces. In all specifications, the magnitude of the impact arms imports conditional on troop size have on rebel or government perpetrated OSV remains small. This suggests the need for policymakers to focus on humanitarian and economic interventions, rather than arms when pursuing protection of civilians.

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Acronyms and Abbreviations

GDP	Gross Domestic Product
MCW	Major Conventional Weapons
ICRC	International Committee of the Red Cross
MPLA	People's Movement for the Liberation of Angola (*Movimento Popular de Libertação de Angola*)
OLS	Ordinary Least Squares
OSV	One-sided Violence
SALW	Small Arms and Light Weapons
SIPRI	Stockholm International Peace Research Institute
TIVs	Trend-indicator Values
UCDP	Uppsala Conflict Data Program
UNITA	National Union for the Total Independence of Angola (*União Nacional para a Independência Total de Angola*)
USD	United States Dollar
VAC	Violence against Civilians

1. Introduction

Armed conflicts cause massive humanitarian suffering for civilians. Violent organised conflicts have resulted in over 2,500,000 deaths in the past 30 years. Out of this, one third or 811,765 deaths were cases where a civilian was intentionally targeted and killed by either the government of a state or a rebel group (Pettersson and Öberg 2020: 598). This figure only captures the tip of the iceberg of all types of violence civilians experience in armed conflicts, such as sexual violence, forced displacement or maiming (Wood 2018). However, intentional killings of individuals not directly involved in the conflict is arguably the most extreme form of violence in wars. This one-sided violence (OSV) robs individuals of their basic rights. As such, the protection of civilians especially from killings has received much attention in international law (IV Geneva Convention 1949), the work of the United Nations (DPO 2019), and academia (see, for example, Eck and Hultman 2007, Schneider and Bussmann 2013, Wood 2010). Especially when intentional, the targeting of civilians also causes considerable public outcry (Graham-Harrison 2022).

As the term armed conflict suggests, most of the violence in modern conflicts is perpetrated with either small arms and light weapons (SALWs) or major conventional weapons (MCWs) (Ministry for Foreign Affairs of Finland 2022). Thus, the international transfers and availability of arms have potentially big impacts on the level of civilian targeting in armed conflicts. With more weapons, especially with more destructive ones, it is logically easier to target larger groups of people.

Perhaps not surprisingly, then, many practitioners and researchers believe that increased arms imports and availability are connected to increased levels of OSV (for example, Mehrl 2017, Sislin and Pearson 2006, Tar and Onwurah 2021). Despite this rather unanimous assumption, no study exists that explicitly analyses the direction of the relationship and the magnitude of the effect. The studies that have analysed arms imports' effects on violence have so far focused on either the onset of conflict (Pamp et al. 2018) or total battle-related deaths that lumps civilian deaths together with combatant deaths (Mehrl and Thurner 2020). The findings from such studies, however, suggest that arms play a marginal role in explaining conflict or deaths. Further, previous research has found that the relative size and/or military capacity of the actors has important implications on the strategies and types of violence they

use, and to what degree arms could interact with those decisions. Particularly important for the study of OSV is the widely accepted finding that comparatively large and strong groups are more able to pursue conventional tactics that are linked to less civilian targeting, whereas comparatively small and weak groups are more likely to pursue irregular tactics that seem to include more OSV (Balcells and Kalyvas 2014, Balcells and Stanton 2021, Mehrl and Thurner 2020, Schwartz and Straus 2018, Valentino 2014).

Due to the nature of OSV, where particularly vulnerable groups are intentionally subjected to lethal violence by armed groups, it is possible that arms imports play a more significant role in the decision or ability of those armed actors to pursue OSV as a strategy. Thus, in this thesis, I set out to answer the following research question: *How do imports of small arms and light weapons (SALWs) and major conventional weapons (MCWs) impact the level of one-sided violence (OSV) against civilians within intrastate conflicts?*

I will do so by separating SALW and MCW imports and analysing how they increase the OSV perpetrated by governments and rebels in civil war contexts. Compiling data from existing datasets, I build a dataset which allows me to condition arms imports with the comparative size of the opposing forces, as well as control for other possible important variables. I use linear OLS models to estimate the direction and magnitude of the impact SALW and MCW imports have on levels of rebel and government perpetrated OSV.

The results of the study are in line with earlier studies. Arms imports in general seem to have a rather small influence on the level of OSV perpetrated by actors in intrastate conflicts. On one hand, the import of SALWs particularly have no or only marginal impacts on government and rebel decisions to pursue violence against civilians. MCW imports, on the other hand, influence the level of OSV by comparatively large military and rebel forces moderately.

The thesis is structured into six sections. After the introduction, section 2 presents previous research on arms and one-sided violence before identifying the research gap. Section 3 builds a theoretical framework based on previous research and presents the hypotheses of the study. Section 4 outlines the research methods, as well as introduces the dataset and statistical models used to answer the research question in section 5. Section 5, besides presenting and discussing the empirical findings, also includes a discussion on the main limitations of the

study. Section 6 concludes by summarising the research and its findings before suggesting ways forward for future research.

2. Literature review

2.1 The Effect of Arms

While firearms by themselves are very seldomly the underlying reasons behind lethal violence, they make carrying it out significantly easier compared to other methods such as bare hands and bladed weapons. The reasons why humans subject other humans to violence vary greatly from individual level motivations such as frustration or envy (Benjamin et al. 2018: 348-9) to societal motivations such as collective grievances (Stewart 2011) and greed (Ross 2004). In many cases, especially with collective violence conducted between large groups of people, the motivation is funnelled through the barrel of a firearm or the gun of a tank. As such, the study of violence and conflict has given significant attention to the role arms[1] play in the phenomena.

2.1.1 National level

On the macro level of nations and the international system, studies – much like on the micro level – often find at least some level of support for the idea that an increase in arms results in an increase in the level of violence.[2] Before looking at the findings, it is important to note that there are different types of arms that are relevant for understanding armed violence within societies. Often when mentioning firearms, people mean small arms and light weapons (SALWs). These are what most think of when thinking about firearms: pistols, rifles, machine guns and mortars to name some (OSCE 2012: 2). These light and easily transported weapons are often designed to be used by a single person. However, the innovations and demands of modern information technology-driven industrial warfare have made it possible to move to a larger scale of destruction. Nowadays, most countries have vast supplies of highly technical weapon systems that often require many people and expertise to use. These major conventional arms (MCWs) such as tanks, aerial vehicles, warships, and missile systems (UNODA 2017: 4-5) are not usable on the individual level but come to have potentially big impacts in the warfare of organised groups. Partly because of their perceived

[1] For the purposes of this thesis, the term "arms" includes major conventional weapons (MCWs) and small arms and light weapons (SALWs). Bladed weapons are not included in the blanket term.
[2] For studies that focus on the impact of arms on micro level violence between individuals, see, for example, Stroebe (2013 and 2016).

significance and, perhaps more, because exhaustive data on MCWs is more available (see, for example SIPRI 2022a) **s**tudies on the relationship between arms and intrastate as well as interstate violence have tended to focus more on MCWs. This is so even amid experts' reminders about the severe human rights impacts SALWs have for civilians in conflicts (UNODA 2018: 40).

With the above in mind, let us look at the literature. Craft and Smaldone (2003) find that arms imports are linked to an increased likelihood of conflict outbreak. However, these findings can only be viewed as preliminary ones for two reasons. First, the SIPRI dataset used in the article only includes MCWs whereas most of the violence in conflicts – at least intrastate ones – is conducted with small arms and light weapons SALWs (Craft and Smaldone 2003: 43). Second, the study lacks a control for endogeneity. In other words, we cannot be sure that it is arms that promote conflict, and not leaders bracing for a likely conflict by increasing their arms supply (Pamp et al. 2018: 431). To address the endogeneity issue, but not the SALW issue, Pamp et al. (2018) employ an instrumental variable method that separates MCWs suitable for use in civil war from ones that could not be used. Looking at the imports of both, they can determine whether the country is preparing for civil war by importing arms that are suited for it, or if the import of any arms works as an escalatory step that promotes conflict onset's likelihood. Their results indicate that arms imports moderately increase the likelihood of conflict onset in countries with low state capacity, but result in only a marginal increase in other countries.

Because the number of arms logically increases in a society undergoing armed conflict, it is hard to effectively eliminate the two variables' covariation. Here looking at cases where conflicting societies are forced to halt the import of more arms lends a hand. Arms embargoes are a reactive tool used by the international community to prevent the inflow of new arms and thus alleviate the human suffering caused by armed conflict (Pattison 2018: 70-1). Studies on arms embargoes have indeed found results that support the idea that arms play an important role in conflicts. Despite arms embargoes never being perfect in stopping the inflow of arms (Vines 2007) they do still in most cases significantly reduce the inflow and availability of new arms – both SALWS and MCWs – for the sanctioned actors (Erickson 2013). Research has found that arms embargoes, and by extension stopping arms flows, has some success in influencing conflict. Brzoska's (2008) results indicate that implementing an arms embargo contributes to an improvement in the human rights situation in 6% of cases, ending civil wars

in 12% of cases, and ending support for terrorism in 10% of cases. Furthermore, Hultman and Peksen (2007) find that arms embargoes – unlike economic sanctions – reduce the number of battle-related deaths in intrastate armed conflicts. They theorise that the reason for this might be that while arms embargoes and economic sanctions both hurt the coercive capacity of the actors they target, it is only the arms embargoes that reduce the actual military capacity that is used to fight battles and determines the strategies available for the military to use.

On the surface, these findings seem to lend support to the findings of Craft and Smaldone (2003) and Pamp et al. (2018) which state that arms availability increases conflicts' likelihood. However, we must be cautious when making such inferences. The efficiency of arms embargoes might rest on some other mechanism than the simple reduction of arms that are used to inflict bodily harm. In fact, research suggests that arms embargoes, like other sanctions, work mainly because they are a way for the international community to socialise states into international metanorms (Erickson 2020). Even still, the finding of Hultman and Peksen (2018) is particularly valuable since it is one of the few studies that has moved beyond treating conflict or conflict onset as the dependent variable and started to estimate not only the direction, but also the degree of the impact arms have on deaths from conflict. This approach helps to reduce the guesswork and abstraction indebted in much political science theorising and knowledge.

Articles specifically attempting to gauge the direction and degree of the impact that arms have on conflict duration and intensity are few. In fact, I have only been able to find two such studies. Moore's (2012) regression analysis shows that MCW transfers to rebels are associated with higher conflict intensity measured with battle-related deaths while MCW transfers to the government increase conflict duration. For governments, transfers prior to conflict might also increase conflict intensity but the coefficient has low statistical significance, so Moore is cautious with his claims. Unfortunately, Moore uses ordinary least squares (OLS) regression with his count data on battle-related deaths, so the degree of impact cannot be determined with confidence (Du et al. 2021). Further, Moore does not include SALWs in his analysis. While the evidence from multiple case studies suggests that the amount of SALWs increase the casualty rate of civil wars (for example, Mehrl 2017, Sislin and Pearson 2006, Tar and Onwurah 2021), as far as I am aware, only one systematic academic study has tried to quantify the effect SALW availability has on the level of battle-related deaths. In the study, Mehrl and Thurner (2020) utilise similar methods as Pamp et al.

(2018) but direct their attention to understanding how many more people die when the number of arms increases in civil war societies. Their results suggest that both SALW and MCW imports increase the deadliness of conflicts. However, the finding is conditional to the relationship between rebel and government military strength measured with troop size. If governments face strong rebels, then the import of either class of arms results in a considerable increase in battle deaths, whereas imports do not cause any effect when governments are facing weak rebels. Much like Moore (2012), Mehrl an Thurner (2020) also use OLS with count data making their findings less robust.

While previous research has given us a relatively solid understanding that arms are linked to increased risk of interpersonal violence and conflict deaths, important gaps remain. Here I will focus on one. What all the previous studies have not yet done, is to separate the civilian casualties from the total picture. Only a rather crude and tentative report from the International Committee of the Red Cross (ICRC 1999) has concluded that arms availability increases civilian targeting during and after conflict, and that 90% of those interviewed knew a case where a civilian had been targeted intentionally (ICRC 1999: 14). Besides this, studies analysing the impact of arms have, so far, focused on conflict as the dependent variable, and only in a few instances on aggregate death tolls that include combatants and civilians in a unified category. However, disaggregating civilians from the total figure has normative and theoretical justifications. Normatively, civilians are outside of accepted casualties of war (IV Geneva Convention 1949) and significant international efforts are made to protect them. Theoretically, civilians are the most vulnerable group in conflicts because they have no fighting capacity. This makes them easy targets for the armed forces of states or rebel groups. With this goal in mind, let us proceed with a review of the literature on civilian targeting before addressing the research gap in detail.

2.2 Intentional targeting of civilians - One-sided Violence (OSV)

2.2.1 OSV in Civil Wars

Despite being a relatively young and a growing field of study, research on violence against civilians (OSV) has produced important insights into the form and logic of this phenomenon that is responsible for nearly a third of all the conflict deaths since 1989, or more than

800,000 deaths (Pettersson and Öberg 2020: 598). Previous research suggests that most violence against civilians is perpetrated during civil wars (Valentino 2014: 94-6, Schwartz and Straus 2018: 222). In fact, only around one per cent of OSV happens in countries that are not currently involved in armed conflict of any type (Eck and Hultman 2007: 237). As a grim reminder of the banality of evil, in times of civil war, civilians are more commonly intentionally targeted rather than accidentally killed (Schneider and Bussmann 2013: 640).

Of course, not all civil wars are fought for the same goals and with equal tactics, so treating them as a unified block will likely lead to findings that do not correspond to real world complexities and thus to policies that fail to protect civilians. In general, researchers have divided civil wars into two types based on the way they are fought, separating irregular civil wars from conventional civil wars (Balcells 2010). The main difference between the two boils down to the level of clarity in separating the opponents. Irregular civil wars are characterised by the lack of easily definable areas of control and frontlines, with the insurgent/guerrilla troops often small, living with civilian populations in clustered and small areas of support nested inside the opposition's area of control (Balcells 2010: 295-6). Conversely, conventional civil wars have major battles fought along the frontline that separates the opponents' large areas of total control from each other. It is to be expected that small rebel groups are more likely to pursue irregular tactics whereas big rebel groups use conventional tactics (Bueno de Mesquita 2013: 324). Studies that have delved into the dynamics of these specific types of intrastate conflicts have often found that the tactics, used in the civil war have specific impacts on the level of civilian targeting in them.

Researchers have a rather unanimous consensus about irregular civil wars that are fought with insurgency or guerrilla tactics resulting in more civilian targeting than conventional civil wars (see, for example, Balcells and Kalyvas 2014, Balcells and Stanton 2021: 51, Valentino 2014: 94). The reason for this finding is more debated than the finding itself. In their qualitative analysis of the Guatemalan Civil War, Schwartz and Straus (2018) first present four possible logics for the strategic use of violence against civilians. It is possible that the actors want to weaken the enemy by coercing its civilian supporters, they can also try to enforce compliance from the civilians with violence, there can be a lack of intelligence or ability to separate enemy combatants from civilians, or finally, the actors may view the civilians as the enemy – or at least an unchangeably loyal support base for it. Although these mechanisms are not mutually changeable, the article only finds support for the first two in the

context of an irregular civil war. Logically, the first two are not well applicable to conventional civil wars with large rebel groups, since total control of an area makes it extremely difficult for the civilian population in the area to support the opposition locked into its own area behind the frontline. On the other hand, despite Schwartz and Straus not finding support for them in the Guatemalan Civil War, the latter two mechanisms are still possible. In fact, the last mechanism in which civilians are seen as the enemy can be particularly destructive since it can lead to a "genocidal logic" (Schwartz and Straus 2018: 225). If the civilian population is a primordial supporter of the enemy, then, in the minds of the decision makers, complete victory can necessitate complete or near complete destruction of the civilian population too. This logic in a civil war context is perhaps most glaringly illustrated by the Rwandan Civil War (for an overview, see Prunier 1995).

2.2.2 Military Capacity and OSV

The attentive reader may have spotted a word which was repeated throughout the above discussion of OSV in civil war but has not yet been discussed in detail: support. Many of the theories on the strategic use of OSV rely on the assumption that governments and rebels are not completely self-sufficient but that they must supplement their war-fighting capacity with external resources that they can extract from civilians. As a result, researchers have tried to gauge the impact organisational capacity has on both rebel and government perpetrated OSV.

Actors involved in conflicts are often backed by international actors such as diaspora communities, foreign governments, or like-minded rebel groups (Petrova 2019). This type of external support has often been linked to more violent civil wars because the rebels that do not depend on the civilians for support face fewer penalties to using violence in large scale than rebels who might lose their civilian support if they started targeting civilians (see Weinstein 2007). The few academic articles on external support and OSV – all of which focus on rebels – have drawn similar conclusions. In his quantitative study which compares rebel groups with local support vs. foreign sponsorship, Wood (2014b) finds tentative support for the idea that foreign sponsorship for rebels (including arms) leads to more civilian targeting by the rebels. However, despite the foreign sponsorship coefficient being positive and practically significant in three of his four models, it is never statistically significant. In a similar study, Salehyan et al. (2014) however do find that external support to rebels is likely to lead to increased OSV – but not when it comes from democratic states.

Still, the dynamic is not as clear cut as Huang and Sullivan (2021) show. When looking at the impact of external military support (such as funding, arms, and training) to rebels from the perspective of positive externalities, they find that rebel groups that have foreign sponsors are likely to significantly increase their social service provisions to their respective civilian supporters. So, while the other studies depart from the assumption that rebels become less dependent on civilian support as they get support from outside the country, often they still need grassroots support such as recruits and accommodation from local civilians (Huang and Sullivan 2021: 805). Despite relying on foreign support whenever it is available, rebels and governments in many cases need to ensure they have local sources of support and domestic capacity to sustain their fight. One important resource that is not readily available from abroad is recruits. For both the government and rebels, civilians are a possible recruitment pool that can be syphoned either voluntarily or coercively. For example, in Rwanda, the government mobilised civilians to perpetrate much of the violence, with the military and police troops setting the example and providing the arms (Loyle and Davenport 2020). So, understanding the impacts that domestic military capacity has on OSV remains important.

Kalyvas (2004: 121-124) argues that rebels are perhaps less dependent on civilian support than often thought. Using case examples, he shows how government attacks on civilian population rarely result in the rebels terminating their campaign – be it because of wanting to protect civilians from more harm or losing the necessary support base. Adding to this, Wood (2010) finds that rebels that are comparatively weak in relation to the government are more likely to use higher levels of OSV compared to strong rebels. Wood's analysis suggests that the reason for this is the weak rebel's attempt to hold onto the civilian support that is vital for the continuation of their fight. If the government targets the rebel group's civilian supporters with its own OSV campaign, weak rebels' level of OSV increases significantly whereas this effect is not observed among strong rebels. Wood's (2014a) later study strengthens the argument's empirical support. He finds that rebels are likely to increase civilian targeting following significant material losses. Possibly so because when they are unable to recover from the losses with their own funding, external support, or willing civilians, they need to coerce civilians with violence to get backing (Wood 2014a: 996). However, Wood's analysis suffers from the simplifying assumption that rebel capacity is equated with nothing more than the number of rebel troops compared to government troops (Wood 2010). It lacks many crucial elements of military power such as the amount and quality of arms as well as the level of training (Horowitz 2010: 13).

Thus, we come to a rather interesting and empirically unexplored counterargument to the idea that weak troops target civilians more than strong ones. Other researchers believe that organised forms of mass civilian targeting are only available to the powerful. Bombings or large-scale ethnic cleansing are only possible for highly organised and equipped skilled troops (Wood 2014b: 464-5, Stanton 2016, Zhukov 2017, Balcells and Stanton 2021: 55). The notion starts to add depth to Wood's analysis without necessarily contradicting it. Wood's (2010) finding that rebels with weak military capacity kill more civilians than strong rebels do on the aggregate level, does not contradict the possibility that when strong rebels decide to target civilians, they can cause much more deaths per event. Thus, it remains possible that weak rebels target civilians often but kill few civilians per event, whereas strong rebels or governments target civilians seldomly but those events result in more deaths per event due to the high military capacity. In fact, this exact mechanism is hinted at in Eck and Hultman's (2007: 237-40) finding that rebels commit OSV more frequently than governments, but that government perpetrated OSV results in mass deaths significantly more often. Because these articles do not focus on arms in their analysis of support or organisational capacity, even though arms arguably are one crucial determinant of any armed organisation's capacity, looking at the relationship between arms imports and OSV could prove fruitful in improving our understanding of why some organisations decide to target civilians and others do not.

2.3 The Research Gap

This dissertation aims to study the impact of a specific type of military power, namely arms, on government and rebel perpetrated OSV in civil wars. Previous research has hinted at the damaging effect different types of arms have for the human suffering and mortality of civilians in civil war contexts. We still need, however, a systematic study looking into the degree of which arms imports increase purposeful civilian targeting. Often studies do not include arms in their analysis of capacity and OSV (Wood 2010), or where they are included, they are coded into an over encompassing variable such as "external support" or "capacity" (Huang and Sullivan 2021) which fails to capture the specific impact arms have. Furthermore, these studies are overwhelmingly focused on the rebels, and as a result the understanding of government perpetrated OSV is narrower. Thus, this thesis seeks to answer the following research question: *How do imports of small arms and light weapons (SALWs)*

and major conventional weapons (MCWs) impact the level of one-sided violence (OSV) against civilians within intrastate conflicts?

Understanding the effect of arms – both SALWs and MCWs – on civilian targeting is important so that protocols, mandates, and agreements on the protection of civilians can be improved and the international community can better evaluate the risk associated with arms exports to conflict areas. If arms exports have no negative effect, they may even be viable in protecting civilians by making the conflict briefer by decreasing the rebel group's militarily capacity. If, however, arms imports tend to boost the targeted killings of civilians, then arms imports – potentially even to peacekeeping forces, but more studies on this would be needed – need to be re-evaluated.

3. Theoretical framework

3.1 Definitions of key concepts

In the previous section, I briefly introduced the key concepts this study is interested in analysing. However, in the pursuit of full understanding and theoretical clarity, a more exhaustive definition and discussion of the main concepts follows.

3.1.1 The Dependent Variable

The study's dependent variable is one-sided violence (OSV). The term has been developed by the UCDP (Eck and Hultman 2007: 234-5) to improve the study of violence against civilians. OSV only includes *direct*, *intentional*, and *lethal* violence against civilians perpetrated by organised groups (Eck and Hultman 2007: 235). While this choice leaves some civilian suffering outside of the scope of the study, it serves the important function of making the phenomenon more defined and thus easier to measure with available data. OSV is also a particularly interesting subset of violence against civilians as it captures its gravest form (Wood 2010: 606).

Before moving on, it is important to further discuss some of the core elements of OSV. The whole idea of one sidedness in the term stems from the power dynamic between the subjects and objects of violence. What makes violence in OSV one sided is that the perpetrator is an armed actor attacking a person or a group of people who have no active agency in the process. Rather, the receiving group, often called civilians, are passive recipients of violence without realistic means to defend themselves. Defining the term civilians itself can be a rather complex undertaking but many – if not most – definitions derive "civilianness" from what it lacks in respect to those who fight in wars, in other words combatants or soldiers. The IV Geneva Convention relative to the Protection of Civilian Persons in Time of War (1949: art. 15.b.) for example defined civilians as the "persons who take no part in hostilities, and who, while they reside in the zones, perform no work of a military character". Academics, such as Balcells, have taken a similar approach and define civilians as unarmed individuals who take no part in the fighting: "a *civilian* is a non-combatant" (Balcells 2017: 20, italics in the original). Yet, despite having the merit of theoretical and observational clarity, this simplistic

definition fails to account for the real-world complexity in which unarmed people often give some help to the armed combatants either voluntarily or after being coerced. Accounts of what most would consider civilians providing combatants with food or labour such as healthcare services (Schwartz and Straus 2018: 228) reveal the dangers of defining civilians as only those who are completely outside the sphere of the military organisation. With the caution in mind, I will adopt the dominant notion that civilians are unarmed individuals that contribute only minimal and non-combat services to the military organisations.

Beyond its target, violence against civilians (VAC) can vary by its nature, motivation, and effect. Using these, we can separate VAC into direct and indirect, intentional and unintentional, as well as lethal and non-lethal. With all three approaches, the type of arms used plays a significant role in determining which class VAC is divided into. Whether the violence is direct or indirect dependents on the level of intelligence the combatants have, their intention, strategy, and available weapons. The most direct violence is the face-to-face killing of a singled-out civilian. This requires high levels of intelligence in order to separate the intended target from all the other possible ones, and is often done with small arms such as rifles or pistols (Balcells 2017: 21-24). As we move towards more indirect violence, we find actors using rifles to massacre large civilian groups, shelling or bombing villages or cities and ultimately besieging cities and using starvation or diseases to kill enemy civilians nearly passively (Balcells 2017: 21-24, Eck and Hultman 2007: 235). It is already easy to see how the intentional-unintentional nexus relates to the above. Intentional violence against civilians includes activity where actors purposefully target civilians. Unintentional violence, on the contrary, means situations where civilians die (or suffer) as a result of violence, but the intended target of the violence was some other group, most often enemy combatants. These unintentional civilian casualties are sometimes characterised as “collateral” casualties (Hultman 2012). Using weapons with large areas of effect such as bombs and missiles is likely to lead to more unintentional deaths than SALWs. Finally, VAC can be divided into lethal and non-lethal violence. Lethal violence results in the death of the target while non-lethal violence does not. Lethal violence is often caused by armed violence whereas non-lethal violence is more varied and includes sexual violence, coerced conscription, and displacement (Wood 2018, Vargas 2009).

As we can see, OSV as a concept captures only one segment of the violence civilians can experience in civil wars. Unlike some other definitions of VAC, OSV’s nature as a more

narrowly defined subset of VAC is ultimately helpful for the uses of a quantitative study, and this is why it is chosen.

3.1.2 Independent Variables

The two main independent variables used in this study are small arms and light weapons (SALWs) imports and major conventional weapons (MCWs) imports. Following the definitions given in the literature review, I define small arms and light weapons (SALWs) imports as the transport of light and easily transported weapons such as pistols, rifles, and mortars (OSCE 2012: 2) into a country from any licit or illicit source. Similarly, MCW imports are the licit or illicit transports of large weapons systems like tanks, planes, warships, and missile systems (UNODA 2017: 4-5) into a country. These include weapons that have been purchased, gifted, smuggled, or otherwise transported into the country.

The concept of arms import is similar to, but crucially different, from arms availability which measures the total stock of SALWs and MCWs any actor can access. Arms availability, then, requires knowing – or reliably and accurately estimating – the number of licit and illicit arms in each society that have been imported, domestically manufactured, and kept in private and public stockpiles. As such, the latter is extremely difficult to measure (Small Arms Survey 2019) and many studies rely on arms imports as their estimator of arms (see, for example Mehrl and Thurner 2020, Pamp et al. 2018).

This approach comes with some limitations. First, the choice to use arms imports limits the study's findings to understanding the impact that the supply of external arms has, rather than the effect the aggregate level of arms in a society has. This in turn does not mean that the findings are about external support alone, since the arms are treated as a specific type of military material and their effects are interpreted in relation to how they are used by the domestic actors. Further, most of the countries which have experienced civil war in the past 30 years are countries without significant domestic production capacities of either SALWs or MCWs making them reliant on foreign arms imports (Craft & Smaldone 2003: 38). Thus, in many cases, the level of arms imports helps gauge the level of arms in the society with enough accuracy.

Alongside the SALW and MCW imports, comparative organisation size is an important variable. This is defined as the ratio of rebel group's troops to the government's military forces. The variable is included because previous research suggests that the comparative size of the military organisation can have a big impact on the way in which they are able to use the arms (Mehrl and Thurner 2020), as well as their military strategy (Bueno de Mesquita 2013, Balcells and Kalyvas 2014).

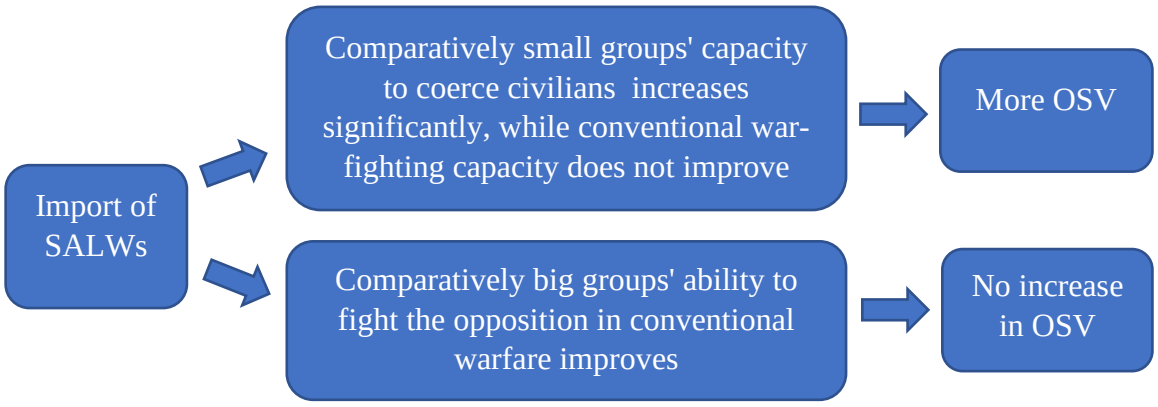
3.2 SALWs' impact on OSV

Here I will present a possible causal mechanism by which SALW imports effect OSV. To begin with, we must understand how imports become tools of violence used by combatants on both sides of the conflict to inflict deadly violence. In most cases where arms imports are well documented, the purchaser of those arms has been either a private firm selling or manufacturing arms, or the national government for use by the military or police forces of the country (European Parliament 2015). Upon delivery, the government hands the weapons out to its troops or stockpiles them for later use. The rebels can, of course, similarly purchase legal and illegal weapons from foreign countries, firms, armed groups, sporting goods stores, or private individuals (Jackson 2010). Rebel groups may have one or more foreign states who support them with arms (Arsu and Erlanger 2011) but they might still face more financial and political constraints when buying arms internationally from established sellers. Thus, other than purchasing or being gifted arms, the rebels can also access government imported arms in a multitude of ways: arms are stolen from national stockpiles, sold by corrupt governmental workers, soldiers or police officers, they are captured following battles, and received from civilian supporters (Mashi and Mohammed 2021: 546-50). Often, these other means of getting government arms are the main source for rebels to arm themselves (Jackson 2010: 131).

Once armed, I expect the size of the military organisation to play an important role in conditioning the impact SALWs have for the level of OSV. The rebels and government can both perpetrate violence against civilians for strategic or non-strategic purposes. Strategic motivations of OSV identified by previous research include coercing support, deterring support for the enemy, lack of ability to identify and separate enemy combatants from civilians, and viewing the civilians as primordial supporters of the enemy (Schwartz and Straus 2018). In all of these cases, it is theoretically possible that the availability of arms

allows for governments and rebel groups to target more civilians if it is part of their strategy. Here the question is then, would they pursue such a strategy. As the literature review showed, studies have found that relative capacity of the warring parties has implications for the level of battle-related violence (Mehrl and Thurner 2020) and OSV (Wood 2010). Military organisations with lower number of troops compared to the opposition are not able to challenge the enemy in conventional battles which tend to be troop intensive (Mehrl and Thurner 2020). Unable to move beyond irregular tactics, these small rebel groups – or if the rebel group was large, comparatively small governments – would then rely more on coercing civilians for support and deterring them from supporting the enemy (Wood 2010). Thus, I would expect that as the number of arms imports into a country increases, rebels and governments with comparatively less troops would use their recently increased coercive capacity to target civilians leading to higher levels of OSV (figure 1).

Figure 1. Causal chain for SALW imports on OSV.



On the opposite side of the picture, when large military organisations receive SALWs, it leads to a substantial increase in their ability to fight conventional wars since the high number of soldiers can be equipped with better weaponry and deployed to combat. As conventional civil war is linked to less OSV (Balcells and Kalyvas 2014), I expect that imports of SALWs to big military organisations lead to no increase in OLS. In this situation, the level of OSV is likely to remain equal to or decrease from the pre-import levels (figure 1).

From this causal chain we derive our first two hypotheses:

Hypothesis 1a: Imports of small arms and light weapons (SALWs) increase the level of one-sided violence (OSV) perpetrated by rebel groups that are smaller than the government forces, and not by rebel groups that are equal or larger than government forces.

Hypothesis 1b: Imports of small arms and light weapons (SALWs) increase the level of one-sided violence (OSV) perpetrated by governments facing rebel groups that are larger than government forces, and not by governments facing comparatively small rebel groups.

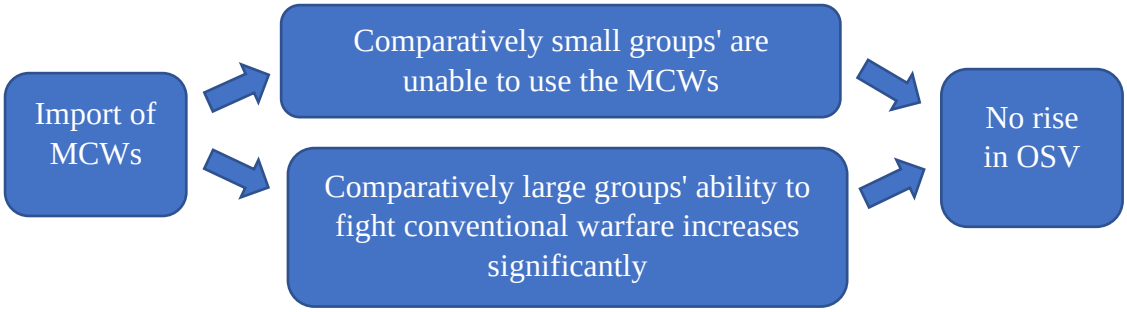
3.3 MCWs' impact on OSV

The theory on MCWs' impact on OSV follows similar logic as that of SALWs and OSV. Much like with SALWs imports, governments can easily access the MCWs imported into the country. However, here the case for rebels diverges sharply. Whereas SAWLs are relatively easily accessed via multiple sources by rebels after their import, rebels desiring MCWs might find it more difficult to get access to them. As the sellers of MCWs are mainly limited to foreign governments and major arms manufacturers, and because MCWs are easier to track, the international norms and scrutiny on transfers and sales of MCWs is stricter than for SALWs (Thrall and Cohen 2022). MCWs are also less often transferred to rebel groups than national governments (SIPRI 2022a)[3]. Adding further to the rebels' difficulty of acquiring MCWs is that these large weapon systems are significantly more difficult to smuggle, loot, or steal than small arms. Thus, the likelihood that rebel groups acquire MCWs that have been transferred for national governments are rather low.

Organisational size is likely to impact the use of MCWs more than SALWs. Modern large weapon systems are often complex and require trained personnel to use and operate them (consider for example tanks and battle ships). This training is part of what national militaries are tasked to do, whereas small – and even larger – rebel groups might lack the time and resources for it (Jackson 2010: 140-1). Thus, even when MCWs are available to small rebel groups, those rebel groups might not be able to use them. Only for very highly organised

[3] The SIPRI (2022) MCW transfer data for Angola, a case where both the MPLA led government and UNITA rebels benefitted from large foreign support, had 27 TIVs of MCWs transferred to the UNITA and 7,529 TIVs to the government during civil war years 1975-2002. This is so even though the Angolan civil war is known as a case with high external support to both sides of the conflict (Hoekstra 2018).

Figure 2. Causal chain for MCW imports on rebel perpetrated OSV.



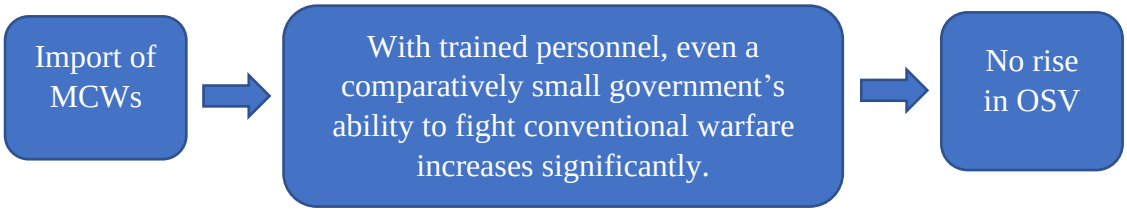
and large rebel groups with a wide pool of skilled combatants, could MCWs potentially become usable. However, as hypothesised in the previous section about SALWs and OSV, these large rebel groups – especially when equipped with MCWs – could pursue conventional tactics and warfare and are thus less likely to use the newly acquired weapon systems for targeting civilians (figure 2).

Thus, for rebels and MCW imports I propose the following hypothesis:

Hypothesis 2a: Imports of major conventional weapons (MCWs) do not increase the level of rebel perpetrated one-sided violence (OSV).

With regards to the government, the situation is slightly different. Comparatively large government militaries, just like large rebel groups, are likely to increase their conventional war-fighting capacity after the import of MCWs making them unlikely to target civilians with them. Additionally, even when a government has a comparatively small military force that

Figure 3. Causal chain for MCW imports on government perpetrated OSV.



government likely has some individuals who have been trained in their use. MCWs with their big impact could then increase the capacity of a comparatively small government to pursue conventional tactics against their opponents (figure 3). Thus, for governments, MCWs are likely to not affect the level of government perpetrated OSV, regardless of the comparative size of the military.

For governments and MCWs I present the following hypothesis:

Hypothesis 2b: Imports of major conventional weapons (MCWs) do not increase the level of government perpetrated one-sided violence (OSV).

4. Methods

As I have outlined in the previous sections, there is currently no systematic scientific understanding on the impact arms imports have on the level of OSV. As such, analysing the direction and degree of the possible correlation is a useful starting point. The best way to do this is with quantitative research. Using quantitative methods allows for the identification and analysis of causal effect (Berg-Schlosser 2016). This is extremely useful when the relationship between two phenomena is unclear – as is the case with arms and OSV. However, this approach does not capture the causal mechanism in detail (Berg-Schlosser 20106). Thus, while the research method allows to effectively analyse the level of covariance, qualitative research is later needed to specify on the mechanism if a relationship between arms imports and OSV is found.

4.1 Operationalisations and Data

4.1.1 Dependent Variable

Data for one-sided violence comes from UCDP One-sided Violence Dataset version 21.1 (Pettersson et al. 2021; Eck and Hultman 2007). The dataset captures the number of civilians killed in purposeful, targeted attacks against civilians by organised political groups when they result in at least 25 OSV-deaths a year in a country (Pettersson 2021: 3). The slight drawback of this dataset is that some of the cases that have been coded to not have any level of OSV likely have some OSV during a year but that level falls under the threshold of 25. Since I study the impact of arms imports on OSV in civil conflicts, I also include data on intrastate conflicts where no OSV has been recorded. The data for intrastate conflicts is derived from the Uppsala Conflict Data Program (UCDP) Battle-Related Deaths Dataset version 5.0 (Melander, Pettersson, and Themnér 2016). Based on UCDP definitions, I define intrastate conflict as an incompatibility between the state government and one or more non-state actors which results in the death of at least 25 battle-related deaths in a calendar year due to intentional killings (Pettersson 2020: 1).

To analyse the impact of arms imports on OSV in intrastate conflicts, I have aggregated the data into country-level conflict-year units of analysis. In practice, this means that if a country has had two separate and distinct rebel groups fighting against the same government during the same year, I have coded those multiple civil conflicts into one. Thus, for example, a country X that had rebel group A and B fighting against the government separately from each other in year *t*, resulting in 50 OSV deaths from the conflict with group A, and 25 OSV deaths with group B, my dataset would have 75 OSV deaths for country X in year *t*. However, while combining all government OSV from different conflicts within the country during the year, as well as all rebel OSV perpetrated by different rebels during the year, I still maintain the separation between government and rebel OSV to be able to study the impact of arms imports on rebel and government perpetrated OSV separate from each other. This approach loses some details that could be used to identify specific rebel groups' OSV. However, since the purpose is to study the aggregate impact of arms imports on OSV on the national level, this approach allows for easier comparison of one country to another. Further, since my arms imports data is country-level data and does not allow me to separate which specific conflict actors the arms have been imported to within the country, losing the detail of specific rebel groups is justified. Due to the focus being on arms imports' impact within the country they arrive in, I have also decided to exclude cases of OSV where the perpetrator operates outside of its country of origin. By doing so, the violence between Hutus and Tutsis, one of the most influential cases of civilian targeting where violence which started in Rwanda poured over into neighbouring countries as well, has been excluded from the dataset[4]. The choice to not include transnational OSV also means that the findings are not generalisable for the recent trend of terrorism where groups such as ISIS have perpetrated attacks against civilians in foreign countries (Wilson Center 2021, BBC 2015).

With the chosen approach, the dataset includes 622 intra-state conflict years between the years 1990-2011 (580 when the observations with missing data are removed). This is the total population of civil-war years without transnational OSV. The time frame has been selected due to data-availability and time constraint reasons.[5] Out of these 622 conflict-years, 317

[4] Rwanda in 1994 would also be an extreme outlier with the level of OSV being more than ten times higher than in the second highest case of Democratic Republic of Congo in 1996, and more than 300 standard deviations higher than the mean level of OSV.

[5] I rely on the replication data from Mehrl and Thurner (2020), as well as publicly available data from Norwegian Initiative on Small Arms Transfers (NISAT; PRIO 2017). Especially the replication data from Mehrl and Thurner (2020) allowed to deal with the time constraints of the master's thesis course which did not allow for the building of a completely new and more inclusive dataset. Thus, the timeframe is limited to the same as in their study.

have experienced at least 25 OSV-deaths a year by either the government or rebels. In total, there are 76 countries in the dataset that have experienced a civil conflict.

4.1.2 Independent Variables

Because the theoretical considerations suggest that the impact of arms imports is conditioned by organisational size, both arms imports and organisational size are thought of as the main independent variables. For arms imports I use two different datasets. Data on SALW imports come from the Norwegian Initiative on Small Arms Transfers dataset (NISAT; Prio 2017). The measure of SALW imports is the aggregate dollar amount of SALWs imported in a year. The import value is derived from the national reports or other publicly available publications such as news articles or expert estimates. As such, the data for some countries is rather incomplete with many import and export reports not specifying the dollar amount of the imported SAWLs. To combat this incompleteness, I use both the import reports of the receiving country and the export reports of the exporting country which complement each other and fill in some of the blanks. Even still, this approach does not, in most cases, give the full value of SALW imports and needs to be treated as a best estimation only. The approach does, however, significantly reduce the possible reporting bias in the data since the data does not come from only the importing country's self-published data which does vary greatly from one country to another, with some reporting all imports well while others not reporting any. The reporting accuracy seems to also vary randomly within the subset of countries I am analysing, making possible gaps in the data random and not systematic.

Data on MCW imports comes from Stockholm International Peace Research Institute (SIPRI) Arms Transfers Database (SIPRI 2022a). SIPRI's approach to measuring MCW imports is to use trend-indicator values (TIVs) which describe, in essence, the strategic value of the MCW imports, not the price paid for them (Holtom et al. 2012: 1-2). Thus, I am unable to create a combined SALW + MCW imports variable and need to analyse SALW imports and MCW imports separately. However, since my theoretical considerations separate the impact of SALWs and MCWs, this is not a problem. One problem in using the MCW data comes from the fact that the reported TIVs can include military technology used in MCWs that are not by themselves lethal. Examples of these are satellites, engines and sensors. Yet, since they are used as part of the lethal MCWs or to gather intelligence on possible targets, they are

Table 1. Summary statistics

Variable	Mean (Median)	Std. dev.	Min; Max
Total OSV	251 (26)	1430	0; 31,900
Rebel OSV	153 (0)	1300	0; 30,500
Government OSV	98 (0)	413	0; 5,800
SALW imports	17,900,000 (615,000)	45,500,000	0; 459,000,000
MCW imports	236 (23.8)	514	0; 3,520
Rebel size (smaller)	0.89 (1)	0.32	0; 1
Years of conflict	8.65 (5)	10.2	0; 47
Polity	0.726 (0)	5.60	-9; 10
Ethnic exclusion	0.28 (0.22)	0.25	0; 0.88
Population	78,100 (24,400)	201,000	582; 1,240,000
GDP	284,000 (50,300)	757,000	871; 12,900,000

Note: Reported values are rounded to two decimal places.

theoretically rather close to any other MCW, making their inclusion acceptable. The MCW imports data, like the SALW imports data, does not likely capture all the imports. SIPRI (2022a) only includes MCW transfers once they are confirmed from credible sources. While this undoubtedly improves the reliability of the data, it likely results in some transfers not being recorded. Further, both the SALW and MCW[6] import data do not allow to identify recipients beyond the country level. Thus, I am unable to separate imports to rebel groups from imports to governments. Due to the research question of this thesis, this is not an issue, but future studies might greatly benefit from this separation.

In order to analyse the conditional effect of rebel/government size on the import of arms, I need to use an interaction variable of comparative troop size *SALWs x Rebel size (smaller)* and *MCW x Rebel size (smaller)*. In line with Mehrl and Turner (2020) whose study used a similar approach, I measure relative organisational size with data from Non-State Actor Dataset (Cunningham, Gleditsch, and Salehyan 2009, 2013). The dataset uses the estimated troop sizes of the governments and rebels and does not include any other military capacities in their estimator of comparative rebel group size (Cunningham, Gleditsch, and Salehyan 2013: 522). This is a preferable approach for my uses, since measures that take arms into consideration in their measures of organisational strength would render the analysis impossible due to overlap with the interaction variable. Following Mehrl and Turner's (2020: 1180) approach, and to aid in interpretation, I code the relative troop size into a dummy

[6] SIPRI data does record some selected rebel groups but not all.

variable where rebels that have equal or higher troop size compared to the government get the value of 0, and 1 if they have fewer troops. Because of my approach of collapsing multiple civil conflicts in a country during the same year into one, I use the largest rebel group's troop size as the comparative element. Summing all rebel groups' troops does not seem logical, since the rebel groups fighting separate conflicts are not likely to collaborate and will maintain separate organisational structures, and artificially combining them into one would lead to artificially inflated rebel troop sizes that likely result in skewed findings.

Having a control for irregular and conventional civil conflict would be ideal, since previous research suggests that this plays an important role in the degree of OSV perpetrated by governments and rebel groups. Unfortunately, I have been unable to find good comprehensive datasets which would include the variable for a large enough sample of post-Cold War civil wars. Thus, I am unable to control for the type of conflict. However, as per previous studies (Bueno de Mesquita 2013), we can assume that small rebel groups are more likely to fight using irregular tactics whereas large rebel groups are more likely to pursue conventional civil conflicts.

4.1.3 Control Variables

To control for possible confounding variables that could have an influence on both the dependent and independent variables, I use a selection of control variables. One important potential confounding variable is the *regime type*. Whether a country is democratic or autocratic can influence the import of arms (de Soysa and Midford 2012) and the level of OSV, especially for governments (Sundberg 2009: 19). To control for regime type, I use a 21-value ordinal scale from Polity IV Project (Marshall, Gurr, and Jaggers 2016) where -10 marks the lowest level of democracy (an autocracy) and 10 the highest level of democracy. Further, since conflicts evolve and shift in focus as they mature, it is likely that the duration of conflict effects the material needs of the armed actors and by extension the level of OSV. As such, I will control for *conflict duration*. The data is from UCDP Battle-Related Deaths Dataset version 5.0 (Melander, Pettersson, and Themnér 2016) and is a discrete ratio data where 0 signifies no conflict and each additional number marks one additional year of conflict.

I also employ three control variables that appear almost ubiquitous in similar studies and whose importance as control variables have become commonly accepted (see, for example, Hultman and Peksen 2017, Mehrl and Thurner 2020). I use logarithmised variables *population* and *GDP per capita*, both having been drawn from the expanded gross domestic product (GDP) and trade data version 6.0 beta (Gleditsch 2002). The GDP per capita variable is especially important as a control variable, since it is likely that a wealthier country is able to buy and consequently import SALWs and MCWs. Similarly, citizens with more disposable income may be more alluring targets for governments or rebel groups wishing to extract support from civilians potentially leading to more instances of OSV. I also control for *ethnic exclusion* with data from the Ethnic Power Relations Dataset (Vogt et al. 2015). The variable captures the proportion of the "powerless" ethnic groups which have been completely excluded from political decision making (Vogt et al. 2015). With lack of political representation and opportunities creating grievances that fuel conflict (Stewart 2011) and ethnicity itself often playing an important role in OSV (Fjelde and Hultman 2014), I choose to include the control variable in my analysis.

4.2 Model

I choose to use OLS regression models for my analysis. This is necessarily a compromise, since due to the dependent variable being count data of the number of civilians killed annually, the use of negative binomial regression would be likely the most appropriate approach (Long 1997). Unfortunately, because of the time constraints and limited researcher capacity at the start of the project requiring a lot of time and resources to be used for learning even basic regression skills, I must accept the imperfect approach with its limitations. To address the shortcomings of the OLS regression, I log-transform the dependent variable so that the skewed distribution becomes more normalised (Lacina 2006, Mehrl and Thurner 2020). While this is an often-used method of improving the fit of count data for use in OLS regressions, it means that the results must be treated more cautiously than with models that are more appropriate for skewed data (Feng at al. 2014). To control for omitted variable bias and the likelihood that the level of OSV in a country in year t_n influences the level of OSV in the same country in year t_{n+1}, I use conflict fixed effects which looks for withing group variation rather than across-group variation (Collischon and Eberl 2020).

Finally, I time lag the independent variables SALW imports and MCW imports to address endogeneity issues. In other words, I use the level of arms imports from the previous year, so I can be more secure in saying that those arms have an impact on the next year's level of OSV and that it is the level of arms imports that effect the level of OSV and not the other way around. This is approach could be further improved with instrumental variables. One of the few examples of the use of instrumental variables in arms research is Mehrl and Thurner's (2020) use of an instrumental variable for sporting rifles, which they argue are not suited for military operations, to control for the endogeneity of military SALW imports. While this is a clever approach in a study of civil war violence because sporting arms are not arguably impactful in conventional warfare, I argue that for OSV this approach does not work due to sporting rifles, shotguns, and pistols being a potentially effective tool for perpetrating violence against civilians.

5. Empirical Analysis

5.1 Arms Imports and Total OSV

I start my analysis by exploring the impact of SALW and MCW imports on the total level of OSV. I do this since there are no prior robust quantitative studies about the relationship of arms imports and one-sided violence, so I need to establish whether a relationship between the two exists in the first place before turning to a more focused analysis that aims to answer the hypotheses presented in Chapter 3 that specify the impact depending on the perpetrator of violence and the relative sizes of the armed organisations.

Table 2 presents the findings from the models using total OSV as the dependent variable. Model 1 is the most basic model used to get a preliminary and tentative sense of the impact arms imports and comparative size of the rebel group have on total OSV. Major conventional weapon imports have a rather small negative coefficient, suggesting that a 1 per cent increase in the import of MCWs into a country results in a 0.16 per cent reduction in the level of total OSV perpetrated by both the government and rebels. This effect is statistically significant at the 95 per cent confidence level. For SALW imports the effect is very small and not statistically significant. The third main independent variable, despite not statistically significant, suggests by its high coefficient that comparative rebel group size could still have a meaningful impact on the level of OSV in the real world. In the simple model, if a country moves from having rebels that are larger or at parity with the government forces to having rebels that are smaller than the government forces, there is a predicted decrease of 49.59 per cent in the level of total OSV. These results change only marginally after the inclusion of control variables in model 2.

With the potential big impact of rebel group size, I move to the models with interaction terms. Models three and four model the interaction between only one type of weapon and small rebel groups, SALW imports and small rebels, and MCW and small rebels, respectively. This approach of segregated models for each interaction term allows me to draw better conclusions of the specific effects of each interaction (Johansson and Hultman 2019: 1667). Starting with model 3, an increase of one percent of SALW imports into countries with comparatively large rebel groups are expected to result in an increase of 0.16 per cent in the

Table 2. OLS regression models for total OSV.

	Dependent variable:			
	Total OSV (logged)			
	Model 1	Model 2	Model 3	Model 4
SALW imports (logged, t-1)	0.026	0.032	0.159***	0.032
	(0.026)	(0.028)	(0.054)	(0.028)
MCW imports (logged, t-1)	-0.158**	-0.133**	-0.118*	-0.183
	(0.064)	(0.064)	(0.064)	(0.145)
Rebel size (smaller)	-0.685	-0.567	0.765	-0.695
	(0.461)	(0.485)	(0.682)	(0.592)
Years of conflict		-0.025*	-0.028*	-0.026*
		(0.015)	(0.015)	(0.015)
GDP (logged)		0.902**	1.033**	0.895**
		(0.424)	(0.424)	(0.425)
Population (logged)		-2.099**	-2.244**	-2.080**
		(0.971)	(0.966)	(0.973)
Ethnic exclusion		0.449	0.317	0.473
		(0.732)	(0.729)	(0.735)
Polity		-0.055*	-0.053	-0.056*
		(0.033)	(0.033)	(0.033)
SALW imports (logged, t-1) x Rebel size (smaller)			-0.159***	
			(0.057)	
MCW imports (logged, t-1) x Rebel size (smaller)				0.057
				(0.152)
Constant	3.544***	15.576**	15.134**	15.597**
	(0.715)	(6.534)	(6.494)	(6.540)
Observations	580	580	580	580
Fixed effects	Yes	Yes	Yes	Yes
R^2	0.416	0.429	0.438	0.430
Adjusted R^2	0.336	0.344	0.353	0.343
Residual Std. Error	2.225 (df = 509)	2.210 (df = 504)	2.196 (df = 503)	2.212 (df = 503)
F Statistic	5.182*** (df = 70; 509)	5.057*** (df = 75; 504)	5.156*** (df = 76; 503)	4.984*** (df = 76; 503)
Note:				*p<0.1; **p<0.05; ***p<0.01

level of total OSV. The result is statistically significant at the 99 per cent confidence level. The change in the magnitude of the impact compared to the simpler models 1 and 2 demonstrates the importance of including the interaction with rebel group size in the models. When the comparative size of belligerent groups is not interacted with the SALW imports, we expect a rather low impact on the level of total OSV as the import of SALWs increases. However, when we include the interaction, the effect of SALW imports to conflicts with large rebel groups increases nearly fivefold. Looking specifically at the interaction term of SALW imports to conflicts with small rebel groups, we see that it produces a negative coefficient which is statistically significant at the 99 per cent confidence level. However, since the interaction term's true coefficient is derived after summing it with the constituent term's coefficient, the effect of SALW imports into conflicts with small rebel groups is actually zero. This implies that when small arms are imported into a conflict where the government is facing comparatively small rebel groups, we expect the total level of OSV not to change at all.

Next, we turn to model 4 which focuses on MCW imports interaction with the comparative size of the belligerent groups. The interaction term for MCW imports and small rebel groups is positive, but not statistically significant. The same is true for the constituent term for MCW which now marks MCW imports to intrastate conflicts with large rebel groups. The coefficient for MCW imports to large rebel groups is, however, rather large (in the negative direction), suggesting that if the effect would be statistically significant, the impact of MCW imports on total OSV, especially in civil wars with large rebel groups, could be meaningful. We would expect a total decrease of 0.18 per cent in the level of total OSV if the import of MCWs increased by one per cent.

In fact, if we interpret the results from models three and four with reference to some real-world numbers, we see that the impact of arms imports can be quite large when measured with the purposeful targeting of civilians. Using the coefficients for SALW and MCW imports for large rebel groups, in a civil conflict with a mean level of total OSV (251 per year), a one per cent increase in the import of SALWs or MCWs would mark one more OSV death per year. However, if we use the highest total OSV year of 1996 in the Democratic Republic of Congo as the baseline, the import of one more percent of SALWs would result in 52 additional OSV deaths per year, and for the same one per cent increase in MCWs we would expect 58 more deaths from OSV. As such, the impact is rather low, but potentially

Table 3. Predicted level of total OSV by arms import type in an intrastate conflict with mean values of independent variables from model 5.

Import Value		OSV	
		Small rebel groups	Equal or large rebel groups
MCW (TIV)			
Sample mean	235.82	1	2
Sample mean + one SD	749.47	1	1
SALW (USD)			
Sample mean	17,852,629	1	8
Sample mean + one SD	63,310,694	1	10

Note: SD = standard deviation

meaningful in the context of increased civilian suffering. Table 3 provides a further analysis of the substantial impact of SALW and MCW imports based on models. I use the sample means of the independent variables to calculate the predicted level of OSV. This method gives us a highly artificial but usable indication of how many total civilian deaths from OSV we would expect to see in a hypothetical civil conflict that had the average values of SALW and MCW imports, GDP per capita, population, ethnic marginalisation, democracy, and conflict duration. This helps us understand the difference between civil wars with large and small rebel groups when arms are imported. As we can see, in an average civil war with small rebel groups, we would expect to see one death from OSV per year when MCW and SALW imports are taken at their sample mean values. When we change only the small rebel groups to large rebel groups, we would expect two deaths in a year for MCW imports, and eight OSV deaths in a year for SALW imports – a significant difference in magnitude. If the import of MCWs to the hypothetical average civil war increased by one standard deviation or by 513.65 TIVs in a year, we would expect the OSV deaths in the next year to not change for small rebel groups but decrease to one for the civil war with large rebel groups. With a standard deviation (45,458,065 USD) increase in the import of SALWs, the level of OSV in the state with small rebel groups would not change. However, for the civil war with large rebel groups, we would expect two more civilian deaths in a year.

These findings demonstrate four things. First, civil conflicts are likely more deadly for civilians when they involve rebel groups that are equal or larger in number than the government military – and the rebel group's size is an important conditioning variable when

trying to evaluate the impact of arms imports. Second, the import of SALWs increases the level of total OSV in civil conflicts with large rebel groups but, holding all other variables constant, the impact is rather low. Third, SALW imports into a state that is experiencing intrastate conflict between rebels that are smaller than the government are not likely to impact the total level of purposeful civilian targeting in that country. Finally, the import of MCW likely has no impact on total OSV in civil wars.

Finally, looking at the control variables tells us even more about the comparative impact of arms imports on total OSV. Together the models which include all the control variables suggest that arms imports, despite their impact, are not among the most important determinants of OSV – as suggested by previous research (Mehrl and Thurner 2020). Since the models are built with the intention of studying the effects of SALW and MCW imports and are thus not ideal for analysing the impact of the multiple control variables, I remain purposefully vague about their effect. Yet, we can see that the level of economic development, the size of the population, and conflict duration all impact the level of OSV more than arms imports. All variables are statistically significant either at the 90 or 95 per cent confidence levels. The coefficients suggest that a one per cent increase in the country's real GDP per capita increases the level of OSV in countries involved in civil wars by around one per cent. This finding contrasts with other studies (Sundberg 2009: 21) and needs to be treated with caution. More substantially, it seems that as the population of the country increases by one per cent, civilian deaths from purposeful targeting decrease by two per cent. Finally, as a conflict matures by an additional year, the level of OSV decreases by around 2.5 per cent.

5.2 Arms Imports and Rebel and Government OSV

With the above analysis indicating that the import of arms, especially SALWs, can impact the level of total OSV in a civil war context, I now turn to my main analysis. This is the segregated analysis that separates the total OSV into two distinct parts: rebel perpetrated OSV and government perpetrated OSV. The aim is to see if rebel or government decisions to pursue civilian targeting are affected by the imports of arms, and how the relative size of the group conditions that relationship. Like with the analysis of total OSV, I start my analysis of both rebel perpetrated OSV (table 4) and government perpetrated OSV (table 5) by

presenting a simple model without the interaction terms before turning to the segregated models each with one interaction term.

5.2.1 Rebel OSV

The simple model (model 5 in table 4) for rebel perpetrated OSV includes the main independent variables with control variables but without the interaction terms. The only statistically significant variable in the model is MCW imports whose coefficient suggests that as a civil conflict receives one per cent more of MCWs, everything else held constant, we expect that rebel perpetrated OSV would decrease by 1.03 per cent. The result, at least when compared to the earlier models, is quite substantive and suggests that the import of MCWs is likely to result in significantly reduced OSV by the rebels. Because the variable for SALW imports is not statistically significant and its coefficients in the simple model is small, we can only say that the simple model finds no relationship between small arms imports and rebel perpetrated OSV.

Including the interaction terms in models six and seven changes the findings from the simple model only slightly. Like in the simpler model, in these more complete rebel OSV models, only the variable for MCW imports to large rebel groups in model seven is statistically significant at the 90 per cent confidence level. The negative effect here is slightly larger than in the model without rebel size interaction, at -1.065 or a predicted decrease in the level of rebel perpetrated OSV by 1.07 per cent when the import of MCWs to conflicts with large rebel groups increases by one per cent. Different model specifications that can be seen from the appendix (table 8) remain similar, with a maximum of one variable ever being statistically significant. A correlation test for independent variables (appendix, figures 4a and 4b) suggests that this is not due to multicollinearity of the independent variables so we are left to accept that we cannot be sure that any variable other than conflict duration differs from zero. Keeping the statistical insignificance in mind, we can still see that the coefficients for SALW imports for civil conflicts with large and small rebel groups are small. Indeed, if one per cent more SALWs were imported into a civil war with small rebel groups, the impact would equal zero per cent less OSV by the rebel group in a year. For civil conflicts with large rebel groups, the same one per cent increase in imports of SALWs would result in an increase

Table 4. OLS regression models for rebel perpetrated OSV.

	Dependent variable:		
	Rebel perpetrated OSV (logged)		
	Model 5	Model 6	Model 7
SALW imports (logged, t-1)	0.014	0.067	0.014
	(0.025)	(0.050)	(0.025)
MCW imports (logged, t-1)	-1.032**	-0.481	-1.065*
	(0.446)	(0.631)	(0.545)
Rebel size (smaller)	-0.024	-0.017	-0.037
	(0.059)	(0.060)	(0.134)
Years of conflict	-0.022	-0.023	-0.022
	(0.014)	(0.014)	(0.014)
GDP (logged)	0.406	0.460	0.404
	(0.390)	(0.393)	(0.391)
Population (logged)	-0.540	-0.600	-0.535
	(0.893)	(0.894)	(0.895)
Ethnic exclusion	-0.012	-0.066	-0.006
	(0.673)	(0.674)	(0.677)
Polity	-0.018	-0.017	-0.018
	(0.031)	(0.031)	(0.031)
SALW imports (logged, t-1) x Rebel size (smaller)		-0.066	
		(0.053)	
MCW imports (logged, t-1) x Rebel size (smaller)			0.015
			(0.140)
Constant	2.583	2.400	2.588
	(6.011)	(6.009)	(6.017)
Observations	580	580	580
Fixed effects	Yes	Yes	Yes
R^2	0.420	0.422	0.420
Adjusted R^2	0.334	0.335	0.333
Residual Std. Error	2.033 (df = 504)	2.032 (df = 503)	2.035 (df = 503)
F Statistic	4.874*** (df = 75; 504)	4.835*** (df = 76; 503)	4.801*** (df = 76; 503)
Note:			*p<0.1; **p<0.05; ***p<0.01

of 0.067 per cent in rebel perpetrated OSV. The coefficient for *MCW imports x Rebel size*, signifying MCW imports to civil conflict with comparatively small rebel groups, a one per cent increase in the import of MCWs would likely result in 1.05 per cent less rebel perpetrated OSV per year. Thus, even if the coefficients would be statistically significant, we would expect that the imports of SALWs into civil war settings would not have a meaningful impact on the level of rebel perpetrated OSV. Still, to emphasise, with the coefficients being statistically insignificant, we do not expect to see an impact for SALW imports of any kind or MCW imports to small rebel groups.

My two hypotheses relating to rebel perpetrated OSV suggest that 1a) the imports of small arms and light weapons (SALWs) increase the level of one-sided violence (OSV) perpetrated by small rebel groups and not by large ones, and that 2a) imports of major conventional weapons (MCWs) do not increase the level of rebel-perpetrated one-sided violence (OSV). The first hypothesis is not supported by the analysis of model six. SALW imports to civil conflicts with small or large rebel groups do not seem to influence the level of OSV the rebel groups participate in. A possible explanation for this surprising finding is that rebels, regardless of their size, are unable to divert some of these arms transfers to themselves and utilise them in military operations. This seems likely since the data captures transfers to governments with higher fidelity than to non-governmental actors. Unfortunately, since no robust dataset for SALW imports to rebel groups exists, this assumption remains an assumption.

The second hypothesis is supported, since, based on the models, we can expect that MCW imports to contexts with large rebel groups in fact reduce the level of rebel perpetrated OSV, whereas they have no impact on small rebel's engagement of OSV. This supports the theoretical assumption that when large rebel groups receive MCWs, they are more able to challenge the government in conventional war and gain full control of large areas and their populace, reducing the need to target civilians in order to deter them from supporting the enemy (Balcells 2010, Schwartz and Straus 2018).

5.2.2 Government OSV

Turning to the analysis of government perpetrated OSV, the import of SALWs and MCWs are both statistically insignificant in the simple model (model 8). The coefficients for both

variables are also rather small, implying that any arms imports, without being interacted with relative troop size, are not linked to an increase, or decrease in the level of government perpetrated OSV.

Model 9, which includes the interaction term for SALW imports and rebel group size, seems to further support the idea that SALW imports have little impact on government perpetrated one-sided violence. The interaction variable for SALW imports to intrastate conflicts with comparatively large government forces (or small rebel groups) is statistically significant at the 90 per cent confidence level. However, the coefficient predicts that as the import of SALWs increases by one per cent, the OSV by comparatively large government forces decreases by only 0.017 per cent. This is an extremely marginal change and in the real world would make no meaningful difference in most cases, including extreme levels of government perpetrated OSV. The variable for SALW imports to civil conflicts with comparatively small government forces (or large rebel groups) is statistically insignificant and, thus, not likely to result in change in the level of government perpetrated OSV.

Turning our attention to the conditional impact of MCWs against comparative troop size on government perpetrated OSV, we find that, once again, only imports to strong governments are statistically significant. The interaction term which is statistically significant at the 95 per cent confidence level suggests that as one per cent more of MCWs is imported into a civil conflict with a comparatively strong government, the level of government OSV is likely to decrease by 0.46 per cent. The effect is significant at the 95 per cent confidence level. MCW imports to contexts with weak governments are statistically insignificant, although potentially meaningful due to the large coefficient. These results suggest that, contrary to theoretical expectations, government perpetrated OSV is more likely to reduce once MCWs are imported into the country, rather than increase.

Theoretically, I expected the imports of SALWs to increase the level of OSV by governments when they face rebels equal to or larger than themselves, but to not increase when the government faces comparatively smaller rebels (hypothesis 1b). Based on the results from the regression model 9, this hypothesis is only partly supported. SALW imports to civil conflicts where comparatively large government forces are fighting against smaller rebel groups are linked to a marginal decrease in the level of OSV, supporting the idea that when large forces' military capacity increases in the form of arms they are more able to conduct conventional

Table 5. OLS regression models for government perpetrated OSV.

	Dependent variable:		
	Government perpetrated OSV (logged)		
	Model 8	Model 9	Model 10
SALW imports (logged, t-1)	-0.0003	0.069	-0.001
	(0.022)	(0.043)	(0.022)
MCW imports (logged, t-1)	-0.080	0.646	-0.768
	(0.390)	(0.551)	(0.474)
Rebel size (smaller)	-0.081	-0.073	-0.345***
	(0.052)	(0.052)	(0.116)
Years of conflict	-0.018	-0.019	-0.020
	(0.012)	(0.012)	(0.012)
GDP (logged)	0.753**	0.825**	0.719**
	(0.342)	(0.343)	(0.340)
Population (logged)	-2.183***	-2.262***	-2.079***
	(0.781)	(0.781)	(0.778)
Ethnic exclusion	0.716	0.644	0.845
	(0.589)	(0.589)	(0.588)
Polity	-0.078***	-0.077***	-0.079***
	(0.027)	(0.027)	(0.027)
SALW imports (logged, t-1) x Rebel size (smaller)		-0.086*	
		(0.046)	
MCW imports (logged, t-1) x Rebel size (smaller)			0.309**
			(0.122)
Constant	16.909***	16.668***	17.018***
	(5.259)	(5.248)	(5.231)
Observations	580	580	580
Fixed effects	Yes	Yes	Yes
R^2	0.488	0.492	0.495
Adjusted R^2	0.412	0.415	0.418
Residual Std. Error	1.779 (df = 504)	1.775 (df = 503)	1.769 (df = 503)
F Statistic	6.414*** (df = 75; 504)	6.406*** (df = 76; 503)	6.482*** (df = 76; 503)
Note:			*p<0.1; **p<0.05; ***p<0.01

operations (Balcells 2010). However, the model finds no support for the theoretical expectation that comparatively small government forces would increase the level of OSV when endowed with SALWs. This could be explained by the government often having at least semi-reliable means of funding and other support structures such as taxation, treasury, or aligned foreign states as international supporters. These structures could reduce the need to target civilians within the areas the government already controls in order to extract additional resources (Schwartz and Straus 2018). The comparatively militarily weak government would also be unable to venture into the regions held by the strong rebel group in order to coerce support from the civilian population there. Together these two mechanisms would then keep the level of government OSV largely unchanged. This alternative explanation is supported by Hultman and Peksen's (2017) finding that when countries are imposed or threatened with economic sanctions, they are likely to increase the level of violence in civil wars. So in the OSV situation, when the government's basic economic arrangements with which they fund the war are not threatened and the opposition supporters cannot be targeted because they live in the area controlled by a strong enemy, governments do not increase the level of OSV even if their stash of arms grows.

Hypothesis 2b, which states that imports of MCWs do not increase the level of OSV violence perpetrated by the government is supported since increasing MCW imports are in fact linked to a decrease in government perpetrated OSV in cases where the government is fighting comparatively small rebel groups. This supports the idea that governments (at least with large militaries) which successfully import MCWs are better able to challenge the rebel groups in conventional battles and do not need to target civilians to coerce support or deter them from supporting the rebel groups (Balcells 2010, Schwartz and Straus 2018).

Finally, to put the results from the government and rebel OSV models into perspective, it is useful to compare them with each other. Even if MCW imports seem to significantly decrease the level of OSV perpetrated by comparatively strong actors – be they government or rebel groups – when the impacts of MCW imports conditioned on troop size are analysed with reference to the levels of OSV observed in real conflicts, the impacts turn out rather small. In the sample of all intrastate conflicts, government perpetrated OSV is in fact rarer than rebel

Table 6. Summary statistics of OSV by perpetrator.

	Rebel OSV	Government OSV	Total OSV
Min (Max)	0 (30,537)	0 (5,801)	0.0 (31,890)
1st quarter (3rd quarter)	0 (62.3)	0.0 (30.3)	0.0 (168.2)
Mean (Median)	153.4 (0)	98.0 (0)	251.3 (26)
Mean excluding zeros	418.0	344.5	479.5
n	226	167	317

perpetrated OSV as can be seen in table 6. Civil wars in the sample see on average 153.4 deaths from rebel perpetrated OSV in a year, whereas government OSV results in an average of 98 deaths a year. The difference between the two is even larger if we exclude cases where there were no deaths from OSV in a calendar year with 418 and 344.5, respectively. Governments also engage in OSV less often with 167 intrastate conflict years recorded compared to 226 years for rebel OSV. Thus, when we look at the impact of MCW imports on an average civil war, we find that government perpetrated OSV is predicted to be negative, meaning that the government would not be expected to perpetrate OSV in the average conflict with a mean amount of MCW imports (table 7). From the numbers in table 7 we can see the marginal changes MCW imports would have on the level of OSV in a civil war where all independent variables would be at mean values. For rebel perpetrated violence the impact is similarly small, despite the expected OSV being higher. In effect, this means that while MCW imports to civil conflicts where one side is stronger than the other is statistically expected to result in less deaths from OSV, in practice, that impact is

Table 7. Predicted levels of government and rebel perpetrated OSV by MCW imports in an intrastate conflict with mean values of independent variables from models 10 and 7.

		Government OSV (model 10)		Rebel OSV (model 7)	
Import Value		Large or equal govt forces	Small govt forces	Small rebel groups	Equal or larger rebel groups
MCW (TIV)					
Sample mean	235.82	-0.551	-0.820	1.944	6.846
Sample mean + one SD	749.47	-0.568	-0.879	1.858	6.538

Note: SD = standard deviation

often negligible. SALW imports, which were statistically insignificant in all models except model nine, and also had small or even marginal (in the case of the interaction terms) effects, are expected to have none or, at best, marginal effects. Thus, we can argue that imports are in general not good predictors of the level of how many civilians will be killed purposefully in a civil war, and this holds for total, government, and rebel OSV. This finding is in line with some of the earlier research on arms and violence (Mehrl and Thurner 2020).

5.3 Robustness Checks

To test the robustness of the results from the main models, I run several different specifications of the models 2, 6, 7, 9, and 10. I use a sample of models due to time constraints, but I make sure all the main models 6, 7, 9, and 10 as well as one from the total OSV (model 2) are used so that every dependent variable is included in the checks. The tables for these robustness checks are presented in the appendix. I begin by replacing the fixed effects models with random effects models (table 9). The results for the main independent variables SALW imports, MCW imports and rebel size remain similar to the original model 2 for the total OSV random effects model. The directions of the effects are unchanged, and the sizes of the coefficients change only slightly. The random effects models for rebel OSV also closely match the original rebel OSV models 6 and 7. None of the main independent variables are statistically significant but rebel size gains statistical significance in the random effects model 7. The coefficient sizes very closely match that of the fixed effects model, except for MCW imports which are now positive and much smaller coefficients. Four of the five control variables are now statistically significant across both models, improving from the original with no statistically significant control variables. Finally, the random effects models for government OSV also mainly resemble their fixed effects versions. The directions and sizes of the main independent variables' coefficients remain close to the originals, expect for the variable for MCW imports which is closer to zero and statistically significant in the random models. The direction for rebel size also changes across the models with small rebel groups now being positively linked to government perpetrated OSV. Regardless, these results give confidence in the original model specifications and their findings' robustness. However, they also call for some caution in our interpretation of the effect MCW imports have on different types of OSV.

The second alternative specification I use is a negative binomial model. Many studies using count data use negative binomial models (for example Fjelde and Hultman 2014, Hultman 2012, Wood 2010) and as such it seems to be the preferred method with count data. Unfortunately, due to researcher skill and time constraints, using a negative binomial model and interpreting its coefficients effectively was beyond this thesis at this time. Still, even without being able to fully interpret the magnitude of the impact from the negative binomial model currently, using the negative binomial model as a robustness check can tell us if the direction of the effects in the original OLS models are similar. In all the three negative binomial models (table 10) the direction of effect for SALW imports, MCW imports, SALW imports x Rebel size, and MCW imports x Rebel size closely follow the corresponding OLS models. Since the coefficients in the negative binomial models for all arms imports variables are small, I assume that the magnitude of the effect is also not much different in the OLS models, but this claim must be taken with caution. The biggest differences to the OLS models are the directions for SALW imports to weak rebels which have a negative direction in the negative binomial models 6 and 9, whereas they have a small positive coefficient in the corresponding OLS models. However, since the variable is statistically insignificant in both specifications, the expected impact remains the same in both cases – namely that there is no impact. Perhaps most interestingly, the coefficients for the variable rebel size (small) are rather large in all negative binomial models, suggesting that the impact is larger than proposed in the OLS models. However, as before, this thought needs further attention before any substantial claims can be made. Still, the directions of the coefficients matching so well across the negative binomial models and OLS models suggests that the OLS model is relatively accurate.

In the third robustness check I follow Buhaug's et al. (2011) approach which deals with a rare events problem. Since half of the intrastate conflicts in my data have no OSV, it is possible that the results are greatly influenced by these cases. To address this concern, I keep all the cases of OSV and a random sample of 10 per cent of cases without OSV in the dataset. The results from these models (table 11) are once again rather similar to the base models. The biggest difference is that with the exception of SALW imports in model 2, all the arms import variables lose statistical significance. This change could be due to the greatly decreased number of observations which is now 324 compared to 580 in the original OLS models. The size of the MCW imports variable in models 7 and 10 are significantly closer to zero than in the base models. Because the same was true in the random effects model, MCW imports'

coefficients in the original model must be interpreted with caution. Other than that, the results do not change substantially. Finally, in a fourth robustness check, I run the OLS regression after identifying and dropping some outliers with high OSV levels, namely Democratic Republic of Congo in 1996 and 1997, Afghanistan in 1998, and Sudan in 2004. I do not remove zero count cases in this specification. The results from this approach change only marginally compared to the main models (table 12) with the exception of MCW imports in model 7 and 10, which further supports the idea that MCW imports for strong rebels must be interpreted cautiously.

5.4 Limitations of the Study

In the end, it is important to be aware of the limitations of my study. Research necessarily involves some compromises between available resources and the ideal research method, and these compromises can affect the results of the study – sometimes in unexpected ways. Transparency and discussion of those limitations helps future research improve on my findings.

The choice to use OLS regression instead of negative binomial regression could be problematic for at least two ways. First, the OLS model is less suited for accurately modelling count models (Date 2019). To help with this, I have had to log-transform the dependent variable. Thus, the expected magnitude of impact of SALW imports or MCW imports that I have presented in the analysis section may be not perfectly accurate. However, since robustness check with a negative binomial model resulted in the exact same directions of impact, we can be quite sure about the findings that SALW imports to intrastate conflicts with large rebel groups are likely to increase the level of OSV by all sides of the conflict, whereas SALW imports to civil conflicts with small rebel groups do not correlate with an increase or decrease in OSV. Similarly, the findings suggest that MCW imports into contexts with large rebel groups will decrease total OSV and OSV perpetrated by governments, while no impact is expected in conflicts with small rebel groups. The impacts of the imports on civilian targeting seem small based on the results, but uncertainty remains due to the choice of OLS.

It is important to emphasise that the causal mechanisms for SALW imports and MCW imports presented in the study are only one possible explanation. There are multiple other

ones that are plausible, but which remain less theorised and analysed in the literature. Yet, to give one alternative perspective, it is possible that there is a U-shaped curvilinear relationship between SALW imports and OSV. It can be that as rebels and governments' access to arms increases, they can better coerce civilians for support or deter civilians from supporting the opposition. However, when a certain level of armaments has been gathered, the actors might feel confident in their ability to pursue conventional warfare and gain full control of territory, which has been identified to relate to lower levels of OSV in civil wars (Eck and Hultman 2007: 240). The choice of OLS regression, even with log-transformation of the SALW import and MCW import variables, is an imperfect way to capture such curvilinear relationships. Thus, other models specifying in curvilinear relationships could yield different results.

Another limitation has to do with the available data. In my analysis, I have used data for SALW and MCW imports that does not separate imports to rebels or governments. Rather, they capture all reported imports to the relevant country during a specific year. As discussed in the previous sections, this type of data is likely to capture mainly imports to governments. I suspect we see this when we compare the findings of the rebel OSV models to the government OSV models, where the latter has more robust findings than the first one. It is possible that the study's findings could look significantly different if one could use data that distinguishes between imports to rebels and imports to governments and run the regression models with those specifications.

My controls for endogeneity are limited. I have utilised a time lag with the SALW imports and MCW imports variables to ensure that when modelled, arms imports precede OSV in time. However, this does not guarantee that there is no endogeneity between the dependent variable and independent variables. It is possible that governments or rebels who face high levels of OSV against their supporters would want to import small arms or major conventional weapons to better fight the opposition group. While I am unable to reject this possibility, an earlier study by Mehrl and Thurner (2020) used an instrumental variable approach to control for endogeneity in their study of SALW and MCW imports' impact on battle-related deaths. Their findings from models very similar to mine found that the results were robust even when controlling for endogeneity. As such, I assume that the same results would likely happen if I controlled for endogeneity with instrumental variables.

Finally, the scope condition of my study presents minor challenges for generalisability. My results are likely robust for post-Cold War civil conflicts where the government is facing one

or more domestic rebel groups. This is the case globally since the data I used is not limited to some region or country. However, my decision to exclude transnational OSV and interstate conflicts means that my findings are not applicable for some more recent cases where OSV and civilian targeting in general has been a concern. The terrorist attacks of al-Qaeda and ISIS, for example, often happen outside of the country where the groups stem from (Krause 2018: 228), and thus are beyond my research. Another influential case that my findings cannot be used for is the 2022 Russian invasion of Ukraine which some claim has seen intentional targeting of Ukrainian civilians by the Russian state (Amnesty International 2022). These cases of OSV violence in international terrorism and intrastate war need to be studied in subsequent studies.

6. Conclusion

This thesis has sought to explore the relationship between SALW and MCW imports and purposeful targeting of civilians, otherwise known as one-sided violence (OSV). In the absence of robust scientific studies, the relationship between SALWS and OSV, in particular, has often been assumed to be a strong positive one with the import of more arms leading to more civilian targeting. Existing previous research on the impact of arms imports on armed conflict has generally found that MCWs and SALWs are positively, albeit marginally, connected to increased conflict likelihood and battle-related deaths. Research on OSV has, in turn, concluded that conventional tactics of fighting war result on average in less deaths from OSV than irregular tactics which are often utilised by armed organisations that are smaller than their opposition.

The theoretical expectations derived from the earlier studies suggest that the interaction SALW and MCW imports with comparative troop size influence the level of OSV in civil wars. The predictions were that SALW imports to comparatively small military or rebel organisations would result in the level of OSV rising as those organisations' ability to coerce civilians increased but their ability to conduct conventional war did not increase. For MCWs, the theoretical predictions expected no rise in the level of rebel or government perpetrated OSV as MCW imports increased because MCW imports to any size government forces likely improve their ability to conduct conventional tactics as they do for large rebel groups, whereas small rebel groups are unable to access or use MCWs effectively against their opposition or civilians.

The results from my OLS regressions are rather inconclusive. The models find no relationship between SALW imports and rebel perpetrated OSV regardless of the comparative size of the rebel groups. For comparatively large government forces, SALW imports are linked to a marginal decrease in the level of government perpetrated OSV, whereas no relationship exists between SALW imports to context with comparatively weak governments and OSV. While the results for SALW imports are contradictory to the expectations and likely due to unideal data for SALW imports that overreports imports to governments, the theoretical expectations for MCW imports are supported. MCWs are not likely to have any impact on the level of OSV perpetrated by comparatively small

government militaries or rebel groups. For large rebel groups and governments, MCWs are linked to a decrease in the level of OSV, but the impact is expected to be small.

Future studies on the relationship between arms and civilian could improve and add to the findings of this preliminary study in many ways. Studies replicating the research question of this study could improve on these findings by using models which are more applicable for modelling count data. This would increase the confidence in the direction and degree of the relationship found in this study. Future studies could also greatly benefit from datasets that allow for the separation of imports to rebel groups and governments. This has the potential to enrich the analysis, since now the imports are an aggregate which overrepresent imports to governments likely resulting in skewed findings. It would also deepen our understanding about the types of arms imports and recipients that are more harmful than others, leading to better informed and designed policy tools such as arms embargoes. Future studies should also find ways to include unintentional or collateral civilian casualties in their analysis. MCWs with their large areas of impact are, in particular, likely to result in high rates of unintended civilian deaths, but the current study is blind to this effect. Finally, extending the analysis beyond civil war contexts could be meaningful in the current political climate. With the Russian invasion of Ukraine resulting in mass deaths of civilians as well as high rates of SALW and MCW imports, studies on arms imports and OSV in interstate conflicts are especially pertinent.

For practitioners and politicians, this study suggests that while SALW and MCW imports are not necessarily impactful for civilians, in civil war contexts where conflict actors are willing to use violence against civilians in large numbers, the small impacts of especially SALW imports to armed groups could result in unexpected and unintended consequences. More importantly, however, the results show that arms imports are not the most important factor influencing OSV. Instead of focusing on stopping the import of arms (or importing more arms), the international community and aid organisations should primarily pursue other tools to reduce the level of civilian suffering, such as economic sanctions, ethnic reconciliation, active conflict resolution measure and diplomacy, and humanitarian aid.

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Appendix

Figure 4a. Pair-wise correlation of the independent variables.

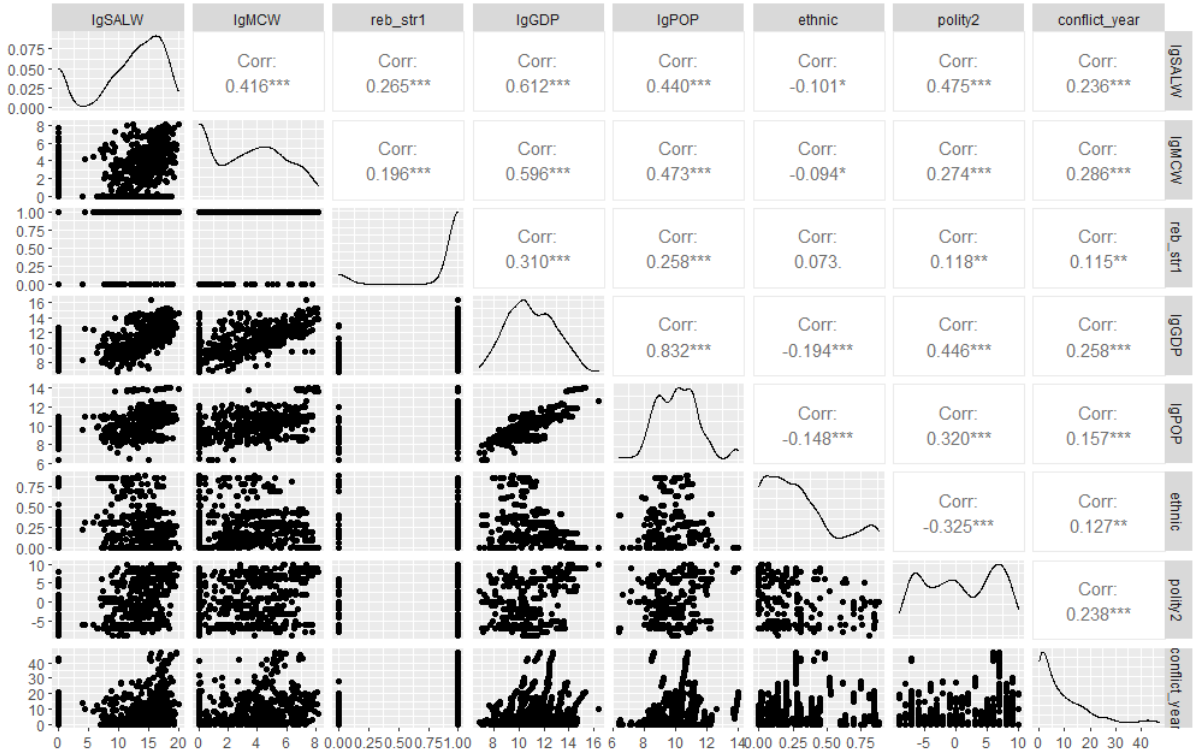

Figure 4b. Correlation plots for independent variables.

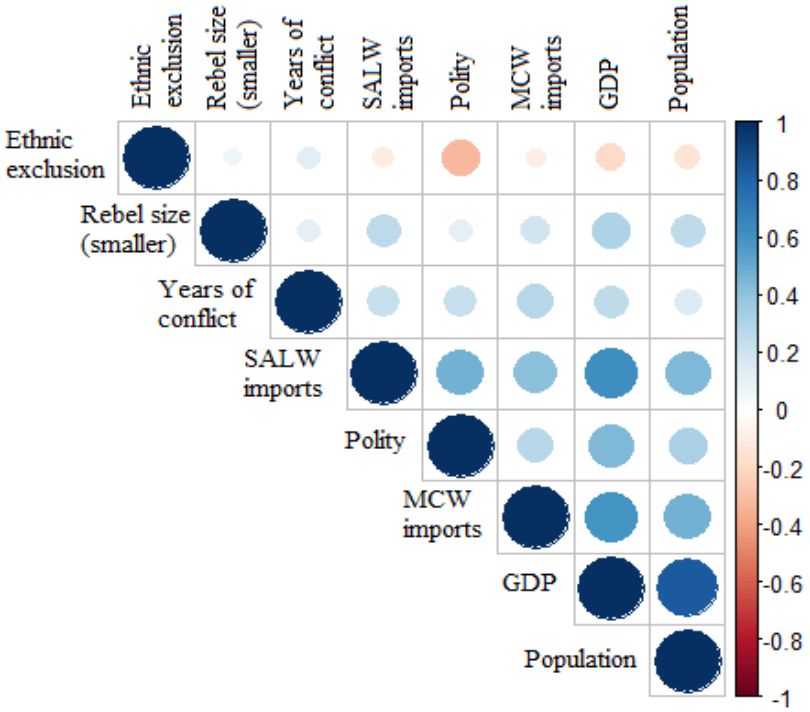

Table 8. All OLS regression models for rebel perpetrated OSV.

	Dependent variable:				
	Rebel OSV (logged)				
	(1)	(2)	(3)	(4)	(5)
SALW imports (logged)	0.019	0.065	0.067	0.014	0.072
	(0.024)	(0.051)	(0.050)	(0.025)	(0.051)
MCW imports (logged)	-0.033	-0.067	-0.017	-0.037	-0.072
	(0.058)	(0.136)	(0.060)	(0.134)	(0.136)
Rebel strength (weaker)	-1.023**	-0.651	-0.481	-1.065*	-0.571
	(0.421)	(0.634)	(0.631)	(0.545)	(0.663)
GDP (logged)			0.460	0.404	0.458
			(0.393)	(0.391)	(0.393)
Population (logged)			-0.600	-0.535	-0.584
			(0.894)	(0.895)	(0.895)
Ethnic exclusion			-0.066	-0.006	-0.045
			(0.674)	(0.677)	(0.677)
Polity			-0.017	-0.018	-0.017
			(0.031)	(0.031)	(0.031)
Years of conflict			-0.023	-0.022	-0.023*
			(0.014)	(0.014)	(0.014)
SALW imports (logged) x Rebel Strength (weaker)		-0.057	-0.066		-0.072
		(0.054)	(0.053)		(0.055)
MCW imports (logged) x Rebel Strength (weaker)		0.046		0.015	0.064
		(0.144)		(0.140)	(0.145)
Constant	0.843	0.714	2.400	2.588	2.405
	(0.653)	(0.762)	(6.009)	(6.017)	(6.014)
Observations	580	580	580	580	580
Fixed effects	Yes	Yes	Yes	Yes	Yes
R^2	0.416	0.417	0.422	0.420	0.422
Adjusted R^2	0.336	0.334	0.335	0.333	0.334
Residual Std. Error	2.031 (df = 509)	2.033 (df = 507)	2.032 (df = 503)	2.035 (df = 503)	2.034 (df = 502)
F Statistic	5.176*** (df = 70; 509)	5.039*** (df = 72; 507)	4.835*** (df = 76; 503)	4.801*** (df = 76; 503)	4.767*** (df = 77; 502)
Note:					*p<0.1; **p<0.05; ***p<0.01

Table 9. Random effects OLS of models 2, 6, 7, 9, and 10.

	Dependent variable:				
	Total OSV (logged)	Rebel OSV (logged)		Government OSV (logged)	
	2	6	7	9	10
SALW imports (logged, t-1)	0.029	0.070	0.030	0.073*	-0.002
	(0.024)	(0.046)	(0.022)	(0.041)	(0.020)
MCW imports (logged, t-1)	-0.111**	0.064	0.037	-0.188***	-0.276**
	(0.055)	(0.049)	(0.127)	(0.045)	(0.116)
Rebel size (smaller)	-0.446	-0.468	-0.917**	1.006**	0.085
	(0.367)	(0.510)	(0.415)	(0.465)	(0.379)
Years of conflict	0.024**	0.015	0.014	0.003	0.001
	(0.012)	(0.011)	(0.011)	(0.010)	(0.010)
GDP (logged)	-0.437***	-0.376***	-0.395***	-0.263**	-0.300***
	(0.132)	(0.120)	(0.119)	(0.109)	(0.109)
Population (logged)	0.882***	0.742***	0.756***	0.362***	0.392***
	(0.146)	(0.131)	(0.132)	(0.120)	(0.120)
Ethnic exclusion	1.629***	0.960**	0.993**	1.823***	1.908***
	(0.481)	(0.433)	(0.439)	(0.395)	(0.401)
Polity	0.025	0.077***	0.076***	-0.027	-0.030
	(0.024)	(0.022)	(0.022)	(0.020)	(0.020)
SALW imports (logged, t-1) x Rebel size (smaller)		-0.050		-0.094**	
		(0.050)		(0.045)	
MCW imports (logged, t-1) x Rebel size (smaller)			0.030		0.100
			(0.133)		(0.122)
Constant	-1.769*	-2.096**	-1.718**	-0.078	0.680
	(0.924)	(0.899)	(0.847)	(0.819)	(0.774)
Observations	580	580	580	580	580
Fixed effects	No	No	No	No	No
R^2	0.096	0.122	0.120	0.159	0.154
Adjusted R^2	0.084	0.108	0.107	0.146	0.140
Residual Std. Error	2.613 (df = 571)	2.353 (df = 570)	2.355 (df = 570)	2.145 (df = 570)	2.152 (df = 570)
F Statistic	7.618*** (df = 8; 571)	8.797*** (df = 9; 570)	8.675*** (df = 9; 570)	11.967*** (df = 9; 570)	11.494*** (df = 9; 570)
Note:					*p<0.1; **p<0.05; ***p<0.01

Table 10. Negative binomial models of total OSV, rebel OSV, and government OSV.

	Dependent variable:				
	Total OSV	Rebel OSV		Government OSV	
	2	6	7	9	10
SALW imports (t-1)	-0.000**	-0.000	-0.000	-0.00000	-0.00000***
	(0.000)	(0.00000)	(0.000)	(0.00000)	(0.00000)
MCW imports (t-1)	0.0004	0.0001	-0.001	0.002***	-0.013**
	(0.0004)	(0.0004)	(0.001)	(0.001)	(0.006)
Rebel size (smaller)	-0.806	-2.412***	-3.091***	-0.299	-1.558*
	(0.547)	(0.714)	(0.720)	(0.890)	(0.863)
Years of conflict	-0.048***	-0.055**	-0.055**	-0.078***	-0.075***
	(0.018)	(0.023)	(0.023)	(0.026)	(0.026)
GDP	0.00000	0.00000	0.00000	0.00000	0.00000
	(0.00000)	(0.00000)	(0.00000)	(0.00000)	(0.00000)
Population	0.00001	0.00001	0.00001	-0.00002**	-0.00003***
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
Ethnic exclusion	1.256	-1.607	-1.361	1.252	1.562
	(0.824)	(1.007)	(1.007)	(1.136)	(1.113)
Polity	-0.096**	-0.140***	-0.133***	-0.218***	-0.191***
	(0.039)	(0.047)	(0.047)	(0.058)	(0.057)
SALW imports (t-1) x Rebel size (smaller)		-0.000		-0.00000	
		(0.00000)		(0.00000)	
MCW imports (t-1) x Rebel size (smaller)			0.001		0.016***
			(0.001)		(0.006)
Constant	7.026***	3.600***	4.231***	6.523***	8.079***
	(0.898)	(1.086)	(1.190)	(1.171)	(1.330)
Observations	580	580	580	580	580
Fixed effects	Yes	Yes	Yes	Yes	Yes
Log Likelihood	-2,455.574	-1,757.947	-1,757.664	-1,350.255	-1,346.309
theta	0.160*** (0.011)	0.117*** (0.009)	0.117*** (0.009)	0.106*** (0.010)	0.109*** (0.010)
Akaike Inf. Crit.	5,063.147	3,669.895	3,669.327	2,854.511	2,846.618
Note:					*p<0.1; **p<0.05; ***p<0.01

Table 11. OLS regression with all cases of OSV and 10% of zero cases.

	Dependent variable:				
	Total OSV (logged)	Rebel OSV (logged)		Government OSV (logged)	
	2	6	7	9	10
SALW imports (logged, t-1)	0.080***	0.005	0.041	0.092	0.003
	(0.028)	(0.073)	(0.037)	(0.063)	(0.032)
MCW imports (logged, t-1)	0.063	0.031	-0.154	0.128	-0.052
	(0.069)	(0.092)	(0.228)	(0.080)	(0.198)
Rebel size (smaller)	-0.535	-1.930*	-1.999**	1.056	-0.642
	(0.528)	(1.096)	(0.953)	(0.950)	(0.830)
Years of conflict	-0.042**	-0.044*	-0.044*	-0.034	-0.032
	(0.018)	(0.024)	(0.024)	(0.021)	(0.021)
GDP (logged)	0.425	0.742	0.662	0.099	-0.032
	(0.498)	(0.661)	(0.669)	(0.573)	(0.582)
Population (logged)	-0.790	-0.341	-0.106	-0.844	-0.580
	(1.123)	(1.490)	(1.514)	(1.292)	(1.318)
Ethnic exclusion	2.361***	0.614	0.681	2.497***	2.821***
	(0.672)	(0.902)	(0.906)	(0.782)	(0.789)
Polity	-0.074**	-0.033	-0.030	-0.107***	-0.105***
	(0.033)	(0.044)	(0.044)	(0.038)	(0.038)
SALW imports (logged, t-1) x Rebel size (smaller)		0.048		-0.109	
		(0.078)		(0.068)	
MCW imports (logged, t-1) x Rebel size (smaller)			0.208		0.184
			(0.228)		(0.199)
Constant	8.281	-1.429	-2.951	10.032	9.713
	(7.486)	(9.945)	(10.009)	(8.625)	(8.716)
Observations	324	324	324	324	324
Fixed effects	Yes	Yes	Yes	Yes	Yes
R^2	0.437	0.481	0.482	0.636	0.633
Adjusted R^2	0.309	0.361	0.362	0.551	0.548
Residual Std. Error	1.540 (df = 263)	2.043 (df = 262)	2.042 (df = 262)	1.772 (df = 262)	1.778 (df = 262)
F Statistic	3.402*** (df = 60; 263)	3.988*** (df = 61; 262)	4.002*** (df = 61; 262)	7.495*** (df = 61; 262)	7.418*** (df = 61; 262)
Note:					*p<0.1; **p<0.05; ***p<0.01

Table 12. OLS regression with outliers removed.

	Dependent variable:				
	Total OSV (logged)	Rebel OSV (logged)		Government OSV (logged)	
	2	6	7	9	10
SALW imports (logged, t-1)	0.027	0.041	0.010	0.067	-0.002
	(0.028)	(0.051)	(0.025)	(0.044)	(0.022)
MCW imports (logged, t-1)	-0.128**	-0.012	-0.012	-0.061	-0.275**
	(0.064)	(0.060)	(0.136)	(0.051)	(0.116)
Rebel size (smaller)	-0.642	-0.609	-0.916*	0.446	-0.797*
	(0.487)	(0.639)	(0.550)	(0.547)	(0.470)
Years of conflict	-0.027*	-0.021	-0.021	-0.022*	-0.022*
	(0.015)	(0.014)	(0.014)	(0.012)	(0.012)
GDP (logged)	0.866**	0.401	0.367	0.816**	0.714**
	(0.422)	(0.393)	(0.390)	(0.336)	(0.334)
Population (logged)	-2.037**	-0.467	-0.425	-2.297***	-2.126***
	(0.965)	(0.894)	(0.893)	(0.766)	(0.764)
Ethnic exclusion	0.248	-0.130	-0.111	0.575	0.728
	(0.730)	(0.675)	(0.678)	(0.578)	(0.580)
Polity	-0.051	-0.016	-0.016	-0.075***	-0.076***
	(0.033)	(0.031)	(0.031)	(0.026)	(0.026)
SALW imports (logged, t-1) x Rebel size (smaller)		-0.038		-0.085*	
		(0.055)		(0.047)	
MCW imports (logged, t-1) x Rebel size (smaller)			-0.004		0.240**
			(0.142)		(0.121)
Constant	14.847**	1.711	1.752	16.682***	16.908***
	(6.495)	(6.005)	(6.009)	(5.142)	(5.139)
Observations	576	576	576	576	576
Fixed effects	Yes	Yes	Yes	Yes	Yes
R^2	0.420	0.409	0.408	0.495	0.495
Adjusted R^2	0.333	0.319	0.318	0.418	0.418
Residual Std. Error	2.193 (df = 500)	2.028 (df = 499)	2.029 (df = 499)	1.736 (df = 499)	1.735 (df = 499)
F Statistic	4.836*** (df = 75; 500)	4.539*** (df = 76; 499)	4.528*** (df = 76; 499)	6.426*** (df = 76; 499)	6.442*** (df = 76; 499)
Note:					*p<0.1; **p<0.05; ***p<0.01