The Impact of the Weapons Supply on the Course of War: The Russia Ukraine War

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Bachelor Thesis

The Impact of the Weapons Supply on the Course of War: The Russia-Ukraine War

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Bachelor Project - International Law, Use of Force, and Protection of Human Rights

Faculty of Social and Behavioural Sciences

Word count: 7962

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Introduction

The phenomenon of international armed conflicts is a multifaceted and unpredictable process. A key point of contention within scholarly discourse is the role of external states in supplying weapons to parties in conflict, given its potential to drastically alter the power dynamics and trajectory of the conflict (Pattison, 2015, pp. 458-459). Within the context of understanding conflict intensity, the Russian-Ukrainian war presents a compelling case study. A substantial portion of weapon supplies was directed toward Ukraine from the West, predominantly NATO countries, with Russia receiving a relatively minor supply from Iran and North Korea. This conflict presents the complementarity of historical, political, economic, and social elements that have a direct effect on contemporary conflicts (Ghincea, 2022; Michailova, 2022; Kurnyshova & Makarychev, 2022). Additionally, it emphasizes the role of international law and norms in shaping state conduct, and the potential aftermath of their infringement (Kumankov, 2022; Noonan, 2023). The aim is to bridge the research gap concerning the role of military aid on the intensity of the war. Thus, this paper will try to answer the research question: *How has the Western supply of weapons impacted the intensity of the Russia-Ukraine war?*

Understanding the causes of conflict intensity can be crucial. The results could potentially help prevent further violence in other regions as well. Additionally, looking at the Ukrainian-Russian conflict as a case study has two benefits. First, it allows testing existing theories in a new context, and second, it provides a robust explanation for the research question. The study possesses significant social relevance considering the constant evolution of conflicts and the transformation of international norms and behaviours. The Russia-Ukraine war impacts millions of lives directly and indirectly through displacement, economic disruption, and political uncertainty. Therefore, understanding the conflict's intensity could help understand how to de-escalate a conflict. Such research could play a significant role in informing effective policy responses, enhancing conflict resolution strategies, and contributing to international peace and security. For undertaking the research, it is necessary to use a dual process. On the one hand, it is crucial to account for the weapons supplied by the West to Ukraine, utilizing data from a public data set created from primary sources. On the other hand, to evaluate the conflict's intensity, another data set will be used, comprising data on the number of violent and non-violent incidents used to assess the intensity of the conflict. The paper will be organized as follows. The first section will review the relevant

literature on the topic. The second section will detail the theoretical framework to be employed in the thesis, followed by the formulation of hypotheses and the conceptualization of the independent and dependent variables. The third section will outline the research design, discuss the dataset, and describe the operationalization of the research. The fourth and last section will cover the analysis. Here will be presented a short background on the conflict, followed by the results. This final section will conclude with a discussion based on the results, alternative answers for the obtained results, and an attempt to answer the research question.

Overview of the Literature

Several studies have specifically analyzed the impact of weapons supplies on the intensity of the Russia-Ukraine conflict starting with the 2014 annexation of Crimea. For example, Galloy (2022) suggests that providing weapons to a party in a conflict could help change the balance of power (pp. 1-2). The concept centers on the belief that by enhancing Ukraine's military capabilities, the country could better defend itself against Russia. The presumption is that the increased risks and potential costs of a fortified Ukraine could make further intensification less attractive, thereby serving as an effective strategy for conflict mitigation.

However, other scholars have raised concerns about the potential risks associated with weapons provision. Mearsheimer (2015) argues that supplying weapons to Ukraine might provoke Russia to escalate the conflict even further and increase its military involvement in the region (paras. 3-5). The fear is that arming Ukraine could be considered by Russia as a direct challenge, thereby inducing a more aggressive response instead of deterrence (Lefèvre, 2015, p. 3). The literature also examines the potential for weapons supplies to create or exacerbate existing divisions within the conflict. Stanek (2015) points out that arms transfers can contribute to the fragmentation of armed groups, making peace negotiations and conflict resolution more difficult (pp. 50-58). Moreover, weapons provision can inadvertently empower extremist factions, as demonstrated in the case of the Syrian Civil War (pp. 46-50).

Direct Impact of Weapons Supply

Conflict, in its inherent complexity, is subject to a wide array of academic interpretations and analyses. For this investigation, the focus will be on differentiating how the conflict dimensions are influenced by the provision of weapons, as found in previous studies. The dimensions of conflict for this examination will be classified into five categories, following the model proposed by Raleigh, Linke, Hegre & Karlsen (2023). They propose a division between violent incidents: battles, drone attacks, explosions, and violence against civilians, and non-violent incidents, such as strategic developments (p.8).

Battles. Cohen's (2022) work underpins much of the discourse on this subject, proving that the introduction of Western weapons, particularly advanced systems like Javelin anti-tank missiles, significantly amplified the operational capacity of Ukrainian forces. Galeotti (2022) builds upon this, delving into the tactical changes brought by these systems. Frederick et al. (2022) argue that the provision of these weapons, while strengthening Ukrainian resistance, also provoked Russia into escalating its military efforts, leading to more intense engagements and protracted battles. In a contrary way, Tsygankov (2023) brings forward an argument suggesting that the increased capability of Ukrainian forces, backed by Western weapons, may have targeted not defeating Russia but forcing it to fight a 'war of attrition', attempting to wear down the Russian military over time. In an interesting twist, Jones, McCabe & Palmer (2023) note that the battlefield impact of these weapons goes beyond their destructive capacity (p. 8). Their report suggests that the presence of Western weapons has also encouraged both tactical and strategic innovation within the Ukrainian forces, as they adapt to effectively employ these advanced systems (pp. 7-10).

Drone Attacks and Explosions. The role of drone technology, provided largely by Western nations, adds a unique dimension to the conflict. Kunertova (2023) details how this technology has significantly bolstered Ukraine's surveillance and reconnaissance capabilities, leading to more efficient planning and execution of battlefield strategies. Expanding on this, she explains how drones have enabled precision strikes against Russian targets, thus also increasing Ukraine's offensive (pp. 96-97). Yet, these benefits have not come without their own set of repercussions. Kallerg (2022) notes that in response to the increasing drone threat, Russia has significantly enhanced its focus on anti-drone technologies and electronic warfare.

He further notes that this rapid development and deployment of countermeasures have triggered a sort of an arms race in drone and counter-drone technologies, increasing the overall intensity of the conflict and requiring better supplies from the West (paras. 4-12).

Freedman's (2023) analysis, though not explicitly connecting Western weapons supply to explosions, insinuates that the increased availability of advanced explosive devices from Western suppliers likely had a significant impact on the escalation of violence (pp. 47-49). In particular, the influx of powerful explosives would increase both the destructive potential of engagements and their unpredictability, thereby complicating the tactical landscape of the conflict. Further exploration of this subject can be found in the work of Biddle (2022), who asserts that the introduction of Western-provided high-explosive munitions and delivery systems led to significant changes in the operational tactics of the Ukrainian forces.

Violence Against Civilians. A consequential aspect of Western weapons supplies' impact on the intensity of the war is the heightened violence against civilians. Becker (2023) suggests that the influx of advanced weaponry from Western nations has led to an increase in collateral damage, with civilian populations often caught in the crossfire. This escalation is attributed to the intensification of military confrontations and the destructive potential of these weapons, which can inflict significant damage on civilian infrastructure. On a similar note, a study conducted by Stelzenmüller et al. (2023) provide insights into how advanced weaponry like drones, while enhancing precision strikes, may also inadvertently result in civilian casualties. The research of Kaldor (2023), however, brings forth a different perspective. They argue that the supply of Western weapons has indirectly amplified violence against civilians by giving Russia an excuse to escalate its actions under the pretext of defending Russian-speaking communities in Ukraine (paras. 15-23).

Protests and Riots. Studies by Darczewska and Żochowski (2015) suggest that the external involvement of Western countries manifested through the provision of weapons may have aggravated social tensions within Ukraine. While these tensions often arise from domestic issues, the perception of Western interference could act as a catalyst, exacerbating existing divisions and grievances within Ukrainian society. Cook-Huffman (2009) looks further into the role of identity and societal narratives in shaping conflict dynamics, arguing that these

factors can contribute to an intensification of violence and make conflict resolution more difficult. In such cases, civil society may start protests or riots against the occupying forces. As seen in Ukraine, such riots that took place in the occupied regions can have a strong effect on the escalation dynamics (McFadden, 2022).

Strategic Developments. The impact of Western weapon supply on strategic developments within the context of the Russia-Ukraine conflict is a crucial dimension. Following the definition set forth by ACLED (2019), strategic developments are non-violent activities by violent groups that "may trigger future events or contribute to political dynamics within and across states" (p. 15). The supply of weapons from the West has potentially influenced the strategic activities of both Russian and Ukrainian forces. The work of Menon and Rumer (2015) presents evidence of increased recruitment drives by Ukrainian forces, potentially stimulated by the availability of superior weapons systems provided by Western nations. On the other hand, Kendall-Taylor & Kofman (2022) highlights how the influx of Western weapons into Ukraine has compelled Russia to intensify its strategic operations. This includes pre-emptive arrests of suspected Ukrainian operatives within Russia and heightened disinformation campaigns, all aimed at counterbalancing the bolstered Ukrainian resistance (OECD, 2022).

Realist Theories for Understanding the Supply of Weapons

The Russia-Ukrainian conflict and the role of Western weaponry in influencing its intensity have raised scholarly interest within the realm of international relations (Pach, 1991; Phythian, 1997; Schmitt, 2014). To reveal the complexities and nuances of this issue, it is necessary to construct a theoretical framework anchored in both offensive and defensive realism, aimed at assessing the impact of power and self-interest on state conduct. While realism may not invariably illuminate every international relations process, it possesses the most powerful explanatory potential for understanding the trajectory of conventional wars. In the context of the Russia-Ukraine conflict, the usefulness of realism becomes evident, especially when analysing the actors and the intensity of the conflict. Primarily, realism acknowledges the anarchic nature of the international system which accurately describes the

geopolitical context of the Russia-Ukraine war. Additionally, the Western powers' involvement, characterized by their weapon supplies to Ukraine, can be explained by the balance of power and national interest. Realism also emphasizes survival as the primary goal of states, which is evident in Ukraine's determined resistance. Moreover, Gotz (2017) presents how realism prevails over other IR theories in providing an explanatory cause in such circumstances (pp. 245-246). Therefore, this essay will articulate a theoretical argument encompassing the concepts of the security dilemma, the spiral model of conflict escalation, the balance of power theory, and the deterrence theory.

1. ***A Realist Perspective and the Security Dilemma*****.** Realism is a prevailing theory in international relations, asserting that states are principally driven by self-interest and the quest for power (Morgenthau, 1973). Realists start with their assumption that states "are expected to act in strategically smart ways most of the time" (Mearsheimer, 2009, p. 246). It appears that in the war between Russia and Ukraine, each of the opponents is escalating or deescalating based on their assessment of the conflict situation. Gotz (2016) further elaborates on the intensification of a conflict by creating a three-stage model which holds that "major powers use soft-power and hard-power tools to constrain the foreign-policy autonomy of neighbouring states" (Gotz, 2016, p. 301). This perspective facilitates an understanding of the motivations underpinning the actions of Russia, Ukraine, and Western nations, as well as the impact of Western arms on conflict intensity.

Upon delving further into the framework, the security dilemma surfaces, proposing that one state's pursuit of security can induce insecurity in others (Herz, 1950). Within the Russia-Ukrainian conflict context, the security dilemma is evident in the provision of Western arms to Ukraine. On the one hand, NATO perceives a Russian victory as a direct security threat, necessitating the provision of weapons to Ukraine. On the other hand, Russia interprets this support as a threat. Such circumstances may incite a response to offset the perceived threat, potentially escalating the conflict further (Galloy, 2022, pp. 3-4). Consequently, the security dilemma provides an explanation for Russia's actions and the Western decision to dispatch increasingly sophisticated and destructive weaponry.

2. *The Spiral of Conflict Escalation* . Extending the concept of the security dilemma, the spiral model of conflict escalation posits that conflicts often intensify through a succession of reciprocal actions and counteractions (Jervis, 1978). In the context of the Russo-Ukrainian conflict, the provision of Western weaponry to Ukraine could be instigating a spiral of escalation, with both Russia and Ukraine reciprocating each other's actions with incrementally escalatory measures (Kurowska & Tallis, 2017). When the West dispatches more lethal weapons to Ukraine, Russia might interpret it as an escalation and bolster its forces in response. This theory underscores the potential dangers associated with external involvement in the conflict, as it may inadvertently perpetuate a cycle of violence and augment the conflict's brutality.

3. *Balance of Powers and Deterrence Theories*. The balance of power theory, as proposed by Morgenthau (1973), supports the idea that states aspire to maintain an equilibrium in the international system to prevent the dominance of any single actor (pp. 3-12). When viewed through this theoretical lens, the Russia-Ukraine conflict becomes a stage where power dynamics are played out. Western countries supplying weapons to Ukraine can be perceived as a strategic attempt to maintain a balance of power within the region. It is essential to remember the vast disparity in military power that existed when Russia first attacked Ukraine. Russia, then regarded as the second most powerful military force globally, significantly overshadowed Ukraine's defence capabilities. Consequently, Western nations supplying weapons to Ukraine could be seen pushing to level the playing field, striving to restore some semblance of balance. Through this theory, it is also possible to understand how, as the war escalates even further, supplies will increase and thus potentially exacerbate the intensity of the conflict.

In contrast, the deterrence theory, as outlined by Schelling (1966), proposes that states can deter escalation by demonstrating their ability and preparedness to retaliate (pp. 92-104). This theory provides an alternative perspective to comprehend the provision of Western weapons to Ukraine. It can be interpreted as a symbolic act of deterrence, signalling to Russia that any further intensification of the conflict will be met with heightened resistance. By supplying weapons, Western countries might aim to project an image of a resilient Ukraine, a country capable of standing its ground. Through those lenses, the West might try to send the message to Russia that the war in Ukraine cannot be won through military means. The only

feasible resolution lies at the end of hostilities and diplomatic negotiations, and therefore the theory serves to explaining the possible reduction of the intensity of the conflict.

Chapter Conclusion. The theoretical framework and literature review provide a comprehensive understanding of the impact of Western weapons on the intensity of the Russia-Ukraine conflict. This means that the paper will look not only at how Ukraine or Russia escalate the conflict but also at the overall intensity of the war. The aim is to understand the interconnectedness of those theories and their collective contribution to our understanding of the conflict. Thus, the framework enables a nuanced analysis of the factors that drive conflict intensity, the role of external suppliers, and the potential consequences of their involvement. As a result, the research question of this paper is: *How has the Western supply of weapons impacted the intensity of the Russia-Ukraine war?*

Generating the Hypotheses

Table 1. Presentation of the Hypotheses

Hypothesis		Description
Hypothesis 1	H1	An increased provision of Western weapons leads to a decrease in the intensity of the Russia-Ukraine conflict.
Hypothesis 2	H2	An increased provision of Western weapons leads to a decrease in the number of battles in the Russia-Ukraine conflict.
Hypothesis 3	H3	An increased provision of Western weapons leads to a decrease in explosions and remote violence in the Russia-Ukraine conflict.

Based on the literature review and theoretical framework, this study aims to explore the extent to which Western weapons impact the intensity of the conflict in Ukraine. As a result, there can be developed three hypotheses that seek to address various dimensions of this relationship.

The first hypothesis (H1) suggests that an increased provision of Western weapons leads to a decrease in conflict intensity in the Russia-Ukraine conflict. This hypothesis is

grounded in the balance of power and deterrence theories, which suggest that enhancing Ukraine's military capabilities would make Russia less likely to engage in escalatory actions due to the risk of retaliation and higher costs. The logic behind this hypothesis is that a well-equipped Ukrainian military would serve as a more potent adversary with capabilities that prevent the intensification of the conflict. The result is attempting to influence Russia to reconsider the potential consequences of escalating the conflict and making it harder for any of the sides to escalate. At the same time, the weapons should not be sufficient for Ukraine to be able to escalate the war either. However, as shown in the literature review, the weapons supplied may have a different impact on distinct aspects of the war that are being used to assess the intensity of the conflict. Therefore, two more hypotheses can be elaborated based on the literature review.

Moving on to the second hypothesis (H2), it supports that an increased provision of Western weapons leads to a decrease in the number of battles in the Russia-Ukraine conflict. The expectations for this hypothesis are built from a two-fold perspective. Primarily, as suggested by H1, the general trend of the intensity is expected to decrease, and thus, each component should follow a similar trend. Second, based on the literature review, it is expected that the weapons supplied by the West are reducing the intensity of the war in two different ways. Firstly, the influx of such armaments could compel Russia to shift its strategy towards a 'war of attrition', thereby reducing the occurrence of direct battles. Secondly, the introduction of technologically superior weaponry alters battlefield tactics, which is anticipated to contribute to a decline in the frequency of battles.

The third hypothesis (H3) suggests that an increased provision of Western weapons leads to a decrease in explosions and remote violence (drone strikes) in the Russia-Ukraine conflict. The foundation for the expectations of this hypothesis is constructed on dual grounds. First, and similarly to H2, since the general trend of the intensity is expected to decrease based on H1, each of the components should follow such a trend. Secondarily, this hypothesis derives its strength from the literature review, which suggests potential mechanisms through which the provision of Western weapons could effectively reduce the occurrence of explosions and remote violence. Particularly, weapons provided by the West allow for more efficient planning and execution of battlefield strategies, reducing the number of violent engagements. Additionally, the defensive systems delivered by the Western nations have the specific function of safeguarding Ukraine from drone and missile attacks. This not

only deters potential attacks from Russia but also significantly contributes towards a substantial reduction in the frequency of explosions and incidents of remote violence.

Defining the Principal Variables

Providing a rigorous and comprehensive analysis requires the conceptualization of the independent and dependent variables: the 'supply of weapons' and the 'conflict intensity'. This process includes defining and measuring these variables based on existing academic literature, and in doing so, the foundation will be set for the subsequent analysis.

The Supply of Weapons. The independent variable - the supply of weapons - has been examined by scholars through various lenses. One approach is to measure the total quantity of weapons delivered to Ukraine, encompassing small arms, light weapons, ammunition, armoured vehicles, and advanced weapon systems (Antezza et al., 2023; SIPRI, 2022) Furthermore, researchers have considered the types of weapons supplied, categorizing them as either defensive or offensive (Levy, 1984, pp. 219-220). This distinction clarifies the strategic implications of the weapons provided and their possible effects on the intensity of the conflict (pp. 219-228). In this vein, Johnson (2017) divides the supplies, by splitting them into "land weapons […] gun ADS, missile ADS, towed artillery, self-propelled artillery, armoured vehicles, and tanks – and […] aircraft – support aircraft, transport aircraft, bomber aircraft, attack aircraft, support helicopter, transport helicopter, combat helicopter, and unmanned aerial vehicles" (pp. 278-279). This approach considers the impact of weapons as decisive as categorizing weapons by type, while still considering the quantity and legal and ethical considerations of weapons. Lastly, examining the monetary value of the weapons supplied can capture the financial investment made (Peleg, 1977). This approach highlights the scale of support and its potential impact on the conflict.

To adopt an inclusive approach, this study will rely on the value of the weapons supplied by the West. This choice is made because it is the most reliable option based on the current context. Considering that the war is still ongoing, some of the suppliers report the value of their aid but are not always transparent regarding the exact weapons that are supplied. Therefore, a complete perspective of the total quantity of weapons supplied or the

specific types of weapons cannot be established. In addition, the timeline of weapons deliveries is even more secretive. This is done intentionally so that Russia will not be able to target the deliveries, and, therefore, an analysis of the weapons deliveries or a time-lagged analysis remains impossible. Therefore, the analysis of weapons supplied through the monetary value of the aid is the only viable option for such research while the conflict is still ongoing.

Table 2: ACLED Event Types

General	Event Type	Sub-Event Type
Violent events	Battles	Armed clash
		Government regains territory
		Non-state actor overtakes territory
	Explosions/Remote violence	Chemical weapon
		Air/drone strike
		Suicide bomb
		Shelling/artillery/missile attack
		Remote explosive/landmine/IED
		Grenade
	Violence against civilians	Sexual violence
		Attack
		Abduction/forced disappearance
Demonstrations	Protests/Riots	Peaceful protest
		Protest with intervention
		Excessive force against protesters
		Violent demonstration
		Mob violence
Non-violent actions	Strategic developments	Agreement
		Arrests
		Change to group/activity
		Disrupted weapons use
		Headquarters or base established
		Looting/property destruction
		Non-violent transfer of territory
		Other

Source: Table from *Armed Conflict Location & Event Data Project (ACLED) Codebook, 2019* (p. 8), by ACLED, 2019.

Conflict Intensity. Moving on to the dependent variable - the intensity of the conflict - various methods have been used to define and measure this concept. One approach counts the number of attacks, clashes, and other military engagements over a given period, providing

insight into the intensity and fluctuations of the conflict (Kalyvas, 2006). Another perspective measures both military and civilian casualties over time, shedding light on the human costs and the severity of violence (Gleditsch et al., 2002). Finally, assessing the impact of diplomatic and political events, such as peace talks or sanctions, on the intensity of the conflict can help understand the role of external factors in shaping the conflict's trajectory (Raleigh et al., 2023).

Given the current international context, publicly available information might be incomplete, or potentially skewed due to war propaganda and secrecy. Such an issue does not allow for the use of military casualties to explore the intensity of the war. Therefore, the choice for this study is to define the intensity of the conflict by looking at the aggregated number of violent and non-violent incidents. Those incidents include battles, explosions and remote violence, protests and riots, and strategic developments. Table 2 provides, through the sub-event type column, a rigorous description of what each of these categories includes. Such an approach will only be based on primary sources, thus considerably reducing the chance of using altered data.

Research Design

1. *Methodology*. Given the research question, the theoretical frameworks employed, and the concepts in play, the most suitable methodological approach is a deductive one, using a longitudinal single-case study. A single-case study allows for an in-depth investigation of a singular case, providing a clear explanation (Halperin & Heath, 2020, pp. 234-237). It also helps by allowing the application of existing theory to a new context (Ulriksen & Dadalauri, 2016, pp. 223-225). Additionally, it holds critical value for testing theory, as it may reveal relationships that are unattainable through other means. This approach will facilitate a comprehensive exploration of the conflict's intricacies and aid in examining the effect of the weapons supplies on the intensity of the war.

This investigation will, therefore, concentrate exclusively on the Russian-Ukrainian conflict and its evolution over a year since its starting day, implementing a single-N study method. The time limitation is due to constraints in the datasets used. The selection of this case is based upon the relevance of the Russian-Ukrainian war, marked as the first post-WW2

conflict in Europe fought with such intensity and stakes. Initially deemed a "limited special military operation" (Putin, 2022, para. 4), the conflict swiftly evolved, assuming the form of a "total war" (Clausewitz, Howard & Paret, 2008, p. 113), as the existence of both Ukraine and Russia appears to be at stake. This conflict presents a novel perspective, as prior research typically examined weapons support for non-state actors, such as rebels (Ramsbotham, Woodhouse, & Miall, 2016). In contrast, this study scrutinizes weapon supplies directly to states, particularly in a conflict where one of the belligerents is a nuclear power, echoing a contemporary version of the USA-USSR indirect war.

To assess the data and explore the relationship between the variables, statistical methodologies such as regression analyses will be employed. Running the regression requires the use of the Ordinary least squares (OLS) method, which can quantify the relationship between the predictors and the response. This method permits the quantitative evaluation of the direction, strength, and significance of the link between the independent and the dependent variables (Field, 2018, pp. 502-526). There will be implemented three regression analysis. The first will be on the impact of Western supplies on the aggregated incidents, which is the variable used to measure the intensity of the war. The other two regressions will focus on narrower aspects of the conflict, directly analyzing the impact of military aid on two of the categories that compose the aggregated incidents, namely: 'Explosions/Remote violence' and 'Battles'.

2. *Data Set*. The research design for this study primarily involves the creation of a data set that consolidates information relevant to the supply of weapons to Ukraine and the intensity of the conflict. It is posited that a quantitative analysis approach would be appropriate for an exhaustive investigation. Accordingly, data for both variables of interest will be amassed from two already created datasets that draw their figures from primary sources. The first is '*The Ukraine Support Tracker: Which countries help Ukraine and how?*' and contains information related to the delivery of weapons by the West (Antezza et al., 2023). This dataset includes information such as the time of announcement for the supply, what weapons it includes, the total cost of the supply, when it was delivered, and sources for all data (sheet 1). The dataset created for this paper will also incorporate data drawn from a second dataset, the 'Ukraine Black Sea 2020-2023' (ACLED, 2023). This dataset contains

data about the incidents that took place during the Russia-Ukraine war. It includes data about the incident types, when they occurred, where they happened, and the sources (sheet 1).

The newly created dataset will be divided into distinct sections that correspond to the independent variable (supply of weapons) and the dependent variable (conflict intensity). The time granulation will focus on the aggregation of both variables per week, starting from the first day of the war (February 24, 2022), thus preventing high differences in range, and numerous outliers. The scope of research will emphasize immediate impacts over time-lagged effects. This approach is justified due to the observed patterns throughout the war, where it was evident that by the time a supply package was publicly announced, the weapons had often already been in operational use by Ukraine for several days (Kyiv Post, 2023). It should also be noted that the constraints of this thesis do not allow for a detailed investigation into the exact time lags required for each supply to exert its impact. Despite the exclusion of time lag analysis from this study, it is crucial to underscore that the research is not biased due to its absence. The chosen methodology is aligned with the pragmatic realities of conflict dynamics and available data, ensuring the reliability and validity of the research findings. Through the systematic compilation and organization of the data, the research aims to analyze the relationship between the two variables methodically.

Table 3. Display of the Variables

Variable Type	Variable Name	Coding	Categories
Independent Variable	Supply of weapons	No code	Only the monetary value in US Dollars for each supply
Dependent Variable	Conflict intensity	0	Explosions/Remote violence
		1	Battles
		2	Violence against civilians
		3	Protests/Riots
		4	Strategic developments

3. *The Two Variables Under Research*. The supply of weapons - the independent variable – includes the monetary value of each supply announced to Ukraine for military purposes. The selected variable will be evaluated based on its monetary value, denominated in US Dollars. This method is necessary primarily due to the data set's provision of the value of the supplied weapons in the currencies of the sending countries, EUR, and USD. The preference for the USD over any other currency is attributed to the fact that the principal

provider of weaponry is the United States. The determination to use monetary value, as opposed to quantifying the type and number of weapons, was made considering the ongoing status of the war. States are not always forthcoming with the precise figures of weaponry, choosing to report the monetary worth of the weapon package instead. Therefore, adopting an approach akin to the one employed by Hagelin, Wezeman, Wezeman & Chipperfield (2002), is considered the most effective.

For analyzing the supply of weapons, the study will employ a dataset created by Antezza et al. (2023), titled '*The Ukraine Support Tracker: Which countries help Ukraine and how?*' selecting only the data from the beginning of the conflict on February 24, 2022, until February 24, 2023 (sheet 2). The dataset provides numerous details and "lists and quantifies military, financial and humanitarian aid transferred by governments to Ukraine" (sheet 1). It draws the data from public commitments made by the governments (sheet 1). As was discussed in the conceptualization section, the data regarding the delivery and the exact weapons might be biased because of the secrecy or the propaganda that exists on both sides in the fog of war. Therefore, the data that will be used consists of the date when the commitment was made, as well as its total value in dollars. However, the variable requires two manipulations before it can be used in the statistical analysis. First, it will be divided into millions of dollars. Afterwards, because the variance is too large, numerous extremities appear, which would render the analysis almost impossible. Therefore, it is also necessary to apply a logarithmic transformation. This choice provides a comprehensive acknowledgement of the supply of weapons and enables testing the correlation with the dependent variable.

On the other hand, the intensity of conflict, the dependent variable, will be assessed through the indicators of incidents. Those incidents are divided into five categories each representing a type of incident that can occur in war, namely: (0) Explosions/Remote violence, (1) Battles, (2) Violence against civilians, (3) Riots/Protests, (4) Strategic developments. For the statistical analysis, the dependent variable will appear as the aggregated incidents, or the constitutive categories will be used. Aggregating the five categories is feasible as they collectively represent various aspects of conflict intensity. From the beginning, in the ACLED (2019) codebook, it is mentioned that these categories represent the violent and non-violent aspects of the war (pp. 7-18). Thus, the aggregate measure will explain the overall intensity of the war, while the individual categories describe the evolving trends of specific conflict dimensions. This method ensures that the research maintains an unbiased approach and retains its explanatory power. The data will be collected from the

Raleigh et al. (2023) dataset '*Ukraine Black Sea 2020-2023'*. Here it is presented how many violent and non-violent incidents occurred daily (sheet 1). The data is collected from primary sources such as newspapers, OECD's assessments, or publications of the participant parties to the conflict (ACLED, 2019, para. 6). For this paper, the data drawn from this data set will be the date of each incident and its type. The period will be restricted between February 24, 2022, and February 24, 2023, to fit with the independent variable.

Undertaking the Analysis

1. *In-Depth Analysis of the Conflict in Ukraine*. The conflict between Russia and Ukraine has emerged as a significant concern in the field of international relations over the past two years. The conflict can be historically traced to the old relations between Russia and Ukraine, which are characterized by centuries of intertwined history and territorial disputes (Hauter, 2014, pp. 38-39). The downfall of the Soviet Union led to the independence of Ukraine and completely changed the Soviet space. With time, tensions and crises appeared in Ukraine leading to the 2004 Orange Revolution, the 2014 Euromaidan protests, the annexation of Crimea, and the ongoing war between Ukraine and the Russian Federation (Gotz, 2016, pp. 307-316; Noonan, 2023, pp. 1-2; 11-16). The main reason is the political bipolarity of the Russo-Ukrainian relationship. The conflict is shaped between Russia, with the intent of retaining Ukraine within its sphere of influence and outside the EU and NATO, and a pro-European Ukraine that resists puppet state status (pp. 301-305). Additionally, economic factors such as energy security, trade dynamics, and economic sanctions had a substantial impact on the conflict's trajectory (Astrov et al., 2022, pp. 22-23). Socially, the conflict led to significant repercussions for the populations within the affected areas, including issues such as displacement, human rights violations, and the emergence of nationalist sentiments (Bischoff, 2023).

2. *The Evolution of the War's Dynamics.* The Russia-Ukraine war has evolved continuously, with different phases marked by varying levels of intensity, strategies, and the involvement of external actors. The initial phase of the conflict, following the advance toward Kyiv, saw a rapid escalation of violence in Northern, Eastern, and Southern Ukraine (Psaropoulos, 2022).

This period was marked by the emergence of Ukrainian separatist movements inside the territory occupied by Russia, the intervention of Russian forces and PMCs, and the significant increment of Western support for Ukraine, which led to multiple Ukrainian offensives (Greenall, 2023; James, 2023). Subsequent phases of the conflict have witnessed fluctuating levels of violence, with periods of relative calm punctuated by an increase in intensity and offensives (Gonzalez & Lynch, 2023). The strategies employed by the actors involved have also evolved, with Russia adopting a total war approach that combines conventional and unconventional tactics, information warfare, and economic pressure. The involvement of Western countries has grown over time, with increased provision of weapons, training, and financial support to Ukraine (Antezza et al., 2023).

Results of Supplied Weapons Impact on Conflict Intensity

Running the statistical analysis consists of undertaking one main regression containing the independent and the dependent variables, followed by two regressions checking for the impact of the independent variable on the categories of the dependent variable. Before presenting any results, it is relevant to check whether the assumptions of linear regression are met. Five relevant assumptions need to be verified: continuity, normality, linearity and homoscedasticity, multicollinearity, and the absence of outliers and influential cases. Their proof of testing is mentioned in Appendices A to F. As a result, it is only possible to run the linear regression for the overall incidents, and for the categories of 'Battles' and 'Explosions/Remote violence'. For the 'Protests/Riots', 'Violence against civilians', and 'Strategic developments' it is impossible to run the regression since they do not meet the assumptions required for such statistical analysis, as can be seen in Appendices D, E, and F.

Table 4. Linear regression model of the impact of supplied weapons on conflict intensity

	Model 1
(Constant)	1095.86***
	(103.36)
Supply of Weapons	-96.959**
	(32.87)
R^2	0.16
Adj. R^2	0.14

N	49

Note: OLS regression coefficients with standard errors in brackets.
***p < 0.001, **p < 0.01, *p < 0.05

First, the results of the regression addressing the impact of the weapons supplied on conflict intensity show a trend where the weapons sent to Ukraine reduce the intensity of the conflict. The bivariate correlation between these two ($R^2 = 0.16$, $p < 0.001$) means that, as the supplies increase in value, the number of aggregated incidents decreases. As a result, Hypothesis 1 can be accepted since the results prove that an increased supply of Western weapons leads to a reduction in conflict intensity.

Table 5. Linear regression model of the impact of supplied weapons on battles

	Model 3
(Constant)	78.47***
	(20.67)
Supply of Weapons	14.07*
	(6.58)
R^2	0.08
Adj. R^2	0.07
N	52

Note: OLS regression coefficients with standard errors in brackets.
***p < 0.001, **p < 0.01, *p < 0.05

Table 6. Linear regression model of the impact of supplied weapons on explosions/remote violence

	Model 2
(Constant)	925.591***
	(11251)
Supply of Weapons	-100.37**
	(35.61)
R^2	0.14
Adj. R^2	0.12
N	50

Note: OLS regression coefficients with standard errors in brackets.
***p < 0.001, **p < 0.01, *p < 0.05

Second, the regression addressing the impact of weapons supplies on the 'battles' and 'explosions/remote violence' reveals quite an interesting side of the conflict. The two variables show different trends. The bivariate correlation between the weapons supplied and 'battles' ($R= 0.08$, $p < 0.001$) supports that as the monetary value of weapons supplied to Ukraine increases, the number of battles will increase. In opposition, the bivariate correlation between the weapons supplied and 'explosions/remote violence' ($R= 0.14$, $p < 0.001$) suggests that as the monetary value of weapons supplied to Ukraine increases, the number of explosions and remote violence will decrease. Therefore, Hypothesis 2 can be accepted, while Hypothesis 3 cannot be accepted.

Implications of the Analysis

Impact on the Main Theories Utilized. The exploration of the consequences of Western weapon supplies on the intensity of the Russia-Ukrainian war holds significant ramifications for the theoretical structures employed within this research paper. Conventionally, the spiral of conflict theory supports that a state's defensive maneuvers may be misconstrued as aggressive threats by an adversary, thereby igniting an escalating spiral of conflict (Jervis, 1978, pp. 180-188). This is typically tempered by the balance of power dynamics, with each state striving to preserve or augment its power to ward off subjugation by the other. Nevertheless, the findings drawn from this study diverge from some of the theoretical expectations. Instead of amplifying hostilities, the upsurge in military aid to Ukraine seemed to diminish the overall intensity of the conflict and the number of explosions and remote violence. As a result, it proves necessary to reevaluate these theories in scenarios where bolstering a less dominant actor could diminish rather than exacerbate the intensification of a conflict. It is plausible that once a certain equilibrium of power was established, further conflict intensification would have posed a challenge for either party. This could occur if defensive weaponry was continually supplied, as witnessed in the current case. However, as the results prove, the armament increased the number of battles, which partially confirms the spiral of conflict. This might also be a result of the Ukrainian offensive aimed at retaking the occupied territory.

These results facilitate the implementation of the deterrence theory. Grounded in the assumption that a show of military prowess or the potential for retaliation can deter an

adversary from initiating aggressive actions, this theory provides a basis for understanding the outcomes of this study. The evidence suggests that Ukraine successfully deterred Russia from intensifying the conflict via the weapons it acquired. Concurrently, the supplies were not adequate to enable Ukraine to escalate the conflict independently but rather to stabilize the situation. It may thus be hypothesized that belligerents might have been inclined to escalate the conflict due to the supplied weapons. Despite that, they were incapable of doing so upon reaching a state of parity in the balance of power. It is also possible that this is just a flare-up in the ongoing conflict, and both Russia and Ukraine are gathering their weaponry to begin new offensives that will escalate the conflict. It is also pertinent to note that while delivered weapons decreased the total incidents and instances of explosions/remote violence, they resulted in an increased frequency of battles. While the supplied armament might offer protection against explosions and remote violence, the sole alternative to avoid conflict stagnation resulted in a rise in traditional military clashes. These findings support the validity of the deterrence theory in this context and illuminate the role of external backing in determining conflict trajectories. Overall, the application of these theories could yield different outcomes based on additional variables at play within a conflict. Nevertheless, the balance of power remains an instrumental framework for comprehending the intensity of a conflict.

Link to the Literature. Traditionally, as described in the literature review, research offers contradictory answers to whether providing external military aid in a conflict can reduce the flames of war. The data obtained from the Russia-Ukraine conflict indicated that weapons supplies reduced conflict intensity. However, the number of battles contradicted the general trend. This result could also be a consequence of the conflict transitioning into a 'war of attrition', where the intensity of individual battles may decrease but their frequency increases. Furthermore, the analysis reinforces the necessity for a context-specific approach to conflict intensity, highlighting that the impact of supplying weapons depends on the complex mix of situations and conditions present. It supports the potential diversity in the outcomes driven by the purpose of the aid. In the ongoing Russia-Ukraine conflict, the intent behind Western weapons supplies has been to bolster Ukraine's defensive capabilities and deter further Russian territorial incursions. In contrast, Russia may have perceived arming Ukraine as an increasing threat, or Ukraine could have used its newly acquired weapons to escalate the conflict on its own. Lastly, the differences in outcomes might be due to advancements in

military technology. In the contemporary geopolitical climate, superiority in technology might supersede numerical strength. With the provision of technologically advanced weapons, Ukraine may have been able to dissuade Russia from further increasing the intensity and protect its population from remote attacks and explosives. Conversely, these weapons were typically defensive and insufficient to enable Ukraine to increase the intensity of the conflict.

Conclusion

The current paper was centered around the critical examination of the influence of Western weapons supplies on the intensity of the Russia-Ukraine war and the resulting implications for the prevailing theories that served as a theoretical framework for this research. A quantitative method of analysis underpinned by a realist theoretical framework was employed in this study. The empirical results indicate that increasing Western military aid led to a significant reduction in the intensity of the conflict. This conclusion is supported by multiple key findings presented within this thesis. Several realist theories, aided by the previous literature on weapons supplies to both states and rebel groups, were used to prepare the investigation. The weapons supply only showed one unexpected trend when the impact was measured on the number of battles. The overall results suggest a scenario where an equilibrium of power, achieved via external aid, could discourage the advancement of conflict. Understanding the strengths and constraints of this research is crucial to analysing its implications. The paper's major strength lies in its case study approach, enabling an exhaustive exploration of the ongoing conflict. Additionally, its contemporaneity is another advantage. The hypothesis that conventional war is unlikely in today's world is long-standing. Hence, a study of such conflict provides a wealth of new information. It offers valuable insights into the applicability of realism theories in today's world, and how conflict intensity has evolved in comparison to the analyses presented in the literature review. Lastly, shifting the focus from studying armed support for rebel factions, a prevalent topic in recent academic literature, to analysing military aid given to states offers a new perspective in the field of international relations.

However, the research presents several limitations. First, the argument does not account for Ukrainian weapons sourced from Russia, which could potentially impact the balance of

power. This oversight is particularly significant given the frequent capture of substantial quantities of Russian weaponry by Ukraine at the frontline (Segura, 2022). Second, the study has not adequately addressed the role of the type of weaponry supplied in shaping conflict dynamics. As Johnson (2017) discussed, different types of weaponry may have different types of effects on the intensity of a conflict (pp. 279-282). A more thorough examination of this aspect could reveal more nuanced effects of external military assistance. Third, another limitation could be the temporal scope of the study, which was constrained to one year due to data set limitations. The current approach might not fully capture the long-term effects of military aid on the conflict. Given the intricate nature of the Russia-Ukrainian war (propaganda, secrecy) and the fog of war, a comprehensive understanding of weapon supply implications may only be attainable once the conflict concludes. Finally, conducting a time-lagged analysis was deemed impractical. This primarily appeared from the inconsistency in the announcement of weapons supplies, with some being publicized after the delivery, and others prior, often without specifying the exact date of the weapons' arrival in Ukraine. Undertaking such an analysis would necessitate evaluating various time lag alternatives to identify the best fit, a process that would overly complicate the analysis. Moreover, the feasibility of such a research design is hindered by the length constraints of the current thesis. To mitigate potential bias, a solution was found in the form of aggregating the delivery of weapons per week instead of per day. However, it is worth noting that future research could potentially incorporate a time lag analysis. For optimal results, this would ideally be undertaken post-conflict, once a comprehensive data set is accessible.

Concluding, multiple opportunities for future research emerge considering these limitations. An extension of the study period or a post-conflict analysis could offer a more comprehensive understanding of military aid's long-term impacts. Additionally, a granular examination of the types of weapons supplied and their specific impacts on conflict intensity could greatly enhance the understanding of these dynamics. A detailed examination of the types of weapons supplied and their specific impact on conflict intensity could also help interpret these dynamics. Through all the elements named before, this thesis provides a novel viewpoint on the understanding of conflict intensity in the Russia-Ukraine war. It illustrates that external military aid may contribute to reducing the intensity of conflict under certain circumstances rather than inevitably fueling it. Therefore, it appears the necessity for a nuanced, context-specific approach in conflict analysis that considers the dynamics of

modern conflicts. While the thesis has discovered new paths for exploration, it also reaffirms the imperative for ongoing research and assessment in the international relations field.

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Appendices

Appendix A - Linear regression analysis assumptions for the supply of weapons and the aggregated incidents

1. *Assumption of continuity*

   Both the independent (supply of weapons) and dependent variables (aggregated incidents) are being considered continuous for the analysis, so the continuity assumption is met.

2. *Assumption of normality*

Regression

/missing listwise

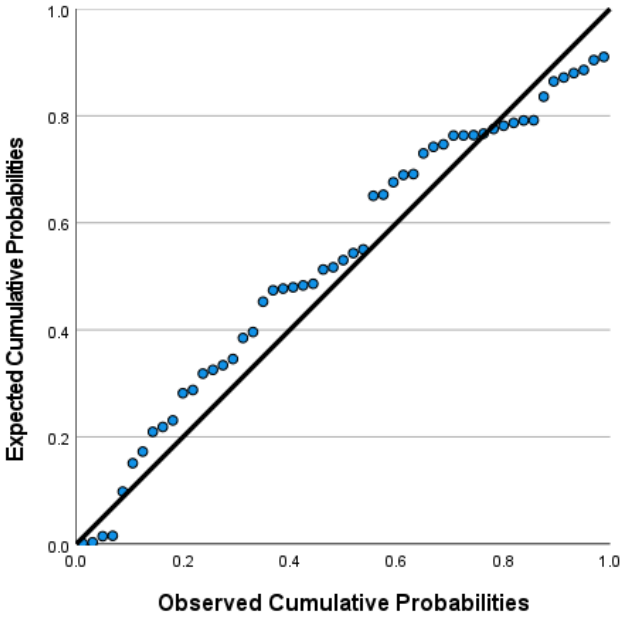
/statistics coeff r anova tol

/dependent aggregated_incidents

/method = enter log_supply_of_weapons

/residuals normprob(zresid).

Figure A.1. P-P Plot of regression standardized residual



Note: Dependent Variable: Aggregated Incidents

The normality assumption is not violated. Residuals of the regression follow a quasi-normal distribution.

3. Assumption of linearity and homoscedasticity

Regression

/missing listwise

/statistics coeff r anova tol

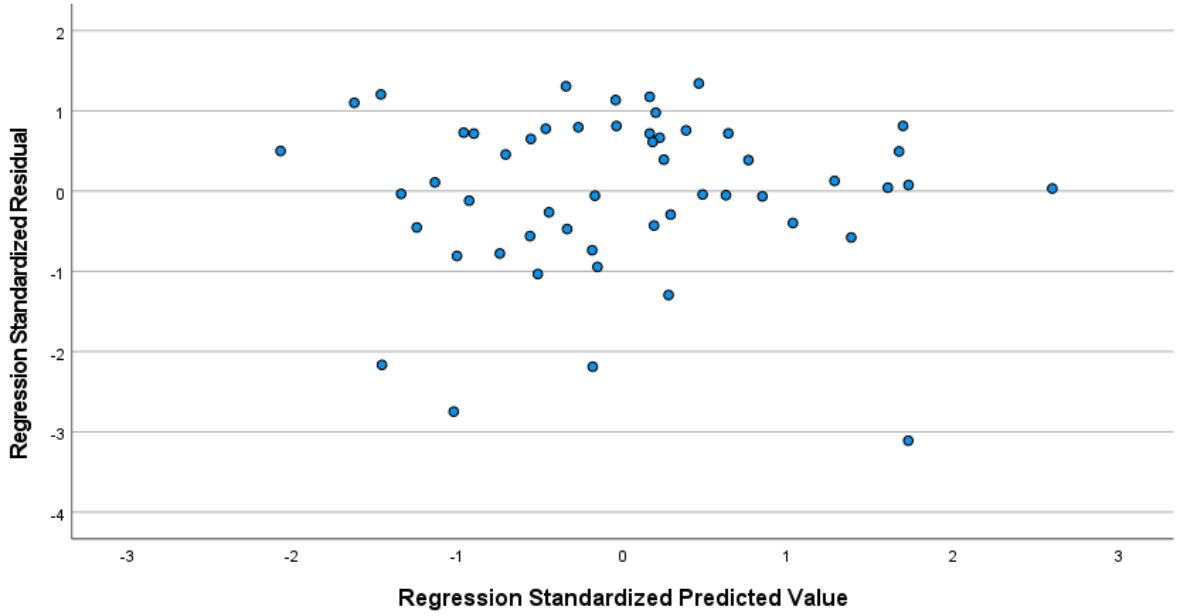
/dependent aggregated_incidents

/method = enter log_supply_of_weapons

/partialplot all

/scatterplot = (*ZRESID, *ZPRED).

Figure A.2. Scatterplot of regressed standardized residual and regressed standardized predicted values



Note: Dependent Variable: Aggregated Incidents

The relationship between the dependent variable and independent variables is linear since there are no non-linear patterns. Additionally, the data is not heteroscedastic as testified by this table.

4. Assumption of multicollinearity

Regression

/missing listwise

/statistics coeff r anova tol

/dependent aggregated_incidents

/method = enter log_supply_of_weapons.

Table A.1. Linear Regression for Multicollinearity testing

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	**Tolerance**	**VIF**
1	(Constant)	1070.68	142.09		7.537	.000		
	Supply of Weapons	-105.312	44.933	- .312	-2.344	0.023	1.000	1.000

Note: Dependent Variable: Aggregated Incidents

The VIF value is below 5. For the tolerance, the value is above 0.2. The assumption of multicollinearity is therefore not violated.

5. Absence of outliers and influential cases

Regression

/missing listwise

/statistics coeff r anova tol

/dependent aggregated incidents

/method = enter log_supply_of_weapons

/save resid (residuals) zresid (standardized_residuals) sresid (studentized_residuals)

/casewise plot(zresid) outliers (2).

```
Compute residual_329 = 0.
    If (abs(standardized_residuals) > 3.29) residual_329 = 1.
Compute residual_258 = 0.
    If (abs(standardized_residuals) > 2.58) residual_258 = 1.
Compute residual_196 = 0.
    If (abs(standardized_residuals) > 1.96) residual_196 = 1.
Execute.

Frequencies
    variables = residual_329 residual_258 residual_196
    /order = analysis.
```

Table A.2. Outliers Statistics (Standardized Residuals Above 3.29 Standard Deviation from the Mean)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	49	100	**100**	100

Table A.3. Outliers Statistics (Standardized Residuals Above 2.58 Standard Deviation from the Mean)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	49	100	**100**	100

Table A.4. Outliers Statistics (Standardized Residuals Above 1.96 Standard Deviation from the Mean)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	49	98.0	98.0	98.0
	1.00	1	2.0	**2.0**	100.0
	Total	49	100.0	100.0	

There were four outliers in the data set. After the removal of the cases in the columns 1, 46, 52, and 53, based on tables A.2 to A.4, no cases have been found with standardized residuals above 3.29 or 2.58 standard deviations from the mean. Only 2.0% of the cases have standardized residuals above 1.96 standard deviations from the mean which is less than the 5% threshold.

Appendix B - Linear regression analysis assumptions for the supply of weapons and the explosions/remote violence

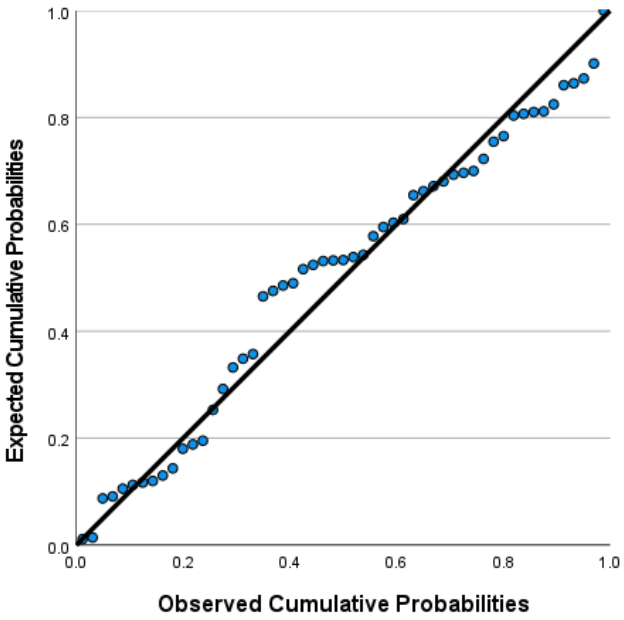
1. *Assumption of continuity*

Both the independent (supply of weapons) and dependent variables (explosions/remote violence) are being considered continuous for the analysis, so the continuity assumption is met.

2. *Assumption of normality*

```
Regression
/missing listwise
/statistics coeff r anova tol
/dependent explosions_remote_violence
/method = enter log_supply_of_weapons
/residuals normprob(zresid).
```

Figure B.1. P-P Plot of regression standardized residual



Note: Dependent Variable: Explosions/Remote violence

The normality assumption is not violated. Residuals of the regression follow a quasi-normal distribution.

3. Assumption of linearity and homoscedasticity

Regression

/missing listwise

/statistics coeff r anova tol

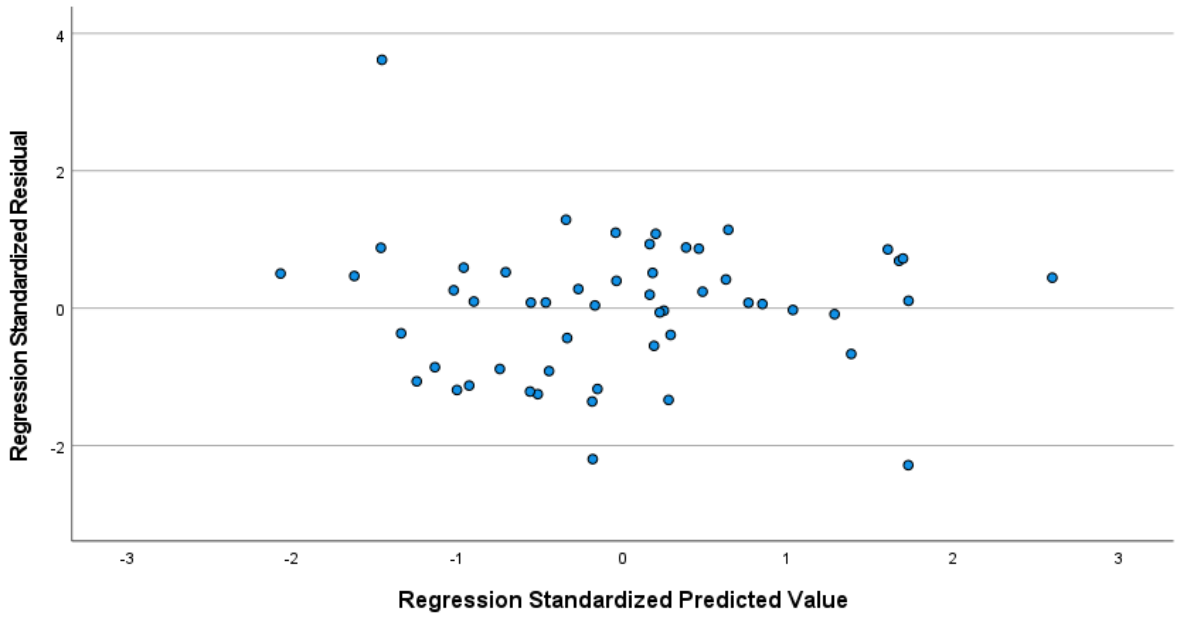
/dependent explosions_remote_violence

/method = enter log_supply_of_weapons

/partialplot all

/scatterplot = (*ZRESID, *ZPRED).

Figure B.2. Scatterplot of regressed standardized residual and regressed standardized predicted values



Note: Dependent Variable: Explosions/Remote Violence

The relationship between the dependent variable and independent variables is linear since there are no non-linear patterns. Additionally, the data is not heteroscedastic as testified by this table.

4. Assumption of multicollinearity

Regression

/missing listwise

/statistics coeff r anova tol

/dependent explosions_remote_violence

/method = enter log_supply_of_weapons.

Table B.1. Linear Regression for Multicollinearity testing

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	**Tolerance**	**VIF**
1	(Constant)	730.352	144.656		5.049	.000		
	Supply of Weapons	-38.279	45.744	- .116	-.837	.407	1.000	1.000

Note: Dependent Variable: Explosions/Remote Violence

The VIF value is below 5. For the tolerance, the value is above 0.2. The assumption of multicollinearity is therefore not violated.

5. *Absence of outliers and influential cases*

```
Regression
/missing listwise
/statistics coeff r anova tol
/dependent explosions_remote_violence
/method = enter log_supply_of_weapons
/save resid (residuals) zresid (standardized_residuals) sresid (studentized_residuals)
/casewise plot(zresid) outliers (2).

Compute residual_329 = 0.
    If (abs(standardized_residuals) > 3.29) residual_329 = 1.
Compute residual_258 = 0.
    If (abs(standardized_residuals) > 2.58) residual_258 = 1.
Compute residual_196 = 0.
    If (abs(standardized_residuals) > 1.96) residual_196 = 1.
Execute.

Frequencies
    variables = residual_329 residual_258 residual_196
    /order = analysis.
```

Table B.2. Outliers Statistics (Standardized Residuals Above 3.29 Standard Deviation from the Mean)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	50	100	**100**	100

Table B.3. Outliers Statistics (Standardized Residuals Above 2.58 Standard Deviation from the Mean)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	50	100	**100**	100

Table B.4. Outliers Statistics (Standardized Residuals Above 1.96 Standard Deviation from the Mean)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	50	100.0	100.0	100.0

There were three outliers in the data set. After the removal of the cases in the columns 1, 46, and 52, based on tables B.2 to B.4, no cases have been found with standardized residuals above 3.29, 2.58, or 1.96 standard deviations from the mean.

Appendix C - Linear regression analysis assumptions for the supply of weapons and the battles

1. *Assumption of continuity*

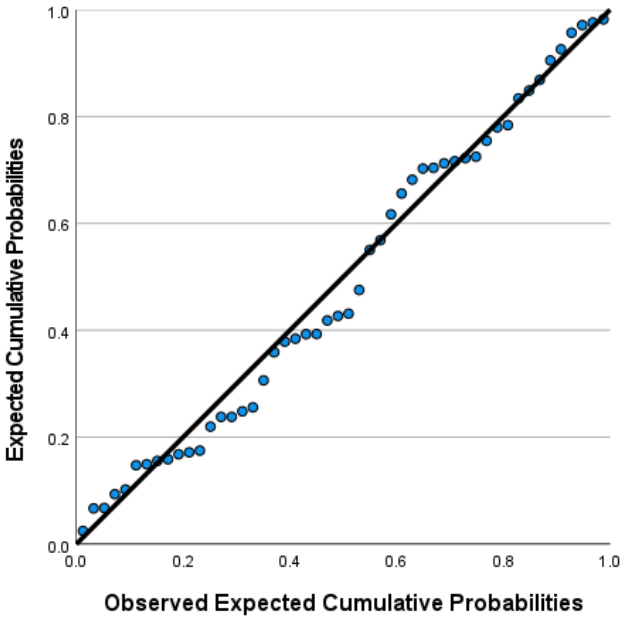
Both the independent (supply of weapons) and dependent variables (battles) are being considered continuous for the analysis, so the continuity assumption is met.

2. *Assumption of normality*

```
Regression
/missing listwise
/statistics coeff r anova tol
/dependent battles
/method = enter log_supply_of_weapons
```

/residuals normprob(zresid).

Figure C.1. P-P Plot of regression standardized residual



Note: Dependent Variable: Battles

The normality assumption is not violated. Residuals of the regression follow a quasi-normal distribution.

3. Assumption of linearity and homoscedasticity

Regression

/missing listwise

/statistics coeff r anova tol

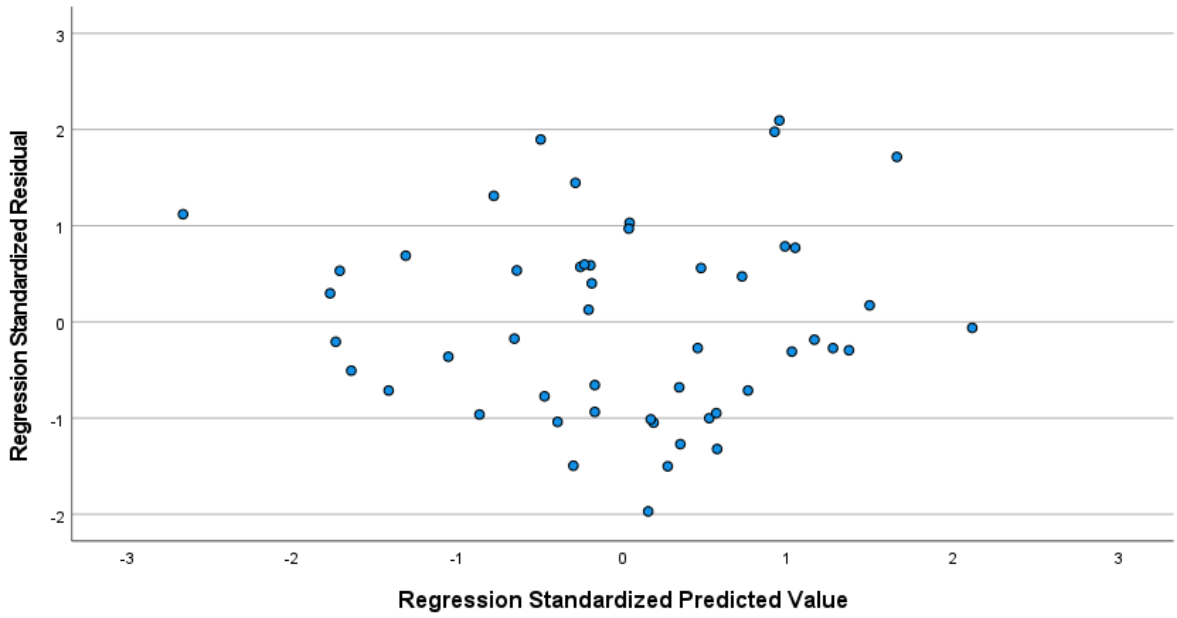
/dependent battles

/method = enter log_supply_of_weapons

/partialplot all

/scatterplot = (*ZRESID, *ZPRED).

Figure C.2. Scatterplot of regressed standardized residual and regressed standardized predicted values



Note: Dependent Variable: Battles

The relationship between the dependent variable and independent variables is linear since there are no non-linear patterns. Additionally, the data is not heteroscedastic as testified by this table.

4. Assumption of multicollinearity

Regression

/missing listwise

/statistics coeff r anova tol

/dependent battles

/method = enter log_supply_of_weapons.

Table B.1. Linear Regression for Multicollinearity testing

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	**Tolerance**	**VIF**
1	(Constant)	93.526	19.893		4.702	.000		
	Supply of Weapons	10.045	6.296	.224	1.596	.117	1.000	1.000

Note: Dependent Variable: Battles

The VIF value is below 5. For the tolerance, the value is above 0.2. The assumption of multicollinearity is therefore not violated.

5. *Absence of outliers and influential cases*

```
Regression
/missing listwise
/statistics coeff r anova tol
/dependent battles
/method = enter log_supply_of_weapons
/save resid (residuals) zresid (standardized_residuals) sresid (studentized_residuals)
/casewise plot(zresid) outliers (2).

Compute residual_329 = 0.
    If (abs(standardized_residuals) > 3.29) residual_329 = 1.
Compute residual_258 = 0.
    If (abs(standardized_residuals) > 2.58) residual_258 = 1.
Compute residual_196 = 0.
    If (abs(standardized_residuals) > 1.96) residual_196 = 1.
Execute.

Frequencies
    variables = residual_329 residual_258 residual_196
    /order = analysis.
```

Table C.2. Outliers Statistics (Standardized Residuals Above 3.29 Standard Deviation from the Mean)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	50	100	**100**	100

Table C.3. Outliers Statistics (Standardized Residuals Above 2.58 Standard Deviation from the Mean)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	50	100	**100**	100

Table C.4. Outliers Statistics (Standardized Residuals Above 1.96 Standard Deviation from the Mean)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	50	100.0	100.0	100.0

There was one outlier in the data set. After the removal of the case in the columns 52, based on tables C.2 to C.4, no cases have been found with standardized residuals above 3.29, 2.58, or 1.96 standard deviations from the mean.

Appendix D - Linear regression analysis assumptions for the supply of weapons and the violence against civilians

1. *Assumption of continuity*

Both the independent (supply of weapons) and dependent variables (Violence against civilians) are being considered continuous for the analysis, so the continuity assumption is met.

2. *Assumption of normality*

Regression

/missing listwise

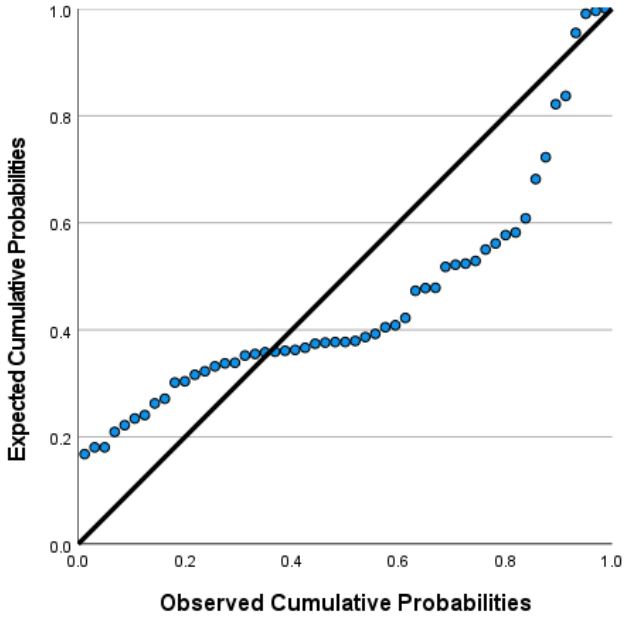
/statistics coeff r anova tol

/dependent violence_against_civilians

/method = enter log_supply_of_weapons

/residuals normprob(zresid).

Figure D.1. P-P Plot of regression standardized residual



Note: Dependent Variable: Violence against civilians

The normality assumption is violated. This issue combined with the small sample size renders the undertake of a regression impossible.

3. Assumption of linearity and homoscedasticity

Regression

/missing listwise

/statistics coeff r anova tol

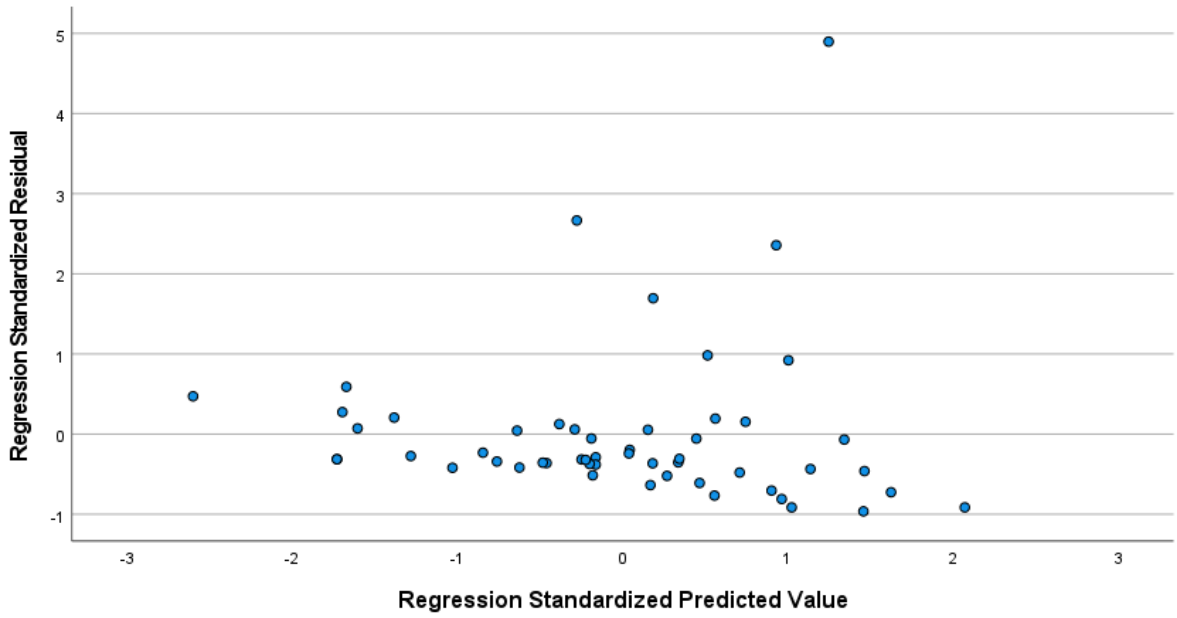
/dependent violence_against_civilians

/method = enter log_supply_of_weapons

/partialplot all

/scatterplot = (*ZRESID, *ZPRED).

Figure D.2. Scatterplot of regressed standardized residual and regressed standardized predicted values



Note: Dependent Variable: Violence against civilians

Based on the Figure D.1, the relationship between the dependent variable and the independent variable is homoscedastic but it is not linear. Considering that both the normality and linearity assumptions do not hold, there cannot be used a regression.

Appendix E - Linear regression analysis assumptions for the supply of weapons and the protests/riots

1. *Assumption of continuity*

Both the independent (supply of weapons) and dependent variables (Protests/Riots) are being considered continuous for the analysis, so the continuity assumption is met.

2. *Assumption of normality*

Regression

/missing listwise

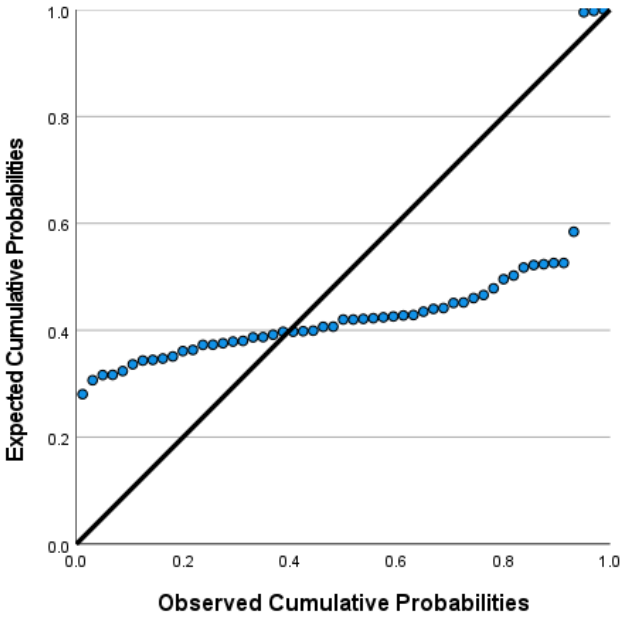
/statistics coeff r anova tol

/dependent protests_riots

/method = enter log_supply_of_weapons

/residuals normprob(zresid).

Figure E.1. P-P Plot of regression standardized residual



Note: Dependent Variable: Protests/Riots

The normality assumption is violated. This issue combined with the small sample size renders the undertake of a regression impossible. Considering that he normality assumptions do not hold, there cannot be used a regression.

Appendix F - Linear regression analysis assumptions for the supply of weapons and the strategic developments

1. *Assumption of continuity*

Both the independent (supply of weapons) and dependent variables (Strategic developments) are being considered continuous for the analysis, so the continuity assumption is met.

2. *Assumption of normality*

Regression

/missing listwise

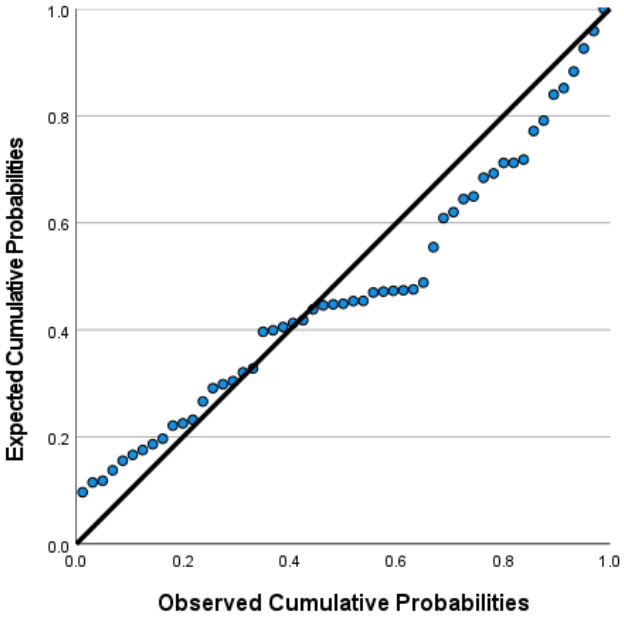
/statistics coeff r anova tol

/dependent strategic_developments

/method = enter log_supply_of_weapons

/residuals normprob(zresid).

Figure F1. P-P Plot of regression standardized residual



Note: Dependent Variable: Strategic Developments

The normality assumption is violated. This issue combined with the small sample size renders the undertake of a regression impossible. Considering that he normality assumptions do not hold, there cannot be used a regression.

Appendix G – SPSS syntax for the regressions

Syntax for Model 1

```
Regression
    /missing listwise
    /statistics coeff r anova
    /dependent aggregated_incidents
    /method = enter log_supply_of_weapons.
```

Syntax for Model 2

```
    /missing listwise
    /statistics coeff r anova
    /dependent explosions_remote_violence
    /method = enter log_supply_of_weapons.
```

Syntax for Model 3

```
Regression
    /missing listwise
    /statistics coeff r anova
    /dependent battles
    /method = enter log_supply_of_weapons.
```