FORSVARET

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CONTRIBUTION OF MILITARY LOGISTICS TO CONVENTIONAL DETERRENCE IN THE CASE OF UKRAINE

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Foreword

I wrote this thesis as part of the Staff Course at the Norwegian Defence University College in the Spring of 2023. Writing the thesis has been interesting and motivating but also challenging at the same time. I am glad that I got to work on an interesting topic, which I feel has been useful in my work. I also feel that I have learned a lot and the work has increased my interest and knowledge in the subject area.

Several people supported me during the work. Special thanks to my family for their support and patience. I would like to thank my supervisor Liselotte Odgaard for her direct and honest feedback, and support with my work. I would also like to think my close friends and colleagues Toivo and Jussi for the feedback and for support with my work.

Sammendrag

Utbruddet av krigen mellom Russland og Ukraina og midlene som ble brukt har vist gjenopplivingen av konvensjonell avskrekking i dagens verden. Utvidelsen av krigen har krevd betydelige ressurser og logistikkens rolle i gjennomføringen av krigen har blitt vektlagt. Logistikk har blitt studert mye som en del av krigføring, men dens betydning for avskrekking har blitt studert svært lite.

Hensikten med denne casestudien er å forstå viktigheten av strategisk logistikk for konvensjonell avskrekkingsstrategi ved å utforske forholdet mellom logistikk og avskrekking i tilfellet med Ukraina. Forskningen svarer på spørsmålet, hvordan bidro konvensjonell avskrekking og logistikk til avskrekkingssvikt mot Russland i tilfellet Ukraina? For å svare på forskningsspørsmålet undersøker studien tre tilfeller der vi undersøker i hvilken grad konvensjonell avskrekking og logistikk bidrar til avskrekkingssvikt. Utvalget av saker er basert på angrepsstrategiene som ble brukt av Russland mot Ukraina, som var Limited Aims -strategi, Blitzkrieg -strategi og Attrition -strategi.

Forskningen er et kvalitativt grunnlag, hvor casestudiemetoden ble brukt. Rammen for forskningen er konvensjonell avskrekking og strategisk logistikk. Empiris' materiale består av vurderinger og forskningsrapporter angående krigen i Ukraina. Det ble brukt en innholdsanalyse for analysen av empirien, hvor analysekategoriene var basert på studiens teoretiske rammeverk.

Hvert forskningsspørsmål ble besvart ved å undersøke evner og militære logistikkmangler som førte til feil med konvensjonell avskrekking mot de ulike offensive strategiene som ble brukt av Russland.

Hovedfunnene i denne studien var at Militær logistikk og dens ytelse har en sammenheng med konvensjonell avskrekking, som varierer mot ulike strategier til en potensiell angriper. Mot de begrensede målene og Blitzkrieg -strategiene som er basert på hurtighet, høy beredskap og evnen til å sette i gang mottiltak raskt vektlegges, som logistikkmessig betyr høy tilgjengelighet, selvforsyning og evnen til å reagere på et raskt situasjonsbestemt rammeverk ved å etablere eller sette inn styrker. Opp mot en strategi basert på avgang, logistikkmessig, fremheves en troverdig evne til å skalere og allokere ressurser til de slitende styrkene. Logistikk kan betraktes som en multiplikator for to hovedelementer for avskrekking, kapasitet og troverdighet.

Resultatene bidrar til å forstå forholdet mellom logistikk og konvensjonell avskrekking mot ulike strategier til en potensiell motstander. Dette bidrar til å utvikle stadig mer effektive avskrekkingsstrategier mot potensielle motstandere.

Summary

The outbreak of the war between Russia and Ukraine and the means used have shown the revival of conventional deterrence in today's world. The expansion of the war has required significant resources and the role of logistics in the conduct of the war has been emphasized. Logistics has been studied extensively as part of warfare, but its importance for deterrence has been studied very little.

The purpose of this case study is to understand the importance of strategic logistics to conventional deterrence strategy by exploring the relationship between logistics and deterrence in the case of Ukraine. The research answers the question, how did conventional deterrence and logistics contribute to deterrence failure against Russia in the case of Ukraine? To answer the research question, the study examines three cases in which we examine to what extent conventional deterrence and logistics contribute to deterrence failure. The selection of cases is based on the attack strategies used by Russia against Ukraine, which were Limited Aims strategy, Blitzkrieg Strategy and Attrition strategy.

The research is a qualitative basis, where the case study method was applied. The framework of the research is conventional deterrence and strategic logistics. Empiris' material consists of assessments and research reports regarding the war in Ukraine. A content analysis was used for the analysis of the empirical data, where the analysis categories were based on the theoretical framework of the study.

Each research question was answered by examining capability and military logistics deficiencies that led to the failure of conventional deterrence against the various offensive strategies used by Russia.

The main findings of this study were that Military Logistics and its performance have a connection with conventional deterrence, which varies against different strategies of a potential attacker. Against the Limited Aims and Blitzkrieg strategies which are based on speed, high readiness, and the ability to start countermeasures quickly are emphasized, which in terms of logistics means high availability, self-sufficiency, and the ability to respond to a quick situational framework by establishing or deploying forces. Against a strategy based on attrition, in terms of logistics, a credible ability to scale and allocate resources to the struggling forces is highlighted. Logistics can be considered as a multiplier for two main elements for deterrence, which are capability, and credibility.

The results help to understand the relationship between logistics and conventional deterrence against different strategies of a potential adversary. This helps to develop increasingly effective deterrence strategies against potential adversaries.

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1 INTRODUCTION

1.1 Introducing the research question

Schelling defines deterrence as a threat-based coercive strategy to maintain status quo and prevent war by discouraging and preventing a potential adversary from doing unwanted actions. (Schelling 2018) According to Lawrence Freedman (2021) deterrence is a relevant concept for Western strategic thinking to avoid war. In Europe, deterrence is once again a key operational concern.

Conflict and war in Ukraine have showed, the role of deterrence has become relevant from the last decade after Russia has shown the will to use military force to achieve its objectives. (Freedman 2021, 1, 8-9) Ukraine was not able to deter Russia' aggressions against Ukraine. Not in 2014, when Russia annexed Crimea and parts of Eastern Ukraine in 2014, nor 2022 when, after long low-intensity conflict, Russia conducted first operation to Kiev and beside that a large-scale invasion Eastern Ukraine. One can ask how the smaller state can deter the larger state. (Bowers 2018) This makes Ukraine an interesting case for studying deterrence.

Logistics is an interesting, but not well studied factor contributing to deterrence. David Beaumont (2018) builds a bridge between successful deterrence and logistics, when he argues "Although nuclear weapons may give an alternative, there is no deterrence, however, without logistics. Beaumont's argument follows the logical relationship between deterrence, credibility, capability, and logistics. This is also argued by Elbridge & Solomon (2015, 40) when they state, "*No strategy for conventional deterrence in Europe can be credible if its logistical underpinnings are insufficient*." This relationship between deterrence and logistics is interesting, especially in terms of to what extent logistics contributes on successful deterrence.

Ukraine forms an interesting example to study the importance of logistics in deterrence. One could argue that Ukraine is not a relevant case to study deterrence since deterrence failed already in 2014. However, to study the subject, the approach must be negative, focusing on why deterrence failed and what was the role of logistics to weak deterrence.

One could also argue that deterrence cannot be studied after 2014 because it failed already then. However, deterrence of Ukraine can be studied in the frame of narrow deterrence. According to Freedman, narrow deterrence is about deter a particular type of military operation in the war. Narrow deterrence assumes it is possible to deter a specific form of warfare even while other forms of warfare are progressed. The approach is depended on the assumption that there are distinct stages in the war which could be well understood and the threat to move from stage to the other would serve as a

deterrent. (Freedman 2004, 32-34) This enables the study of deterrence against Russia's different offensive strategies at different stages of the war.

To study deterrence in Ukraine, it is also important to understand what Ukraine's deterrence was about and in what kind of frame we can study its successfulness. Firstly, deterrence was conventional because military's capability was built on conventional capabilities. Secondly, deterrence can be described as direct because the purpose was to deter a specific actor, Russia. Thirdly, deterrence was immediate because it was focused on specific situation and context. Also, it is important to understand that Ukraine's deterrence was not extended because the country was not part of any alliance.

There is long history of studying military logistics and deterrence, which provides a solid theoretical background for further studies. By reviewing the existing literature and studies in the context of this research, it was clear that, there are only few academic studies which touched upon the relationship of logistics and deterrence. This area is almost unexplored and leaves a research gap, which makes this study relevant and interesting

By studying how military logistics contributed to deterrence in Ukraine, we can expect to identify some logistic factors which presence or absence affected positively or negatively on the credibility of Ukraine's deterrence strategy against Russia. By having a better and more comprehensive understanding of conventional deterrence and logistics role to it, the study allows to develop better strategies for successful deterrence in a specific context. As Freedman (2021) accent, "*deterrence's efficacy should not be taken for granted, especially in situations when deterrent threats are formulated under time pressure and deterrence's credibility is in doubt*".

1.2 Purpose and research question

The purpose of this case study is to understand the importance of strategic logistics to conventional deterrence strategy by exploring the relation between logistics and deterrence in the case of Ukraine.

Key terms are conventional deterrence and strategic logistics. In accordance with Mearsheimer (1983, 15, 62), Freedman (2019, 19) and Mueller (2021), the conventional deterrence is defined as a strategy to persuade a potential aggressor not to initiate aggression by threatening it with the conventional ability of the armed forces to resist the aggression, and to deny the achievement of the objectives or to punish aggression. The purpose is to indicate the opponent the probability that the probability of the success of the aggression is low and the consequences would be unbearable for the attacker.

In accordance with Kress (2002) and Eccles (1959) strategic logistics is defined as discipline that encompasses resources and operations to build and maintain military forces and its operations to

achieve desired outputs. One output is deterrence, which according to Robert Art (2015) is one of the four functions when using military as instrument of power to pursuit state's political goals.

The research question of this study is, **how did conventional deterrence and logistics contribute to deterrence failure against Russia in the case of Ukraine?**

The research question is answered through following three sub-questions .

1. **To what extent did Ukraine's conventional deterrence and logistics contribute to deterrence failure against Russia's limited aims strategy in 2014**?

2. **To what extent did Ukraine's conventional deterrence and logistics contribute to deterrence failure against Russian blitzkrieg strategy in Spring 2022**?

3. **To what extent did Ukraine's conventional deterrence and logistics contribute to deterrence failure against Russian attrition strategy in Summer 2022**?

After defining the cases and the theoretical framework of the study, the three sub-questions are studied in the chapter of their own, each dealing their own case. First question will be studied in chapter three, the second question in chapter four and the third question in chapter five. The results from the case studies and answers to the sub-question are presented in the chapter six, where it is presented to what extent the capabilities of strategic logistics and military capabilities together contributed to deterrence in different cases. As a result of examining each case, we can expect to find a case-by-case deficiencies in Ukraine's military capabilities and logistics causing the failure of conventional deterrence against Russia.

The research question is answered in chapter six, where I explore the relation between the results from the answers to three sub-questions. With this it is possible to form some generalizations that give an answer to the research question. At the end of the study, I evaluate the reliability of the research and its results and consider possible topics for further research.

1.3 Methodology

This section presents the research methodology and sources used to answer the research questions and discusses weaknesses and potential threats to validity and reliability.

This study has a qualitative approach and applies case study as research design. As the the research question and sub-questions describes, the intent is to understand the studied phenomenon in a specific context and explore the relation of logistics and deterrence. Reasoning is best described as abductive, and the analysis method used in the study process is content analysis.

An abductive reasoning occurs when the analysis utilizes both a deductive and an inductive approach. (Streefkerk 2023, see also Bhandari 2022) The study does not test a theory, but theoretical framework of guides the analysis and reasoning. Empirical material is examined from a theory perspective when doing a context analysis, but new factors and patterns are also identified from the empirical material to draw conclusions and expand contents. This dialogue of approaches can be seen between the stages of the analysis process.

Qualitative research suites well to study the subject of this study and to answer the research question because this approach aims to understand the phenomenon comprehensively in a real-life situation, uses the inductive approach to make a multifaceted and detailed review of the material, the selection of the sample is done according to the purpose, and the case is seen as unique. (Cresswell 2014, 185-186; Hirsjärvi, Remes & Sajavaara 2013, 164) In addition, the flexibility of qualitative research serves the implementation of the research due to available resources and practical constraints.

Case study as a method is suited well for this study because deterrence strategy is case-specific phenomenon in a real-world context as Mueller (2020, 60) and Sweijs and Zilincik (2020, 151) have described it. Case study is defined by Yin (2014, 16. See also Brown 2018) as an *"empirical inquiry that investigates a contemporary phenomenon (the "case") in depth and is within its real-world"*. The experimental design would have been unsuitable to answer the research questions or even impossible to implement. Brown (2008) describes that the scope of the case study is limited, and the findings are not always generalizable, but the case study can offer significant insights into the events. However, when the examination of the incident is concise it also serves the reader's own generalizations. According to McCombes (2023) case study suites well for describing, comparing, evaluation and understanding aspects of the research question, but also keeps study more focused and manageable when there is not time or resources for large-scale research. These advantages apply also in this study.

To be more specific, this study is a multiple-case study, which is well suited to the aim of building a rich understanding of the phenomenon and relationship between logistics and deterrence in the case of Ukraine. Yin (2018) describes that multiple-case study includes two or more cases or replications across the cases to investigate the same phenomena. The purpose is to by studying multiple cases to understand the differences and the similarities between the cases (Gustafsson 2017) Multiple-case study serves well the ways to answer the research question. Firstly, studying several cases in the context of conflict between Ukraine and Russia, it is possible to build a rich picture and understanding supporting analysis. Secondly, by exploring the relationship between logistics and deterrence in several cases, it is possible to understand differences and similarities between the cases. Finally, by comparing the results from the cases, it is possible to find the results which are generalizable only util some extent,

because according to Crowe (2011) theory driven case definition is likely to result in a more informed appreciation and helps to create knowledge that is potentially transferable to other contexts.

Explorative approach suites and describes well this study because there are only some discussions and not focused academic studies on the relationships between conventional deterrence and logistics. Explorative nature is aligned with the research question on "how" question, which displays the purpose is to study and understand phenomena in the everyday contexts in which they occur (Crowe 2011,4). Approach is interpretative, which means that aim is to understand the meanings and context perceived from different perspectives presented in sources. Focus is on building the new understanding. (Crowe 2011,4-5).

The empirical material is studied with theory-driven content analysis. According to Lu (2022) content analysis can be used to find out the purposes, messages, and effects of the content. By using the method, conclusions can also be drawn about the producers and audience of the analyzed texts. According to Tuomi & Sarajärvi (2018) theory-driven content analysis is based on abductive reasoning, in which case the analysis is not based directly on theories or is theory-testing. Previous knowledge helps the material-based analysis by opening thought paths based on the theories in question.

Theory-driven Content analysis is well suited to this study because it enables the use of the theoretical framework of the study to determine the concepts of interest for the analysis, the examination of the sources to assess producers' reliability, and when well described, the method improves the transparency and repeatability of the knowledge. Context analysis allows to examine data to find patterns and to explore causal relationships between logistics and deterrence to answer the research question of this study.

The weaknesses in content analysis are reductiveness, when the words, sentences or concepts that are the focus of the analysis limit the analysis too much, subjectivity, and interpretability, which can lead to various biases. (Luo 2022) The possibility of reduction is reduced by making the categories of the context analysis loose, but also by defining them by using the theoretical framework of the study. Loose categories may increase subjectivity and interpretability, which was the second weakness of the analysis method. Due to the nature, approach, and reasoning of the study, these weaknesses cannot be avoided. Therefore, the aim is to make the research and analysis process as transparent as possible, so that the reader can assess subjectivity and reliability of the study.

1.4 Case study

According to Crowe (2011) case should have pre-defined boundary to clarify the nature and time covered by the case study, relevant sources, focused interest to the investigator, the types of evidence to be collected, and the priorities for data collection and analysis.

Conflict and war between Ukraine and Russia offer several interesting aspects to study how logistics might have contributed to Ukraine's deterrence in different phases of the conflict. As a wider case, it defines the boundaries of the research by focusing attention on the dynamics between the two parties, as the focus is on Ukraine's deterrence against Russian aggression. The capabilities of the Armed Forces of Ukraine and deterrence effect of Ukraine have been based on conventional capabilities, which is why attention is drawn to conventional deterrence. Eventually, this clarifies the layout of the research question. The research question and case have the potential to provide new insights into the subject of relationships between logistics and deterrence, and open new ideas for future research.

One could argue that Ukraine is not a relevant case to study deterrence since its deterrence against Russia failed. However, this is not a problem, as the purpose of this research is to examine what were the shortcomings of Ukraine's deterrence, focusing on the logistics that was supposed to maintain those military capabilities which were to provide potential threat required for deterrence effect.

Getting to know the theories of deterrence and logistics made it possible at the same time to build the theoretical reference framework for the research, to refine the research question into the sub-questions, and to carefully select three cases from the conflict and war between Ukraine and Russia. This integrates the study into existing knowledge and does not make study just an isolated description.

This study's sub-questions are bound into three cases in the war in period 2014-2022 through a theoretical framework. Cases are determined using Mearsheimer's theory on the aggressor's three possible conventional strategies, which are limited aims, blitzkrieg, and attrition strategies. These strategies are recognizable in Russia's war against Ukraine, which allows the cases to be delineated through Russian actions and objectives. Mearsheimer's theory is presented in chapter two.

1.5 Sources

Sources were selected purposefully, based on understanding built on a content analysis. There exists a large number of studies and literature about deterrence both theoretically and empirically. Deterrence as a phenomenon and related concepts have developed over time, and it has experienced ups and downs as an interest. Conventional deterrence has experienced a new rise in recent years,

which is why the theoretical basis of this study is to be built based on the most recent studies and academic articles.

In the theory chapter, some of the well-known deterrence researchers and relevant scientific articles concerning conventional deterrence will be referred. Referred articles include, among others works by Lawrence Freedman, James J. Wirtza and Michael J. Mazarr. The most important contribution to theoretical framework comes from John Mearsheimer and Karl Mueller. John Mearsheimer was one of the first to define and to develop a theory on conventional deterrence and bring the term into the mainstream in his book Conventional Deterrence from 1983. Mearsheimer studied systematically about how deterrence works when there is a possibility of a major conventional war (Mearsheimer 2018)

Karl Mueller, in his article "The Continuing Relevance of Conventional Deterrence" (2021) discusses about the theory of conventional deterrence and describes four ideal categories for conventional deterrence. Michael Mazarr's article "Understanding Deterrence" (2021) is important, providing a throughout insight to deterrence and was important when framing the study and developing the research question. Both Mueller's and Mazarr's articles, among many other articles concerning deterrence, are found in a book "Deterrence in the 21st Century – Insights from Theory and Practice" (2020) edited by Frans Osinga and Tim Sweijs,

Some well know books building theoretical background for strategic military logistics and this study are Henry E. Eccles "Logistics in the National Defence" (1959), Thomas M. Kane's "Military Logistics and Strategic Performance" (2001). Martin Van Creveld's "Supplying War" (1977), and Moshe Kress's "Operational Logistics: The Art and Science of Sustaining Military Operations" (2002). Eccles (1959) defines logistics role as a bridge between a nation's economy and its military, defines the operational reach, describes growth of logistical activities and them becoming self-sustaining, in worst case beyond what tactical forces need. Kane (2001) argues that logistics in warfare is crucial for strategic success since it creates circumstances for strategy and tactics and because supply determines whether plans can be brought into action. Van Creveld describes in his book how logistics can make a difference to the outcome of a battle. Kress (2002) explores military logistics in terms of the theoretical foundations of operational logistics and its applications in the context of the operational level of war.

As mentioned earlier, there are only some articles which briefly touches the relationship between deterrence and logistics. An interesting article on the relationship between deterrence and logistics is "*The Critical and Foundational Role of Strategic Logistics in the New Era of Deterrence*" by Edward Dorman (2018). In that article, among other things, he presents the formula of successful deterrence, where the power of logistics is a multiplier for the two key elements of deterrence, to capability and

credibility. Dorman's idea of the importance of logistics for capabilities and deterrence is also reflected in this study.

Steven Brym (2016) made in his study theoretical and historical review of the role of logistics-enabled military presence as a part of coercive strategies. Dave Beaumont (2018) emphasized in his article that effective deterrence requires logistics, which capacity can sway the mind of a potential adversary. Beaumont and Todd Ashurst (2020) discussed in their article that military partnerships and interoperability would enhance the effectiveness of logistics, which would develop offsets and deterrence.

The sources have been collected from public sources according to the delimitation of the case. Primary sources consist of some official documents of Ukraine's authorities with the purpose of communicating about Ukraine's strategies, armed forces, and logistics arrangements to other state actors. It is important to note that Ukrainian official documents have both informative and communicative purposes. Communication may involve a political interest, for example, convincing Western partners and linking achievements. To ensure the accuracy of the information, information from official documents is compared with research reports used as secondary sources.

Secondary sources include assessments, scholarly articles, academic studies, and some books. There are a wide range of academic studies or papers concerning the war of Ukraine, but not that many which could contribute to this study. The most of the empirical material leans on reports, assessments, articles, and think-tank studies concerning the war in 2014-2015 and 2022-2023. Studies and reports from researchers and think-tanks are seen as more reliable than for example social media. However, is important to understand that think-tanks might serve a country or specific agenda, and this might effect their perspectives.

The most important empirical material sources are reports, studies, and assessments from the Royal United Services Institute for Defence and Security Studies (RUSI), and The RAND Corporation. Other important sources are reports and assessments from The Institute for the Study of War. These institutes have an analytical approach, and they have several experienced researchers working with their product, which increases their reports academical value and reliability. Also, by using these sources, it is possible to compare results and conclusions to assess the validity of results but also to build a more broad and wide understanding of the subject.

The selected documents are in English, which suggests that they are intended for a broad Western audience. Sources in Ukrainian and Russian were cut off due to poor knowledge of those languages. This excludes many documents whose information is aimed at Ukrainian or Russian speaking audiences. Using sources in the Russian or Ukrainian language, could have led to wrong

interpretations. This delimitation of sources emphasizes the point of view of Western. On the other hand, the views are broadened by the academic studies and articles used as secondary sources, some of which have also used Ukrainian actors as sources.

2 THEORETICAL FRAMEWORK

This chapter presents the theoretical framework of the study, which consists of three concepts. The first section will present the aggressor's military strategies, which conventional deterrence is seen related. This theory is important to identify and frame the three cases studied. The second section will present the theory and concept of conventional deterrence. It builds the basis to analyze the empirical material by presenting conventional strategies according to Mueller and by identifying essential factors to deter different military strategies of an aggressor. The third section will present the concept of strategic logistics. The section will present essential contents of strategic logistics. The fourth section will present the analytical framework of this study. It is built on the contents and categories based on the presented theoretical framework, and it will be used in content analysis of empirical material.

2.1 Conventional military strategies of aggressor

According to Mearsheimer (1983) conventional deterrence is related to military strategy, how aggressor nation's armed forces are employed to achieve specific objectives. He defines three strategies, which all have different implications on deterrence by defender. Strategies are the limited aim, the blitzkrieg, and the attrition strategy. When aggressor's objective is to defeat opponent decisively, used strategy would be either attrition or blitzkrieg. If the objective is to seize some portion of the defender's territory, a "ideal" strategy would be the limited aims strategy. (Mearsheimer 1983, 28-30)

Beside the Mearsheimer's (1983, 203, 24-28) own theory, there are also two alternative theories. One is the numerical advances in forces, and another focus on nature of the weaponry possessed by each side. Mearsheimer argues that both theories are unsatisfactory, and it would be necessary to go beyond reasons to explain why these theories worked or not. (Mearsheimer 1983, 24-28, 203) To have built comprehensive understanding on deterrence, this study uses Mearsheimer's theory.

In the limited aims strategy emphasizes minimum contact with defender, low costs, and surprise with purpose to achieve limited objectives, for example seize a slice of opponent's territory before defender can mobilize its defenses. In limited aims strategy purpose is to avoid an engagement with the main body of defender. After achieving objectives, the attacker takes defensive position and prepares for

counterattacks. At this point attacker assumes that defender will either do nothing militarily or is challenged to launch an undesired war of attrition, which will eventually be costly for defender. The limited aims strategy has a high possibility for success when strategic surprise is possible (Mearsheimer 1983, 28-30, 53-56)

The limited aims strategy is not often seen as attractive, because there is a tendency that limited wars escalate in the modern world. (Mearsheimer 2018) Mearsheimer (1983, 56) argues that the limited aims strategy is not seen attractive firstly, because modern states have favor for decisive victories and secondly, because there is a risk of escalation and transformation to attrition war if the defender after attacker's campaign launches a counterattack and decides to continue fighting. The latter is seen likely because defender' decision makers will have a pressure to recapture the lost terrain and to punish the aggressor.

In the blitzkrieg strategy the purpose is to defeat an opponent decisively and quickly. This will be done by breaking defender's will to defend with low costs using speed, mobility, and surprise, avoiding a series of exhausting battles. The principal aim is to effect strategic penetration, by piercing defender's front and drive deep into the defender's rear. This done by concentrating forces to a specific place in a specific time to achieve advantage on the defender. Spearhead of the offence is supposed to bypass defender's strong points. Ultimate result is the paralysis of the defense. Success involves psychological dislocation and demoralization of defender. (Mearsheimer 1984, 29-30, 35-38, 47-49. See also Mearsheimer 1981) Leonhard (1991, 19-20) discusses about maneuver warfare, which coincides with Mearsheimer's definition of blitzkrieg.

Mearsheimer (1983, 42-43) concludes that blitzkrieg strategy has two essential elements. Firstly, the deep strategic penetration and secondly large-scale military formations, as armored, operating independently to effect deep strategic penetrations. The blitzkrieg strategy is seen attractive because it promises a quick victory with relatively low costs (Mearsheimer 1983, 58) It is worth to mention that the blitzkrieg strategy, which was developed based on to the German way of fighting in the Second World War has been evolved into Maneuver warfare concept which has been adapted to Western military doctrines since 1980s and it has become dominant in Western doctrines. (Lind 1984; Høiback &Ydstebø 2021, 152-160)

In the attrition strategy the purpose is to defeat defender by engaging in numerous battles of annihilation and wear opponent down until resistance is no longer possible. The attrition strategy bases on attacker's assumption that he can outlast the defender and acceptance of casualties and significant losses. Attrition strategy entails high costs. (Mearsheimer 1984, 29-30, 34. See also Mearsheimer 1981, 60-62) Leonhard (1991, 19) describes that in attrition, the key is to defeat an

enemy through destruction of the enemy force's mass, focusing on physical components. Approach focuses on bringing the enemy to battle and defeat it in that battle or in a series of following battles.

According to Mearsheimer (1984, 34, 59) the key concepts in attrition warfare are initial-force ratios, numerical and material superiority, loss ratios, the rate of losses as a result of battle and fractional exchange ratios. The side with greater resources is likely to win. The idea is to improve the force ratio by achieving and sustaining acceptable force ratio over the opponent. Mearsheimer bring outs that it is difficult to predict the costs and the point when costs are seen as unacceptable. It is also a difficult to anticipate political developments during a lengthy war, which increases the uncertainty in long time. (Mearsheimer 1984, 29-30, 34)

Mearsheimer (1983, 58-59) emphasizes that the military risk of each strategy depends on defender's and attacker's capabilities and on the terrain and eventually effects on the choice of a strategy. The concept of deterrence does not apply in the situation, where attacker has such a significant military superiority on defender, that he would be certain of the outcome. This would be because military considerations would not act as a threat or even break.

Mearsheimer also emphasizes that military factors must be viewed in conjunction with the expected political gains, since conventional deterrence is based on broader relationships. Decision makers balance between desired political objectives, risks, and costs of a military campaign. Decision makers analyze on the balance between political gains, the potential costs and risks of military action determines wheatear deterrence fails or not. Deterrence is most likely obtained when a potential aggressor believes that probability of success is low and attended costs are to be high. There is always the possibility that the chosen strategy fails. (Mearsheimer 1984, 56-61)

The attrition, blitzkrieg, and limited aims strategies, each has different implications for deterrence. For the aggressor, the limited aims strategy is the least risky and least costly because it is the least ambitious strategy. For decision makers, it is not attractive because it does not provide decisive victory and there is a risk, if defender is willing to continue to fight, war gets prolonged, and the type of warfare might change into undesired one. The blitzkrieg strategy is attractive because it offers a fast and decisive victory. This strategy is seen as the most desirable of the three strategies and most likely to lead to a deterrence failure. The attrition strategy is seen as attractive only if it is seen as only possible option. Due to high costs and great uncertainty, deterrence lasts best when potential aggressor sees it as an only possible strategy. If a potential aggressor cannot launch a blitzkrieg, he will likely consider employing a limited aims strategy. (Mearsheimer 1983, 61-63)

2.2 Deterrence as a strategy and conventional deterrence

Patrick Morgan (2003) distinguishes deterrence theory and deterrence strategy. Theory concerns the underlying principles on which strategies are based. Deterrence strategy refers to specific military posture, threats, and ways to communicate to aggressor to be deterred. (Morgan 2003, 8)

Deterrence is a threat-based coercive strategy to maintain status quo and prevent war by discouraging and preventing a potential adversary from doing unwanted actions. (Schelling 2018) According to Robert Art (2015) deterrence is one of the four functions when using military as instrument of power to pursuit state's political goals. According to Mearsheimer (1983, 14) and Freedman (2019, 19) deterrence is about persuading a potential aggressor not to initiate a specific action because the perceived benefits do not justify or outweigh the estimated costs and risks. This emphasizes the opponent's assessment of the benefits to be gained using a particular strategy, relative to the potential losses associated with the strategy. Mearsheimer (1983, 208-209. See also Mearsheimer 1981) emphasizes the political-military context of conventional deterrence, where two main variables, relative costs, and probability of success of military actions, interact with political considerations that move a state toward war.

Levy (2008) notes that deterrence is a political and psychological strategy that must be directed by political leaders, coordinated with diplomacy, and sensitive to the adversary's political constraints, worldviews, and perception. According to Freedman, deterrence depends on the assumption that the behavior of a potentially hostile other can be manipulated through timely and appropriate threats. (Freedman 2004, 26-31; Freedman 2020) Bar (2022) argues that the deterrent signal must, in fact, get past the enemy's filters of history, culture, language, religious and ideological axioms, as well as social-psychological factors, in order to be effective.

It is important to define two fundamental approaches of deterrence, scope of deterrence, and circumstance for deterrence. First, deterrence is distinguished into two fundamental approaches, which are deterrence by denial and deterrence by punishment. Deterrence by denial seeks to deter potential aggressor actions by making actions appear infeasible or unlikely to succeed and achieve objectives. (Mazarr 2020, 15) Dall'Agnol & Duarte (2022) argues that in order to achieve deterrence by denial, a state only needs to prevent an enemy from quickly winning a battle. According to Mazarr (2020, 15; see also Mueller 2021, 48) denial represents effort and intention to defend set commitment. A capability to defend amounts to a capability to defend. Deterrence by punishment threatens severe punishment is unwanted action occurs. Focus is not directed to defend the contested commitment but on threat to punishment, which would rase the accost of an attack. (Mazarr 2020, 15; see also Mueller 2021, 48)

Second, in this study the scope is defined according to Freedman (2004), who defines that narrow deterrence is about deter a particular type of military operation in the war. Narrow deterrence assumes it is possible to deter a specific form of warfare even while other forms of warfare are progressed. The approach is depended on assumption that there are distinct stages in the war which could be well understood and the threat to move from stage to the other would serve as a deterrent. (Freedman 2004, 32) Freedman's definition is central to this study, as it allows the examination of deterrence against different adversary strategies and the determination of cases for this study.

Third, the study focuses on discussion to circumstance of direct deterrence. Mazarr (20202, 16-17) describes that direct deterrence is about efforts to prevent attacks on state's own territory, while extended deterrence, as another way to approach deterrence, involves discouraging actions of third party to prevent the aggressor's attack.

Studies have identified three essential factors for success or failure of deterrence strategies. According to (Mazarr 2020, 23-26) these are the level of aggressor motivation, the clarity about the object of deterrence and actions the defender will take, and aggressor must be confident that deterring state has capability and will to carry out threats. The first essential "factor level of aggressor motivation" refers to cognitive aspect which has been already highlighted. The second essential factor "The clarity about the object of deterrence and actions the defender will take" refers to so called "red line". The defender needs to be clear about what is trying to deter and what it will do if the threat is ignored. The third essential factor "aggressor must be confident that deterring state has capability and will to carry out threats" means simply that potential aggressor must believe that defender has both the capability and the will to do what it is threatening.

This study focuses on discussions to the third essential factor for deterrence, which the confidence of an aggressor that deterring state has capability and will to carry out threats. According to Mazarr (2020, 23-26) military and non-military capabilities must be strong and credible enough to convince potential aggressor that defender can carry out threats. Aggressor's perception on defenders' capabilities can determine the deterrence outcome. Will is more abstract variable and can be subject to misperception. Will is about defenders' motivation to defend its interests and carry out given threats

Haffa (2018) highlights the importance of capability and credibility as components of deterrence beside communications. He defines that capability is about the acquisition and deployment of military force able to carry out plausible threats. Credibility is about believable resolve to carry out declared intent to protect interests. Credibility can be reinforced by force structure, proximity, and projection capability. Communications is about relaying the capacity and will to carry out the deterrent threat to potential aggressor. (Haffa 2018)

Deterrence is obviously failed when a line set by deterrer will be crossed by the aggressor. (Freedman 2019 There are several ways deterrence can fail. George and Smoke (1974) have identified three distinct casual paths to deterrence failure caused by actions of the aggressor. Firstly, by a fait accompli driven by the perception of a weak commitment by defender. Secondly, by limited, reversible probe, when the aggressor crates a controlled crisis to put pressure on defenders and making defender to clarify its ambiguous commitment. Thirdly, controlled pressure, where the aggressor recognizes weaknesses in the defender's unambiguous commitment and by exploiting weaknesses or situations puts the pressure on defender and convince it that its options are limited, and risks are high. According to Levy, addition to previous three, deterrence can also fail if adversary is "undeterrable" (Levy 2008, 546-547) According to Mearsheimer (2018) when considering going to war states want to know what is going to happen when battles begin, how likely it is to achieve desired goals and how much there is risk involved in going to war. Sometimes states assess that even though the likelihood for military success is very low, they still go to war, because political assessments dictate that it is worth taking the risk.

In this study, conventional deterrence is defined according to Mearsheimer (1983, 15, 62) "the capability to deny an opponent his objectives on the battlefield through purely conventional means" and it occurs "when a potential aggressor realizes that his military forces are not capable of achieving their battlefield objectives." The definition is not in contradiction with for example, Mueller's (2021) later definition on conventional deterrence as "deterrent threats to resist or to inflict costs against an aggressor using conventional military force during the resulting conflict."

Mueller (2021, 50-52) presents four ideal types of conventional deterrence categories, which are defined by threat they involve and the extent to which they focus. They are Battlefield Defeat, Punitive Resistance, is Strategic Retaliation and Strategic Defeat. These types overlap considerably in practice. Mueller (2021, 59) notes that when "deterrence and defence overlap, deterrence is strengthened, and forces meant to deter can still defend if deterrence fail." Distinctions are done because of differences among their characteristics, advantages, and limitations.

According to Mueller (2021, 50-52) Battlefield Defeat has operational extend and the approach is denial, not punitive. Operational extend means that threat is towards enemy's ability to conduct military action or operation, but not in strategic extend to go into war. According to Mueller (2021, 50-52) The threat is to defeat aggressors forces so that it won't achieve desired success or goals with action. The aim is to convince aggressor that probability to success is low for action to be worthwhile. In practice it would mean that the defence appears to have credible and prepared capability to stop offensive force before it reaches its objectives.

Punitive Resistance has operational extend and approach by punishment. The threat is to inflict high losses to aggressor, so that even it ultimately wins the costs would outweigh achieved benefits. In practice it would mean that the defence appears to have credible and prepared capability to cause sufficiently heavy costs to offensive force to make an invasion look unattractive. (Mueller 2021, 50-52)

Strategic Retaliation has strategic extend and approach by punishment. The threat is to punish an aggressor by using conventional forces to attack targets less directly related to resisting the enemy attack. Idea is to be able to hold aggressor's valuable targets at risk. This category also includes threats of horizontal escalation. In practice it would mean that the defence appears to have credible and prepared capability to strike against aggressor's high-value targets in its homeland or to response with attack against aggressor's more vulnerable territory or forces in other theatres. (Mueller 2021, 50-52)

Strategic Defeat threats that if aggressor attacks, defender will go for a long war and ultimately win that war. Credibility on this option lies in ability to survive, so it does not lend itself to deterrence of weaker states. In practice, this would mean that defender appears to have credible and prepared capability to liberate lost terrain and ultimately prevail in a prolonged war. (Mueller 2021, 50-52)

Mueller emphasizes some principles for conventional deterrence, which tend to apply in many cases even though every deterrence situation is different. Firstly, deterrence strategy should take case-specific considerations focusing on specific adversaries. Secondly, forces should be designed to deter in terms of capabilities, readiness, basing, interoperability, and other factors. Thirdly, deterrer should expect and mitigate misperceptions, which might be affected by cognitive and motivated biases, intelligence errors, and communication failures. Fourthly, punitive threat should target something aggressor values to carry deterrent weight. Fifthly, threats should be easy to imagine, and they should have immediate and relatively automatic consequences. Sixthly, narrative about deterrence should make optimism about aggression impossible. (Mueller 2021, 60-61)

There is little research on the connection between deterrence and logistics, and one of the most interesting articles is Edward F. Dorman's article (Dorman 2018) where he presents a successful deterrence formula, where the power of logistics is a multiplier for the two key elements of deterrence, capability, and credibility. Dormans's formula for successful deterrence is: Capability plus Credibility to the power of Logistics x Resolve x Signaling = Deterrence. ($D=C_L + C_L *R*S$). (Dorman 2018) In this study, capability and credibility will be discussed, as well as the relationship of logistics to them.

2.3 Strategic Military Logistics

Military logistics is complex system that is formally distinct but closely related to commercial logistics. Business and military logistics are fundamentally intertwined units with the same origin, looking

toward the same future, and working toward the same objective—to satisfy the needs of the end user, whether they be customers or military troops on the front lines. (Aćimović et. alv2021).

The purpose of civilian logistics is to increase value and benefit for the customer or end user by managing and directing logistical flows in systems formed by chains. The basic benefits produced by logistics are management, time and place, the fulfillment of which is a prerequisite for satisfying the needs of the end user. Logistics primarily affects time and place benefit, i.e., the transmission of material or service in the supply chain. (Harrison & van Hoek 2008, 6; Hokkanen et. al 2011, 17) Supply chain consists of the activities and infrastructure whose purpose is to move products from where they are produced to where they are consumed. The whole formed by logistic chains is often described as networks or systems that describe connections between different actors. (Snyder, Lawrence & Shen 2019)

According to Kress (2002, 1, 4, 14), military logistics differs from the safe operating environment of civilian logistics due to its scope, large scale, and the uncertain and dangerous operating environment in which the enemy seeks to undermine the logistics system's capabilities. Erbel & Kinsey (2018) argues that warfare and strategy are at best incomplete or at worst wrong when they ignore the crucial role of military logistics.

Eccles (1959, 42 and 45) has written about military logistics and has defined that "The objective of a logistic effort is the creation and sustained support of combat forces." and "Military logistics is the process of planning for and providing goods and services for the support of the military forces.". Kress (2002, 7) has defined logistics as "discipline that encompasses the resources that are needed to keep the means of the military process (operation) going in order to achieve its desired outputs (objectives). Logistics includes planning, managing, treating and controlling these resources." NATO (2016) has defined logistics as "The science of planning and carrying out the movement and maintenance of forces."

Van Cerveld (1977) has emphasized the importance of logistics and relation to strategy, when he notes "Strategy, like politics, is said to be the art of the possible; but surely what is possible is determined not merely by numerical strengths, doctrine, intelligence, arms and tactics, but in the first place, by the hardest facts of all: those concerning requirements, supplies available and expected, organization and administration, transportation and arteries of communication"

Eccles (1959, 32) describes those fundamental relations between strategy and logistics, is that logistics governs both the scope and timing of strategic plans. The composition, the balance, and the deployment of military forces and the rate they are built up is determined by the relation of strategy,

logistics and tactical considerations. Eventually, logistics may impact that important political position or objective is either maintained or lost without resource to war.

Black (2021, 178-180) highlights the importance to discuss on logistics on strategical level and emphasizes the importance of logistics, when he describes that logistics is a key element of the process and method of matching ends, ways and means. In war the requirements and capacity of logistics is determined by the types of forces, their availability, deployment, and tasks. According to Ashurst & Beaumont (2020) Strategic logistics highlights armed forces preparedness by resourcing the military and therefore future operations while tying directly into the economic power of the nation-state.

Black (2021, 178-180) notes that logistical capacity is not simply bureaucratic capacity or state capacity, and it is not dependent on technological proficiency. In terms of logistics, what really matters is the effort of a means of supplying and conveying an armed force with reference to its environment and situation. Logistics should be considered across the spectrum from tactics to strategy, not just on the operational level as an aspect of the conflation of organizational capability and operational art. Erbel and Kinsley (2018) writes that logistics is not just about deploying and sustaining military forces in wartime, but it also includes the defence industrial and civilian supply base to meet of potential future military operations.

It is important to understand that military logistics is not separated from civilian logistics but an integrated part of it. Eccles (1959, 42) notes, civilian logistics is foundation logistics and civilian side has overall authority on in national defence. Eccles also describes connection between civilian and military logistics by defining that international logistics supports military forces and civilian economies, at the international level; national level supports miliary forces and its operations, a state's civilian economy and its international obligations and requirements; and civilian logistics supports the civilian economy. (Eccles 1959, 45. See also Prebilič 2006) Logistics have both long-lasting but also critical impacts on strategical level. Kress (2002, 25-26) nots that strategic logistics plans are seen stable with long-lasting effect on military organizations and capabilities.

Kress separates military logistics into three levels which are strategic logistics, operational logistics and tactical logistics. These levels are similar as levels of war, which are strategic, operational, and tactical. The levels of logistics are not separate from each other, but depending on the activities, there are connections between the levels through many functions, processes, especially by information. However, levels can be distinguished from each other based on their special features. (Kress 2002, 17-18)

At the tactical level, logistics concerns activities that influence the support of troops and systems with a short time perspective. Effectiveness is emphasized at the tactical level. The purpose is to deliver the

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required support in the right form and at the right time in all operating environments to support operational activities. (Kress 2002, 26-28)

Operational logistics combines strategic-level national resources and tactical-level support of troops operations through operational requirements. Operational logistics deals with the use of means, resources and organizations in time and place to support military actions and operations. At the operational level, both the economic and efficient use of resources and effectiveness are considered. Resources are shared between units, regions, tasks, and functions to operational effectiveness. In operational level logistics, the focus is on achieving operational goals instead of the tasks and actions of the troops. Logistic actions at the operational level comprises actions to establish the logistics network, or also called as logistics infrastructure, deployments of resources to the operations, and employment, which is about implementing the logistics network to sustain military operation. (Kress 2002, 39-41, 47-48)

Strategic logistics, in which this study focuses, concerns building and maintaining military capabilities and military-related infrastructure. Strategic logistics focuses on long-term issues which have wide-ranging effects. At the strategic level, the whole of the national logistics system is planned, which should enable the building of military capabilities, the maintenance of troops in peace time, the mobilization, the built-up of the logistics system in crisis and conflict, and the use of the logistics system to support military operations and troops. Strategic military logistics is associated with few operational level issues which are such as doctrine and logistics related development, strategic movement for power projection, and coordination with other entities. (Kress 2002, 23)

At the strategical level, the economics and efficiency of using of national resources are emphasized. (Kress 2002, 15-19, 21-24) Eccles (1959, 30) notes that relationship between strategy and logistics is based on the idea that much of strategy grows out of the economic situation. Kress (2002, 19) states that economic constrains affect on logistical capabilities which also determine operational capabilities. Decision-making concerning strategic logistics is often focus on distribution of budget among the logistic infrastructure and distribution of resources within a logistic infrastructure. (Kress 2002, 19-21, 25-26)

Military related infrastructure includes technology, industry, inventory, storages, and transportation. Technological infrastructure provides the capabilities to develop, improve and maintain technical systems, for example weapons. Level of technological capabilities contributes directly to military capabilities. Industry is the actual implementation of technology, providing means for producing and maintaining equipment and supplies needed. Industry includes both military and civilian industries. Inventories of logistical resources comprise stockpiles needed for military operations. The ways to

build stockpiles are acquisition or own production. Storage facilities are places where needed inventories of stockpiles are kept and maintained to sustain military operations. Transportation consists of static components such as transportation infrastructure, while dynamic components are means to transport material and cargo. (Kress 2002, 22-23) Ashurst & Beaumont (2020) notes that logistics infrastructure is part of logistics network which is operated on operational level of logistics. Logistics interoperability builds strategic resilience and responsiveness.

Based on the previous review, four content can be identified which will be used in the analysis when examining the empirical material. The contents are the ones which associates from strategic logistical level to operational and even on tactical level and by this, have important effect in use of military capabilities. The first content is military infrastructure, which enables operational level logistics and sustainment of troops. Second content is deployment, which is about the ability to deploy and project military forces to the operations. The third content is build-up rate, which means the ability to mobilize forces required for the operations. The third content is sustainment, which means the ability to maintain the operations, operational capabilities of forces and systems on required level.

The analysis categories used in content analysis are based on the theoretical concepts of conventional deterrence and strategic logistics. Analysis categories are credibility and capability of deterrence, and military infrastructure, deployment, build-up rate and sustainment of strategic logistics. The relevant units of meaning for the analysis are both derived from the theoretical framework presented identified also from the empirical material, which reflects abductive reasoning of this study. Relevant units are not specific words or phrases, but more meanings and themes. Since logistics is reflected on capability necessary for deterrence, the relevant units of meaning used in this study are logistical abilities to build and maintain those military capabilities.

2.4 Analytical framework

The analysis in this study is done as a content analysis, where the material is examined using the categories and meaningful units determined based on the theoretical framework, and by identifying essential concepts and themes also from the data itself. Analytical framework of this study is presented below, and it also describes the contents used for analysis. Contents are derived from the theoretical framework.
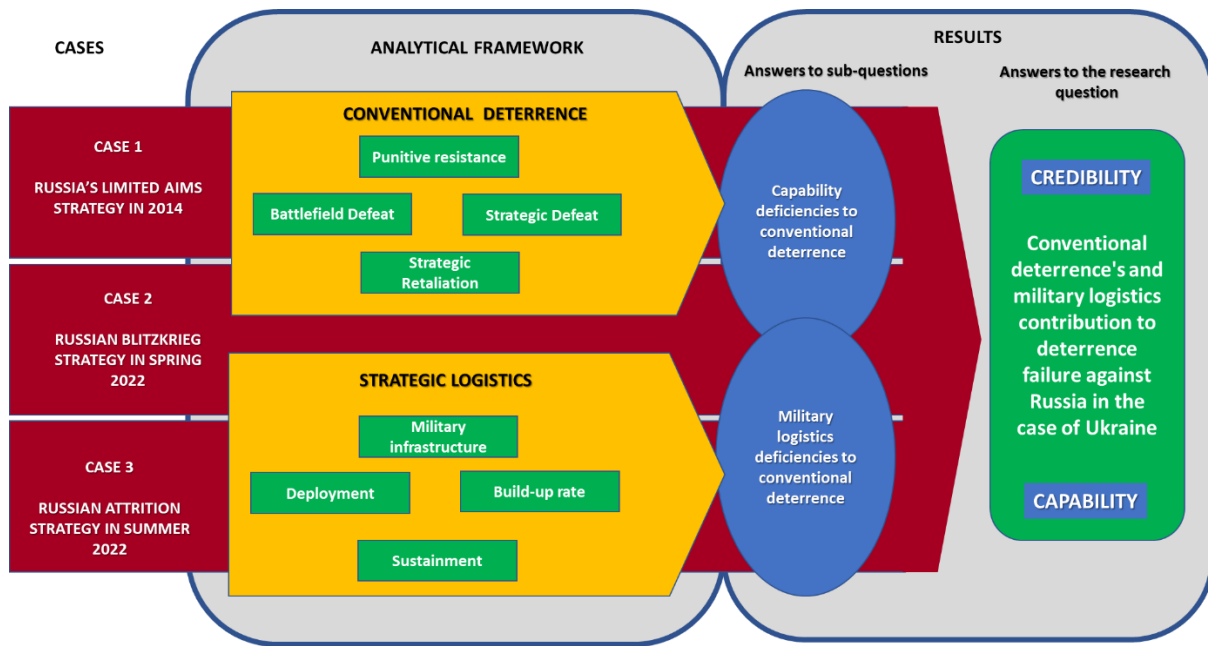
Picture: Research process and analytical framework

The three cases are identified with Mearsheimer's theory on conventional offensive strategies of the attacker. The cases are limited in terms of time and type of operations Russia conducted against Ukraine. Based on theory of narrow deterrence, the conflict between Ukraine and Russia is seen as a continuum including different phases, which allows the examination of conventional deterrence against the different types of strategies. The focus is on direct deterrence against each strategy.

Each case is analyzed from two perspectives. Perspectives are conventional deterrence and strategic logistics. When studying each case, I first describe the most relevant events from the case. After that, I examine in what extend the capability deficiencies of the Ukrainian armed forces weakened the implementation of various conventional deterrence strategies against Russia. The content analyze categories are identified with Mueller's theory on conventional deterrence strategy categories. Categories are Punitive Resistance, Battlefield Defeat, Strategic Retaliation, and Strategic Defeat. In the conclusions, I assessed which of the conventional deterrence strategies would have been potentially most effective to have focus in the next phase of analysis.

Next, I will examine to what extend the strategic military logistics deficiencies weakened the effectiveness of various deterrence strategies. To examine this aspect, the content analyze categories are identified based on the theories of military logistics presented in the study. Content analysis categories are according to strategic logistics military infrastructure, deployment, build-up, also called mobilization, and sustainment. In the conclusions, I assessed which of the categories would have been the most important for deterrence.

After studying all the cases, I answer to the sub-question by explaining to what extent did Ukraine's conventional deterrence and logistics contribute to deterrence failure against Russia in each case. Finally, I answer to the research question by examining and comparing the results obtained from the three cases. When discussing on the results it is expected to find connections between the cases and between logistics and deterrence.

3 CASE 1: FAILURE OF CONVENTIONAL DETERRENCE AGAINST RUSSIA'S LIMITED AIMS STRATEGY IN 2014

3.1 Russia's Limited Aims Strategy in spring 2014

Russia annexed Crimea and conducted a campaign in Eastern Ukraine starting from February 2014. There were several reasons that influenced Russia's decision to attack Ukraine, bur one often argued reason was that while NATO had expanded after the Cold War, Ukraine's impending relationship with the European Union and NATO was perceived in Russia as a threat and unacceptable to its position, control, and influence in the immediate vicinity of the former Soviet Union (Freedman 2019, 82-85; Braithwaite 2014; Merry and Pomeranz in Wood et al. 2016). According to Freedman (2019, 86) key objective for Russia was to shape its new political ordering such way that Ukraine's governmental decision-making would be paralyzed. This would be done by exercising control by seizing Crimea. Russia's aggression was, according to Mearsheimer (1983, 211) when he noted "When nations are dissatisfied with the status quo, the prospects for deterrence are not promising".

Annexation of Crimea represented a decisive and competent use of military force in pursuit of political ends, while campaign in Eastern Ukraine did not achieve all the goals set for it. (Kofman et al. 2017) The Russian aggression can be described as a Limited Aims Strategy, as it fulfills the characteristics defined by Mearsheimer for that strategy.

Russia was attracted to seize Crimea because it could be done straightaway and there was not contingent upon how other stares and actors would respond. (Freedman 2019, 86) Russian operation to annex Crimea started on February 24, when Russian troops in Crimea left their bases to conduct planned operation. By February 27 Russian troops occupied strategic facilities to blockade Ukrainian forces. Some military and law enforcement officials defected to the Russian side. (Freedman 2019, 86) Governmental institutions in Crimea were taken over by pro-Russian actors (Freedman 2019, 86) On 6 March Parliament of Crimea decide to join Russia and asks Russia to start procedures of Crimea becoming part of Russia. On 19 March Russian troops seize the headquarters of the Ukrainian navy in Sevastopol and another naval base. On March 21 Putin signs laws admitting Crimea to Russian

Federation. By March 27 Russian forces have seize Ukrainian naval bases in Crimea and Ukrainian government had ordered its troops to pull out from Crimea. (Kofman et al. 2017)

When annexing Crimea, Russia avoided open contact with Ukrainian forces by implementing a covert operation using both Naval infantry forces already in place and special forces deployed to Crimea. The surprise was achieved, for example, by deploying troops in Crimea as a surprise by using legitimate transit arrangements and at the same time by deploying troops near the Ukrainian border as an operational distraction. (Kofman et al. 2017)

The speed of action achieved surprise and the ability to lead troops in small-units level Crimea were important aspects in successful operation for Russia's forces. Ukraine's overall superior forces in Crimea offered no resistance to Russian forces. (Kofman et al. 2017) Ukraine's deterrence was dependent on its national army due to the lack of collective defence arrangements with other countries and effective resilience capabilities. Ukrainian military was not ready for conflict, not materially or by chain of command. (Takacs 2017) These made it possible for Russia to seize of piece Ukraine's territory before it could mobilize its defenses and to avoid casualties.

Besides using military means, Russia included non-military means to operation, such as propaganda and misinformation campaigns, economic levers, intimidation and means of cyber warfare to achieve its political objectives. Russia utilized several vulnerabilities in Ukraine's societal cohesion, the lack of a nation-state narrative, corruption and weak government institutions, and a lack of trust and cooperation between the state and civil-society actors and citizens Ukraine. This mixture of coercive and subversive activities, and coordination of conventional and unconventional methods has been called as hybrid, asymmetrical warfare, or non-linear warfare (Takacs 2017)

Kofman et al. (2017) concludes that in Crimea, Russia achieved quick success through direct use of military power and demonstrated effectiveness in using deception and surprise, and had great success for capitalizing on Ukrainian weakness, missteps, and slow or ineffectual decision-making. Annexation was a covert operation that resulted in a conventional invasion, but since the is little basis for generalization Kofman et al. (2017) argues that since Ukraine did not resist militarily in Crimea and warfighting did not take place the operation cannot be analyzed for lessons on Russian warfighting or to generalize events.

In Eastern Ukraine Russia had a different approach than in Crimea. Russia promoted anti-government movement in the eastern regions of Donetsk and Luhansk, with several other large cities in the region. Russia used a political warfare campaign to undermine the authority of the interim government, without using military forces. At the same time Russia supported efforts with intelligence operations,

network of fighters from the post-Soviet area and supporting the local security forces. (Kofman et al. 2017)

In April 2014 Ukrainian army and Interior Ministry Forces were used for efforts to respond to separatists in Eastern Ukraine. Security forces were ineffective and was not able to advance to the captured cities. In May the Ukrainian army launched a campaign to contain the pro-Russian rebellion to position the military for a decisive offensive against the rebel enclaves once Ukraine's national mobilization had been completed. the Ukrainian government's official name for its campaign against the separatists was The Anti- Terrorist Operation. The separatist obtained weapons and material help from Russia and eventually Russia switched its actions to direct by reinforcing the separatist. (Kofman et al. 2017)

From May 2014Ukraine's offensive operations and battles with separatists escalated the conflict vertically for Russia, resulting in the transition to conventional warfare. From June to August Russia provided heavy equipment such as armor an advanced munitions to separatists operated by its own units. In August 2014 the situation had become critical for separatist, and Russia switched to conventional operations and used its regular troops to support separatists. Russian troops gain success and won battles, for example in Ilovaisk. (Kofman et al. 2017)

The Minsk I ceasefire was signed in early September 2014. Russia began to develop separatist conventional capability with a train-and-equip mission. The conflict continued with lower intensity, while both sides rearm and trained their troops, until Russia launched its second offensive on January 13, 2015. Following defeats and losses, Ukraine signed the

Minsk II ceasefire on February 12, 2015, with terms favorable for Russia. Agreement created a frozen conflict in Ukraine. The separatist republics of Donetsk and Luhansk were technically Ukrainian territory in control by Russia. (Kofman et al. 2017)

Russian efforts in Eastern Ukraine met resistance by Ukraine and resulted in a sequence of adaptations by Russians. Russia focused on minimizing political and geopolitical costs with the purpose to avoid escalation. Russia began its campaign in Eastern Ukraine by supporting the separatist but eventually, due to Ukrainian response, it was forced to direct participation in late Spring 2014. As a result, the warfare transformed into more conventional war. (Kofman et al. 2017) According to Freedman (2019, 166) since the separatists were not self-sufficient in Eastern Ukraine, and Ukraine adapted to their losses, Russia had to take more direct actions and the strategy to avoid escalation failed.

As a conclusion, Limited Aims Strategy's characteristics describes well describes Russia's actions in Crimea where Russia executed a quick and successful operation to seize the area. On the other hand, the Limited Aims Strategy does not describe very well the Russian operation in the Eastern Ukraine in

the spring of 2014, because escalation of the conflict between the Ukrainian security authorities and the separatists forced Russia to involve to direct battles. Russia was in a reactive role and at the stage when it started direct action with troops, neither speed nor surprise described the operation. For this reason, to study limited aims strategy the focus of this analysis in next sections will be on Ukraine's deterrence in the beginning of conflict

3.2 Capability deficiencies that led to the failure of conventional deterrence against Russia's limited aims strategy

Ukraine had unclear military strategies and military declarations before 2014 because of economic problems, inconsistencies in national strategy, and neglect of national defense requirements. (Polyakov 2017) Ukraine had inherited the Soviet Legacy of equipment and material, infrastructure, and military-industrial complex, which reflected the old USSR's military priorities and brought enormous financial burden. (Jarowsky 1996) In 2014 The Ukraine's military doctrine was based upon the principle of neutrality and country participated actively in military cooperation with NATO and western countries to compensate for its weaknesses (Sutyagin 2014; Polyakov 2017)

Freedman (2019, 167-170) argues that Ukraine had little strategy and there was no attempt to deter Russian aggression against Ukraine in 2014. Ukraine government was in no position to issue deterrent threats, as non-ally Ukraine was not covered by NATO's Article 5, nor the US or the EU had prepared to deter Russia. Freedman's argument is aligned with Takacs (2018), who argues that Ukraine's military deterrence capabilities were solely dependent on its national army because it was lacking collective defence arrangements and effective resilience capabilities.

Ukraine's and the West's deterrence against Russia did not meet the requirements of successful deterrence. Neither Ukraine nor the West had considered the annexation of Crimea as a significant threat. Due to this perception and the speed of Russian decision making and actions, nor Ukraine or the West did not regulate direct and immediate deterrence against Russia. Deterrence was based on the capabilities that Ukraine had in readiness at the time and the will to use them. Direct deterrence against a Russian attack was based on the capabilities that Ukraine had in its current basic readiness and since Ukraine was not NATO member, they were not covered by NATO's extended deterrence.

By the end of year 2013 Ukraine's Armed Forces had total strength of 165 500 persons. Most relevant units for defense of Crimea would have been Naval Forces consisted of total 14 700 military personnel, High- Mobility Assault Forces structure consisted Separate Airborne Brigades with total of 6000 military personnel, and mechanized brigades, infantry brigades, tank brigades, Artillery brigades and regiments and Army aviation regiments of Operational Command South. (Ministry of Defense of

Ukraine 2016) These units were present In Crimea or in the vicinity of Crimea, and they potentially had capabilities to defend and repel the attack.

Moments before the Russian invasion of Crimea, Ukraine had about 18,800 personnel in the Crimea. The force in Crimea included 41 main battle tanks, 160 infantry fighting vehicles and 47 artillery systems and heavy mortars. The coastal defence troops included a missile artillery brigade, a coastal defense brigade and two marine battalions. Other Ukrainian units in Crimea were not seen as potent since most of the air force units were in disrepair and air defence units were in questionable readiness. There were also approximately 2500 Minister of Interior troops present, although they had little defensive value. In February Ukraine' minister of defence considered approximately only 1500 – 2000 troops in Crimea were dependable and willing to fight against Russia. Units were also lacking infantry fighting vehicles, armor, or artillery. (Kofman et al. 2017)

Before invasion Russia had approximately 12 000 military personnel in the Black Sea Fleet bases in Crimea. Its Naval Infantry Brigade was mainly well equipped, trained, and paid contract troops. In addition, due to the terms of Russia's basing agreement with Ukraine, Russia had the possibility to transfer more units to Crimea. (Sutyagin and Clarke 2014)

At the beginning of the Russian campaign, the numerical advantage of the forces was not on the side of Russia. Looking at the numbers alone, the power ratio was about 1.5:1 on the Ukrainian side. However, the numerical analysis does not tell about credible deterrence, as Russia had a significant ability to increase its strength in Crimea and, moreover, the commitment of the Ukrainian forces to defend was questionable. Based on the nature of the armament, Ukraine should have had a credible ability to repel a Russian attack. However, considering the availability of the equipment, the capability was not credible. These findings support Mearsheimer's claim that analysis should be explanatory.

To deter the annexation of Crimea, Ukraine should have demonstrated the ability to deny Russia from implementing the Limited Aims Strategy. Referring to the description of the limited aims strategy presented earlier, deterrence would have required the ability to respond to a surprise and rapid attack by Russia with forces in high readiness. The defending forces should have had the ability to engage with the attacking forces and thus prevent them from reaching objectives quickly and with low costs. In addition, the defender had to have the ability to launch a counterattack to hit the attacker's forces either at the beginning of the attack or if they had taken defensive positions. Ukraine should have shown Russia that in the event of an attack, it would not have surrendered, but initiated immediate countermeasures that would have enabled it to resolve the situation without prolonging it.

In theory, the action described above best corresponds to Mueller's Battlefield Defeat or Punitive Resistance category. The assumption of this is that Russia would not have been ready for the escalation

of the conflict and turning it into a protracted and large-scale operation. What would have been significant would have been the choice of how much resources are required from the defender to create the desired ability for deterrence.

The ability to deny the achievement of objectives would probably have required fewer troops, but the risk would have been that regardless of countermeasures, the attacker would have had the opportunity to continue the mission by reinforcing troops or supporting them with other capabilities. Punitive Resistance would have required more capabilities, but on the other hand, if successful, it would have had a better chance of defeating the attacker and denying the continuation of its operation.

3.3 Military logistics deficiencies that led to the failure of conventional deterrence against Russia's limited aims strategy

Credibly high readiness of the forces in Crimea and ability to respond quickly to Russian attack, would have been a key factor in creating deterrence. It would have been critical to both the Battlefield Defeat and the Punitive Resistance deterrence strategies. In terms of logistics, sustainment and military infrastructure would have been particularly prominent in the formation of credible deterrence. When drawing conclusions, it should be noted that due to the short duration of the Russian operation and basically non-existent battles, the logistics of the Ukrainian armed forces were hardly put to the test during the operation. Moreover, at the same time, Ukraine's attention was on the threat in the East, which must also have influenced the focus on logistics capacity of Ukraine.

Ukraine's military infrastructure, on which the logistical network and support was built, was not sufficient to maintain the capabilities required by deterrence and to support operations. Ukraine's armed forces and military infrastructure were based on the legacy of the Soviet Union. The infrastructure was old, and Ukraine had not maintained its condition. The infrastructure was built during the Cold War when the threat was in the West. The logistical infrastructure had been established at that time for large-scale warfare in accordance with the strategy and doctrine of the Warsaw Pact and the Soviet Union. The infrastructure was therefore not optimal against the Russian threat or for the use of Ukrainian forces.

One of the key elements in today's military logistics is cooperation with the civilian component of logistics. However, it is difficult to verify the depth of this cooperation in Crimea. If the civilian component was important for the maintenance of the material, equipment and systems in Crimea, the poor condition of the equipment and material suggests that this cooperation was not functional. Based

on this, the level of military-civilian cooperation in logistics at the troop level would not have been at a high level, and therefore not credible in terms of deterrence.

Regarding the deployment capability of logistics, it can be estimated that since Ukraine did not deploy troops in the direction of Crimea, the logistics system's ability to move troops must have been weak or at least unprepared. Deployment of the forces would have required a significantly higher ability of the logistics system to transport the forces in reserve. However, the use of reserves is a significant operational decision and considering the threat of Russia in the east, the decision not to send troops to Crimea could have been behind it.

The mobilization of the Ukrainian forces was implemented relatively late after Russia began the occupation of Crimea. As the events of spring 2014 showed, political decision-making to initiate a partial mobilization of troops was not credible to counter a quick occupation. Also based on the later mobilization of forces, the forces were not prepared to be used in Crimea to retake the region. This may indicate that the first forces to be established were not even planned for Crimea. This has naturally influenced the prioritization of the use of the logistics system and logistics network in some other direction.

Sustainment would have emphasized the ability to have logistical self-sufficiency required for the high readiness of the troops. The forces should have been able to maintain their combat capability until Russia's objectives had been contested or the force used for the attack had been defeated. In battles that are expected to last only days, the self-sufficiency formed at the troop level is emphasized because the scaling up the logistical network can take time, especially if scaling-up is not planned and prepared. Logistical self-sufficiency in contested or hostile environment also requires resilience for logistics. Logistics should have been able to take hit caused by enemy and ability to recover to the required level to support the troops effectiveness in combat at right place and right time.

Based on the previous points, the Ukrainian logistics infrastructure in Crimea should above all have been able to maintain the high readiness of the troops and to deploy and receive reserve force to Crimea. Since Ukrainian forces relied on existing bases in Crimea, the Ukrainian Armed Forces should have had a good opportunity to create a high logistical capability to maintain a high level of combat readiness, to deploy reserve units, and to mobilize forces. Military infrastructure's capability and sustainment capability should have been significantly higher in order to create the operational high readiness required for deterrence.

In summary, it can be stated that due to the short duration of the occupation operation in Crimea, the importance of logistics was emphasized at a lower tactical level as the ability to maintain a high readiness of the forces. However, in terms of deterrence and defensive capabilities, the readiness of

the troops was insufficient. It is difficult to assess the readiness or combat duration of the Ukrainian logistics system in such a short operation, where the troops practically surrendered without a fight. During the operation, the Russian armed forces practically did not attack the infrastructure in Crimea at all, but on the other hand, they gained control of the population and key actors very quickly. It can be stated that the importance of logistics during the operation was not significant, but its importance should have been increased in the phase before the attack, when deterrence should have been created by demonstrating high readiness.

4 CASE 2: FAILURE OF CONVENTIONAL DETERRENCE AGAINST RUSSIAN BLITZKRIEG STRATEGY IN SPRING 2022

4.1 Russia's Blitzkrieg Strategy in spring 2022

After several years of conflict and war Russia decide to invade Ukraine in February 2022 to subjugate of the Ukraine state. (Zabrodskyi et al. 2022, 7) Before the actual preparations for the attack, Russia tried to pressure Ukraine and Western countries to avoid conflict by restarting the Minsk II negotiations and encouraging Kiev to make concessions. In addition, Russia tried to isolate Western countries' support for Ukraine by showing the threat of military escalation. (Zabrodskyi et al. 2022, 7) This happened, among other things, by increasing military strength in Ukraine's neighboring regions, demonstrating military capabilities through exercises and pre-positioning military equipment for rapid build-up forces. (Akimenko et al. 2022. See also Zabrodskyi et al. 2022, 7)

In July 2021 Russia began to plan the occupation of Ukraine. Planning assumptions for the invasion were that speed was critical to render the response of the international community, the removal of Ukraine's leaders would allow pro-Russian Ukrainians to support the occupation, controlling some of the critical functions allow to control most of the Ukrainian population, and Russian Armed Forces could defeat the Ukrainian Armed Forces with its modernized capabilities. (Zabrodskyi et al. 2022, 8)

According to Zabrodskyi et al. (2022, 8) the key military-strategic objectives for Russian military and security forces were to "*degrade Ukraine's ability to defend by destroying its air, maritime and air-defence forces, defeat Ukrainian Land Forces by fixing them in Donbas, Diffuse Ukraine's will and capacity to resist by eliminating Ukraine's political and military leadership and occupying critical centres of political and economic power, and Deceive the Ukrainian government as to the time, location, scope and scale of Russia's invasion.*"

In September 2021, Russia concentrated troops on the Ukrainian border, and conducted a joint strategic exercise Zapad with Belarus in Western Russia and Belarus. Russian units had received orders

that they would be away from their barracks for nine months, which suggests that Russia was preparing for a few months-long operation in Ukraine. (Zabrodskyi et al. 2022, 12) According to Russia's announcement, about 200,000 soldiers participated in the Zapad exercise to train on mobile active defence on friendly soil. (Clark & Barros 2021) Pili and Minniti (2021) argues that the exercise did not prepare Russian armed forces to operate at scale with the whole of the army, and it did not prepare Russia for the logistical and material demands of the operation in Ukraine 2022.

October 2021, the threat of a Russian invasion became apparent to the West. US intelligence made an assessment that Russia is preparing a full-scale invasion of Ukraine. According to the intelligence, Russia would carry out a significant strategic attack on Ukraine from multiple directions simultaneously. The goal of the attack would be to seize Kyiv in three to four days and install a Kremlin-friendly government. Separately, Russian troops would attack in the east to drive through central Ukraine to the Dnieper River, while troops from Crimea took over the southeastern coast. This phase was estimated to take weeks. (Harris et. Al 2022)

December 2021, United States revealed publicly the scale of the troop buildup that continued along Ukraine's borders. Analysis stated that Russia planned to deploy up to 100 battalion tactical groups on Ukraine's borders. (Harris et. Al 2022) In January 2022 the United States warned Ukraine about the immediate threat of Russia's intention to conduct an offensive on Kyiv. (Harris et. Al 2022) According to the intelligence, Russian operation would begin by Russian forces taking over an airport in Hostomel to further accommodate massive Russian transports of troops. On January 19 Joe Biden publicly said he thought Russia would invade. (Harris et. Al 2022) US intelligence was aware of Russia's intentions and the situation, throughout the preparations for the operation, which made it possible for Ukraine to prepare to defend.

Russia planned and prepared to commence the invasion with a missile and airstrike campaign against Ukraine's military infrastructure, command and control and air defence. The critical infrastructure was to be unacted because it was to be in Russian use after the invasion. Russian special services were to eliminate Ukraine's political leadership and with air-assault troops to capture key objectives, such as power stations, airfields, central bank ad parliament in Kiev. Simultaneously, Russian Ground Forces were to advance with several groups of forces to occupy administrative centers on the eastern bank of the Dnipro River, along with Kyiv, Kherson, Mykolaiv, and Odesa. (Zabrodskyi et al. 2022, 8)

The starting point for the operation was that Russia assumed Ukraine would not be capable of significant resistance, and by utilizing speed, the operation would achieve the stabilization phase already ten days after the start. In the stabilization phase, the conventional forces were supposed to support the Russian special services, which would have been responsible for establishing the

occupation administration. The assumption of the plan was that the Ukrainian regime would have either fled or been captured and that due to the shock, the Ukrainian society and population would not have been capable of organized resistance. The purpose was to take both national and regional political control by utilizing the critical infrastructure to be taken under control, such as electricity and water distribution. (Zabrodskyi et al. 2002, 9-10, see also Massicot 2023)

Before the Russian invasion in February 2022 nearly 200 000 troops near the boarders. (Massicot 2023) The United States warned Ukraine of an imminent threat of attack. (Borger& Sabbagh 2022) The intelligence community of Ukraine had assessed that the most dangerous enemy course of action was Russia's high-intensity offensive against Donbas, with the aim to destroy the Ukrainian forces in the area. The most likely enemy course of action was a prolonged period of political destabilization to shape the conditions for a military offensive in the early summer, with the main effort in Donbas. The assessment was based on two points. Firstly, the Russian troops north of Kiev was assessed to have purpose to draw attention away from Donbass, as the troops would lack sufficient ability to capture Kiev. Secondly, the troops in the direction of Gomel were not prepared or believed to go into battle. (Zabrodskyi et al. 2002, 22)

Based on the threat assessment, the focus of the Ukrainian forces was on the direction of Donbas. The forces in Donbass comprised half of the maneuver forces of the Ukraine Armed Forces. Ukrainian troops were also grouped in Kharkiv, Dnipro, Sumy and Odesa areas, a maneuver brigade and two artillery brigades were in the vicinity of Kiev and additional units were in training areas. There were no significant forces in the direction of Gomel or Crimea. The Territorial defense forces had not yet been fully integrated into the armed forces. Defense plans of Ukraine were aiming for a six-week high-intensity defense in the direction of Donbas, which would give time for full-scale mobilization of the reserves. (Zabrodskyi et al. 2002, 23)

Based on early warning, Ukraine began dispersing munitions and stockpiles a week before the attack. The air force and air-defence systems were dispersed hours before the attack. When it became clear that Russia would attack both from the direction of Gomel and Chernihiv, Ukraine directed troops to the areas about seven hours before the attack. As a result, the troops were not in defensive positions when they encountered the Russian troops, and they got into a engagement with the enemy. (Zabrodskyi et al. 2002, 23)

The invasion began with a fire-strike campaign across Ukraine targeting mostly military installations such as military industrial facilities, fuel, and energy storage facilities, air-defence sites, C2 infrastructure, ammunition storage points and troop assembly areas. During the first two weeks Ukrainian transport infrastructure was not targeted so that it could be utilized in Russia's own use. The

use of fire was most effective against stationary targets in Ukraine and there was no significant impact on mobile targets. Due to the use of fires and the decentralization of Ukraine's troops, for example, the ability of Ukraine's anti-aircraft system had weakened during the first day, but only momentarily. A significant weakness in the Russian strike campaign was battle damage assessment. Russia was unable to assess the impact of the strikes, which is why they were based on a plan and calculated assumptions about the results. (Zabrodskyi et al. 2022, 24. See also Clark et.al 2022b, and Institute for the Study of War 2022a)

To ensure operational security, Russia did not issue the order to launch the attack to the troops until 24 hours before the invasion. Therefore, the troops did not have a clear understanding of their part in the operation, and they had not had time to prepare for the operation, for example, in terms of sustainment. The lack of understanding of the plans and the weak initiative of the troops came to cause problems for the leadership. The purpose of conventional forces was more to show force than to act as the main effort. The troops advanced in columns, passing units of the Ukrainian Armed Forces. The lack of planning, preparation, awareness, and coordination led to a slow rate of advance. (Zabrodskyi et al. 2022, 26. See also Clark et.al 2022a)

Russia succeeded in the operational level surprise but not in the tactical level surprise. Unlike the Ukrainian troops, the Russian troops did not know they were going to be in a battle, and thus the Ukrainians had the tactical initiative. The layout had a significant impact on the battles of the first three days. (Zabrodskyi et al. 2002, 23)

The almost free and rapid advance of Russian troops from the direction of Gomel towards Kyiv was a challenge for the Ukrainian armed forces. In response, Ukraine committed a significant part of the special forces in the direction of Gomel, mobilized reserve units to form new forces in the Kiev region, and mobilized new forces from military school cadets and personnel. These formed units, together with the mechanized brigade and two artillery brigades previously in the Kiev region, were ordered to counter the Russian forces advancing in the direction of Gomel. (Zabrodskyi et al. 2002, 26. See also Institute for the Study of War 2022b) To build up more forces Ukraine announced 25 February full mobilization and all men aged 18-60 are forbidden from leaving Ukraine. (Walker 2023)

The Russian attempt to take over the Antonov Airport in Hostomel near Kiev, with air-assault units failed on the first days of the operation. Ukraine forces were able to inflict losses on Russian helicopters and the air-assault units landed in Hostomel airfield were destroyed by artillery fire and the attack of mechanized forces. Similar air-assault operations by Russian special forces in southern Ukraine were also repelled. At the same time in Kiev, the operation of the Russian special services to neutralize the

political leadership of Ukraine failed when the Ukrainian security service identified, isolated, and destroyed Russian infiltrated groups. (Zabrodskyi et al. 2002, 28-29. See also See also Clark et.al 2022a)

Skoglund, Listou & Ekström (2022) assess that takeover of Antonov Airport in Hostomel would have been critical factor for Russia's offensive to Kiev. Russian forces were prepared for short few days operation having material self-sufficiency for 3-5 days. Antonov Airport was meant to be used as logistical hub to support forces after these few days of intensive phase, and by this control area around Kiev. First attempt was to take Airfield with air assault and establish logistical hub through air bridge. When this operation was failed, Russian Armed Forces tried to advance to the Airport north of Kiev with its infamous convoy, take the Airport and establish a logistical base. Since Ukraine could defeat Russian forces trying to take over the airport, Russian did not had deployment area, convoy had to halt, and it became an easy target for Ukrainian forces.

In the direction of Donbas, the Russian operation to bind the Ukrainian armed forces was the Crimea, the Russian attack proceeded as planned and it was able to quickly capture Melitopol and Kherson, as well as bring Mariupol under a siege. In the direction of Kharkiv, the operation did not proceed as planned and the Russian troops suffered significant losses. (Zabrodskyi et al. 2002, 27. See also Institute for the Study of War 2022b)

Three days after the start of the invasion, Ukraine's air defenses were still operational, Russian Armed Forces advance had stopped, Russia's special operation to neutralize the political leadership had been prevented, and Ukraine Armed Forces had been able to establish new forces and become capable for organized resistance. (Zabrodskyi et al. 2002, 29. See also Institute for the Study of War 2022c)

Viitaniemi & Kytöneva (2023) estimate that behind the failure of the Russian attack were misjudgments regarding the short duration of the operation, the adequacy of their own forces and the ability of the Ukrainian armed forces to defend themselves. Russia attacked with four Group of Forces on a front up to 1300 km wide, aiming for a depth of up to 300 km. At the beginning of the attack, Russia had no reserves or a second echelon, because of which the Russian armed forces lost their freedom of action in a few days, engaging in simultaneous battles in a wide area and deep in the Ukrainian soil.

Due to the failed operation, Russia recognized the need to change its strategy to deliberate combat operations to defeat the Ukrainian Armed Forces. The change started already three days after the start of the invasion, but it still took a long time before the commanders and leaders could implement the change. (Zabrodskyi et al. 2002, 29) The change from the Blitzkrieg strategy towards the attrition strategy had begun.

As a conclusion, the Russian plan and operation to invade Ukraine at the end of February 2022 reflects the strategy of blitzkrieg described by Mearsheimer. The Ukraine was to be defeated decisively and

quickly with use of large-scale military formations and deep strategic penetration from the North towards Kiev as the strategic goal. Russia's aim was to defeat Ukraine's will to fight with low costs using speed, mobility, and surprise. This included the goal of overthrowing the Ukrainian regime.

4.2 Capability deficiencies that led to the failure of conventional deterrence against Russia's Blitzkrieg strategy

To prevent Russia from carrying out an offensive according to Blitzkrieg Strategy to overthrow the Ukrainian government and take over Kiev, Ukraine should have had credible capability to deny the success of the Russian strategy either by threatening with denial or punishment. According to Oliker et. al (2016) the Ukrainian security establishment had improved significantly, but more reforms were required before it could become effective, efficient, transparent, and accountable.   Next, I examine the lack of capabilities against different deterrence strategies, after which I evaluate in the next section to what extent the deficiencies in strategic logistics contributed to the failure of deterrence.

Firstly, in the Battlefield Defeat deterrence strategy, the essential thing would have been to have credible prepared capability to stop offensive force before it reaches its objectives. The troops around Kiev were not a sufficiently credible threat. Ukraine should have had a credible ability to stop Russia's attack on Kiev and deny the achievement of its goals. Since Russia's strategy was based on speed and low costs, the implementation of the strategy would have required Ukraine to have the ability to start causing losses and slowing down the attack of Russian forces as soon as the attack began.

The Punitive Resistance deterrence strategy to make an invasion look unattractive would have required Ukraine to have capability to inflict significant losses on the troops attacking in the direction of Kiev. Ukraine should have had a credible ability to stop the Russian offensive towards Kiev and defeat the invading forces. The assumption would have been that the Ukrainian forces would have inflicted such significant losses on the attacking Russian forces that it would not have been profitable to start an attack. The implementation of the strategy would have required more ambitious goals than Battlefield Defeat. Ukraine should have been able to start causing losses and breaking the order of battle as soon as the Russian attack began, as well as being able to create the conditions for a counterattack in which the Russian forces would have been defeated.

Strategic Retaliation deterrence strategy would have required a credible capability to punish Russia by using conventional forces by attacking high value targets of Russia indirectly. Ukraine should have had an ability to use conventional forces and capabilities to affect important or critical targets for Russia. This could have meant, for example, the use of fire and forces on Russian territory

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Strategic Defeat deterrence strategy would have required that Ukraine would have had credible capability and will to go for a long war and ultimately win that war. This would have required that Ukraine would have had the goal of turning the war into a long-lasting war of attrition as quickly as possible, and eventually winning the war either with conventional forces or asymmetric warfare. The key would have been the will and the support of the West, as the later stages of the war have shown.

Key shortcomings for the implementation of the strategies appeared especially in the number of troops and artillery in the north and northeast of Kiev. According to Zabrodskyi et al. (2002, 16-17) the importance of the lack of troops and artillery was increased by the tactics of the Ukrainians, according to which the intention was that maneuver units would fix and canalize attackers to enable their destruction by concentrated artillery fire.

Ukraine had limited capability to stop Russian Armed Forces offensive towards Kiev with its Territorial Defence Forces or maneuver brigades. Due to the threat assessment that Russian offensive would be more likely in the eastern Ukraine, Ukraine Armed Forces did not have the forces and resources to conduct credible defensive operation to counter the attacks coming from the north and northeast.

Ukraine's territorial defense forces did not have the ability to repel Russian attack was limited. The territorial defense forces were established in January 2022 and there were deficiencies especially in terms of armament and command structure. The territorial defense forces had not yet been fully integrated into the armed forces. Ukraine had a large and capable reserve, but just a limited amount of equipment to equip them. (Zabrodskyi et al. 2002, 14-15) After the February 2022 Russian invasion, in order to increase society's resilience, the total defense system brought together all the activities required to be able for the war from both military and civil defense organizations. Ukraine's model employs both a bottom-up and a top-down approach, with the government and society functioning as equal partners. (Shelest 2022)

The Ukrainian armed forces had several high-performance maneuver brigades, but their ability to repel the Russian attacks were limited. This was because total number of maneuver brigades was significantly smaller than the Russian maneuver brigades, and half of the Ukrainian maneuver forces were deployed to Donbass. (Zabrodskyi et al. 2002, 14-15, 23) The Ukrainian Armed Forces were estimated to have about 900 main battle tanks, while Russia had 2,800 and the proxies in the Donbas had about 400. (Zabrodskyi et al. 2002, 14-15, 16)

Ukraine had only two artillery brigades in the vicinity of Kiev, which can be seen as insufficient compared to Russian forces and artillery used for offensive towards Kiev. (Zabrodskyi et al. 2002, 23) In total the weakness of the Ukraine armed forces artillery was not in its quantity, which was the second largest in Europe after Russia. Instead, the weakness was the amount of artillery ammunition

which only met the needs of six weeks of high-intensity warfare. (Zabrodskyi et al. 2002, 16) Since the focus of Ukraine's defense was in the east, it can be assumed that the amount of artillery ammunition around Kiev was less than six weeks' need.

In terms of defense, one important capability was anti-tank. Ukraine had developed the Anti-tank capability of its armed forces by acquiring and producing significantly new anti-tank systems for the troops. As a result, there were several different types of anti-tank weapons. (Zabrodskyi et al. 2002, 18-19) Their usability in different types of situations was variable, but as an anti-tank ability it was remarkable for defence.

The air defense in the Kiev area must have been at a reasonable level in terms of the whole. According to Zabrodskyi et al. (2002,19-20) Ukraine had purposefully developed its air defense capability since 2014 by acquiring new equipment and reorganizing forces. More effective and longer-range anti-aircraft systems were used to protect many military-political centers and industrial and energy facilities across Ukraine, of which Kiev was perhaps the most important. Troops were protected with short-range portable anti-aircraft missile systems. The Air Force's capability had improved since 2014, but the Russian air force was technically more advanced, able to destroy targets from further away and protect itself from Ukrainian air-to-air missiles.

As a summary, the Ukrainian armed forces in the vicinity of Kyiv did not have sufficient capabilities to form a credible deterrent in accordance with the Battlefield Defeat strategy to deny Russia from achieving its goal of overthrowing the Ukrainian government and taking over Kyiv. Even less did they have a credible ability to punish the attacking force under the Punitive Resistance strategy.

Punitive Resistance and Battlefield Defeat strategies would have required a larger number of forces that would have been able to start wearing down the Russian forces right from the beginning of the attack, able to stop the attacking forces and able to carry out counterattacks. In addition, the Battlefield Defeat strategy would have required maneuver units and significant amount of artillery that could have caused significant losses to the attacker. Since Russia's purpose was also to overthrow the regime, Ukraine should have been able to demonstrate its ability to identify and prevent the goals and activities of Russian Security Services and special forces.

The implementation of the Strategic Retaliation deterrence was not realistic for Ukraine. To implement Strategic Retaliation strategy Ukraine should have been able to threaten targets critical to Russia, which would have meant attacking deep into Russian territory. If Ukraine's deterrence had been based on the strategy of strategic retaliation, this would have meant that corresponding countermeasures would have been launched immediately after Russian offensive elsewhere than north of Kyiv. The punishment should have been carried out with the existing capabilities, which were undersized and

intended for a defensive battle with the focus on Eastern Ukraine. For this reason and due to the balance of power of the Russian forces, this strategy was not realistic.

Regarding the Strategic Defeat strategy, the situation is interesting. Initially, Ukraine did not threaten Russia with this strategy, but after the war escalated to the next stage, this strategy became real, especially with the support of the West. The realization of this strategy could also have been possible if Russia had succeeded in overthrowing the Ukrainian government and capturing Kiev. Afghanistan, where the Taliban were able to defeat both the Soviet Union and the Western countries, can be considered as an example of the implementation of this strategic threat.

4.3 Military logistics deficiencies that led to the failure of conventional deterrence against Russia's Blitzkrieg strategy

In this section I will examine to what extent the deficiencies in strategic logistics contributed to the failure of Battlefield Defeat or Punitive Resistance deterrence strategies. I examine the shortcomings of military logistics through four entities, which I have presented in the analysis framework. They are military infrastructure, deployment, mobilization, and sustainment.

Since 2014 Ukraine had improve its interoperability with NATO by adapting several NATO standards, particularly in logistics The introduction of NATO standards improved supply chain management ensuring cost-efficient inventories, an accurate operational picture, and accountability, although the logistics system had weaknesses due primarily to a lack of funding. (Shelest 2022)

Regarding the military infrastructure, the focus of logistics was created in Eastern Ukraine, where the most significant threat was estimated to come and where the focus of the use of troops was. Ukrainian armed forces had prepared for less than two months of war. inventory of war material was not sufficient for due to the focus of troops and logistics, as well as the readiness of the forces near Kiev, the inventory of war material of the Ukrainian armed forces was not sufficient to start fighting against the rapid attack of the Russian armed forces. This is especially emphasized in the material readiness of the lower tactical level forces, because in the end the Russian operation to capture Kiev lasted only a short time.

In terms of technology, the key would have been the performance of the material and the readiness of the troops to start fighting quickly. Again, due to the focus of the Ukrainian armed forces in the east, the level of materiel of the forces around Kiev cannot be assumed to have been the best possible. This may have partly influenced Russia's assessment of Ukraine's ability to repel an attack.

Transportation capability is important for logistics and, but also in terms of troop transfers. The logistical infrastructure around Kyiv was good and the number of civilian logistics operators was big, which is why the transport capability could be estimated to be at least good, even though the capability would have been based on civil infrastructure and operators. This brought flexibility to transport and logistics arrangements, as evidenced by Ukraine's ability to focus rapidly formed units on the defense of Kiev.

Regarding the deployment capability, the ability to transport and concentrate reinforcements in the area would have been important to deterrence since Ukraine did not have a significant number of troops around Kiev. As it has been pointed out several times, the focus of Ukrainian defense was on Eastern Ukraine, which is why it can be assumed that reserves and forces to be established were also prepared to be moved primarily in that direction. The Deployment ability should have demonstrated the ability to project enough troops for defense and, depending on the strategy, also for counterattacks.

Deployment capability was supported by the region's infrastructure and especially the ability of the civilian component of logistics to move personnel and move resources. As a demonstration of the deployment ability, Ukraine was able to quickly concentrate special forces, a mechanized brigade, artillery, and separately established forces for the defense of Kyiv. From the point of view of conventional deterrence, it would have been important to be able to demonstrate the ability for large-scale transfers and deployment of troops from one front to another before the Russian attack.

Build-up capability can be considered to have been important for the same reason as deployment capability, to increase combat capability quickly in an area where there are not enough wet troops ready. To create a credible conventional deterrence, Ukraine's mobilization ability should have been credible to establish a sufficient number of troops before Russia would have time to achieve its goals. This means that the logistic military infrastructure must be able to support the build-up to equip personnel, prepare the troops and initiate troops deployment on the mission.

The Ukrainian build-up capability can be assumed to have been somewhat credible because Ukraine had years of experience in establishing and rotating troops to the front. The built-up capability was largely dependent on the ability of the military infrastructure and logistics network to acquire, produce, store, and distribute material and equipment to the forces being established. Even though Ukraine was able to establish troops of experienced reservists, the challenge was to equip the troops, which ate away at credibility.

Sustainment ability was not in the emphasized sense in creating deterrence against Russia's blitzkrieg strategy because the operation was supposed to last for a short time. Sustainment ability is

emphasized in longer operations and battles. On the other hand, the importance of the ability increases if the battles escalate and continue longer time. On the other hand, sustainment ability can be viewed from the perspective of readiness. If the logistics' sustainment capability is sufficient, the forces and their equipment are operational. Compared to the seizure of Crimea, the material performance of the Armed Forces of Ukraine could be considered higher and thus increased the credibility of the force's capabilities.

5 CASE 3: FAILURE OF CONVENTIONAL DETERRENCE AGAINST RUSSIAN ATTRITION STRATEGY IN SUMMER 2022

5.1 Russia's Attrition strategy in 2022

While the quick capture of Kiev by forces attacking from the north and special forces failed, the Russian Central Group of Forces, attacking Kiev from the direction of Chernihiv was in trouble as the Ukrainian forces held the initiative and ambushed the forces scattered for a long distance. The advance of the Russian Southern Group of Forces, which had attacked in the south, had slowed down as the forces dispersed in several directions of advance. Russian forces controlled the airspace and achieved significant success, but by avoiding population centers it allowed Ukraine to mobilize forces and launch countermeasures against dispersed Russian forces. During the siege and capture of Mariupol, the Russian troops were clearly better prepared. They concentrated forces and fire, able to wear down the defender and eventually capture the city. (Zabrodskyi et al. 2002, 33-34)

Already three days after the start of the invasion Russia recognized the need to change its strategy to deliberate combat operations to defeat the Ukrainian Armed Forces. Russia changed its strategy to the most dangerous course of action for Ukraine. The objective of the Russian armed forces became the destruction of the Ukrainian armed forces in Donbass and the seizure and control of Luhansk and Donetsk. In addition, Russia focused on destabilizing Ukraine and weakening Western support by using economic and political means to wage war. The effort was to make the Ukrainian administration bend to negotiations unfavorable to it. (Zabrodskyi et al. 2002, 34-35) Russia changed it's strategy from the Blitzkrieg strategy to the attrition strategy.

During April, the Russian forces had suffered significant personal and material losses in the vicinity of Kiev and the fighting morale of the forces had decreased. The Russian government did not approve of the mobilization in April, so Russia had to initiate additional recruitment and the use of Wagner mercenaries to increase its fighting power. Despite this, Russia did not change the principle of using larger force formations, but battles were fought in the Battalion Task Group formations. Over time,

the organizational principles of the Russian army became a task-specific organization usually composed of brigade groups that included several independent companies. (Zabrodskyi et al. 2002, 35)

At the beginning of the attack on Donbass, Russia tried to encircle the Ukrainian forces from the north and south. However, the Russian armed forces were unable to achieve an armored breakthrough and had to resort to maneuver by fire. The effectiveness of the infantry attack was weakened by the fact that the troops were not willing to attack without significant artillery support. The effect of Russia's use of fire was enhanced by the longer range of its artillery than Ukrainian artillery and the support of electronic warfare. The battles emphasized the use of Unmanned Aerial Vehicles (UAV), with which both sides are trying to improve targeting. (Zabrodskyi et al. 2002, 36-37)

Russia's ability to use artillery fire was relatively effective. The use of the artillery system could not be disrupted significantly until the Ukrainian armed forces got longer-range precision systems into use. During the attack, the Russian armed forces used an estimated 20,000 to 32,000 rounds in Donbas, compared to Ukraine's approximately 6,000 rounds per day. The superiority of Russian artillery in Donbas was 12:1 in May and June.

Despite the artillery superiority, the Russian attack progressed slowly. In order to achieve success, the Russian troops changed their tactics and organized the attacks in waves. In the first allo, the troops exposed the defender's position with an attack, on which massive artillery fire was used. After the artillery fire, the more capable troops belonging to the second wave carried out a deliberate assault, forcing the Ukrainians to retreat. After this, the positions were taken over by the troops belonging to the first wave, and the capable troops caught in the battle prepared for the next attack. (Zabrodskyi et al. 2002, 38-39)

As for the Air Force, Russia's ability to attack in Ukrainian airspace was weakened after the failure to capture Kiev. Instead, air forces began to be used in increasing amounts for long-range precision fire and to some extent for close air support. Russia increased the use of ballistic missiles deep into Ukrainian territory, up to the vicinity of the Polish border. In addition, Russia also increased the use of other older and inferior land-target missiles as its stockpiles deplete. (Zabrodskyi et al. 2002, 40-41)

By June, the Russian armed forces were able to effectively inflict losses on the Ukrainian armed forces and take over the country. At the same time, however, the importance of its logistics grew due to the increased need and growing consumption and distances. Russia's logistics relied especially on railroads for fuel supplies and ammunition depots to be established near the troops. Centralization is emphasized in the logistics of the Russian armed forces. (Zabrodskyi et al. 2002, 42-43)

The Russian offensive in Donbas can be considered to have ended in the summer of 2022, at the same time when Ukraine received the HIMARS and M270 long-range weapon systems. With their help, Ukraine was able to influence the logistics, replenishment and artillery positions of the Russian armed forces. (Zabrodskyi et al. 2002, 43) It is a demonstration of systems that are critical in modern warfare. Without modern systems, it would be impossible for Ukraine to switch from a strategic defensive posture to an offensive posture. (Bielieskov 2021)

As a conclusion, the Russian plan and operation to invade Ukraine at the end of February 2022 reflects the strategy of attrition described by Mearsheimer. The Ukraine was to be defeated decisively and quickly with use of large-scale military formations and deep strategic penetration from the North towards Kiev as the strategic goal. Russia's aim was to bear Ukraine's will to fight with low costs using speed, mobility, and surprise. This included the goal of overthrowing the Ukrainian regime. Russia overestimated the capability and readiness of their own military while underestimating the resilience of the Ukrainian leadership, military, and people, which goes align with assessment of Bar (2022)

5.2 Capability deficiencies that led to the failure of conventional deterrence against Russia's attrition strategy

To prevent Russia from carrying out a warfare according to attrition strategy to defeat Ukrainian Armed Forces in Eastern Ukraine, Ukraine should have had credible conventional capability to threat Russia with denial or punishment. Next, I examine the lack of military capablities against different deterrence strategies, after which I evaluate to what extent the deficiencies in strategic logistics contributed to the failure of deterrence.

Battlefield Defeat deterrence strategy would have required credible capability to deny Russia from defeating the Ukrainian armed forces in Eastern Ukraine. This would have required ability avoid losses to keep Ukrainian Forces operational and the ability to deny Russian armed forces ability to cause losses to Ukrainian forces.

The problem with the Battlefield Defeat deterrence strategy was that it focused on the denial on the operational level, while Russian level of ambition grew. Russia had overwhelming advance on size and resources, because of which the strategy would probably have only bought additional time, but not brought the desired solution to the end of the war for Ukraine. The mere existence of Ukrainian armed forces would not have created the conditions for peace negotiations. The choice of strategy was further influenced by Ukraine's will to prevent Russia from taking over population centers and regions or subjugating people. Thus, the Battlefield Defeat strategy was not realistic for Ukraine's goals either.

It is worth noting that the Battlefield Defeat deterrence strategy would hardly have produced the desired outcome for Ukraine, even if the extent of the support later given by Western countries had been known from the beginning of the war. Denial simply would not have been an effective means of preventing Russia's spending strategy because it was not threatening enough. The strategy was focused above all on operational victory, which was no longer a realistic option after the war escalated to a large scale.

The Punitive Resistance deterrence strategy had the same problem as the Battlefield Defeat deterrence strategy. That, too, focused on the threat at the operational level, which was not realistic as Russia's level of ambitious grew. With the strategy, it could have been possible to get local victories, which would have brought success at the operational level, because Russian armed forces did not have an actual second echelon or reserves to continue the attack.

The Punitive Resistance deterrence strategy would have required the Ukrainian armed forces from the beginning to have a credible ability for operational counterattacks, which it did not have. One of the main reasons can be assessed as the lack of material, which did not allow the establishment of large forces even though an experienced reserve was available. The lack of counter-attack capability of Ukraine is indicated especially by the lack of tanks and artillery ammunition, which eats away at two important elements for a counterattack: fire and maneuver.

Strategic Retaliation deterrence strategy would have required a credible capability to punish Russia by using conventional forces by attacking high value targets of Russia indirectly. This would have required Ukraine to have the ability for a large-scale attack deep into Russia, threatening its critical targets, or the ability to use fire deep into Russian territory. Ukraine did not have this ability.

Furthermore, the usefulness of Strategic Retaliation deterrence strategy would have been reduced by Russia's significant ability to escalate warfare to a level that would theoretically have been intolerable for Ukraine. Russia had a credible ability to escalate the war into a large-scale war of attrition and, in principle, the ability to even use nuclear weapons. As a non-aligned country, Ukraine's ability to respond to the escalation was not credible.

At the beginning of the war, Russia had a better ability to disrupt and target Ukrainian artillery, and the year of longer range had the advantage on its side. Only later, after the war continued, did Ukraine get more long-range anti-aircraft systems, which increased the opportunities to influence the ability of Russian units more effectively. The lack of capability weakened the credibility of the deterrence strategy, but at the same time it can also be stated that the range and power of the system would not have been sufficient to threaten important targets deep in Russia.

Also, the ability of the Ukrainian Air Force for deep strikes was not credible. The weakness was caused especially by the superiority of the Russian air force and Russian anti-aircraft defense. In practice, when used for a deep strike, the survivability of Ukrainian Air Force aircraft would probably have been very poor.

Strategic Defeat deterrence strategy would have required that Ukraine would have had credible capability and will to go for a long war and ultimately win that war. Ukraine has later shown that it is capable of a long war of attrition according to the threat of this strategy, but as the plans and goals of the Russian attack showed, Ukraine's ability in question was not entirely credible. One of the main reasons must have been the lack of support and resources from the West before the start of the Russian attack in the spring of 2022.

As a summary, Ukraine's deterrence against the Russian attrition strategist had failed even before Russia's attack on Kiev. Russia had massed significant numbers of troops on the border with Ukraine, which showed the ability to escalate the war and launch a large-scale war of attrition. If Ukraine's conventional deterrence strategy had been any of the above, one of the main reasons for its failure was the force and material superiority that Russia had, which was central to the war of attrition. As a non-aligned country, Ukraine's ability to wage a prolonged war with only its own resources and capabilities was not credible in terms of deterrence.

There were several deficiencies in Ukraine's Capabilities to create credible deterrence against Russia's attrition strategy. Conventional deterrence against Russia's attrition war strategy should have been formed even before the attack that started in February 2022. The fact that Russia's operational surprise succeeded in putting the Ukrainian forces in a reactive state at the beginning of the attack, possibly encouraged Russia to take advantage of the shift of the main effort of the Ukrainian armed forces in the direction of Kiev. Despite the destabilization of the push towards Kiev, the situation possibly improved the balance of power in favor of Russia in Eastern Ukraine. In terms of Ukraine's deterrence, the most important thing would have been to be able to demonstrate a credible ability to wage a long-term war of attrition before the start of the attack, the ability to repel a large-scale attack, and the ability to move from prevention to counterattack and cause significant losses to Russia.

5.3 Military logistics deficiencies that led to the failure of conventional deterrence against Russia's Attrition strategy

In this section I will examine to what extent the deficiencies in strategic logistics contributed to the failure of conventional deterrence against Russia's attrition strategy. I examine the shortcomings of

military logistics through four entities, which are military infrastructure, deployment, mobilization and sustainment

The main effort of the Ukrainian armed forces was in eastern Ukraine at the beginning of the Russian attack, but the deterrent effect was not sufficient despite that. From a logistics point of view, the success of the deterrence strategies presented in previous section would have required demonstration of the credible ability to build, concentrate and maintain much larger forces and more credible military capabilities than the Ukrainian armed forces had, before Russia would be able to achieve its goals. Considering Ukraine's logistics capacity, the integration of Western support into the logistics system would have become central in terms of credibility.

Regarding the military infrastructure, Ukraine's logistical capability was neither sufficient nor credible to build and maintain the capability of the Ukrainian armed forces to defend themselves against Russia's large-scale offensive operations. Ukraine had a significant arms industry and industry, for example for the development of missile systems, but its production capacity was not large enough to equip the Ukrainian armed forces. For example, the Nepture anti-ship missiles were put into operational use only in April 2022 (Zabrodskyi et al. 2022, 21).

Ukraine had materially prepared for a war of less than two months, that is, its inventory of war material was not sufficient for a long-lasting war of consumption. In a war of attrition, material and resources are needed both to maintain one's own ability to consume the opponent, but also to compensate for the consumption caused by losses. Considering Russia's ability to influence deep into the territory of Ukraine, to save material, the inventory should have been protected from influence. In terms of its material and resources, storage was not possible, the industry's ability to produce that resource or Ukraine's ability to acquire the material was highlighted.

In terms of technology, the equipment and material of the Ukrainian armed forces was a Russian legacy, but some of it was obtained or acquired from Western countries. In terms of performance and credible deterrence, both legacy and new material should form the right mix to create synergy. This means efficient modernization of the fleet taking into account the doctrines of the armed forces. It is difficult to assess how Ukraine's ability to deploy and modernize credible operational capabilities influenced Russia's assessments.

Transportation is central both in terms of logistics and material transport, but also in terms of troop transfers. At the beginning of the war, there were no significant deficiencies in transport capacity, and Russia did not seek to destroy the transport infrastructure at the beginning of the war either. Its capacity can be assumed to have been sufficient for the needs of the troop movements of both parties.

However, it is worth noting that after years of war, the Ukrainian Armed Forces had created a logistical network to support operations in eastern Ukraine. Based on this and Ukraine's threat assessment, it can be assumed that the logistics infrastructure in the region would have been well prepared to support a large-scale attack. At least as well as Ukraine's resources allowed.

Regarding the logistics deployment capability, the ability to transport and concentrate reinforcements and resources to Eastern Ukraine was based on the arguments presented above and the ability to repel Russian attacks at least at a reasonable level. This made it possible to stop Russia's offensive which advanced with minimal tactical level goals. Deployment capability was not a significant weakness in terms of deterrence strategies.

Deficiencies in the build-up capability could have been one of the most important things weakening conventional deterrence. The reason for this was Ukraine's weak ability, above all, to equip the forces being formed with new material and the ability to return troops and equipment to the battle. The reason for this was the lack of materials and the ability of our own industry to produce more resources. The background of this view and uncredible conventional deterrence can be considered to have been a critical assumption for Russia, that Western support for Ukraine does not enable sufficient build-up capability.

However, the strength of Ukraine's build-up capability was a large and experienced reserves. In addition, Ukraine was developing the concept of Territorial Defense Forces, where a strong reserve was the key starting point. This may indicate a high potential to build-up forces, but at the same time it can be assumed that Russia though that it would be able to defeat the Ukrainian armed forces before Ukraine is able to increase its combat potential with reserves.

In terms of logistics sustainment capability, the most significant capability that weakens conventional deterrence can be considered to have been the credible ability to maintain a broad front against an attack. The forces in eastern Ukraine were on high alert and they and the Ukrainian armed forces had been well prepared for battles for several years. Russia's strategy was to wear down the defense on a wide front and seek success from weak points. However, this method of fighting did not bring results, due to the lack of troops and reserves of the second stage, which still allowed the Ukrainian forces to reorganize after the battles and prepare for the next battle.

The sustainment ability of the Ukrainian armed forces can be considered to have been sufficient on a tactical level to maintain troops in individual battles, but from Russia's point of view, considering their tactics, the ability of the Ukrainian armed forces to sustain its forces was not credible.

6 RESULTS AND CONCLUSION

6.1 To what extent did Ukraine's conventional deterrence and logistics contribute to deterrence failure against Russia's limited aims strategy in 2014

Ukraine did not have a deterrence strategy against the threat of Russian attack according to limited aims strategy. It is difficult to assess what Ukraine's threat assessment was, but clearly there was no preparation for the Russian attack on Crimea. The most central element for Russia's success was surprise and the ability to take advantage of Ukraine's low readiness. Considering the time element in question, Ukraine should have been able to create operational level conventional deterrence, which would have meant Battlefield Defeat or Punitive Resistance deterrence strategies.

Ukraine Armed Forces' capabilities and their abilities were not enough to create deterrence effect against Russian operation in Crimea. Most of all, deterrence was lacking credibility. Credibility would have required right forces, at the right place at the right time. Considering the timeframe of the operation, all deterrence capabilities should have been in high readiness on place in Crimea. On the other hand, at the same time, Russia had massed forces on the borders of eastern Ukraine, which certainly took Ukraine's attention away from Crimea.

The role of logistics in deterring the operation conducted according to the Limited Aims Strategy was significant because the level of readiness is based on logistical capacity to maintain the forces in high readiness. This is highlighted, whether the defender's strategy was based on Battlefield Defeat or Punitive Resistance. Deployment ability could have been important if Ukraine had tried to beat the Russian forces with counterattacks. If Ukraine's deterrence strategy had been based on Punitive Resistance, in terms of logistics, the ability to deploy troops to defeat the attacker would also have been emphasized. In other respects, the importance of logistics was not significant, as the Ukrainian troops surrendered without a fight and the duration of the entire operation was short.

The deficiencies in the military capabilities of the Ukrainian armed forces and further in logistics were a significant reason for the failure of conventional deterrence against Russia's Limited Aims strategy. Looking at the three prerequisites for successful deterrence according to Mazarr (2020), Ukraine's deterrence did not meet any of those prerequisites. Firstly, Ukraine was unable to influence Russia's motivation level for starting the occupation operation. Secondly, in the absence of a deterrence strategy, Ukraine did not have a clear or communicated goal for deterrence and for countermeasures to be taken is aggression occurs. Thirdly, and the focus of this study, Ukraine did not have credible capabilities, and in Crimea, the troops did not have the will to initiate countermeasures against Russia.

When reflecting to three distinct casual paths to deterrence failure according to George and Smoke (1974), Ukraine's commitment to defend Crimea was seen as weak due to lack of capabilities and their

level of readiness. Secondly Ukraine had not shown a clear will to launch countermeasures to defend Crimea. Thirdly, Russia identified weaknesses in Ukraine's unambiguous commitment and exploit the weaknesses and situation where Ukraine's countermeasures would have put a risk to its defense elsewhere.

6.2 To what extent did Ukraine's conventional deterrence and logistics contribute to deterrence failure against Russian blitzkrieg strategy in Spring 2022

As a result, there were several deficiencies in Ukraine's conventional capabilities to create credible deterrence against Russia's blitzkrieg strategy. In terms of conventional deterrence at the operational level, focusing on Battlefield Defeat or Punitive Resistance deterrence strategies, the most significant shortcoming was simply the credible ability of the forces around Kiev to stop a rapid attack by Russian troops and special forces before they could reach their objective.

Since Russia was attacking Kiev from several directions and trying to make landings successful, the number of Ukrainian troops should have been larger, covering the main directions of the Russian threat. In addition, Ukraine should have had a credible ability to concentrate forces in the area with which it would have been able to strengthen the defense or, if necessary, beat the attacking Russian forces.

The shortcomings of logistics in terms of Battlefield Defeat or Punitive Resistance deterrence strategies are linked to the capability shortcomings described above. Ukraine's military infrastructure was suspended in eastern Ukraine, in the wrong direction in terms of deterrence in the Kiev region. The logistics network's support was also directed to the East. Ukraine did not have a significant and therefore credible ability to establish or quickly move large numbers of troops in the most threatened direction, and the logistics system did not have the ability to support the seizure of the initiative until the

Regarding conventional deterrence strategists at the strategic level, the examination of the case is more challenging, because the goal of the Russian operation was to quickly achieve goals and win, and thus avoid escalation and a long-lasting war. Perhaps Russia did not consider this option likely and was ready to take the risk of starting a full-scale war. In any case, the capabilities of the Ukrainian armed forces were not sufficient or credible to threaten targets important to Russia. Moreover, without the support of the West, Ukraine's ability to wage a long-lasting war of attrition was also not credible. Because of this, Russia tried to keep the West out of the war and supporting Ukraine.

Regarding the capabilities of Strategic Retaliation and Strategic Defeat, the most significant shortcoming is the resilience of Ukraine's Military Infrastructure, the ability to withstand a Russian

attack and recover to the level required by the strategy to support the war. The strategy would have required Ukrainian logistics above all to be able to build and support such a number of troops and capabilities that would have constituted a real threat to deny Russian goals or to punish with countermeasures. Thus, the most significant logistics deficiencies were related to all aspects of logistics in terms of scalability.

It can be stated that the prevention of an attack according to Russia's Blitzkrieg strategy would have required above all a successful conventional deterrence strategy at the operational level. In terms of the capabilities and military logistics of the Ukrainian armed forces, the most central shortcoming was related to the credible ability to quickly repel a Russian offensive in the area with defensive forces and, if necessary, by strengthening the defense with additional forces that can be quickly concentrated and established, or by conducting a counterattack with reserves that can be concentrated in the area.

The deficiencies in the military capabilities of the Ukrainian armed forces and further in logistics were a significant reason for the failure of conventional deterrence against Russia's Blitzkrieg strategy. Looking at the three prerequisites for successful deterrence according to Mazarr (2020), Ukraine's conventional deterrence met only partially some of those prerequisites. Ukraine was unable to influence Russia's level of motivation to launch an attack on Kiev. On the contrary, considering the potential of the Russian armed forces before the attack, Ukraine had left a potential opportunity for Russia to implement the Blitzkrieg strategy. Thirdly, and partly related to the previous point, Ukraine did not have credible potential capabilities in the vicinity of Kyiv to prevent the Russian operation.

When reflecting to three distinct casual paths to deterrence failure according to George and Smoke (1974), Ukraine's commitment to defend Kiev was high due to the importance of Kyiv and generally UIkraine's will to defend the country. Russia had increased its forces on the Ukrainian border north of Kiev, but despite this, Ukraine had not reacted strongly to this potential threat. Instead, Ukraine had a significant number of troops in eastern Ukraine. and the number of defending troops in the vicinity of Kiev was small, in proportion to the number of Russian troops near the border. In terms of logistics, the commitment should have been reflected in a change in focus and operations, including an preparations for force build-up and deployments. This can be estimated to have been a significant reason for the failure of deterrence.

6.3 To what extent did Ukraine's conventional deterrence and logistics contribute to deterrence failure against Russian attrition strategy in Summer 2022

It is difficult to look at Russia's attack on eastern Ukraine from the perspective of operational level deterrence. Already in the spring of 2021, Russia demonstrated the ability to concentrate large

numbers of troops on the Ukrainian border, which could have indicated the threat of a large-scale war of attrition. Russia also used ZAPD 2021 for messaging its capabilities (Akimenko et.al 2021) However, neither Ukraine's nor the West's reactions at the time showed Ukraine's credible ability to respond to a large-scale attack. Thus, it is possible that Russia saw an attack based on the attrition strategy as possible, but also surprising for Ukraine and the West.

In the spring of 2022, Russia had concentrated enough troops on the Ukrainian border to launch a large-scale attack. When its strategy to win the war, by overthrowing the Ukrainian government and capturing Kiev failed, it began to implement a large-scale attack based on an attrition strategy.

The most glaring shortcomings of conventional deterrence were at the strategic level, in the credible ability of the Ukrainian armed forces to repel a large-scale attack launched from several different directions, where the culmination point is sought with material superiority, with attrition.

Since it is a deterrence formed at a strategic level, it emphasizes the utilization of the resources of society. From the point of view of the conventional deterrence formed by Ukraine, the key would have been to show a travel license and the ability to implement the Strategic Defeat deterrence strategy already from the summer of 2021. One key issue would have been guarantees of receiving Western support in the case of conflict.

In terms of logistics, the most significant weaknesses were linked to the credible ability to support the battles of the troops on a wide front and the ability to build-up new troops, where the main deficiency was the equipping of the troops.

In addition, one significant weakness was Ukraine's credible ability to scale the logistics supporting the defense operation to respond to a large-scale attack that entered the country from several different directions and affected the Deep Ukrainian region. This ability is related to the ability of the strategic military infrastructure to produce resources, but also to the ability to receive resources from outside the country and effectively deliver them to the fighting forces.

It can be stated that the prevention of an attack according to Russia's Attrition strategy would have required above all a successful conventional deterrence strategy at the strategical level. In terms of the capabilities and military logistics of the Ukrainian armed forces, the most central shortcoming was related to the credible ability to scale up its logistics capacity and to provide enough resources need for the attrition warfare.

The deficiencies in the military capabilities of the Ukrainian armed forces and further in logistics were notable reason for the failure of conventional deterrence against Russia's Attrition strategy. Ukraine's conventional deterrence met only partially some of those prerequisites for successful deterrence presented by Mazarr (2020). Ukraine was unable to influence Russia's level of motivation to launch a

large-scale offensive in Eastern Ukraine, after Russia's operation take over Kiev was failed. Ukraine had created the focus of the use of its forces in eastern Ukraine, which indicated possible heavy fighting for Russia. However, considering the potential success of the Russian attack, due to the broad grouping of the Russian armed forces, the number of troops and the potential resource superiority in relation to Ukraine, Russia did not feel that the threat posed by Ukraine was sufficiently credible.

When reflecting to three distinct casual paths to deterrence failure according to George and Smoke (1974), None of the reasons they gave were significant for the breakdown of Ukraine's deterrence. Ukraine showed no weak commitment to its defense, as several years of war showed. Ukraine's target level was also very clear. Ukraine, in its strategy papers, had even announced its goal to regain the territories it had previously lost. All that remains is Russia's interpretation of Ukraine's weakness to wage a large-scale war of consumption and, more broadly, the weak commitment of the West to support Ukraine.

6.4 Answer to the research question

The cases discussed in this study represented three different Russian offensive strategies. The cases offered different perspectives on the shortcomings of Ukraine's military capabilities and logistics, which had undermined conventional deterrence against Russia's offensive strategies, and ultimately led to the failure of the deterrence. It can be considered that there is a connection between the cases and, therefore, Ukraine's deterrence can be considered to have failed in stages. Russia had a clear will to subjugate Ukraine to its will and was ready to escalate the war and change its offensive strategy as needed. As a summary and as an answer to the research question, how did conventional deterrence and logistics contributed to deterrence failure against Russia in the case of Ukraine, the following can be stated.

In the first case Russia achieved its goals by seizing Crimea using the Limited Aims strategy. In another case, Russia was unable to overthrow the Ukrainian government and take over Kiev using the Blitzkrieg strategy. In the third case, Russia was not able to destroy the Ukrainian armed forces in Eastern Ukraine in accordance with the Attrition strategy, but the war continued as a war of attrition as Russia had to adapt to the situation and change its goals.

In the first case, when comparing to principles for conventional deterrence according to Mueller (2020), Ukraine did not have a clear deterrence strategy against Russia's Limited Aims strategy, which is why the threat of countermeasures had not been communicated and deterrence was not focused clearly. Ukraine also did not have the credible military capabilities and readiness to deny Russia from achieving its goals or to punish the attack. Ukraine had shortcomings both in plans and in the ability to

execute immediate and relatively automatic countermeasures to create consequences for an aggression. The key factor was the will, the lack of which eventually showed up as the non-existent will of the Ukrainian forces to fight against the Russian troops annexing Crimea.

In terms of logistics, the most central shortcomings concerned the ability to maintain the high readiness of troops and systems, the ability to build-up and deploy more troops quickly to deny or punish purposes. Time and speed were central in the case, which emphasized normal time readiness, also for logistics and logistical infrastructure. Ukraine had not been able to demonstrate the ability to deny Russia from achieving the goals it had set. The logistics of Ukraine's armed forces faced the same challenges as its armed forces and troops in Crimea, the unclear purpose of creating deterrence and defense capability

Based on the first case, it can be stated that strategic logistics had a clear connection with deterrence, as essential function to maintain the performance of forces and systems on credible level to threat the achievement of Russia's goals. In the absence of a clear deterrence strategy and readiness requirements the investments in logistics and infrastructure were low, which led to weak readiness, weak material readiness and further low will to fight, which must have been at the end a focal reason for the failure of deterrence in Crimea. Weaknesses in logistics, above all, weakened deterrence effect against Russia's Limited Aims Strategy.

In the second case, Ukraine's deterrence was overall more credible and clearly targeted against Russia. The background was naturally the war that had been going on for several years and Russia's active military activity in the neighboring regions of Ukraine. When studying how the principles for conventional deterrence (Mueller 2020) manifested in the case, it can be stated that Ukraine had a clear opponent, it had shown immediate and relatively automatic countermeasures if the attack took place and it had communicated to the attacker the impossibility of achieving the goals. Despite this, Russia was determined to subjugate Ukraine. The background could be various cognitive biases and intelligence errors, but perhaps the most central reason was Russia's confidence in the number and ability of its armed forces in relation to the performance, readiness, deployment, and logistics of the Ukrainian armed forces in the Kyiv region.

In terms of logistics, the most obvious deficiencies undermining deterrence concerned the ability to build-up and deploy troops to strengthen the defense and to defeat the enemy, because due to the focus of the Ukrainian armed forces in Eastern Ukraine, the logistics ability could be assumed to be weaker in the Kyiv area. In this case too, time and speed were emphasized, but on a different scale than in the first case. In the end, the significant difference was that the Ukrainian armed forces

established and deployed a sufficient number of troops in critical directions and had sufficient ability to stop the Russian attack and deny it from achieving its goals in the Kyiv region

In the second case the strategic logistics had a clear connection with deterrence, but unlike in the first case, logistics also contributed to strengthening deterrence. In this case, the effect of deterrence was weakened above all by the absence of a credible mass in the vicinity of Kyiv. In terms of logistics, deterrence was weakened by the fact that, above all, the ability to establish or concentrate new forces in the area had not been credibly demonstrated. On the other hand, there was no doubt about the ability of the logistics in the Kyiv region to support the troops in the area, because the Russian strategy was based above all on speed and surprise and thus on a short operation, where the logistics capacity did not have the same importance as the self-sufficiency of the troops. Logistics can even be considered to have led to the use of the Blitzkrieg strategy.

In the third case, the deterrence targeted against the Russian attrition strategy in Ukraine can be considered to have formed at the same time as the deterrence against the Blitzkrieg strategy formed in the previous case. This convergence follows the idea of narrow deterrence (Freedman 2004), according to which there are distinct stages in the war and that it is possible to deter a specific form of warfare even while other forms of warfare are progressed.

Following this idea, it is possible that Russia had created the capability for a large-scale attack when going to war, but the primary goal was to avoid escalation and try to subjugate Ukraine using the Blitzkrieg strategy based on the formed understanding of the situation. The attrition strategy was switched to only because the operation following the Blitzkrieg strategy failed, and because Russia felt that its armed forces had sufficient capability and potential to quickly strike the Ukrainian armed forces. At the same time, Russia would take advantage of the smoked success in the south and northeast and the relative superiority of its resources compared to Ukraine.

Regarding the conventional deterrence strategy formed against the attrition strategy, it can be recognized that the same principles for conventional deterrence defined by Mueller (2020) as in the previous case were realized for Ukraine. Also in this case, various Cognitive biases and Intelligence errors of Russia could have influenced the failure of deterrence, but in this case the main reason was Russia's confidence that the number and quality of its forces are sufficient for a relatively quick resolution of the war by defeating the Ukrainian armed forces in Eastern Ukraine. So Russia used to rely above all on the number and ability of its armed forces in relation to the performance, readiness, deployment, and logistics of the Ukrainian armed forces.

In terms of logistics, the most obvious deficiencies in the case three were related to strategic-level logistics and the logistical capability of the Ukrainian state and armed forces to maintain the capability

of the armed forces for large-scale warfare. Since Russia's attack was based on a belief in the superiority of its own resources, the demonstration of support from the West that later materialized could have been a key element related to logistics to create a credible conventional deterrence against Russia. This is primarily related to the scaling of Ukraine's logistical infrastructure and other capabilities, so that it would have corresponded to the resources allocated to Russia's war of attrition.

In the third case the strategic logistics had also a clear connection with deterrence. In this case, Eastern Ukraine was clearly the focus of logistics, which is why the military infrastructure built in the long term was able to support the construction, concentration and maintenance of troops. However, a clear deficiency was related to the logistical ability of the Ukrainian industry and the state to wage a war of consumption, which can be estimated to have weakened the deterrent against the attrition strategy. Later, the western logistical support that Ukraine received, including material and resources, could have been a key addition to creating a credible deterrence. Thus, it can be stated that the ability of logistics to support a long-lasting war is a critical condition for deterrence against the attrition strategy.

As a conclusion and as the answer to research question, it can be stated that the importance of logistics for conventional deterrence is emphasized more the longer and wider the threat of war a country or coalition has to prepare for. This applies to both resilience and the ability to generate resources and support fighting forces. The role of logistics is also central when preparing for and preventing the threat of a quick and short war. In this case, flexibility, the ability to maintain high readiness and thus the military infrastructure that enables them are emphasized in logistics. Deterrence is a context-bound multifaceted entity, the effect of which takes place above all in the cognitive environment among the decision-makers who make decisions about whether the state will go to war and what kind of strategy it will implement. The builder of deterrence must strive to understand the goals of the potential attacker, the possible attack strategy, the threshold of acceptable costs and the belief in the probability of success of military actions.

At the strategic level, there are a few things that stand out in logistics against all the attacker strategies studied. On the cooperation of the civilian logistics component and the military logistics component of the armed forces, logistical chains with allies and partner countries, the ability of the country's military infrastructure to produce combat equipment and resources, the ability to deploy these resources and forces in operations, the ability to build-up capabilities and the ability to sustain the high readiness of the forces and the ability to fight in an environment where resources are consumed by one's own actions and by the actions of the enemy. Interoperability of logistics with civilian and military actors moth nationally and internationally creates strategic resilience and responsiveness important for deterrence.

At the end, effective logistics are necessary for effective deterrence. The logistics capacity and capability also play a significant but underappreciated role in strategic competition and for deterrence. While procuring new military equipment and planning how to use them, it is needed to have a logistics system that can support them if it is wanted to create credible deterrence effect. Logistics can be considered to be a multiplier of two important elements in terms of deterrence, capability and credibility.

7 DISCUSSION

7.1 Evaluation of the research

According to Hirsjärvi (2013) assessing the validity of qualitative research is a comprehensive critical examination. Evaluation should be continuous during the research process. The validity and reliability of the research is increased by describing the stages of the research process and the principles used as well as possible. Reliability assessment is possible by relating the research results to the methods used. Reliability can be assessed as the compatibility of descriptions, explanations, and interpretations.

In this study, assessment was continuous throughout the research process. Continuous evaluation of reliability is manifested in the justification of choices and interpretations, as well as in the description of the use of methods and results in the research report. The whole and the process are described logically and comprehensibly in the introduction, which enables an assessment of the reliability of the research.

The study followed the frame and scope set for the research. The delineation of the subject was done by forming a preliminary understanding of the research topic by familiarizing ourselves with previous studies and theories. The delineation became more precise as the understanding of the research topic developed and at the same time as the research question and sub-questions were structured more precisely. As is typical for qualitative research, the research object and delimitation became more precise as the researcher's understanding of the subject grew.

The scope of the research was formed by the concepts, perspective and delimitation presented in the theoretical framework. The frame and scope are manifested in the implementation of data collection, in the analysis of empirical material and in drawing conclusions. The research progressed consistently, answering the set sub-questions in accordance with the set research question.

Based on the results of the research, it can be stated that the sub-questions were appropriate to provide information to answer the research question and understand the case better and provide new information from the relations of deterrence and logistics. Due to the used research methodology, the

sub-questions and research questions were solved in a logical order. Due to the inherent nature of the research process, the reliability of the results depends on the reliability of the results of the previous steps. The results produced in different stages can be considered relatively reliable, although the researcher's own thinking is emphasized in the analysis and results.

Qualitative approach and case study can be considered well suited to examining the research object and answering the research questions. The qualitative approach was suitable for collecting and analyzing empirical data, first to create understanding and finally to draw analysis and conclusions.

It was possible to build a functional entity from the research, which manifests itself in the consistent use of methods throughout the work. The collection of empirical material and the analysis of the material pushed the research process forward, ultimately producing answers to the set research questions. Content analysis was suitable for the analysis of qualitative material based on documents, producing information suitable for the purpose of the research.

The sampling of the empirical document material can be estimated to have been comprehensive to form a sufficient overall picture of the research phenome. The selection highlighted a few research reports produced by well-known research institutes CSIS and RAND. The reliability of those reports is increased using several researchers in their preparation. During the study, the information in the reports has also been compared with other studies, assessments, and reports. No significant difference was observed.

The sources used in this study can be considered to have been comprehensive enough to obtain reliable results. In qualitative research, the material is needed as much as is necessary for the topic or the research task. The sufficiency of the empirical material was found when the new sources did not produce significant new information. On the other hand, it should be noted that there is not lots of studies available on the events of 2022, which is why it is likely that subsequent studies will produce information that would be relevant for answering the questions of this study.

The reliability of the research results should be evaluated based on the description of the use of the different stages and methods of the research. The reliability of the results was improved by tying the use of research methods to the theoretical background of the research by using abductive reasoning in the analysis. By describing the use of research methods, the used analysis framework and phasing accurately enough, the reader is given the opportunity to assess the reliability of the research.

As a criticism of the results, the context-relatedness typical of a case study can be presented, which weakens the generalizability and transferability of the results. On the other hand, context-boundness results from the limitation made to examine the research object, which enables a deep understanding of the subject. Also, he relatively narrows sampling can be considered a weakness.

Criticism can also be presented for the theoretical framework used in the study. The theory dealing conventional deterrence was strongly based on the concepts created by Mearsheimer and Mueller, and other theoretical models were hardly discussed. On the other hand, Mearsheimer's model of conventional deterrence is well known, and no significant deviant model has been created. Mueller's concept of conventional deterrence has not been precisely defined or tested, which is why its use can be criticized. On the other hand, it can be seen as a benefit of limiting the review and finding perspectives for deterrence strategies.

The theory of strategic logistics was strongly based on the definitions of Kress and until some extent on Eccles. It is difficult to define the theory of strategic logistics, because logistics is seen as a function that cuts through several different levels. On the other hand, since the theory was not precisely defined, it allowed flexible examination and the use of abductive reasoning to obtain results. In addition, the theory can be assessed as promoting the generalizability of the research.

The study followed guidelines for good scientific practice. Honesty, care, and precision in accordance with the general guidelines have been tried to be shown in the research report by describing the implementation of the research accurately and by examining the implementation of the research critically.

7.2 Further studies

Conventional deterrence has experienced a new rise due to Russia's aggressive actions, and several new studies and academic papers have been written on the subject. However, there are still enough interesting areas and perspectives in the subject, which by studying it is possible to produce new information about the formation of credible deterrence.

Firstly, this study examined the importance of logistics for Ukraine's conventional deterrence against Russia. In order to evaluate or generalize the reliability of the results formed in this study, the importance of logistics for conventional deterrence could be studied using other cases where the potential attacker's strategy is based on the same categories presented by Mueller. Applying the theoretical background used in research to new cases could also enable testing theories and finding new perspectives for theories.

Secondly, in this study, above all, the relation of land warfare and the logistics for conventional deterrence was emphasized. This was natural because land warfare has been at the center of the war between Ukraine and Russia. The contribution of logistics to conventional deterrence could be expanded by studying how its contribution is seen in cases emphasizing air or sea warfare, for example.

This broadening of perspectives would bring out the scope and transversality of logistics in different domains.

Thirdly, further studies could deal with the importance of logistics for conventional deterrence in a wider geopolitical context, where the examination would expand to include the resources of the entire alliance or, for example, the West to create conventional deterrence against potential aggressor or aggressors. At this stage, the state's instruments of power would also come up more strongly in examining the importance of logistics. This would bring a thousand and one dimensions to the topic and could be a current topic considering the changing picture of war, geopolitical transitions and possible competition between East and West.

REFERENCE LIST

Aćimović, S., Mijušković, V., & Golubović, M. (2021). *Military Logistics vs. Business Logistics: A Comparative Analysis.* Economic Analysis (0013-3213). 2021, Vol. 54 Issue 1, p118-138. 20p.

Akimenko, V., Daukšas, V., Liubinavičius, B., & Petraitis, D. (2022). *ZAPAD 2021 Communication Analysis: Messages, Narratives, (Dis)Information.* Riga: NATO Strategic Communications Centre of Excellence. Retrieved 20.3.2023 from

https://stratcomcoe.org/pdfjs/?file=/publications/download/ZAPAD-2021-Communication-Analysis-DIGITAL-1ef19.pdf?zoom=page-fit

Ashurst, T. & Beaumont D. (2020). *Logistics Interoperability, Deterrence and Resilience – Why Working as Allies Matters Now More Than Ever.* Posted on January 30, 2020. Retrieved 20.7.2022 from https://logisticsinwar.com/2020/01/30/logistics-interoperability-deterrence-and-resilience-why-working-as-allies-matters-now-more-than-ever/

Art, R. J. (2015). *The Four Functions of Force*. R. J. Art & R. Jervis, International politics: Enduring concepts and contemporary issues (12. utg.). Boston: Pearson.

Bar, S. (2022). *Deterrence After Ukraine—A Critical Analysis.* Quillette, 24 Mar 2022. Retrieved 18.2.2023 from https://quillette.com/2022/03/24/deterrence-after-ukraine-a-critical-analysis/

Beaumont D. (2018). *Is Logistics the Ultimate Conventional Deterrent?* Posted on April 2018. Retrieved 11.8.2022 from https://logisticsinwar.com/2018/08/22/is-logistics-the-ultimate-deterrent/

Bhandari, P. (2022). *Inductive Reasoning. Types, Examples, Explanation*. Scribbr. 5.12.2022. Retrieved 2.4.2023 from https://www.scribbr.com/methodology/inductive-reasoning/

Bielieskov, M. (2021). *The Russian and Ukrainian Spring 2021 War Scare*. Center for Strategic and International Studies. September 2021. Retrieved 25.3.2023 from https://www.csis.org/analysis/russian-and-ukrainian-spring-2021-war-scare

Brown, P. (2008). *A Review of the Literature on Case Study Research*. Canadian Journal for New Scholars in Education/ Volume 1, Issue 1, July 2008. Retrieved 2.4.2023 from https://journalhosting.ucalgary.ca/index.php/cjnse/article/view/30395/24837

Black, J. (2021). *Logistics: The Key to Victory.* Pen & Sword Military; 2021. Accessed March 25, 2023. https://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=3032894&site=ehost-live

Borger, J. & Sabbagh, D. (2022). *US warns of 'distinct possibility' Russia will invade Ukraine within days.* The Guardian 11.2.2023. Retrieved 23.3.2023 from https://www.theguardian.com/world/2022/feb/11/biden-ukraine-us-russian-invasion-winter-olympics

Bowers, I. (2018*). Small State Deterrence in the Contemporary World*. Oslo: IFS Insight 9. Retrieved 23.11.2022 from https://fhs.brage.unit.no/fhs-xmlui/bitstream/handle/11250/2569031/IFS%20Insights_9_2018.pdf?sequence=1&isAllowed=y

Braithwaite, R, (2014). *Russia, Ukraine, and the West.* The RUSI Journal, 159:2, 62-65. Retrieved 21.2.2023 from https://doi.org/10.1080/03071847.2014.912805

Dorman, E. F, (2018). *The Critical and Foundational Role of Strategic Logistics in the New Era of Deterrence.* In Braun, III W. G., von Hlatky s., & Nossal, K. R. (2018) *The Return of Deterrence: Credibility and Capabilities in a New Era*. The Kingston Conference on International Security Series Centre for International and Defence Policy School of Policy Studies, Queen's University Kingston, Ontario, Canada & Strategic Studies Institute U.S. Army War College, Carlisle, PA, USA.

Byrum, S. S. (2016). *Downloading Deterrence: The Logic and Logistics of Coercive Deployment on U.S. Strategy.* School Of Advanced Air and Space Studies Air University Maxwell Air Force Base, Alabama. Retrieved 9.1.2023 from https://apps.dtic.mil/sti/pdfs/AD1030394.pdf

Clark, M., & Barros, G. (2021). *Russia's Zapad-2021 Exercise*. Institute for the Study of War. Sep 17, 2021. Retrieved 21.3.2023 from https://www.understandingwar.org/backgrounder/russia%E2%80%99s-zapad-2021-exercise

Clark, M., Barros, G. and Stepanenko, K. (2022a) *Russia-Ukraine Warning Update: Russian Offensive Campaign Assessment, February 27.* Institute for the Study of War, 27 February 2022. Accessed 1.3.2023 from https://www.understandingwar.org/sites/default/files/Initial%20Russian%20Offensive%20Campaign%20Assessment.pdf

Clark, M., Barros, G. and Stepanenko, K. (2022b*) Russia-Ukraine Warning Update: Initial Russian Offensive Campaign Assessment*. Feb 22, 2022. Institute for the Study of War, 27 February 2022. Accessed 1.3.2023 from https://understandingwar.org/backgrounder/russia-ukraine-warning-update-russianoffensive-campaign-assessment-february-27

Crowe, S., Cresswell, K., Robertson, A., Huby, G., Avery, A., & Sheikh, A. (2011). *The case study approach.* BMC Medical Research Methodology 11:100. Retrieved 18.3.2023 from https://doi.org/10.1186/1471-2288-11-100

Dall'Agnol, A. C., & Duarte, É. E. (2022). *Military Power and Conventional Deterrence*. Revista De Relaciones Internacionales, Estrategia Y Seguridad, 17(1), Revista de relaciones internacionales, estrategia y seguridad, 2022, Vol.17 (1). Retrieved 16.2.2023 from http://www.scielo.org.co/scielo.php?pid=S1909-30632022000100101&script=sci_arttext

Eccles, H. E. (1959). *Logistics in the National Defense*. Naval War College Logistics Leadership Series. Naval War College Press, Newport, Rhode Island. First printing 1997

Elbridge, C. & Solomon, J. (2015). *Facing Russia: Conventional Defence and Deterrence in Europe.* Survival, 57:6, 21-50. Retrieved 15.3.2023 from https://doi.org/10.1080/00396338.2015.1116146

Erbel, M. & Kinsey, C. (2018). *Think again – supplying war: reappraising military logistics and its centrality to strategy and war.* Journal of Strategic Studies, 41:4, 519-544, Retrieved 11.3.2023 from https://doi.org/10.1080/01402390.2015.1104669

Freedman, L. (2004). Deterrence (pp. VI, 145). Cambridge: Polity.

Freedman, L. (2019). *Ukraine and the Art of Strategy*. Oxford University Press. Accessed 10.4 2023 https://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=1989904&site=ehost-live

Gustafsson, J. (2017). *Single case studies vs. multiple case studies: A comparative study.* Academy of Business, Engineering and Science Halmstad University Halmstad, Sweden. 12.1.2017. Retrieved 19.3.2023 from https://www.diva-portal.org/smash/get/diva2:1064378/FULLTEXT01.pdf%20(10

Haffa, R. P. (2018). *The Future of Conventional Deterrence: Strategies for Great Power Competition*. Strategic Studies Quarterly, Winter 2018. Retrieved 16.8.2022 from https://www.jstor.org/stable/pdf/26533617.pdf

Harris, S., DeYoung, k., Khurshudyan, I., Parker, A., & Sly, L. (2022). *Road to war: U.S. struggled to convince allies, and Zelensky, of risk of invasion*. Washington Post 16.8.2022. Read 23.3.2023 from https://www.washingtonpost.com/national-security/interactive/2022/ukraine-road-to-war/

Hirsjärvi, S., Remes, P., & Sajavaara, P. (2013). *Tutki ja kirjoita*. Bookwell Oy, Porvoo 2013.

Institute for the Study of War (2022a). Ukraine Conflict Update 8. February 25, 2022. Russia Team. Received 14.1.2023 from https://www.understandingwar.org/sites/default/files/Ukraine%20Conflict%20Update%208%2025%20FEB.pdf

Institute for the Study of War. (2022b). *Ukraine Conflict Update 9*. Russia Team. February 27, 2022. Received 14.1.2023 from https://www.understandingwar.org/sites/default/files/Ukraine%20Conflict%20Update%2010_0.pdf

Institute for the Study of War. (2022c). *Ukraine Conflict Update 12*. Russia Team. March 1, 2022. Received 14.1.2023 from https://www.understandingwar.org/backgrounder/ukraine-conflict-update-12

Kofman, M., Migacheva, K., Nichiporuk, B., Radin, A., Tkacheva, O., & Oberholtzer, J. (2017). *Lessons from Russia's Operations in Crimea and Eastern Ukraine.* RAND Corporation, RR-1498-A, 2017. Retrieved 5.2.2023 from https://www.rand.org/pubs/research_reports/RR1498.html.

Kress, M. (2002). *Operational Logistics. The Art and Science of Sustaining Military Operations.* Boston: Kluwer Academic Publishers, 2002.

Levy, J. S. (2008). *Deterrence and Coercive Diplomacy: The Contributions of Alexander George.* Political Psychology, 29(4). Accessed 2.10.2022 form http://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=34185332&site=ehost-live.

Lind, W.S. (1984). *The Case for Maneuver Doctrine*. From Clark, A. A., Chiarelli, P. W., McKitrick, J. S., & J. W. Reed (Red.), The defense reform debate: Issues and analysis. Johns Hopkins University Press, 88–100. (12 s.)

Luo, A. (2022). *Content Analysis. Guide, Methods & Examples*. Scribbr 5.12.2022. Retrieved 4.4.2023 from https://www.scribbr.com/methodology/content-analysis/

Massicot, D. (2023). *Russian Military Operations in Ukraine in 2022 and the Year Ahead*. Santa Monica, CA: RAND Corporation, 2023. Retrieved 20.4.2023 from https://www.rand.org/pubs/testimonies/CTA2646-1.html.

Mazarr, M. J. (2021). Understanding Deterrence. In: Osinga, F., Sweijs, T. (eds) NL ARMS Netherlands Annual Review of Military Studies 2020. NL ARMS. T.M.C. Asser Press, The Hague. Retrieved 15.11.2022 from https://doi.org/10.1007/978-94-6265-419-8_2

McCombes, S. (2023). *What Is a Case Study? Definition, Examples & Methods*. Scribbr 30.1.2023. Retrieved 4.4.2023 from https://www.scribbr.com/methodology/case-study/

Mearsheimer, J. (1981). *Maneuver Mobile Defense and the NATO central front*. International Security, 6, nr 3, 1981-82. Retrieved 19.11.2022 from https://doi.org/10.2307/2538609

Mearsheimer, J. (1983). *Conventional Deterrence*. Cornell Studies in Security Affairs. Cornell University Press. Ithaca and London. Accessed 20.8.2022 form http://www.jstor.org/stable/10.7591/j.ctt1rv61v2

Mearsheimer J. (2018). C*onventional Deterrence: An Interview with John J. Mearsheimer*. Strategic Studies Quarterly, Vol. 12, No. 4 (WINTER 2018), pp. 3-8 Published by: Air University Press Stable. Retrieved 22.11.2022 from https://www.jstor.org/stable/10.2307/26533611

Minzarari, D. (2022). *Failing to Deter Russia's War against Ukraine: The Role of Misperceptions.* SWP Comment 33, April 2022. Stiftung Wissenschaft und Politik. German Institute for International and

Security Affairs. Retrieved 24.2.2023 from https://www.swp-berlin.org/publications/products/comments/2022C33_WarUkraine_Misperceptions.pdf

Ministry of Defense of Ukraine. (2016). *The White Book 2015*. Ministry of Defence Ukraine 2016. Retrieved 21.2.2023 from

https://www.mil.gov.ua/content/files/whitebook/WB_2015_eng_WEB.PDF

Ministry of Defense of Ukraine. (2022). *White Book 2021 Defence Policy of Ukraine.* Ministry of Defence Ukraine, 2022. Retrieved 21.2.2023 from

https://www.mil.gov.ua/content/files/whitebook/WhiteBook_2021_Defens_policy_of_Ukraine.pdf

Morgan, P. M. (2012). *The State of Deterrence in International Politics Today*. Contemporary Security Policy, 33:1, 85-107. Retrieved 19.1.2023 DOI: 10.1080/13523260.2012.659589

Mueller, K. (2021). *The Continuing Relevance of Conventional Deterrence*. In: Osinga, F., Sweijs, T. (eds) NL ARMS Netherlands Annual Review of Military Studies 2020. NL ARMS. T.M.C. Asser Press, The Hague. Retrieved 15.11.2022 https://doi.org/10.1007/978-94-6265-419-8_4

Oliker, O., Davis, L. E., Crane, K., Radin, A., Ward Gventer, C., Sondergaard, S., Quinlivan, J. T., Seabrook, S. B., Bellasio, J., Frederick, B., Bega, A., & Hlavka, J. (2016). *Security Sector Reform in Ukraine.* RAND. Accessed 25.32023 from

https://search.ebscohost.com/login.aspx?direct=true&db=e000xww&AN=1442495&site=ehost-live

Osinga, F., & Sweijs, T. (2020) (eds) NL ARMS Netherlands Annual Review of Military Studies 2020. NL ARMS. T.M.C. Asser Press, The Hague. Retrieved 15.11.2022 form

https://link.springer.com/book/10.1007/978-94-6265-419-8

Pili G., & Minniti, F. (2022). *Understanding Russia's Great Games: From Zapad 2013 to Zapad 2021*. The Royal United Services Institute for Defence and Security Studies (RUSI), 7 June 2022. Received 25.3.2023 from https://rusi.org/explore-our-research/publications/commentary/understanding-russias-great-games-zapad-2013-zapad-2021

Polyakov, L. (2017). *Defense Institution Building in Ukraine at Peace and at War*. Connections, Summer-Fall 2018, Vol. 17, No. 3 (Summer-Fall 2018), pp. 92-108. Partnership for Peace Consortium of Defense Academies and Security Studies Institutes. Read 6.4.2023 from

https://www.jstor.org/stable/10.2307/26934693

Prebilič, V. (2006). *Theoretical aspects of military logistics*. Defense & Security Analysis, 22:2, 159-177. Received 12.1.2023 from https://doi.org/10.1080/14751790600764037

Schelling, T. C. (2008). *Arms and Influence*. New Haven: Yale University Press

Skoglund, P., Listou, T. and Ekström, T., (2022). R*ussian Logistics in the Ukrainian War: Can Operational Failures be Attributed to logistics?*. Scandinavian Journal of Military Studies, 5(1), p.99–110.DOI: https://doi.org/10.31374/sjms.158

Streefkerk, R. (2023). *Inductive vs. Deductive Research Approach. Steps & Examples*. Scribbr. Retrieved 14.3.2023 from https://www.scribbr.com/methodology/inductive-deductive-reasoning/

Shelest, H. (2022). *Defend. Resist. Repeat: Ukraine's lessons for European defence*. European Council on Foreign Relations. ECFR. Received 12.1.2023 from https://ecfr.eu/publication/defend-resist-repeat-ukraines-lessons-for-european-defence/

Sutyagin, I., & Clarke, M. (2014). *Ukraine Military Dispositions*. *The Military Ticks Up while the Clock Ticks Down.* RUSI Briefing Paper, Royal United Services Institute, 2014. Read 6.4.2023 from https://static.rusi.org/ukranian-military-dispositions-rusibriefing-2014.pdf

Sutyagin, I. (2014). *Ukraine's Ground Forces*. Commentary, Royal United Services Institute, 27 March 2014. Read 6.4.2023 form https://rusi.org/explore-our-research/publications/commentary/ukraines-ground-forces

Sweijs, T., & Zilincik, S. (2019). *Cross Domain Deterrence and Hybrid Conflict*. The Hague Centre for Strategic Studies. December 2019.

Takacs, D. (2017). *Ukraine's deterrence failure: Lessons for the Baltic States*. Journal on Baltic Security, 3, 1–10. https://doi.org/10.1515/jobs-2017-0001 The Two Sides of Deterrence in Ukraine. (n.d.). Retrieved 14.8.2022 from https://www.csis.org/analysis/two-sides-deterrence-ukraine

Tuomi, J., & Sarajärvi, A. (2018) Laadullinen Tutkimus ja Sisällönanalyysi. Uudistettu laitos. Helsinki: Kustannusosakeyhtiö Tammi, 2018

Wirtz, J. J. (2018). *How Does Nuclear Deterrence Differ from Conventional Deterrence*? Strategic Studies Quarterly, Vol. 12, No. 4, Winter 2018. Retrieved 17.9.2022 from https://www.jstor.org/stable/10.2307/26533615

Wood, E., Pomeranz, W., Merry, E., & Trudolyubov, M. (2016). *Roots of Russia's war in Ukraine*. Washington, D.C: Woodrow Wilson Center Press Columbia University Press.

Yin, R. K.(2014). *Case study research design and methods* (5th ed.). Thousand Oaks, California: SAGE.

Robert K. Yin. (2014). Case study research design and methods (5th ed.). Thousand Oaks, CA: Sage. 282 pages

Robert K. Yin. (2014). Case study research design and methods (5th ed.). Thousand

Oaks, CA: Sage

Yin, R. K. (2018). *Case study research and applications: Design and methods* (Sixth ed.). Los Angeles, California: SAGE.

Walker, N (2023). *Conflict in Ukraine: A timeline (2014- present*). House of Commons Library. 24 February 2023. Received 28.3.2023 from https://commonslibrary.parliament.uk/research-briefings/cbp-9475/.

Van Creveld, M. (1977). *Supplying war: Logistics from Wallenstein to Patton*. Cambridge: Cambridge University Press.

Viitaniemi, J., & Kytöneva, S. (2023). *Venäjän hyökkäys ukrainaan vuonna 2022 Käsiteanalyyttinen tapaustutkimus maaoperaatioiden toteutuksesta*. National Defence University Department of Warfare Series 3: Working Papers No. 29. Helsinki 2023. Received 25.3.2023 form https://www.doria.fi/bitstream/handle/10024/186729/Viitaniemi%26Kyt%C3%B6neva_Ven%C3%A4j%C3%A4n%20hy%C3%B6kk%C3%A4ys%20Ukrainaan_verkko_140323.pdf?sequence=3&isAllowed=y