

INTERIM SECURITY INSIGHTS AND IMPLICATIONS FROM THE FIRST TWO MONTHS OF THE RUSSIA-UKRAINE WAR

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EXECUTIVE SUMMARY

Russia's ongoing struggles during its invasion of Ukraine have led some to suggest that the Russian military lacks the capability to credibly threaten the North Atlantic Treaty Organization (NATO) and its member states. However, narrowly focusing on Russia's tactical and operational struggles, while omitting the flawed Russian strategic decisionmaking which underpinned the invasion, is a dangerous approach. While Russia's significant losses in this war will clearly degrade its ability to conduct large scale offensive operations against NATO in the short term, it is too soon to write off the medium to long-term threat posed by Russia. Therefore, as the Russian invasion enters a new phase, it is useful to determine what lessons should and should not be derived from this conflict.

There are several conclusions NATO leaders should avoid. First, it would be unwise to think Russia no longer poses a threat and therefore further investment in NATO military forces is unneeded. Early evidence indicates that secretive Russian political decisionmaking and faulty strategic assumptions hindered effective operational planning and force employment. Second, it would be equally unwise to assume the enabling strategy employed by NATO in Ukraine would work elsewhere. Finally, NATO cannot assume the solidarity enjoyed to-date will endure indefinitely. Considering these factors and the strong likelihood that tensions with Russia will persist, NATO leaders must be clear-eyed about the need to enhance the alliance's conventional deterrence posture.

Reviewing insights from Russia's struggles provides a useful means to assess NATO's conventional capabilities. Initial analysis clearly reaffirms well-known axioms that underpin large scale combat operations, lessons NATO should take to heart as the alliance looks to deter future Russian aggression. Specifically, Russia's degraded military readiness, struggles synchronizing combined arms operations, deficient logistics support, and inadequate force ratios help explain the Russian military's miscarried offensive. Poor Russian command and control exacerbated each of these failings. While other variables contributed to Russia's failures, we narrowly focus on these factors as they are most critical to explaining Russian land forces' challenges. As the Russian military reviews its performance, it is reasonable to expect it will implement reforms to address its failings. Indeed, early evidence from Russia's narrowed offensive, focusing on eastern and southern Ukraine, suggests that Russian tactical adaptation is already underway.

Just as Russia adapts to better conform to these principles, NATO should similarly adapt to strengthen its conventional deterrence capabilities. Beyond considering the lessons learned by Russia and NATO, Beijing is likely drawing conclusions from this war and how they might apply to a Chinese invasion of Taiwan. China may believe the U.S. will choose to avoid a direct military confrontation and instead employ a robust sanctions regime even if the sanctions negatively affect the U.S. economy. Moreover, the Chinese likely perceive a successful invasion would require the initial use of overwhelming firepower but be concerned with the potentially high cost of an amphibious invasion against the well-armed Taiwanese Defense Forces.

In our subsequent analysis, we analyze these initial insights and provide policy recommendations for NATO to enhance its conventional capability and strengthen its ability to credibly deter future Russian aggression.

INTRODUCTION

Russia's ongoing invasion of Ukraine is the largest armed conflict in Europe since World War II and will fundamentally alter the continent's security landscape. By early May 2022, the Russian offensive has killed an estimated 3,153 Ukrainian civilians and created 5.5 million Ukrainian refugees.¹ Militarily the Ukrainians have purportedly lost up to 3,000 soldiers killed² while recent estimates suggest 15,000 Russian soldiers have been killed, with significantly higher numbers wounded.³ Due in no small part to the staggering human costs and subsequent failure to achieve their initial objectives of demilitarizing Ukraine and unseating the government in Kyiv, Russia has changed course to a seemingly more limited strategy of expanding its control in eastern and southern Ukraine.⁴ As the conflict shifts from one initially focused on the capture of Kyiv and other major cities to a potentially more lethal one in the east, it is useful to take stock of what lessons can be drawn from the conflict to-date.

While the Russian military's offensive has fared poorly thus far, policymakers should be cautious and avoid drawing premature conclusions as the next phase of the conflict may be quite different from the previous one. Russia's underestimation of Ukrainian resolve and struggles to attain

military objectives is well-documented.⁵ However, it is only two months into the conflict, one which will very likely, as U.S. Chairman of the Joint Chiefs of Staff General Mark Milley suggests, "be measured in years."⁶ Therefore, it is likely the Russians will, to some degree, adapt and fight along fewer axes, allowing them to mass forces and firepower which could eventually wear down the Ukrainian military. Further, tensions between NATO and Russia are at their highest point in decades, making a sober assessment more critical.

As the Russian military learns and adapts from its initial failings, NATO political and military leaders should similarly use insights from the war to strengthen the alliance's conventional deterrence posture and secure its eastern flank against future Russian aggression.

In the enclosed work we review the first two months of the Russia-Ukraine War and consider what conclusions NATO should and should not learn from the ongoing conflict. While strategic conclusions about Russia's demise may be premature, initial insights clearly reaffirm tactical and operational axioms that underpin large scale

combat operations. As the Russian military learns and adapts from its initial failings, NATO political and military leaders should similarly use insights from the war to strengthen the alliance's conventional deterrence posture and secure its eastern flank against future Russian aggression. Beyond considering lessons learned from NATO and Russia's perspectives, many are watching events unfolding in Ukraine and how it may apply to a scenario where China attempts to take control of Taiwan.⁷ We therefore examine what conclusions Beijing may be drawing from the ongoing conflict. The assessments NATO, Russia, and China are making based on this conflict will have strategic significance for many years to come.

CONCLUSIONS NATO SHOULD AVOID

There are several conclusions NATO should avoid drawing from the conflict, because they could have dramatic impacts on the alliance's ability to deter or defeat Russia in the long term.

The first and arguably most dangerous conclusion is the Russian military is ineffective and therefore does not pose a significant threat in the future. In recent articles, Phillips Payson O'Brien and Stephen M. Walt summarize the argument, stating the reasons why Russia lacks the capacity to defeat Ukraine and attack NATO territory in the future.⁸ Such thinking is dangerous as it could drive the alliance to halt efforts to invest in military capability, posture forces forward, or innovate. While O'Brien makes several salient points about Russia's failures, the idea that Russia does not pose a threat long-term falls flat for three reasons.

First, a long-term degradation of the Russian military threat should not be inferred from the significant political and strategic failings that underpinned Russia's invasion. Secretive Russian strategic decisionmaking prevented adequate time for operational planning and faulty political

assumptions regarding Ukrainian resolve and cohesiveness contributed to inefficient Russian tactical force employment.⁹ Despite Russia's numerous offensive challenges and the large number of casualties it has taken, it still possesses the fifth largest military in the world.¹⁰ While Russia's military is unquestionably of varying quality and will need time to reconstitute losses, its sheer size means it will continue to pose a threat to NATO. If the Russians apply their overall force ratio advantages, they could eventually succeed in Ukraine through an attrition strategy.

Second, there are signs Russia is learning from its early missteps, suggesting it may prove more successful in the next phase in Ukraine and in a future conflict with NATO.¹¹ As an example and discussed in greater detail below, the Russians appointed General Alexander Dvornikov as the theater commander in Ukraine, which demonstrates an attempt to fix some of their shortcomings. Consequently, there is the potential that the Russians' recent performance will not be repeated.¹²

Third, Russia has consistently shown that it is willing to use military force to achieve its policy goals regardless of international opinion or condemnation. It is not entirely implausible that Russian President Vladimir Putin would use force against the Baltic states (Estonia, Latvia, and Lithuania) or another NATO member state if he thought the rewards outweighed the risks, particularly if his hold on power is called into question. Consequently, NATO policymakers should avoid thinking Russia will not pose a threat in the future.

The second conclusion that NATO should avoid drawing is that alliance members do not need to worry about investing in their own militaries and can instead focus on enabling partners to deter or defeat Russia. Admittedly this is a seductive strategy that eliminates the need for expensive, large militaries and plays to the economic strengths of major Western powers. Since the

start of the conflict on February 24, the U.S. has committed almost \$4.8 billion in military aid in addition to what its NATO allies have given, and Congress is considering a request from the administration for an additional \$20 billion in future military aid.¹³

While this equipment was essential to Ukraine's defeat of Russia's advance on Kyiv, it is unclear if this strategy will ensure success in the east or in a future fight with NATO for several reasons. First, as already mentioned, the Ukrainians' success was also due to the multitude of Russian shortcomings. As the fight continues and Russia learns and adapts, an enabling strategy may no longer work either in Ukraine or on NATO territory. Second, initially providing a myriad of easily transportable and employable weapons played to the Ukrainians' use of small teams in urban terrain. The terrain in eastern Ukraine is more conducive to maneuver warfare requiring heavier weaponry, which is more difficult to supply and maintain. Though the West has clearly adjusted the nature of support it is providing to reflect a new phase of the conflict, it is unclear if the West will get the Ukrainians the equipment they need in enough time to enable success. For NATO, the terrain along the likely axis of a Russian advance in Poland or the Baltics is similar to that of eastern Ukraine, meaning heavy weapons and larger maneuver formations are needed to deter/defeat Russia.

Third, the success of the Ukrainian military during the first six weeks was also due to significant, focused training by the U.S. and NATO advisors, operating since 2015 under the Joint Multinational Training Group-Ukraine.¹⁴ Applying a similar approach to NATO would take years of sustained partnership. Finally, all the military aid provided prior to hostilities did not deter Russia from invading Ukraine nor has it made Moscow sue for peace since. Logically similar efforts elsewhere would not either so NATO must invest in military capabilities and force structure to deter future Russia aggression.

The final conclusion that NATO should avoid is that unity and solidarity can be maintained indefinitely. The U.S. and its allies have done an exceptional job of building a coalition opposing Russia that has remained remarkably intact over the last 10 weeks. Indeed, U.S. and international sanctions on Russian banks, cutting off several Russian banks from the SWIFT payments network, and the cessation of Nord Stream 2 certification will have lasting impacts on the Russian and global economy.¹⁵ However, the ability to maintain such cohesion not only for the sanctions but from a political and security perspective long-term is doubtful for three reasons. First, the true bite of the sanctions has yet to fully impact the European economy. The International Monetary Fund is predicting a decrease in global economic growth from 6.1% in 2021 to 3.6% in 2022.¹⁶ The longer the conflict drags on, the greater the impact, meaning support may wane as the cost of goods and transportation rise. Second, elections may bring European leaders into power who are less supportive of Western efforts and may pursue a different track. France is a fitting example. Though Marine Le Pen lost the recent presidential election there, she received the highest vote tally ever for the far-right National Rally party. Her campaign commitments to remove France from NATO's command structure were surely troubling to NATO leaders.¹⁷ Were a similar leader to gain prominence in the future and threaten a like move, it could complicate NATO efforts to isolate Russia. Third, despite the temporary focus on the Russian threat, the 30 NATO member states will continue to perceive threats differently, based on each state's unique geographic, economic, and political circumstances.¹⁸ Finally, the casualties that would likely occur in even a limited NATO conflict with Russia may lead risk-averse NATO members to reconsider honoring their Article 5 commitment, given the cost in human lives, and thus be less supportive of an extended conflict. Consequently, NATO would be wrong to expect the newfound consensus will apply universally to a future conflict.

KEY INSIGHTS FROM THE WAR'S FIRST TWO MONTHS

Though observers should be cautious when deriving conclusions about Russia's strategic demise, the Russian military's struggles over the last two months reinforce numerous operational and tactical axioms. Specifically, Russia's degraded military readiness, struggles synchronizing combined arms operations, deficient logistics support, and inadequate force ratios help explain the Russian military's miscarried offensive. Poor Russian command and control underpinned and exacerbated each of these failings. While a host of other shortcomings have inhibited Russian battlefield success, we narrowly focus on these factors as they are most critical to explaining Russian land forces' challenges. These insights are not revolutionary and reflect existing tenets of large-scale combat operations, codified in Russian, U.S., and NATO doctrine.¹⁹ While effective tactical and operational adaptation depends on a host of factors, it is reasonable to expect Russian forces will begin to address these shortcomings in the coming weeks and months. Therefore, it is vital that NATO similarly incorporate these lessons to strengthen the alliance's security in the immediate future. We proceed by reviewing each principle as it pertains to the Russian military's invasion force and consider adjustments NATO should implement to strengthen its conventional deterrence posture.

Military readiness matters

Russia's struggling invasion and NATO's response have underscored the importance of military readiness. Military readiness encompasses several factors which enable "a military force to fight effectively on short notice."²⁰ These readiness factors include structural readiness – having forces with the right organization and equipment to succeed in an unknown, future conflict; operational readiness – the ability to

rapidly deploy, fight, and win; and mobilization readiness – the state's ability to generate additional military power.²¹

The Russian military's structural readiness is hindered by several task organization deficiencies, which limited their effectiveness in combat. First are the shortcomings in logistics force structure. At the tactical level, the Russian tactical formations lack a robust, internal sustainment capacity to resupply frontline units. Instead, the Russian sustainment enterprise relies heavily upon rail networks for resupply, meaning that limited logistics support units the Russians do possess were incapable of timely replenishment of combat forces, which constrained Russian offensive tempo.²² Second is a lack of infantry within large maneuver formations, which inhibits combined arms operations. While the Russian invasion has relied heavily upon Battalion Tactical Groups (BTGs), units internally organized with a host of capabilities to permit semi-independent operations, it is evident that numerous BTGs lack adequate infantry to support clearance operations on foot, which has contributed to significant Russian armor losses.²³ Finally and perhaps most importantly, Russian active ground forces are not structured for sustained, large-scale combat operations without deliberate employment of conscripts and mobilization of reserves.²⁴ Unfortunately for Russia, correcting structural shortcomings is time-intensive and these issues will likely not be fixed anytime soon.

Russian operational readiness has been challenged by inadequate training, poor equipment maintenance, and limited recovery capabilities, as was evident in Russia's failed attempts to capture Kyiv in the first 10 weeks of the Ukraine invasion.²⁵ The Russian invasion force's months-long wait in assembly areas around the Russian and Belarusian borders with Ukraine further degraded operational readiness, as outdoor conditions in frigid winter months adversely impacted vehicle and equipment

maintenance.²⁶ The Russian army's operational readiness will suffer continued degradation the longer it remains in sustained combat in Ukraine. It is too soon to tell how Western sanctions against the Russian defense industry will impact Russia's ability to reconstitute its military power, but widespread destruction of Russian equipment will undoubtedly result in degraded mobilization readiness.²⁷ Recent estimates suggest that 500 Russian tanks have been destroyed, amounting to two years of tank production.²⁸ Russia's ability to quickly mobilize additional ground force personnel and domestic sensitivities regarding its conscript system are just as important as the Russian defense industry's struggles to replace material.²⁹ While Russian readiness challenges have hindered offensive operations so far, these glaring deficiencies have already prompted tactical and operational adaptation as the Russian military refocuses on operations in eastern and southern Ukraine.³⁰

Assuming Russian military adaptation is successful, and tensions with NATO persist, it behooves NATO to improve its own military readiness to better deter future Russian aggression on NATO's eastern flank. NATO's response to the Russian invasion also highlights significant readiness deficits, pertaining to force structure, operational readiness, and national mobilization capabilities. As we have argued in earlier analysis, NATO lacks the armored force structure required to conventionally deter Russian aggression on NATO's eastern flank.³¹ Beyond NATO's enhanced Forward Presence battlegroups, European NATO allies lack high-readiness armored forces that are available to quickly react in a crisis.³² As NATO states begin rebuilding their atrophied conventional military capabilities, NATO should carefully examine the force structure of forward positioned units in the Baltics and Poland, and expand the number of high-readiness armored formations. These armored force structure deficits are exacerbated by operational readiness challenges that constrain NATO's ability to quickly mass combat

power in a crisis. This was apparent when the U.S. Army rapidly flew personnel from the 1st Armored Brigade Combat Team (ABCT), 3rd Infantry Division to Europe, but the unit was still being issued vehicles at distributed prepositioned equipment sites across Europe a month after their initial deployment.³³

To be relevant in a potential crisis where a Russian mobilization against NATO is identified, high-readiness units must be stationed forward in Europe, or able to arrive in one to two weeks, given Russia's favorable geographic position.

Furthermore, the absence of permanent U.S. armored forces in Europe is a critical vulnerability. This was evident when the U.S. Army sent two additional ABCTs to Europe in response to the Russian invasion, leaving the U.S. Army with portions of five ABCTs forward deployed: three in Europe, one in South Korea, and one in Kuwait.³⁴ With only 11 ABCTs in the active force and five in the National Guard, the current ABCT deployment tempo is unsustainable, and risks severe impacts to the ABCTs' modernization, training, and quality of life. To be relevant in a potential crisis where a Russian mobilization against NATO is identified, high-readiness units must be stationed forward in Europe, or able to arrive in one to two weeks, given Russia's favorable geographic position. Consequently, pre-positioned stocks of equipment, fuel, and ammunition must be placed in or closer to Poland or the Baltics to decrease the time required to issue said material in a crisis. Finally, the U.S. defense industry's ongoing struggles to quickly produce and resupply Ukraine with lethal aid underscore challenges that persist with U.S. mobilization readiness, and similar issues exist with Europe's defense industry.³⁵ Therefore, the alliance must take a hard look at the manpower and structure, equipment, and material required to deter and if needed, defeat a Russian attack on NATO.

Combined arms maneuver is key

Combined arms operations refer to the synchronizing of distinct combat capabilities in a complementary manner to increase lethality and survivability during armed conflict.³⁶ While distinct specialties often train and certify on their area of expertise (i.e., infantry, tanks, artillery, sappers, attack aviation, etc.), merging these distinct units in an effective combined arms team requires deliberate training and unique expertise. If done properly, effective combined arms operations reduce exposure to enemy fire, enable friendly maneuver, and limit the enemy's ability to maneuver.³⁷

However, Russian forces have struggled with combined arms operations since their invasion began. First, Russian armored columns frequently operated beyond the range of supporting artillery and without infantry clearance operations, which were needed to suppress and clear Ukrainian defensive positions and anti-tank guided missile positions.³⁸ These tactical failures to operate in cohesive combined arms teams were exacerbated when operating in urban terrain, where Ukrainian anti-tank ambushes have wrought destruction on Russian armored vehicles.³⁹ Second, numerous Russian tactical formations operated well forward of their supporting higher echelons, leading to over-extension and subsequent isolation. This is best captured by the Russian joint forcible entry attempt during the Battle of Antonov Airport, which failed to secure an initial lodgment because Russian air assault forces lacked requisite combined arms support, forcing outnumbered and isolated Russian paratroopers to defend against counterattacking Ukrainians.⁴⁰ Third, across the entire theater, the Russian air force has struggled to gain air superiority and fully support ground maneuver, hampering the Russian army's ability to secure ground objectives.⁴¹ Early indicators suggest that Russia's renewed offensive in eastern Ukraine is adapting from these initial failings, and deliberately focusing

on strengthened combined arms maneuver with increased air support.⁴² It remains to be seen if the Russian's adaptations will prove successful.

From NATO's perspective, combined arms maneuver remains a decisive competency to deter Russian aggression or effectively respond to a crisis. However, conducting synchronized, multilateral combined arms maneuver amongst dozens of allied states poses distinct challenges.⁴³ There are several distinct capability gaps that currently hinder NATO's ability to conduct combined arms maneuver. Amongst the most critical are the high-readiness armored forces and logistics capabilities previously mentioned, integrated air and missile defense, and bridging and gap crossing assets required for moving across rivers. As Ukraine's successful use of dispersed air defense networks demonstrates, air defense is essential in any future fight. There are widely acknowledged shortcomings in NATO's integrated air and missile defense at the operational and tactical level.⁴⁴ The alliance therefore must invest in interoperable short, medium, and long-range air defense capabilities. Further, given Europe's extensive rivers and the complexity of gap crossing operations, NATO must address widespread deficiencies across the alliance in bridging capabilities and gap crossing expertise.⁴⁵ As NATO bridging and gap crossing capabilities come online, the alliance must regularly conduct large scale exercises such as the Defender series with bridging and wet gap crossing scenarios included.⁴⁶

Logistics drives operations

Logistics can be understood as "the practical art of moving armies and keeping them supplied," and this vital but underappreciated military function is critical to enabling and sustaining offensive operations.⁴⁷ While distinct combat specialties must be properly synchronized for combined arms maneuver, logistics support must be synchronized with all maneuver units to sustain a desired offensive tempo. Russia's

dismal logistical support is arguably one of its greatest weaknesses during its invasion of Ukraine.⁴⁸ Beyond the structural issues already highlighted with the Russian military's task organization, poor sustainment planning and execution has compounded resupply difficulties.

Despite Russian reliance on rail networks mentioned above, Russian combat units failed to secure key Ukrainian rail nodes early on in the invasion and successful sabotage efforts have denied key rail lines, preventing timely resupply and overextending limited wheeled support units.

Specifically, Russia's initial invasion across a massive front forced Russian sustainment units to operate across vast exterior lines of operation. Limited support units needed to travel extremely long distances, further overextending Russian sustainment support.⁴⁹ Conversely, Ukrainian forces enjoyed interior lines of operation, which enabled them to conduct resupply with shorter distances. Russia's elongated resupply routes place logistics convoys at increased risk as they operate in a non-permissive environment and frequently encounter ambushes.⁵⁰ Despite Russian reliance on rail networks mentioned above, Russian combat units failed to secure key Ukrainian rail nodes early on in the invasion and successful sabotage efforts have denied key rail lines, preventing timely resupply and overextending limited wheeled support units.⁵¹ Beyond these sustainment planning challenges, the Russian logisticians and commanders initially struggled to implement controlled supply rates for key munitions, as was apparent as Russia's precision guided munitions (PGMs) were quickly expended in the war's first few weeks.⁵² Russia appears to be learning from these initial setbacks, as PGMs are now restrictively

employed on high-value targets.⁵³ As Russia shifts to more focused offensive operations in eastern Ukraine, their resupply distances, convoy security requirements, and logistics support requirements will lessen as they are attacking along fewer axes in much closer proximity to the Russian border. However, the systemic structural logistical shortcomings in the Russian army will remain, which suggests the Russians will still struggle to sustain operations long-term even in a somewhat easier mission.

Logistics is equally important to NATO's ability to conventional deter future Russian aggression and react to a future crisis. The routine sustainment interoperability challenges of multilaterally resupplying many separate NATO member armies are already daunting. However, in a crisis contingency with Russia, NATO planners would also be faced with the enormous challenge of quickly transporting and sustaining significant volumes of combat power to the east, in a potentially contested environment.⁵⁴ Recent assessments have highlighted that existing NATO transportation networks are insufficient for this vital task.⁵⁵ Focusing on the oft-cited Russia-Baltics contingency, Russia's geographic position endows Moscow with inherent sustainment advantages based on proximity and the Russian Western Military District has a robust sustainment infrastructure that would ease sustainment in a Baltics contingency.⁵⁶ From NATO's perspective, Eastern European states' limited rail capacity, varying rail gauge sizes, aging infrastructure, and weight capacity constraints all pose major impediments to the alliance's ability to rapidly reinforce its eastern flank.⁵⁷ Further, major NATO rail hubs are fixed locations that would be vulnerable to intermediate range Russian PGMs and cyber disruption. To overcome these challenges NATO states must increase investments like the Rail Baltica project, which expand rail networks, increase capacity, and modernize and harden infrastructure and key nodes. Further, NATO states need to create

redundancies with additional military heavy equipment transport units that can independently move armored vehicles, without relying on time-intensive rail movements.⁵⁸

Correlation of forces still matter

U.S., NATO, and Russian doctrine all incorporate correlation of forces models (COFM) as operational planning tools to determine the appropriate force size when conducting offensive operations.⁵⁹ Based on historical battle analysis, the 3:1 rule of thumb suggests that attackers should have at least three soldiers for every defending soldier to overcome the defense’s natural advantages and increase probability of offensive success.⁶⁰ An important condition for the 3:1 force ratio is that attackers’ and defenders’ military capabilities should be qualitatively similar. If one side enjoys significant qualitative and technical advantages over an adversary, then they might secure success without meeting that rule of thumb.

When analyzing theater-wide force ratios in the Russia-Ukraine war, it is apparent that the Russian invaders lacked the requisite force to accomplish their maximalist objectives. Looking at the critical capabilities required to effectively conduct combined arms maneuver, Russia failed to attain the 3:1 ratio for ground troops, main battle tanks, infantry fighting vehicles (IFVs), and artillery. Table 1 lists the raw capability counts of the Russian invasion force and compares them against capabilities of Ukraine’s active military. Significantly, the Ukrainian figures do not capture reserve units or militias. As Ukraine has implemented national mobilization to defend against the invasion, Russian force ratio deficiencies are even greater than depicted in Table 1.

TABLE 1

Force ratio analysis of Russian invasion forces vs. Ukrainian active military, 2022

Unit	Ground troops	IFVs	Tanks	Artillery
Russian invading forces	190,000	3,600	1,200	844
Ukraine active military	131,600	1,759	918	1,122
Force ratios (Russia:Ukraine)	1.4:1	2:1	1.3:1	0.75:1
Theoretical 3:1 requirements	394,800	5,277	2,754	3,366
Shortcoming	204,800	1,677	1,554	2,522

Source: Forbes, The New York Times, International Institute for Strategic Studies⁶¹

While the Russian army did not adhere to the 3:1 rule of thumb when structuring its invasion force, this does not necessarily indicate that it does not consider force ratios, or that COFMs are irrelevant. Instead, it is likely that Russian political leaders badly underestimated Ukrainian resolve and political cohesiveness. Beyond these faulty strategic assumptions, it is also likely that Russian military planners incorrectly assumed that Ukrainian forces were qualitatively inferior and lacked the capability to exercise command and control of such a large operation. As Russian forces mass in eastern Ukraine, beginning the war's next phase, the Russian military is deliberately trying to build sufficient combat power against the defending Ukrainian Joint Forces Operation, reflecting Russian adaptation to earlier failings.⁶² Their new effort may prove successful if they mass all available combat power. However, the success of Russia's eastern campaign is anything but certain. Though units have been repositioned in the east, the short time between the initial phase of the Russian invasion and the new offensive likely did not leave enough time for the Russians to effectively reconstitute units bloodied in earlier combat. Consequently, time will tell what the future holds in the east.

From NATO's perspective, correlation of forces still matters for NATO's efforts to strengthen conventional deterrence against future Russian aggression. In earlier work, we analyzed significant force ratio deficiencies against NATO ground forces in the Baltics and Poland.⁶³ Confirming other assessments, we find that NATO's standing forces in the Baltics lack the capability to successfully defend the Baltics (and thus deter) a Russian invasion.⁶⁴ Alarming, NATO's degraded structural and operational readiness (especially amongst its conventional armored and mechanized forces) means that NATO would struggle to rapidly reinforce the Baltics to attain favorable defensive force ratios, if a Russian mobilization were identified.⁶⁵ This problem is further exacerbated by NATO's aforementioned military readiness and mobility

challenges. As NATO's current conventional deterrence posture is based around a "deterrence by rapid reinforcement" framework, NATO's inability to rapidly reinforce its eastern flank poses a major security vulnerability that should be urgently addressed.⁶⁶ While the Russian military lacks the capacity to credibly threaten the Baltics in the short term while it is consumed with Ukraine, this war will eventually end, and Russian-NATO tensions will remain high for the indefinite future. It behooves NATO to implement policy reforms aimed at strengthening its conventional deterrence posture and bolstering its eastern flank.

Command and control remains critical

Russian command and control (C2) challenges underpin each of the aforementioned tactical and operational issues. The initial invasion's planning and execution was hindered by Moscow's failure to establish an overarching theater command structure, with disparate Russian military districts and commands operating together without an established chain of command for the newly assembled invading force.⁶⁷ While Putin's recent appointment of General Dvornikov may partially resolve these issues, it is still unclear if there is a true joint forces commander who has the ability to synchronize Russian action across domains.⁶⁸ Beyond command relationships, undisciplined Russian transmissions on unsecured lines point to further weaknesses with Russian military's communications infrastructure, and highlight the apparent shortages or poor training with secured communications.⁶⁹ Beyond these operational and equipment C2 issues, the Russian army's overreliance on officers and weak non-commissioned officer corps has similarly exposed issues with tactical-level C2.⁷⁰ Large-scale combat operations require disciplined, well-trained tactical leaders who can operate in a dispersed environment, without explicit guidance from their chain of command. Ukrainians have adeptly targeted Russian generals, command posts, and lower-ranking officers to sow chaos

at tactical echelons.⁷¹ Given the Russian army's weak non-commissioned officer corps, and overreliance on officers, Ukrainian targeting efforts underscore the importance of competent junior and non-commissioned officers who can operate in disbursed conditions while adhering to commander's intent.

While C2 for one state with one predominate language is difficult enough, C2 for NATO's 30 member states, speaking a multitude of different languages and operating with a host of unique C2 equipment, represents a major challenge.⁷² While the alliance benefits from over 70 years of collaboration, NATO's militaries' unique communications and encryption capabilities create significant challenges in establishing reliable, multilateral tactical networks. Beyond these technical issues, NATO's streamlined decision making is inherently complicated with 30 distinct national governments, and operational command structures can be reformed to enable rapid decisionmaking needed to prevail in a crisis contingency.⁷³ NATO should take heed of Russia's ongoing C2 challenges and ensure that interoperable, secure communications are available throughout the alliance and that such systems are refined through use during major exercises.

CONCLUSIONS CHINA MAY DERIVE

While Russia and NATO both have much to learn from operations in Ukraine to-date, there are several conclusions China may derive that are applicable to a Taiwan scenario. The first, based off statements by President Joe Biden about not committing troops to fight in Ukraine,⁷⁴ is that China may perceive the West will take a similar approach with Taiwan. The Taiwan Relations Act purposefully creates some "strategic ambiguity" about a U.S. response to a Chinese assault on Taiwan.⁷⁵ While there is some utility in the ambiguity, when combined with precedence from Ukraine, the Chinese could potentially perceive

the U.S. will avoid direct military confrontation were they to attack Taiwan. Admittedly, Taiwan is not a direct comparison to Ukraine geographically or politically and a Chinese attack on Taiwan would obviously be different due to the need for a large-scale amphibious assault to take the island.⁷⁶ However, the basic premise remains valid, and the potential Chinese perception must be accounted for.

Second, China must be drawing conclusions from the heavy use of sanctions on Russia as they continue their offensive. As previously highlighted, the unprecedented sanctions regime has remained cohesive to-date and will have significant impacts on the U.S. and global economy moving forward. Given the example of Ukraine, it is reasonable for the Chinese to assume the U.S. would be willing to impose crippling sanctions in a Taiwan scenario even if it would negatively impact the U.S. and the world economically. Such willingness to use sanctions must be considered by the Chinese. However, due to major differences between the size and nature of the Russian economy versus the Chinese, the U.S. and its partners would need to develop a more comprehensive method for waging long-term economic warfare.

The Chinese, like the rest of the world, have observed the initial Russian operations in Ukraine and are analyzing Russia's actions to see what does and does not work.

Third, the Chinese, like the rest of the world, have observed the initial Russian operations in Ukraine and are analyzing Russia's actions to see what does and does not work. Similar to Russia's pre-war objectives for Ukraine, China would hope to affect a rapid takeover of Taiwan, decapitating Taipei's political leadership to ensure disorganization at the tactical and operational level. The Russians failure to

use its overwhelming advantage in the air to destroy the Ukrainian air force and knock out command and control, inexplicably attacking along multiple fronts, and ineffectual application of its vast arsenal of cyber tools are amongst the many lessons learned from the opening days of Russia's invasion.⁷⁷ These are some of the many takeaways the Chinese will glean, with potentially devastating consequences for Taiwan. They suggest China, unlike Russia, would apply massive firepower in the initial stages of an invasion targeting air defense, command and control, and infrastructure to set the conditions for an invasion. Once complete, China would likely attempt a large-scale air and amphibious operation to overwhelm the Taiwanese military with mass. If a Chinese fait accompli is possible before the West can mount an effective response, then this increases the odds of their invasion's strategic success.⁷⁸ This does not assume a Chinese invasion would necessarily be successful or easy for the reasons detailed below, but it is likely the Chinese would avoid making the same mistakes so painfully learned by the Russians.

Fourth, while the Chinese may believe the U.S. will not intervene militarily, the vast array of Russian missteps may make the Chinese hesitant to attempt a large amphibious assault for three reasons. One, the Ukrainians have demonstrated how vulnerable surface combatants are to artillery or anti-ship missiles. The successful sinking of the Orsk in the Sea of Azov port of Berdyansk on March 24⁷⁹ and the Moskva in the Black Sea on April 14 are illustrative of how costly an amphibious assault could be.⁸⁰ Unlike Ukraine, Taiwan has an extensive inventory of advanced anti-ship missiles, aircraft, and land-based rocket and tube artillery. The past three U.S. administrations have provided over \$39 billion in military sales to Taiwan including hundreds of Harpoon anti-ship missile systems, torpedoes, Paladin artillery systems, HIMARs rocket launchers, F-16s fighters, AH-64 attack

helicopters, and advanced early warning radars.⁸¹ With such an extensive arsenal, it is reasonable to assume Taiwan would have even greater success in damaging or destroying a seaborne Chinese invasion force. Two, the Ukrainians have successfully defended their airspace with a combination of portable short-range missiles and legacy Soviet S-300s.⁸² As with the anti-ship capability, Taiwan enjoys a considerable anti-air and missile advantage over Ukraine including radars and Patriot missile batteries.⁸³ Therefore, a reasonable assumption the Chinese may derive is they'd be more challenged in the air than they previously expected. Three is casualties. As previously highlighted, the Russians have taken up to 20,000 killed and two three times that number wounded during their eight weeks in combat. While the Chinese have the largest military in the world with roughly two million active service members,⁸⁴ one of the lasting effects of the one child policy is the limited available pool of manpower.⁸⁵ China could struggle to reconstitute its force in a high-casualty scenario. Based on the Russian experience, the Chinese may then be more hesitant to attempt a Taiwan invasion.

LIVING WITH A RUSSIAN THREAT

This war has made evident the enduring threat that a Putin-led Russia poses to European and international security.⁸⁶ Widespread Russian support for Putin suggests Moscow will remain a threat for the indefinite future.⁸⁷ It is imprudent to assume that the Russian military lacks the capability and competence to conventionally harm NATO, based on its early missteps in its ongoing invasion. Rather, recent indicators suggest that the Russian military is learning and adapting, as is evident from Russia's improved forces ratios against the Ukrainian Joint Forces Operation, local air superiority in the east, refined command structure, and improved combined arms maneuver. Further, though Russia's combat

power may be degraded in the short term, Moscow will deliberately attempt to reconstitute its military power in the long term.

As NATO considers further expansion, with Finland and Sweden likely to apply for membership in the near future, it is highly probable that Putin will continue using the Russian military as a coercive tool against NATO allies.⁸⁸ While it is too soon to predict the war's final outcome or when

Russian forces will return to pre-war levels in its Western Military District, it is clear Russia-NATO tensions will remain high and that the Russian military will continue to threaten NATO for the foreseeable future. Therefore, just as Russia learns and adapts, all NATO members states need to act now to strengthen the alliance's conventional deterrence posture and ensure collective security.

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