Mission Impossible:  
Measuring the Offense-Defense Balance with Military Net Assessment

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Charles Glaser’s *Rational Theory of International Politics* argues that state security competition is not an inevitable consequence of international anarchy.¹ To be sure, sometimes the attempt by one state to increase its security has the unintended and unavoidable effect of decreasing the security of others—triggering a spiral of arms racing and diplomatic hostility that results in war. At other times, however, this security dilemma can be avoided. According to Glaser, under a surprisingly wide range of conditions, states should be able to feel secure, build military forces to signal peaceful intentions, and thereby avoid unnecessary competition and conflict. In short, much of the tragedy of international politics could be ameliorated if state leaders were more attuned to conditions conducive to cooperation.

What are these conditions? For Glaser, offense-defense variables are key. The nature of the offense-defense balance (ODB), and whether offense and defense are distinguishable, helps determine whether states can avoid negative security spirals. When the ODB favors defense, and the forces that support offense are distinguishable from the forces that support defense, security-seeking states can build defensive forces at less risk and without threatening the adversary’s ability to defend itself. This reassuring defense posture signals benign motives, encourages cooperative arms control policies, and has the potential to improve political relations over time. In sum, offense-defense variables are a crucial determinant of a state’s security environment and vital to the causal logic and policy prescriptions of Glaser’s theory.

Glaser’s analysis is clear, rigorous, and comprehensive. The book is a major contribution to international relations theory. However, the theory’s reliance on offense-defense variables—specifically, its faith in the ability of states to assess the offense-defense balance and shape military policy accordingly—undermines its explanatory and normative power.

Scholars have previously challenged the validity of offense-defense explanations. Glaser responds to many of these critiques in his book; the full debate does not need to be recounted here. Instead, the discussion below focuses on Glaser’s crucial claim—which has yet to be fully debated—that when it comes to measuring the ODB “the analytic tasks required are the same as those required to perform military net assessments” (140, emphasis added). As he stipulates, “If useful net assessment is feasible, useful estimates of the offense-defense balance are also feasible” (140). “Useful” in this context means that states are capable of measuring offense-defense variables, performing the analysis envisioned in the theory, and adopting the appropriate prescribed strategy when conditions permit.

The argument that states are capable of assessing offense-defense variables as long as they are capable of performing military net assessment is unconvincing for two reasons. First, the task is impractical. The standard tools of military net assessment are not nearly as fine-grained as necessary for states to identify the conditions conducive for cooperative security policies as outlined in Glaser’s theory. Second, the task is logically flawed. Even if practically possible, states could not use the results of that analysis to shape arming and force posture decisions to yield the security benefits envisioned in the theory. In short, there is a fundamental mismatch between Glaser’s theory and its real-world applicability.

The sections below briefly summarize the role of offense-defense variables in Glaser’s theory, discuss the limitations of net assessment compared to the demands of estimating the ODB, and explore why the carefully calibrated force structures envisioned by the theory would make little sense in the real world.

Offense-Defense Variables in Glaser’s Theory

Material variables—those that determine a state’s military capability—play a major role in determining whether a state can choose a cooperative security

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3 Since Glaser describes his theory as ‘a theory of what states should do, not necessarily what they do do,’ critiques about empirical validity can seemingly be set aside (143).
strategy. For Glaser, the key material variables are power, the ODB, and offense-defense distinguishability. He argues that the standard realist emphasis on power alone is problematic because offense-defense variables are necessary to understand how power is translated into a state’s ability to perform relevant military missions, such as defending or conquering territory. The relative ability to defend or attack—not simply the balance of power—largely determines the severity of the security dilemma.

The offense-defense balance signifies the relative ease of conquest. It is defined as “the ratio of the cost of the offensive forces the attacker requires to take territory to the cost of forces the defender has deployed” (43). The ODB depends on a variety of factors, most importantly the nature of technology and geography, and is assessed assuming the attacker chooses the “best available offense to the defender's best available defense” (45). This variable raises the prospect—if defense advantage is great enough—that even states much less powerful than their adversaries might satisfy their defense requirements.

Offense-defense distinguishability indicates whether states can build defensive forces as a means of signaling benign motives and encouraging arms control. “When offense and defense are completely distinguishable,” Glaser writes, “the forces that support offensive missions do not support defensive missions, and vice versa; when offense and defense are entirely indistinguishable, the forces that support offensive missions can be used as effectively in defensive missions, and vice versa” (45). The distinguishability variable is crucial for Glaser’s theory because it helps determine whether a state can deploy forces that are useful for self-defense, but not for attacking an adversary, and whether a state can signal benign motives by foregoing forces with offensive potential.

According to Glaser, a security-seeking state considering whether to pursue an arms buildup should ask whether doing so would be destabilizing and counterproductive. That is, it should ask whether building more arms would decrease its adversary’s defensive capability, whether its buildup is likely to signal malign motives incorrectly, and whether it would be better to pursue security gains more cooperatively. Offense-defense variables point the way to answering these questions: all other things being equal, defensive advantage and the ability to distinguish between offensive and defensive forces should allow states to protect themselves, signal their benign motives, and avoid negative military and political spirals. Under these conditions, rational security-seeking states should opt for arms control, defensive force postures, and unilateral restraint. Defense dominance renders doing so less risky, and distinguishability makes benign communication more feasible.

In sum, when offense-defense conditions permit, security seekers should aim to maintain the military capabilities required to deter and defeat adversaries, but also seek to preserve other states’ security by avoiding policies that undermine opposing military capabilities. According to Glaser’s theory,
the degree to which a state will have difficulty in balancing these potentially conflicting strategic objectives is largely a function of the severity of the security dilemma, which, in turn, is determined largely by the ability of states to measure and understand offense-defense variables.

The Limits of Net Assessment Versus the Demands of Estimating the Balance

A key claim in Glaser's argument is that statesmen can ascertain the ODB. The analytic tasks required to comprehend the ODB, Glaser asserts, are "the same as those required for military net assessments—analyses of the ability of a state's forces to perform military missions against the forces of an opponent" (139–41). If states can perform net assessment, they can estimate the ODB:

Both require analyzing the ability of a defender's forces to succeed against an attacker's forces. Standard net assessments analyze the ability of the forces deployed by the attacker to defeat the forces deployed by the defender. The same tools can be adapted to determine the ODB. Instead of focusing on deployed forces, to measure the balance we allow the attacker's forces to vary. The balance is defined where the offense is large enough to defeat the defense; the ratio of the cost of these offensive forces to the cost of the defensive forces is the offense-defense balance (140).

Glaser acknowledges that accurately estimating the ODB is complex, requiring a number of demanding assumptions and judgments—but he is optimistic that none of the required tasks are unmanageable (138).

Equating net assessment with measuring the ODB belies a fundamental misunderstanding. Net assessment simply cannot yield the kind of precise knowledge necessary for states to make the strategy and force structure decisions called for in Glaser's theory.

War is a highly uncertain business, so the tools of net assessment are blunt; they are not intended to produce fine-grained results. The best that net assessment can typically yield, even with sophisticated combat modeling, is a simple range of possible outcomes: most commonly, that the attacker will likely win, the defender will likely win, or the outcome of the war is uncertain because the two forces are relatively evenly matched. Of course, that determination is often suitably accurate for states to use as a general guide for force procurement and deployment decisions. But the methods of net assessment cannot somehow be fine-tuned to produce the much more precise assessments that states would require in order to opt for the strategic policies Glaser recommends.

Net assessment can be undertaken in many different ways, but it essentially involves the analysis of relative military capabilities. The process involves analyzing the interaction of opposing forces in realistic battle scenarios in order to determine strategic vulnerabilities and opportunities against
a given adversary in a given theater of operations. Net assessment typically begins with basic questions: Who is the adversary? What are the conflicting political objectives? Where would a military conflict take place? What forces would be involved and what is their expected quality? Given the actors, objectives, location, and forces involved, net assessment seeks to determine the military strategies that each state can be expected to employ to achieve its objectives, the appropriate models or analytical tools to assess the relative military effectiveness of those strategies, the results produced by those models, and the sensitivity of those results to changes in basic parameters (especially alternative forces, locations, strategies, and the models themselves).

The typical payoff for undertaking this exercise is some indication of whether a given military conflict is likely to be a closely fought competitive battle, or whether one side is far superior to the other. In other words, either one actor will appear to have a clear military advantage, or the situation will appear competitive enough that the ultimate outcome of battle will depend on any number of factors—including relative skill or will, luck, the friction of war, and other unanticipated strategic wildcards—that cannot be fully predicted beforehand. The analytical community has developed increasingly sophisticated military models to predict battle outcomes, but the basic limitations on net assessment remain.

Among several excellent recent net assessments—for example, of the US-Iranian conflict in the Strait of Hormuz and US military operations at Tora Bora in Afghanistan—none purport to do more than suggest likely outcomes and all are careful to qualify the findings. Peter Krause argues that the US battle at Tora Bora in 2001 would have been more likely to have succeeded with more troops, but concludes that operations would have been difficult and complicated, success was by no means guaranteed, and much about the outcome would have depended on logistics, intelligence, al Qaeda’s strategic choices, the performance of various US and allied forces, and the highly unpredictable factors of weather and terrain where the fighting would occur. Similarly, Eugene Gholz’s analysis of Iran’s ability to cripple the supply of oil to the global market and Caitlan Talmadge’s evaluation of the potential interaction of Iranian and US military forces in the Strait are models of net assessment; each aims to improve public debate and strategic decision making by suggesting how different assumptions about military capabilities might generate different predictions about likely outcomes. Neither predicts just how a US-Iranian conflict would turn out, recommends specific US force requirements, or purports to overcome a host of military and nonmilitary factors that would preclude making such concrete conclusions.4

Glaser’s theory contends that we can take net assessment—with its already demanding information requirements, as well as modest objectives—and ask it to do much more. According to Glaser, states should adapt net assessment techniques to measure the ODB in order to “maintain the military capabilities required to deter and defeat adversaries, but also to preserve other states’ security by signaling benign motives and avoiding policies that undermine opposing military capabilities” (53). The goal is to meet a state’s military requirements for successful defense while simultaneously minimizing the threat those capabilities pose to an adversary. This Goldilocks strategy (as I label it) aims to build just the right amount and kind of military force: not too much, not too little, not too menacing, not too reassuring. Leaving aside the question of whether this balancing act is theoretically possible, in practice it would require information that far exceeds the capability of existing military modeling tools.

Consider, for example, the debate over the NATO-Warsaw Pact conventional military balance in Europe in the 1980s. Analysts disagreed on basic assumptions about forces, strategies, and doctrines, as well as the relative merits of various models used to predict battle outcomes, but most views fell into one of two schools: those who argued that NATO was hopelessly overmatched against a conventional Warsaw Pact attack and those who believed that NATO might be able to defend successfully. The most serious debate occurred within the latter group, with some analysts believing that NATO could probably thwart a Pact attack and others contending that NATO would probably lose. But both the qualified optimists and the qualified pessimists understood that the conventional balance was highly competitive—the outcome of the battle would largely depend on whether NATO received adequate strategic warning of an attack and mobilized its forces accordingly. None of the analyses attempted to define the precise point at which NATO forces would be just strong enough to stop a Warsaw Pact attack, let alone determine the cost ratio of building those hypothetical forces.

Other examples abound. Most analysts agree that the Israeli Defense Forces (IDF) could defeat a Syrian invasion today. But figuring out exactly how much the IDF might cut its air and ground forces to the point that it could just barely defend Israel without unnecessarily threatening Syria would be analytically impossible. It would also be strategically foolish. In 1973, the Israelis believed the IDF to be unassailable. But a coalition of Arab states led by Syria and Egypt succeeded in launching a surprise attack, and the vastly superior IDF came perilously close to being swept from the Golan Heights, which would have given the Syrians a short, open road to Tel Aviv. Had the

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IDF aimed lower and tried to build a Goldilocks force, it would have likely suffered a decisive defeat.

The problem is manifest even in more limited conflict scenarios that have been closely studied for years. For example, what is the Goldilocks force for the US mission to maintain air supremacy against China in the event of a regional conflict? American planners have identified the air battle as a vital component of the broader strategy to defend allies in the region, and have thus analyzed it carefully. Yet the tools of net assessment cannot tell us what amount and kind of US capabilities would meet minimum military requirements without unnecessarily threatening Chinese security. Even with sophisticated net assessment, military planners today face great uncertainty about US capabilities against Chinese air and air defense capabilities during a regional conflict. Some analysts believe US air power could easily gain and maintain air supremacy. Production of the F-22 Raptor fighter ended in 2009 in large part because US planners were satisfied with existing capabilities for any air superiority mission. Others argue that US air supremacy is not only doubtful in a future conflict scenario against China, but also uncertain if a conflict were to occur today. In the assessment of these analysts, Chinese surface-to-surface missile attacks against air bases in Japan and Guam combined with surface-to-air missile attacks would dramatically degrade US air capabilities and defeat the air superiority mission. This view calls for a huge bolstering, not cancellation, of F-22 production simply to meet minimum requirements to conduct the defensive mission. Serious analysts using sophisticated tools of net assessment have advanced both positions, with no clear answer. The more ambitious type of net assessment required by Glaser’s theory—to determine a force that would just barely win—would likely generate even greater uncertainty.

Net assessment is often used as a valuable tool to inform political judgment and strategic choice, but one should not get carried away in thinking that these analytical techniques can somehow indicate just the right level of risk for a state to assume in the pursuit of peace and security.

One Goldilocks Force, Many Missions

There is a second major reason why Glaser’s optimism about a state’s ability to make useful assessments of offense-defense variables is unconvincing. Even if one could overcome the substantial practical obstacles to measuring

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the ODB and using that understanding to guide force production and deployment decisions, the causal logic of the theory is inapplicable in a world where states have more than one adversary, pursue security interests beyond their own territory, or face multiple military missions. Glaser suggests that the narrow, dyadic version of his theory can be extended: “A natural next move would be to address more fully situations that include more than two major powers” (271). But doing so would undermine the theory’s core normative prescriptions. Simply put, the right force structure for a single dyad—that is, that which reduces the adversary’s vulnerability and signals benign motives without compromising a state’s own security—will likely be the wrong force structure for another dyad. Furthermore, because forces can be concentrated, several separate Goldilocks forces inevitably undermine the purported security benefits of each individually tailored force.

The theory developed in *Rational Theory of International Politics* seeks to explore the security dynamics between two states. It assumes a state can determine the ODB for a single conflict scenario against one adversary in a lone theater of operations. The theory calls for states—under permissive conditions—to build and deploy a force that balances the capability to deter and defeat that adversary without undermining the adversary’s own security.

In the real world, many states—and all great powers—plan for a variety of conflicts against multiple adversaries in several theaters of operation. Any force that addresses a range of threats in a range of scenarios will have great capacity for offensive operations in any single theater. For example, even assuming that the ODB favored the defense, and offensive and defensive forces were distinguishable, how could the United States configure its armed forces to be able to defend South Korea from invasion, protect Japan, keep East Asia’s sea lanes open, defend Kuwait and other Gulf Allies, keep the Strait of Hormuz open, and fulfill US commitments to NATO without having a force that could be concentrated for an overwhelming invasion of North Korea? What imaginable force would be barely sufficient to prevail in each of these missions without unnecessarily threatening potential adversaries? Or imagine that offense-defense conditions allowed China to build just sufficient air and naval power to keep the US Pacific Fleet at bay—but nothing more. In trying to convey benign motives and build just enough capability to stalemate US forces in the Pacific, China would inevitably generate enormous security fears in Japan, Indonesia, Australia, and other regional states. In short, a Goldilocks force against one adversary is likely to be excessive against another.

Even if a state were able to adapt net assessment to usefully estimate a favorable ODB and tailor a separate military force for each mission, the fact of the matter is that these forces could likely be concentrated for battle in any single campaign. Even in the Cold War, when defense against a Warsaw Pact invasion in Western Europe was the main strategic challenge, US forces earmarked for other missions—including naval and air assets
around the world—could have contributed substantially to the central mission if war occurred. Similarly, even if the United States could configure a Goldilocks force in East Asia aimed at allaying Chinese insecurity, many other US capabilities (particularly naval forces) deployed to other regions for other purposes could be concentrated in the region fairly quickly. To be sure, any state faces potential costs to concentrating its forces—for example, in accepting temporary vulnerability against threats elsewhere—and adversaries are likely to understand and seek to capitalize on those costs (perhaps by allying with those other threatening states in order to undermine a concentration strategy). Yet understanding such regional and global strategic dynamics highlights the problem with analyzing the offense-defense balance—and a Goldilocks force—between a pair of states in isolation.

In short, the sum of separate mission forces—or even the combination of a fraction of these forces—is likely to exceed the level necessary to signal benign motives, minimize the adversary’s insecurity, and create conditions favorable for a cooperative security spiral.

In the real world of international relations, states facing multiple security missions would see little sense in trying to simultaneously estimate the minimum force necessary to meet security requirements across the range of scenarios, the maximum capability they could deploy without unduly threatening their adversaries in these scenarios, and the right kind of force that would split the difference. Only a state without multiple adversaries, alliance commitments, and distributed interests would seem to have a chance of following such policy prescriptions. Unfortunately, this rules out virtually all major-power states today.

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8 Note that a coordinated strategy among states to balance against the potential concentrator would require those countries to adopt greater offensive forces and strategies (to be able to threaten the potential concentrator) than would be necessary for an adequate measure of security in a purely dyadic context. Even if many other hurdles were overcome, defining, developing, and deploying a Goldilocks force in this context appears impossible.