Coercion and Cooperation: A Balancing Act Between Status Quo and Revisionist Powers

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Abstract

The rise of China and resurgence of Russia have renewed questions about how revisionist states interact with established powers. Though conflict and war receive the most attention in public discourse, competing powers mix both conflictual and cooperative strategies in practice. We adopt a game-theoretic approach to model the relative proportion of conflictual and cooperative strategies taken by each power as a function of economic, military, and ideological factors. We identify equilibria under which either conflict or cooperative policies dominate, but also those where states mix strategies. The mixed strategies, in particular, highlight when revisionist and status quo powers bundle competitive and cooperative actions in varying proportions. The model generates a number of novel predictions, such as revisionist powers acting more aggressively in response to economic integration and rising costs of war. We illustrate the model by examining China's interactions with competing powers from the nineteenth century to the present.

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The rise of China and resurgence of Russia has caused many to question the future of global order and security. Does the US labeling China and Russia "long-term strategic competitors" indicate that major power conflict is inevitable (US Department of Defense 2018, 4)? That a protracted, low-conflict 'Cold War' is on the horizon? Or can the US, China, and Russia peacefully coexist or even cooperate? Beyond global competitions, how do revisionist and established middle powers interact, e.g., Saudi Arabia and Iran?[1]

While competition and cooperation are often framed as mutually exclusive, in practice competing powers employ both of these strategies. In 2022, for example, the US responded to Russia's full-scale invasion of Ukraine by implementing wide-ranging sanctions and providing the target with lethal aid (Chyzh 2022; Norrlof 2022; US State Department 2022), while at the same time cooperating over the Iranian nuclear deal (Tirone and Motevalli 2022). Likewise, in the same year, trade between the US and China reached record levels in spite of growing geopolitical competition and efforts to decouple strategic sectors (Zhou and Tobita 2023). The two powers also maintained collaborative initiatives related to climate change (Lee 2022), despite ongoing tensions around intellectual property protections, human rights, and the status of Taiwan (Mertha 2018; Congressional Research Service 2021; Spence 2013).

How do revisionist and established powers choose a particular mix of cooperative and conflictual strategies towards one another? Most theories of revisionism focus on the onset or escalation of militarized conflict. An overemphasis on conflict at the expense of cooperation, however, causes a disconnect between our theoretical understanding of foreign policy compared to observed outcomes. A focus on only conflict processes cannot explain, for example, why the US worked to bring China into the WTO, just a few years after the Taiwan Straights Crisis led US policy elites to fear a new 'China threat' (Thies 2015). Nor does it elucidate why China acted as a co-stabilizer alongside the US during recent financial crises, serving as a reserve for distressed assets and a counter-cyclical source of capital to help stabilize exchange rates (Norrlof and Reich 2015). Finally, explanations centering competition and

[1]We use the terms *established* and *status quo power* interchangeably.

rivalry are unable to explicate why successive US presidents 'reset' US–Russia relations, even after Russian ties with their predecessors eventually soured (Thies and Nieman 2017).

Rather than relying on only coercion, competing powers often walk a tightrope of mixing both cooperative and conflictual strategies. This strategic complexity is evident in countries' grand strategies: e.g., US doctrine describes competition as a continuum, with simultaneous fields of cooperation and competition (Joint Chiefs of Staff 2019). The precise nature of these interactions, and the relative mix of cooperation and competition at a given time, is highly contingent: benefits and costs of various foreign policy actions are conditioned by the degree of economic interdependence and costs of decoupling, the costs of military conflict, as well as a status quo power's risk tolerance. The posture a revisionist state adopts towards its neighbors, as well as the ability of an established power to coordinate with partners to counteract and contain the revisionist state, adds a multilateral dimension.

We model these complex interactions using a game-theoretic approach. We explore how economic, military, and ideological mechanisms impact the relative bundle of cooperative and coercive strategies employed across revisionist–established power interactions. The game has equilibria under which conflictual or cooperative policies dominate and where states employ mixed strategies. The mixed strategies, in particular, reveal conditions where a status quo and revisionist power are expected to allocate collaborative and combative actions in varying proportions, resulting in broad sets of foreign policy behavior with different relative weights along the cooperation–conflict spectrum.

We derive two stark, counter-intuitive predictions. First, as economic integration increases, the revisionist power is emboldened, rather than constrained, and the established power responds with accommodation rather than retaliation. The enabling mechanism is the handcuff effect of trade and investment on the status quo power. Swayed by economic gains, the status quo power willingly cedes influence to a revisionist state, who proceeds to act without consequence. This result holds without relying on incomplete information or uncertainty regarding the revisionist state's intent.

Second, we identify conditions under which increasing war costs deter the status quo power, but not the revisionist state. This occurs despite costs being assigned equally to the two players. As the costs of war increase, containment becomes more expensive. Knowing that the established power will do little to constrain it, the revisionist power acts more aggressively. The result is that revisionist powers expand their influence while established powers stand by and watch. This explains, for example, Germany's reluctance to take a firm stance against an aggressive Russia, with Berlin shrugging off Moscow's escalating provocations—such as cyberattacks, industrial sabotage, election interference, and assassinations—rather than addressing, or often even acknowledging, them (Kayali et al. 2024). We illustrate the model's logic using China's interactions with competing powers over the last two centuries: Great Britain during the nineteenth century, the USSR between 1962–1979, and contemporaneous relations with the US.

Our theory has implications across international relations. Modeling the full range of revisionist state behavior helps to delineate and reconcile predictions from seemingly contradictory approaches, such as deterrence and spiral models. A focus on revisionist states also contributes to studies of regional or global order, adding conceptual clarity in identifying relevant challengers and generating theoretically-informed policy prescriptions. Finally, the model spotlights how the golden handcuffs of economic interdependence do not apply equally, instead leading established powers to turn a blind eye to revisionist aggression when the price is right.

Revisionist States and Foreign Policy

Revisionist states seek to alter the status quo. This straightforward definition manifests differently across various strands of the literature. Research on international order, as well as formal models of conflict, often treat revisionism as a state type (e.g., Kugler and Organski

1993; Jordan 2022).[2] That is, revisionism is treated as an innate characteristic defining a state's preferences and driving its foreign policy.[3] In contrast, the peace science literature tends to conceptualize revisionism as an issue-specific feature of state interaction, applying under specific circumstances and contexts (e.g., Jones, Bremer and Singer 1996; Gibler 2017*b*). A state may be revisionist in its attitude towards its boundary demarcation with neighbor A, for example, but prefer the status quo with neighbor B.

The underlying cause of revisionism is also debated. Some attribute it to relative power changes driven by systemic processes (Gilpin 1981; Kadera 2001). Others contend that the effect of systemic processes on a state's satisfaction with the status quo depends on state-level factors (Kugler and Organski 1993). Those favoring a second-image perspective often attribute revisionism to leader hawkishness (Carter 2024) or regime type (Danilovic and Clare 2007). Researchers treating revisionism as issue-specific, however, argue that it is contextualized by relational features, such as dyadic characteristics—e.g., shared regime type or interests (Lemke and Reed 1996; Mousseau 2019)—or network effects—e.g., position within a third-party managed hierarchy (McDonald 2015; Nieman 2016*b*).

Despite this lack of conceptual and causal consensus, revisionism is a central assumption for many foundational models of conflict, such as deterrence and spiral theories. In deterrence models, one state attempts to prevent an adversary from taking some action (Huth and Russett 1993; Fearon 1994). Deterrence is achieved by sufficiently raising an adversary's expected costs of war relative to their expected gains. These expected costs are a function of both relative capabilities and the expectation to act. Yet, without a state seeking to revise the status quo, there would be no one to deter.

Similarly, spiral models expect adversarial states to escalate in response to each other (Jervis 1976; Kydd 1997*a*,*b*). Escalation occurs either because of a lack of trust—i.e. any

[2]Much of the literature on rogue states—a closely related concept—is similarly attributed at the state-level (e.g., Caprioli and Trumbore 2005; Mitchell and Trumbore 2014).

[3]Some work adds additional nuance by extending the binary revisionist/status quo distinction (e.g., Kang and Gibler 2013; Cooley, Nexon and Ward 2019), or arguing it is conditioned by external factors (e.g., Metzger 2017; Goddard 2018), but the resulting classification remains state-level.

action is viewed as hostile, necessitating a response (Sample 1997; Gibler, Rider and Hutchison 2005)—or vulnerability to attack, e.g., a lack of geographical barriers or technological conditions that favor first-movers (Fearon 1995, 402-409; Biddle 2001). This model also requires that one of the actors take the first step to alter the status quo for a spiral to initiate. In both models, a revisionist state is a necessary assumption on which the theory builds.

In addition to requiring at least one revisionist actor, many applications of deterrence and spiral models also assume incomplete information. Doing so can conflate, however, the role of signaling a revisionist type with the concept of revisionism itself, potentially obfuscating the latter's impact on cooperation and conflict. While an emphasis on incomplete information can tell us a lot about the behavior of actors under different assumptions of uncertainty and game structures, it often tells us less about key theoretical parameters. Seemingly benign modeling choices can sometimes lead to dramatic effects on a game's predictions. For example, Tomz and Wright (2010) examine several models of interstate finance to determine when states default or expropriate assets. They find that variation in assumptions regarding how states incorporate reputation is a key driver for differing model predictions. That is, the assumptions about actor uncertainty may put the analytical emphasis on a model's structure rather than theoretical parameters.

The role of uncertainty, moreover, is perhaps less central to studies of revisionism than other topics. Though some uncertainty is a truism—the future can never be fully known—states invest significant resources into intelligence services with the specific goal of ascertaining the intentions, aims, and behaviors of foreign powers (Carson and Yarhi-Milo 2017; Cormac and Aldrich 2018). Many characteristics, such as leader dispositions, are readily inferred from observed backgrounds (Carter and Smith 2020; Nieman and Allamong 2023; Goldfien, Joseph and Krcmaric 2024), psychological profiles (McManus 2019, 2021; Foster and Keller 2023), and prior actions (Crescenzi 2018; Lupton 2020). States also take overt and costly actions to indicate benign motives, such as pursuing arms controls, implementing friendly policies towards weaker neighbors, and tolerant and restrained treatment of domes-

tic minorities (Kydd 1997*a*).[4] As such, both established and revisionist powers can assess their adversary and update their beliefs in relatively short order. Using this information, states should be able, with relatively high confidence, to assign one another general types or roles (e.g., revisionist or benign, friend or foe).

One theory that incorporates both deterrence and spiral models, while emphasizing first principles, is Braumoeller's (2008) general equilibrium, n-player model. Braumoeller models how changes in states' domestic interests affect their security activity at the systemic level, incorporating both the deterrence and spiral logics into the game though states' responses to one another. Within this context, conflict is less likely if security activity is balanced from the spiral perspective, whereas conflict is less likely if security activity is imbalanced from a deterrence view. That is, the predictions run in precisely opposite directions.

Braumoeller (2008, 79, 89) incorporates the deterrence and spiral models into his theory, however, at a much-aggregated level of abstraction, grouping several specific mechanisms together as security behavior. He does not distinguish, for example, between the key parameters of interest for most deterrence models—such as material capabilities, costs, and resolve (Fearon 1994)—from those of spiral models—such as mistrust and vulnerability to attack (Kydd 1997*b*). Moreover, neither deterrence, spiral, nor Braumoeller's model offers theoretical space for cooperative and conflictual strategies to be used in tandem.

A Theory of Status Quo–Revisionist Power Interaction

We develop a game-theoretic model for how status quo–revisionist power interactions change in response to the complexities introduced by economic incentives, ideology, and strategic ambition. Our model includes insights from the models described above, but departs from earlier work by zeroing in on how specific theoretical parameters drive variation in the cooperation–conflict strategy profile. We focus on first principles in order to draw a stronger connection between the key parameters of the status quo–revisionist power relationship,

[4]Goldstein, Joseph and McManus (2023) also argue domestic actions affect international reputations.

player strategies, and the outcome of their interactions. As such, we parameterize actor characteristics, such as resolve or the scope of expansionary aims, in the payoffs, rather than treating these traits as something to be signaled or a player type to be inferred. This approach increases the model's generalizability while also incorporating elements of both the state-type and issue-specific conceptualizations of revisionism.

The model involves two players: a *status quo power* and a *revisionist power*. Each player simultaneously chooses one of two actions, reflecting either a cooperative or a conflictual policy profile.[5] The status quo power's policy action is either *contain* or *détente*. Containment involves aggressive posturing, e.g., applying sanctions, deploying personnel to strengthen regional partners. Détente consists of more accommodating policies towards the revisionist power. The revisionist power chooses whether to pursue *aggressive* expansion—strong-arming neighbors into granting concessions—or a *benign* foreign policy, which consists of pursuing goals through non-coercive means.

Based on these actions, there are four potential outcomes, each with a unique set of payoffs. First, if *détente* and *benign* are chosen, then the two players engage in mutually beneficial cooperation. Each player gains $T \geq 0$, which represents trade, investment, and other economic gains. This parameter increases with more economic interactions and decreases when hostility reduces business confidence or states impose economic restrictions. For the status quo power, this gain is counterbalanced by the revisionist power's relative gains. This is captured by subtracting the product HT from T, where H represents the weight the status quo power places on relative gains, ranging between 0 (only cares about absolute gains) and 1 (only cares about relative gains). Concern with relative gains often reflects the hawkishness of the foreign policy establishment.[6] Status quo powers with a more liberal inclination place a low value on H and, hence, experience little to no cost. Conversely, status

[5]Since state interactions can be treated as having infinite horizons, the model can be collapsed to a one-shot game. Powell (2002) demonstrates the flexibility of such games in handling temporal complications.

[6]One could think of H as a parametized version of Kydd's (1997*b*) *fearful/trusting* player types. This parameter may contain a power's institutional constraints, leader dispositions, or milieu goals (e.g., establishing a reputation, promoting preferred norms) (Braumoeller 2008; Chyzh and Labzina 2018).

quo powers that hold a more hawkish perspective place a high value on H, and experience a greater cost. At the extreme, where $H = 1$, the relative gains of the revisionist power are enough to negate any benefits the status quo power receives from economic engagement.[7]

Second, if *contain* and *benign* are played, then the actors experience joint economic loss since the status quo power's hostility precludes economic cooperation. That is, both players experience opportunity costs, relative to other outcomes, from a lack of economic engagement. Given the revisionist power's benign actions, however, there are no direct costs incurred by either player. We normalize this set of payoffs to zero.

Next, if *détente* and *aggressive* are selected, then there is an expansion of the revisionist power's influence owing to the revisionist power's aggressive overtures and the status quo power's lack of a security response. The revisionist power makes inroads to strategic gains, $A \geq 0$, to the detriment of the status quo power, which loses an equal amount $(-A)$.[8] The revisionist power's gains are the status quo power's losses, which reflects the zero-sum nature of spheres of interest or acquisition of rivalrous resources. In addition, conditional on the status quo power's concern for its relative position, such losses may reduce its prestige and damage its reputation, modeled as the negative product HA in the status quo power's payoff. At the same time, the status quo power continues to engage with the revisionist power economically, resulting in mutual gains, T. That is, as long the status quo power allows it, economic cooperation can still exist, in spite of the revisionist power's hostility. Gains from economic cooperation, however, come at the detriment of the status quo power's relative position, conditioned by its concern for relative gains, $-HT$.

Finally, if the actors play *contain* and *aggression*, respectively, conflict ensues. Here, the achievement of the revisionist power's strategic goals A is conditioned by the status quo power's containment efforts, E. This parameter models the vulnerability of an established power's interests to a revisionist power's aggression, and its ability to counteract that aggres-

[7]Since a revisionist power seeks to alter the status quo, an increase in its absolute position also increases its relative position. We thus excludes H from its payoff.

[8]One could consider A as a parametized version of Kydd's (1997*b*) *greedy/security seeking* player types.

Table 1: Outcomes and Payoffs for Status Quo and Revisionist Power Interactions.

		Status Quo Power	
		Détente	Contain
Revisionist Power	Benign	*Mutually Beneficial Cooperation* t, $t - ht$	*Joint Economic Loss* 0, 0
	Aggressive	*Revisionist Power Expansion* $t + a$, $t - ht - a - ha$	*Conflict* $a - ae - w$, $-a + ae - w - ha + hae + hw$

Note: Payoffs for the *Revisionist Power* are listed on top, with payoffs for the *Status Quo Power* on bottom. A, T, and W are equal or greater than zero, while E and H are bound from 0 to 1.

sion. E ranges between 0 (perfect containment) and 1 (no containment) and is symmetrical, with the status quo power losing an amount equal to that gained by the revisionist power, $-AE$. It also loses additional utility dependent on its concern for relative gains, $-HAE$.

To reflect the risk and costs of aggressive actions spiraling into war, both powers' payoffs include the cost $W \geq 0$. This cost reflects not only the risk of war, but also related costs of mobilization, military exercises, and militarized incidents. These costs may be partially offset for the status quo power, dependent on its predilection for relative gains, reflected as the product HW. Mutual hostility also causes both powers to miss out on benefits from economic engagement. The game is presented in normal form in Table 1.

Solution and Implications

The game is solved using the Nash equilibrium concept. We focus on solutions for the ranges of mixed and pure strategies of T, A, and W below.[9] The mix of strategies can be intuitively interpreted as the ratio of cooperative and conflictual actions taken by the competing powers in their interactions across issue areas. Thus, foreign policy implications are discerned by assessing how strategy mixes change in response to variation in key parameters.

Each quantitative variable—trade value (T), aggressive capacity (A), and cost of war (W)—is set to equivalency at 1 so that they are easily comparable. As variables change,

[9]The full analytical solution is reported in the appendix.

they can be compared as ratios; in a scenario where $T = 2$, the value of trade would be double the cost of war or the value of gains from aggressive expansion. A scenario where T, A, and W are all doubled would result in the same strategic equilibrium, since the ratios would not change. The bounded variables—containment effectiveness (E) and status quo power hawkishness (H)—are set to values where players choose mixed strategies. We set $H = .5$ to test a middle-ground government concerned with both absolute and relative advancement. We initialize containment effectiveness as moderately high, $E = .75$—containment mitigating 75 percent of possible aggressive gains by the revisionist power. A relatively high value is reasonable given the significant effort that established powers take in employing forces abroad to promote their own influence and prevent that of rivals (Nieman et al. 2021).

For each parameter, we first visually display how changes affect player probabilities of selecting a particular strategy, as well as observing each of the game's outcomes. We then describe the intuition behind these effects and discuss their implications.

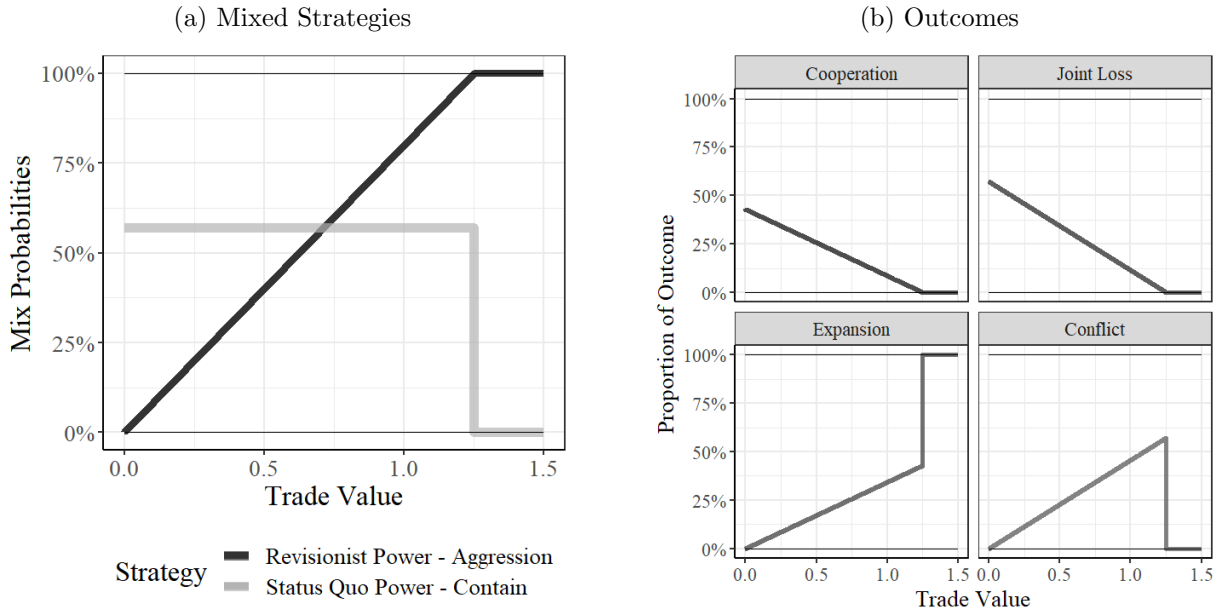
Economic Interdependence

First, we explore the effect of changes in economic engagement. Economic relations are often ascribed a pacifying effect, with close economic links reinforcing shared interests (Danilovic and Clare 2007; Nieman 2016*a*; Mousseau 2019), while severing them imposes costs on each actor that extend the range of acceptable bargains to avoid conflict (Gartzke, Li and Boehmer 2001; McDonald 2009). We explore whether this logic extends to revisionist states.

The left-hand side of Figure 1 displays the mixed strategy probabilities of the revisionist power selecting the aggressive strategy (P) and of the status quo power choosing the containment strategy (Q), for varying levels of trade. The right-hand side of the figure shows the corresponding probabilities for each of the four possible outcomes.

Starting with each player's strategies, we see that increases in trade correspond to increases in aggressive behavior by the revisionist power, all else equal, with P increasing linearly, whereas the status quo power selects a consistent mix of containment Q until reach-

Figure 1: Effect of Trade



Note:Variables are initialized to $A = 1$, $E = .75$, $W = 1$, $H = .5$, with T varying from 0 to 1.5

ing a critical threshold, at which it plays a pure strategy of détente (i.e. $Q = 0$). The intuition is that, for the status quo power, increasing trade makes choosing containment more costly relative to détente, resulting in a greater tolerance for aggression. Given this greater tolerance, the revisionist power continues to increase its aggressive actions. This relationship—a positive effect of trade on aggression, all the while the status quo power's mix of containment and détente remains unchanged—holds until the value of trade is great enough to outweigh any benefits from containment for the status quo power. At this point, each player chooses a pure-strategy: the revisionist power plays $P = 1$ (always *aggressive*) and the status quo power plays $Q = 0$ (always *détente*).

These changing strategies impact the likelihood of observing the four outcomes. As trade increases and the revisionist power selects an increasingly aggressive strategy, the probability of observing conflict increases linearly, before reaching a point where each player selects pure strategies and the probability of observing conflict is zero. In contrast, the probability of observing revisionist power expansion increases monotonically, being observed with certainty once players select pure strategies. Finally, both the cooperation and joint loss outcomes are

observed with a monotonically decreasing probability as trade increases.

Implication 1: An increase in bilateral economic relations results in: (a) an increase in the revisionist power selecting aggression; (b) no effect on the status quo power selecting containment until a change-point, after which containment is never played; and (c) a monotonically increasing probability of observing revisionist power expansion.

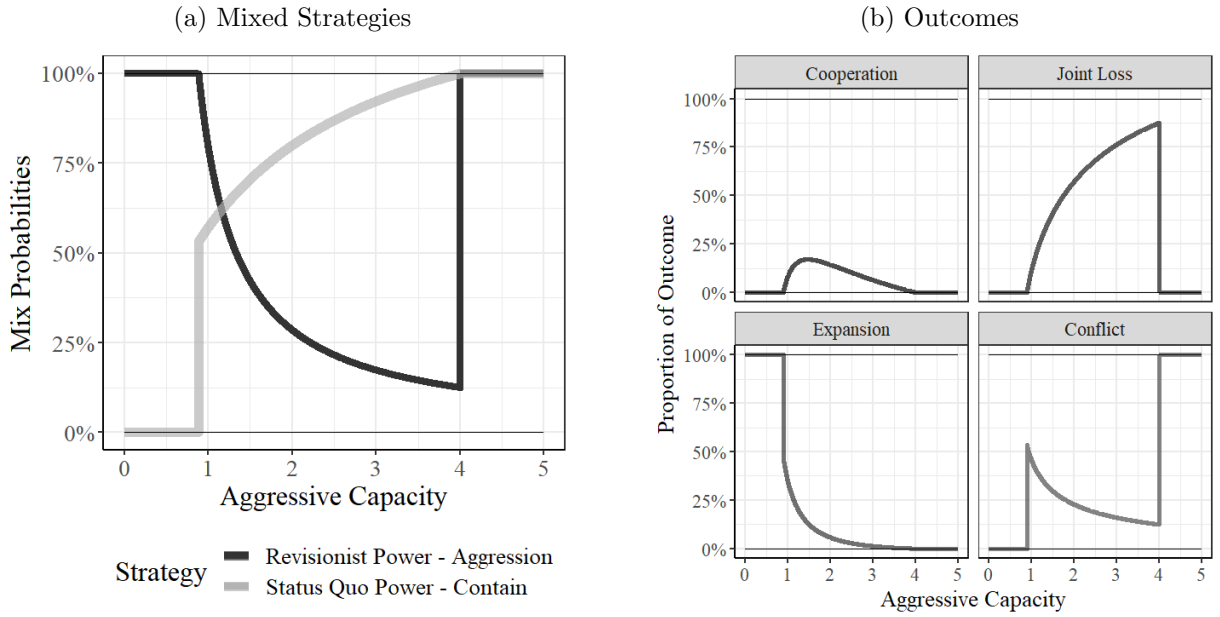
Aggressive Capacity

Next, we consider the direct effect of variation in the revisionist power's aggressive capacity, A. The revisionist power's aggressive capacity may vary due to expanding military size, integration of new technology and capabilities, or increasing regional hegemony. Any of these or related factors would allow it to more effectively coerce others, increasing the value of A.

Figure 2 displays the mixed-strategy solutions of the game for different values of A, as well as the probabilities of observing each outcome. As shown, changes in A result in a complex, but relatively intuitive effect on each player's strategy profile. For low values of A, i.e. A is relatively weak compared to the values of economic integration (T) and the cost of war escalation (W), the revisionist power can bully smaller neighbors without attracting any containment response from the status quo power. Here, the revisionist power selects a pure strategy of aggression.

Once the relative value of A surpasses that of T and W, however, the revisionist power chooses an aggressive strategy with decreasing probability. The status quo power, meanwhile, selects the containment strategy with increasing probability. From the status quo power's perspective, this situation is one where the cost of war escalation is eclipsed by prospective losses from the revisionist power's expansion. The revisionist power's increased capacity vis-á-vis its neighbors induces increasingly strong responses from the status quo power. The revisionist power, in response, selects a less aggressive policy mix to reduce the probability of conflict. In sum, as A increases to all but the most extreme values, the revisionist power chooses aggression with monotonically decreasing probability while the status quo power

Figure 2: Effect of Aggressive Capacity



Note: Variables are initialized to $T = 1$, $E = .75$, $W = 1$, $H = .5$, with A varying from 0 to 5.

selects containment with monotonically increasing probability.[10]

These strategy profiles hold for most of the parameter range, so we focus our discussion on these most likely types of interactions. The probability of conflict, for instance, begins as negligible, despite the revisionist power's high level of aggression, as no containment on the part of the status quo power occurs. Once the first critical threshold is reached ($A \approx 0.9$) and the status quo power begins to play a containment strategy with an increasing probability, the likelihood of conflict shows an initial uptick before beginning a gradual decline. This decline happens because the effect of decreases in the rate of aggression by the revisionist power outpace the increase in the status quo power's use of containment.[11] The cooperation outcomes reverse most conflict trends: it is not observed for low values of A (0 to ≈ 0.9), before increasing and slowly declining as A increases. The revisionist power

[10] At extreme values—e.g., A significantly outweighs T and W—the status quo and revisionist powers play pure strategies of containment and aggression, respectively, resulting in a conflict equilibrium. The intuition is that, while the revisionist power receives economic gains when the status quo power sometimes plays détente, these gains are lost once containment is always selected. Thus, the revisionist power receives no benefit from constraining its behavior and instead only benefits from extracting concessions from neighbors.

[11] The decrease in the probability of conflict continues until reaching a second critical threshold, at $A = 4$, where it is observed with certainty.

expansion outcome is observed with certainty for low values of A (0 to ≈ 0.9), after which its probability monotonically declines as A increases, while that of a joint economic loss outcome increases monotonically.[12]

Changes in the outcome probabilities have important substantive foreign policy implications. If we think of increase in A in terms of a revisionist power's growth in military capability over time, then the model highlights the difficulty in using observed conflict–cooperation trends to forecast future behavior. The revisionist power would appear to act more cooperatively as its capacities increased, at least after reaching the critical value of $A \approx 0.9$. The status quo power, therefore, may appear as needlessly overbearing as it continues to ratchet up containment. The increase in containment, of course, is precisely why the revisionist power acts less aggressively and overt conflict is avoided.

Implication 2: As the revisionist power's aggressive capacity increases, the mixed strategy equilibrium probabilities of revisionist power aggression and containment are initially inversely related: (a) revisionist powers are decreasing aggression; (b) status quo powers increasingly choose containment; and (c) the probability of observing the revisionist power expansion outcome is monotonically decreasing.[13]

Costs of War

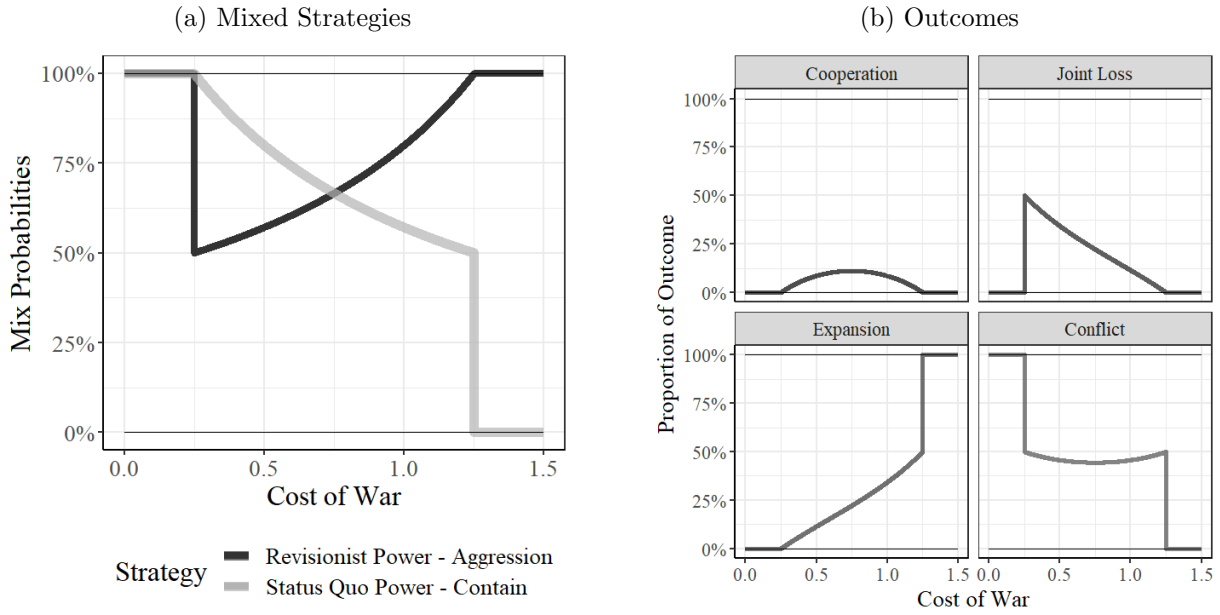
Third, we assess variation in the costs of war, W. This parameter captures material costs, such as blood and treasure, as well as psychological costs linked to salient tangible and intangible issues, e.g., control of strategic territories or loss of influence (Mitchell and Prins 1999; Hensel et al. 2008).

Figure 3 reports mixing strategies as the costs of war change, as well as the probability of observing each outcome. When war costs are low, the status quo power plays a pure containment strategy. The revisionist power responds with an aggressive strategy, as low costs make otherwise risky strategies more tenable. The value of containment decreases monoton-

[12] Joint economic loss increases monotonically from $A \approx 0.9$ until $A = 4$, when it is no longer observed.

[13] At extreme values, aggressive capacity overwhelms both trade and war costs, and only conflict is observed.

Figure 3: Effect of Cost of War



Note: Variables are initialized to $T = 1$, $A = 1$, $E = .75$, $H = .5$, with W varying from 0 to 1.5.

ically as the costs of war rise and, once war is sufficiently costly, the status quo power plays containment with zero probability. Once the status quo power starts mixing, the revisionist power mixes as well. From that point, the revisionist power employs an increasingly aggressive strategy, corresponding to a decreasing expected costs as the probability of containment declines. Eventually, a threshold is reached after which the status quo power opts for a pure détente strategy and the revisionist power—a pure aggressive strategy.

The change in player strategies affects the probability of each observed outcome. At low values of W, conflict is the equilibrium outcome; for low to middle values of W, the probability of conflict is around 0.5; while no conflict is observed at high values of W. Cooperation is observed across the middle range of W, but not observed at either low or high values. Joint loss is never observed at low values of W, but is observed with a probability of 0.5 at $W \approx 0.25$, after which it declines until reaching zero at high values. While the probabilities of each of the previous outcomes are non-monotonic as W increases, the probability for the revisionist power expansion outcome is monotonically increasing.

The non-monotonicity of the revisionist power expansion outcome adds richness to models

of brinkmanship. It shows that, despite still being more powerful, a status quo power is much more likely to cede a sphere of influence to a revisionist power as war costs ratchet up. A possible contemporary example is the status of Taiwan in US–China relations. China has presented recognition of an independent Taiwan as a credible red line, causing the US to limit overt support. The US hedges its efforts at containing China, opting for 'strategic ambiguity' rather than a firm commitment to deterrence. China, on the other hand, has frequently taken aggressive actions towards Taiwan, leveraging sanctions, testing its air defense, firing rockets just outside ports, and practicing blockades of Taiwan, with relatively little substantive, public push-back from the US.

Implication 3: An increase in the cost of war leads to: (a) beyond low levels, an increasing probability of revisionist powers selecting aggression; (b) a monotonically decreasing probability of status quo powers choosing containment; and (c) an increasing probability of observing revisionist power expansion.

Containment Effectiveness and Hawkishness

Finally, we consider the two bounded variables, containment effectiveness (E) and hawkishness (H). Their effects are straightforward: at relatively low levels, the status quo power employs a pure détente strategy until it reaches a change-point, thereafter it plays containment with a moderate probability. The revisionist power, in turn, plays a purely aggressive strategy until the point where the status quo power begins mixing, after which the revisionist power chooses to act aggressively with declining probability. The Appendix includes additional detail and visualizations.

Application to China, 1800–present

We illustrate the causal logic of our model using cases of China's interactions with competing powers from the nineteenth century to the present day. Focusing on one revisionist power's

Table 2: Opium War Parameters

Parameter	Quantity	Rationale
T	High $\rightarrow$ None	Lin Zexu blocked trade.
A	Low	China had little ability to project power beyond its homeland.
W	Low	Few casualties were expected, but dispatching a fleet has cost.
E	Very High	China could do little if contained by the Royal Navy.
H	Low $\rightarrow$ Moderate	China became a reputational threat.

interactions with several status quo rivals allows for zeroing in on the effect of different parameters. We first highlight how shifts in trade and hawkishness impacted the First Opium War. Next, we show how changing costs of war and aggressive capacity affected the Sino-Soviet split. Lastly, we assess contemporary Sino-American relations in light of variations in economic ties and containment effectiveness.

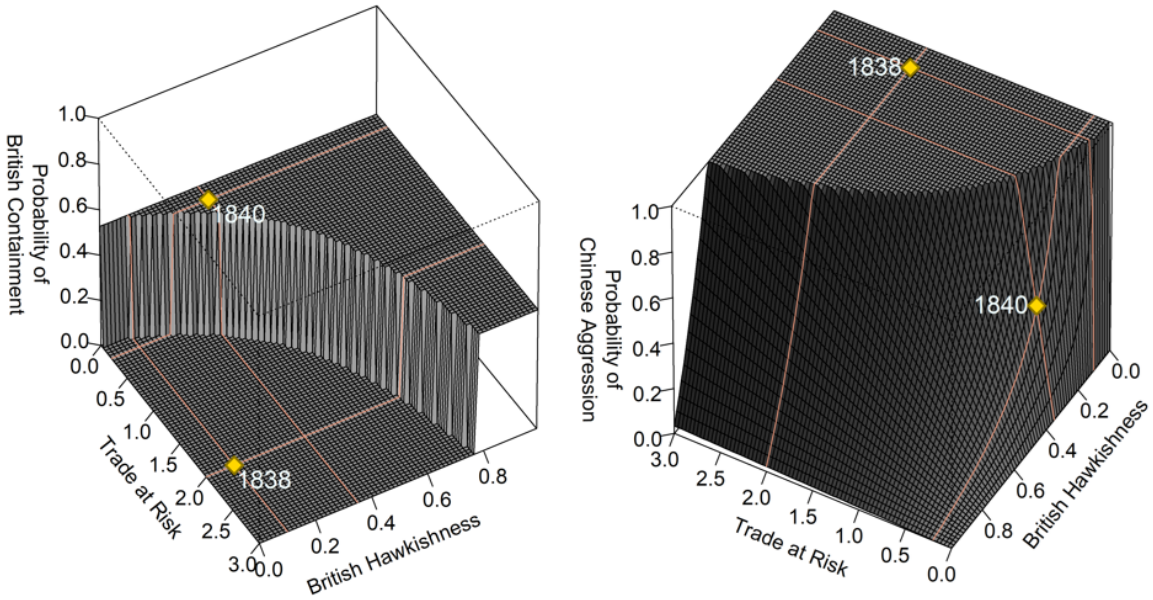
First Opium War

Peaceful trade relations between the Qing Empire and the UK quickly deteriorated in 1839. Our model helps explain this seemingly spontaneous and egregious conflict outbreak. In the early 1800s, the two countries exchanged a large volume of trade T, as shown in Table 2. The costs of war, W, were relatively low, both in magnitude and probability, while China's gains from coercive action with its neighbors, A, were similarly small owing to geographic and budget constraints.[14] British warships in India could effectively mitigate any Chinese aggression, giving a high value for E. Finally, British hawkishness, H, was at a low point, as the Congress of Vienna had brought in dovish members to the British Parliament, war-weary after a decade of fighting wars against Napoleon and the US.

The situation slowly changed leading up to 1838. The East India Company lost its trade monopoly in 1832, and Parliament could not agree upon a regulatory structure to manage the free traders who replaced it. This absence of control resulted in a massive expansion of the opium trade, leading to a Chinese crackdown on all trade and threats against merchants

[14]China's military capacity had recently been exhausted due to suppressing a domestic rebellion.

Figure 4: 1838–1840 British and Chinese Strategy Spaces



Note: The figure to the left is the British strategy space, to the right is China's strategy space. The figures above are based on variables initialized to $A = .5$, $W = .5$, $E = .9$. T varies from 0 to 3, and H varies from 0 to 1.

(Melancon 1999; Platt 2019).[15] As a result, T fell close to zero.

When news of the crackdown reached Britain, the ruling Whig Party had to decide how to respond. The attitude of Parliament members towards China hardened during debate, significantly raising H.[16] As Parliament considered war, they were assured that a conflict would be short and low cost: China would quickly acquiesce once the British blockaded major rivers, as Chinese junks could not challenge the Royal Navy ships-of-line (Platt 2019).

Our model indicates that the decision to go to war in 1840 was by no means inevitable; had a few specific actors taken different actions, trade would likely have continued as it had for centuries (Platt 2019). To illustrate, Figure 4 presents the model outcomes before

[15]The crackdown peaked in 1839, when a new commissioner of trade, Lin Zexu, was sent to Canton to tighten controls on opium imports. Lin applied sudden and shocking pressure on foreign traders: decreeing death for those caught smuggling opium. He conveyed his resolve by executing Chinese smugglers in front of their compound and sieging them in their accommodations until they relinquished all their opium. Lin kept trade closed to the British until all traders agreed not to deal in opium (Platt 2019).

[16]Critically, two of the most respected British individuals on China, Charles Elliot and George Stanton—who had both previously supported a pacifist policy—argued Lin's harassment of British traders was a break from the previous laissez-faire attitude toward foreign nationals, and force was necessary to protect Britain's reputation (Melancon 1999; Platt 2019). They argued that failing to reproach China could embolden China further, and may cause the British dominions to question British primacy (Platt 2019).

and after the critical events at different levels of British hawkishness H, and values of trade T. Beyond a curve of safety, there is a precipice where British strategy shifts to containment. China's 1839 threats toward British merchants increased H and the severance of trade decreased T, barely pushing the British from the détente zone. This sudden shift is consistent with *Implication 1* from the theoretical model, where the established power transitions from a pure strategy of détente to one where containment is mixed with some probability. Specifically, the decrease in trade and increase in hawkishness greatly contributed to a more assertive British posture, as the model predicts containment to now be played with a relatively high probability, whereas it had been quiescent until 1838—when trade was high. This, combined with a slightly more gradual change in the revisionist power's behavior, dramatically increased the probability of military conflict.

Thus, high levels of trade and Parliament's dovish sentiment were the key to amicable relations. When China besieged the British traders, British opinion of China deteriorated; but had China not also halted trade, British manufacturers would not have lobbied for intervention as passionately, making the intervention seem so advantageous. The combined increase in British hawkishness and decrease in trade was sufficient to alter British strategy from a predominantly hands-off military approach to one emphasizing containment more strongly, subsequently increasing the probability of conflict.

Sino-Soviet Split

The progression of the Cold War brought about a realignment within the Communist sphere. Ideological shifts, mutual distrust, a collapse of trade, and competing interests resulted in the USSR becoming the primary obstructing force against Chinese expansion. Understanding the bilateral dynamics of this period is critical to explaining how, over the span of a decade, the most conflictual great power relationship in the Cold War switched from the US-Soviet dyad to the Sino-Soviet dyad. Summaries of the key parameters are shown in Table 3.

In the mid-1950s, hawkishness within the Sino-Soviet dyad rose as the divergent lead-

Table 3: 1962-1979 Parameters

Parameter	Quantity	Rationale
T	Low	Trade was extremely limited by 1960.
A	High $\rightarrow$ Low	China's conventional military decreasingly emphasized aggression.
W	Low $\rightarrow$ High	Proliferation of nuclear weapons increased costs.
E	High	Soviet conventional forces were both proximate and superior.
H	Moderate	The most immediate USSR threat became the CCP.

ership contributed to mutual suspicion.[17] A decoupling of economic ties precipitated costs for both countries as trade was reduced to a fraction of its former level.[18] The USSR's role as the leader of global communism—and the resulting alliance network—ensured continued Soviet military domination across land, air, and sea domains.

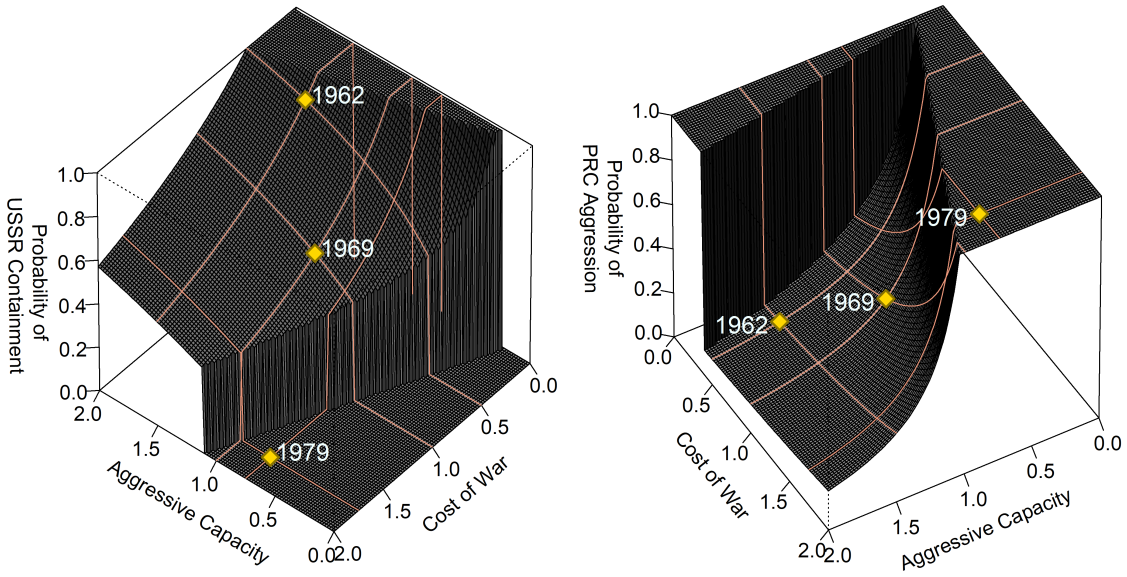
The most proximate causes that brought the jump from uneasy allies to adversaries were the large changes in PRC aggressive capacity, A, and war costs, W. Leading up to 1960, the PRC crushed mainland civil war holdouts and normalized most external borders. Experienced in military campaigns, the Chinese army became a threat to Soviet interests in Central, South, and East Asia. This force, however, would atrophy in size and power over the following decades. China's industrial base, roiled by Mao's intervention through the Cultural Revolution and cut off from Soviet technical expertise, lagged behind the military developments of the era. Likewise, Mao shifted from a security strategy focused on modernizing China's military industry to a guerrilla-based, defense-in-depth approach emphasizing light infantry mass. These actions lead to a decline in the value of A.

As a result of China's declining military and industrial capacity, by the time of China's 1962 invasion of India, the USSR had established robust military assistance ties with Delhi

[17]A growing ideological rift between Soviet leadership and Mao stemmed from Khrushchev's "de-Stalinization" program (Lin 2024, 104-107)—specifically, Mao was concerned with Soviet criticism of sacrosanct political figures, and the ensuing political turmoil in Poland and Hungary (Lüthi 2008, 46-79). Moreover, the USSR dragged its feet on promised air support in the later stages of the Korean War while also disrupting peace talks (Lüthi 2008, 36). By the 1970s, Chinese and Soviet leadership remained recalcitrant while Sino-American relations were renewed, further driving a wedge in the former's relationship.

[18]Mao's Great Leap Forward, followed by a sudden withdrawal of all Soviet specialists on July 18, 1959, decimated domestic production (Lüthi 2008, 174-77). China subsequently fell far below its trade obligations to the USSR. The fracturing facade of Sino-Soviet trade finally shattered in 1960 when the PRC suspended all outstanding supply contracts, instead increasing trade with Japan and Western Europe.

Figure 5: 1962-1979 USSR and Chinese Strategy Spaces



Note: The figure to the left is the USSR strategy space, to the right is China's strategy space. The figures above are based on variables initialized to $T = .5$, $E = .75$, $H = .5$, A varies from 0 to 2, and W varies from 0 to 2

(Chari 1979). By arming China's rival, the USSR had changed its strategies from one of pure détante to a heavy mix of containment, as expected by *Implication 2*. This is shown at point 1962 in Figure 5.

The destructive potential of a war between the USSR and China, however, also radically increased as each developed its nuclear arsenal. In the early 1960s, the USSR maintained a nuclear arsenal a fraction of the size of the US; however, after being humiliated in the 1961 Berlin Crisis and again in the Cuban Missile Crisis, the USSR rapidly expanded its arsenal (Ellsberg 2017). By 1964, China conducted its own nuclear weapon test. The realization that a Sino-Soviet conflict could now go nuclear forced a reevaluation of Soviet strategy.

These dynamics are depicted in Figure 5, with the USSR's probability of choosing containment decreasing over time as the costs of war increased. As these costs rose, the two powers were brought into the mixed strategy region, where conflict and escalation occurred several times over disagreements demarcating the 2,600-mile-long shared border from 1967–1969 (Lüthi 2008, 340-344; Lin 2024, 136-192). Further expansion of the PRC's strategic and conventional arsenal pushed the costs of war W higher, and the direct clashes seen along

the border subsided in the 1970s. Consistent with *Implication 3*, this change in posture—the status quo power opting against containment—allowed China to adopt a policy of aggressive expansion in Southeast Asia, including against Soviet protégés such as Vietnam in 1979, even despite its limited material capacity.[19]

Contemporary US-China Relations

Since the end of the Cold War, US-China relations have seen a mix of both cooperation and conflict. The Chinese market has proven a lucrative commercial interest leading to expanded ties, while the issue of Taiwan has been an area of continued disagreement. This relationship too, has seen large swings in a relatively short period. We focus our analysis on the impact of economic ties, T, and containment effectiveness, E, as these factors have been particularly volatile, with the most potential for continuing change in the medium term.[20]

Three decades ago, US-China relations exhibited cooperation and competition in similar quantities. As the remaining Communist power, China was the clearest opposition to the US unipolar order, but had few tools with which to project power. China's fear that the US would recognize an independent Taiwan—during Taiwan's first democratic election—led to a temporary breakdown in relations (Gunness and Saunders 2022). On the other hand, the Clinton administration made numerous overtures for cooperation. Efforts of economic engagement culminated with the US orchestrating China's 2001 ascension into the WTO as a means for co-opting the PRC into the liberal international order (Viola 2024). The US's goal was to change the PRC's foreign policy interests by empowering domestic economic actors—whose source of power would require continued peaceful economic conditions—at the expense of reactionary elements (Mousseau 2019, 187–190).

[19]China's military expenditures were less than 19% that of the USSR in both 1962 and 1979, and were never more than 33 in any year in-between, with a median of 25% (Singer 1988).

[20]Though forecasting is not the model's goal, setting parameters to reasonable values can help identify the range and rough probability of possible outcomes. One can say, with relative confidence, that as China modernizes its military, its aggressive capacity, A, will increase. Likewise, the costs of war, W, will rise with enhanced nuclear, naval, and air capabilities expanding a potential zone of combat. Finally, while US hawkishness, H, toward China could lessen, current popular sentiment makes this less likely.

During this period, China lacked the tools to wield power globally, despite its increasing capabilities. Yet, facing little push back, it used coercion commensurately with its capacity to expand influence within East and Southeast Asia. Moreover, as China became increasingly central to supply chains of US-based firms, the US found its own hands tied in responding to increasing PRC influence in Central Asia, the South China Sea, and the Indo-Pacific. As US interests shifted to the Middle East at the expense of Asia in the 2000s, it allocated fewer resources and effort towards reassuring allies that faced increasing Chinese aggression. As a result, countries throughout the region adopted hedging strategies (Jackson 2014; Bajpai and Laksmana 2023), reducing the quality of US containment.

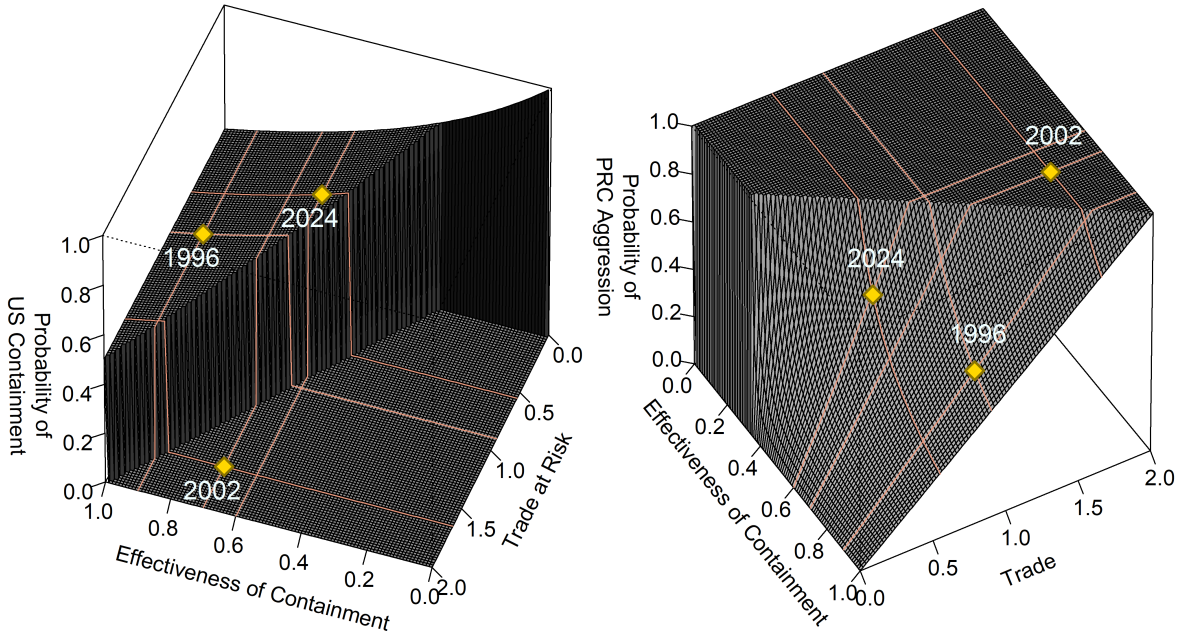
These trends accelerated after the 2008 financial crisis and through the Belt and Road Initiative (Norrlof and Reich 2015; An and Wang 2024), at least until the onset of the Covid-19 pandemic. Given economic headwinds at home and abroad, it is unclear how US-China economic relations will fare as efforts to decouple in critical industries gain traction.[21] Continuing advances in China's missile technology and its increasing industrial capacity, moreover, have diminished the effectiveness of containment strategies (Stokes 2023).

Figure 6 shows strategy spaces for varying degrees of economic relations and containment effectiveness. Consistent with *Implication 1* and illustrated through souring relations over the past 20 years, economic integration did not disincentivize PRC aggression but did limit US containment efforts. Meanwhile, the consistent decline in E only partially offset the changes in the effect of trade. As T increased from 1996 to 2002, the probability that China acts aggressively increased until $P = 1$, before dropping slightly in 2024.[22] At the same time, there is a stark decline in the probability of containment as T increases, with the US shifting from a mixed strategy in 1996 to a pure strategy of détente in 2002. That both sides play pure strategies—détente for the US and aggression for the PRC—at the combination of low containment effectiveness and higher relative trade value exemplifies the insight that trade

[21] Internal challenges include local debt crises, low consumer confidence, and corruption scandals; External issues include anti-dumping tariffs, the popularity of industrial policies, and supply chain diversification.

[22] This period illustrates the importance of relative shifts in the model: as T is relative to W and A—held constant in Figure 6—growth in PRC military and grey-zone capabilities partially offset increases in trade.

Figure 6: Contemporary US and Chinese Strategy Spaces



Note: The figure to the left is the American strategy space, to the right is China's strategy space. The figures above are based on variables initialized to $A = 1$, $W = 1$, $H = .5$, T varies from 0 to 2, and E varies from 0 to 1.

can have a hands-tying effect even among adversaries.

Going forward, if economic cooperation T becomes only moderately valuable, and the US is also moderately effective at containment E, such as at the point labeled 2024, then hostile and cooperative strategies are mixed by both sides. Increasing the effectiveness of US containment reduces the probability that China pursues aggression and, with it, the level of conflict. Likewise, when the effectiveness of containment, E, increases, so does the likelihood of cooperation as containment and aggressive strategies become less likely.

In policy terms, this space shows the ability to punish aggression within China's weapons engagement zone is critical. To do so, however, military resources are necessary but not sufficient. Effective containment requires Coast Guard resourcing, maritime domain awareness, intelligence sharing, and strengthening cooperation with regional partners across the Indo-Pacific. It remains to be seen, however, if the US has the sufficient political will to implement its long-awaited 'Asian Pivot.'

Discussion

The model offers a number of insights into when states will play a simultaneous mix of competitive and cooperative strategies, and why changes in trade, military spending, and alliance-building promote peace or confrontation. The model indicates that increasing trade and war costs, weak containment efforts, and either unconcerned or dovish leaders embolden revisionist powers. So, too, does increased revisionist power coercive capabilities. Only the last factor, however, is likely to trigger a containment strategy from a status quo power.

The model has implications beyond understanding historical cases or providing a theoretical lens for policy analysis. It contributes to the debate on the deterrence vs. spiral models, by incorporating the full range of cooperative and conflictual actions into strategy profiles. The model also shows how economic interdependence may create golden handcuffs, delineating scoping conditions of economic peace. Finally, it provides a theoretical framework for understanding how regional and global powers interact with revisionist challengers. Notably, it does so without requiring one to invoke the framing of power transition theories and apply them to cases for which they are not intended.

Spiral vs. Deterrence Models

Spiral and deterrence models are treated as making opposing predictions (Zagare and Kilgour 1998; Braumoeller 2008; Fearon 2018). As such, empirically evaluating these competing theories should be straightforward, and yet the evidence is mixed (Huth and Russett 1993; Kertzer, Brutger and Quek 2024). By focusing on the specific mechanisms associated with each process, our theory reconciles these discrepancies.

One implication of the spiral model is that conflict becomes more likely as the aggressive capacity of the revisionist state increases: aggressiveness by the revisionist power spurs the status quo power to implement containment, leading to a vicious cycle. Our results, however, suggest this is not the case. While status quo powers increasingly select containment to counter a revisionist state's aggressive capacity, revisionist powers respond by choosing

belligerent policies less frequently—an outcome inconsistent with the spiral model.

The deterrence model, meanwhile, implies that increased expected war costs cause the revisionist state to opt for less aggressive foreign policies. Increases in the status quo power's hawkishness, its containment effectiveness, and the costs of war, then, should reduce conflict. Our model shows that both hawkishness and containment effectiveness operate as step functions in terms of the status quo power's policy choice; containment is never played until a critical value is reached, after which it is played with a constant probability. At this same critical value, the revisionist power begins to play aggression with a declining probability. The result is that conflict is never observed until that critical value is reached, at which point it spikes before gradually declining. For each parameter, therefore, conflict is only observed at moderate to high values—counter to what is expected by the deterrence model.

Our model also finds that increasing war costs reduces observed conflict, but not due to the process described by deterrence models. Rather than increasing costs leading the revisionist power to pursue less aggressive policies, it is the status quo power that chooses more benign actions. That is, the established power is the one that is deterred, and chooses to accommodate the revisionist state.

Finally, the Soviet–China case illustrates the interaction between spiral and deterrence dynamics, with aggressive capacity proxying the logic of the spiral model and the costs of war triggering the mechanisms for deterrence. The left subfigure in Figure 3 makes clear that either increasing war costs or decreasing aggressive capacity monotonically reduces the probability of Soviet containment. The right subfigure, however, shows that China behaves aggressively with any imbalanced combination of these parameters. Thus, our model helps explain the mixed empirical record of both spiral and deterrence theories, as applied to revisionist states.

Golden Handcuffs

The model is also relevant to debates underlying the commercial peace. While greater economic interdependence is associated with peaceful relations in general (Russett and Oneal 2001), the mechanisms driving this outcome are less clear. Previous work shows that exclusion from trade networks removes incentives for domestic reform (Chyzh 2016, 2017), preventing commercial actors from gaining the political influence necessary to implement pacific foreign policies (McDonald 2004; Mousseau 2019). Yet, trade may increase the size of absolute benefits over which to negotiate, broadening the bargaining range that actors find acceptable (Gartzke, Li and Boehmer 2001; Simmons 2005).

We find that increased trade constrains the established, but not the revisionist, power. The revisionist state can act more aggressively, knowing it is incumbent upon the established power to continue acting cooperatively in order to reap economic gains. These golden handcuffs arise from an increased bargaining range—more outcomes are acceptable to the status quo power at the expense of its other strategic considerations. The substitutability of A and T in the established power's utility explains why it—rather than the revisionist state—has something to give in order to maintain a positive relationship.[23] This result holds even though the model assumes that economic gains accrue equally—revisionist aggression does not arise from trade imbalances or dependence within the model.

As applied to debates concerning the pacific effects of trade and the economic peace, the model indicates that not all economic interaction is equal; rather, the role of shared interests and norms is paramount for the economic peace argument to hold. One policy implication is that economic engagement with revisionist powers is unlikely to encourage peace and may actually increase conflict. Rather, the pacific effect of economic engagement may be conditional on at least some shared interests already being present.

[23] Only established powers with a relatively high value of H would find the utility from reducing A to be greater than both the cost of W and offset the loss of T when confronting aggressive revisionists.

Power Transition

Many theories of power transition treat rising powers as opposing the existing international order and are thus revisionist by assumption (e.g., Gilpin 1981). Yet, others counter that increasing power is not a sufficient condition for conflict. Kugler and Organski (1993), for instance, argue that since major powers disproportionately benefit from the existing political order, they are unlikely to challenge it. Instead, only those powers that are dissatisfied will challenge the status quo. Lemke (2002) extends Kugler and Organski's framework to the regional level, finding that conflict is much more likely if the leading contender is dissatisfied rather than if it has just risen to parity. Sample (2018) finds similar results using a global sample of states and alternative measures of dissatisfaction. Taken together, it appears that a revisionist power is more threatening than a rising one. Thus, revisionism is necessary for observing a conflict at the (sub-)system level, whereas rising power is not.

Despite this, many analysts and practitioners conflate 'revisionist' and 'rising' powers, using the terms interchangeably. Consider the commonality of so-called 'rising powers' with growth rates near or below the global average. From 1996–2021 the average annual growth rate for all states was 1.90 percent. Yet, countries with revisionist aims, such as Russia (2.74 percent) or India (0.66 percent), are treated as 'rising' whereas non-revisionist states, such as Poland (3.78 percent) or Vietnam (6.43 percent), are not.[24] Such theoretical imprecision results in theories of power transition being applied to any revisionist state—regardless of actual power trajectory—stretching the concept to applications beyond its intended scope.[25]

At the same time, it limits the generalizability of theories of revisionism. Though theories of power transition may be useful for explaining system altering outcomes, they do not constitute the full theoretical range of inquiry of revisionism—a concept with wide ranging applicability and policy relevance. Revisionism underlies many regional security threats while also representing a hazard to global order—whether a state is growing rapidly or

[24]Moreover, drastic shifts in relative capabilities are rare and seldom correspond to the timing of conflict onset among pairs of states (Gibler 2017*a*).

[25]Volgy and Gordell (2024) make a similar assessment.

not. The revisionist aims of the Maduro regime, for example, threatens regional stability despite Venezuela's declining material capabilities. Bridging the gap between academics and policymakers requires incorporating the full range of revisionism.

Our theory, and its application, helps address this. Theoretically, the model makes no assumptions regarding the revisionist power's ability to project power or the degree of revision sought—variation in either can be flexibly accommodated through the E and A parameters, respectively. As such, our framework applies to any interaction involving a state with revisionist aims, whether that is systemic or even bilateral. Empirically, by looking at several different snapshots within China's historic rise, we see how a revisionist state interacts with established powers at multiple points as the power imbalance shifts towards parity. At each snapshot, we identify conditions where either power selects more or less aggressive policy profiles, suggesting that increasing capabilities alone does not dictate foreign policy behavior.

Conclusion

Revisionist power interactions with major powers are often understood as following pure strategies, with a straightforward causal logic determining policy prescriptions. We argue that states have a number of competing incentives that complicate this picture. To gain leverage in understanding these complexities, we adopt a game-theoretical approach. Our modeling strategy underscores the delicate balance between economic and security interests and the complexity and multi-dimensional nature of state interactions when both cooperation and competition are considered.

Our framework contributes to several foreign policy discussions. By parameterizing and emphasizing economic, military, and ideological mechanisms, the framework applies to any case of revisionism, whether in a local, regional, or global competition. The model offers insights to contemporary debates regarding US foreign policy and underscores the impor-

tance of containment. This requires more than just defense budget outlays; it necessitates a coherent geopolitical strategy that includes developing regional partnerships to increase the effectiveness of a containment strategy rather than just raising the costs of war. Moreover, the theory suggests that economic overtures, within the context of status quo and revisionist power interactions, do more to deter the former than constrain the latter.

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APPENDIX

The appendix is divided into three sections. Section A displays the mixed strategies and outcome probabilities for the revisionist and status quo power across a range of values for containment effectiveness, E, and hawkishness, H. Section B reports general solutions for the mixed-strategy equilibria. Lastly, section C shows the solutions for individual variables for these equilibria.

Section A. Containment Effectiveness and Hawkishness

We discuss the solutions for the ranges of mixed and pure strategies for E and H below.

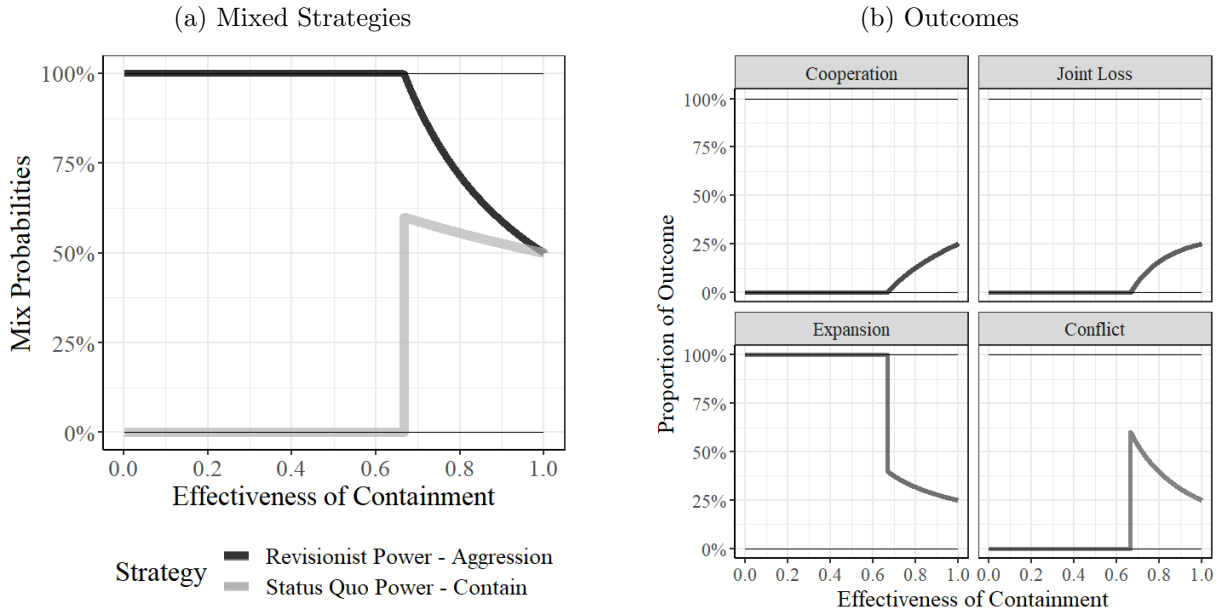
Containment Effectiveness

The relative effectiveness parameter captures the degree to which the status quo power is able to counteract any revisionist power aggression. The players' mixed strategies over varying levels of containment effectiveness are displayed on the left-hand side of Figure A.7, while the probabilities of each observable outcome are shown on the right-hand side. When $E = 1$, a status quo power is able to perfectly counteract any aggressive actions by the revisionist power, whereas when $E = 0$ a revisionist power is able to pursue aggressive action completely unencumbered by the status quo power. An established power can increase its containment effectiveness through its operational strategy—improving relations with and between states within the revisionist power's region, providing regional partners with military aid, re-balancing military deployments, or through technological advancements. Conversely, a revisionist power can decrease containment effectiveness by improving its own relations with neighbors, implementing more agile deployments, or its own technology development. China's A2AD strategy, for example, seeks to box out the US Navy from China's coast to offset containment effectiveness.

Initially, changes in containment effectiveness have no effect on player strategies. Once a critical threshold is reached where the status quo power chooses to contain with a positive probability, however, do both players select increasingly pacific strategies thereafter. The revisionist power rapidly decreases its aggression, with the status quo power also selecting contain at with decreasing probability, though at a far less rapid pace than the change in the revisionist power's behavior. For our selected values, Figure A.7 reveals that the critical value is at approximately $E < 0.65$.

In terms of outcomes, cooperation and joint loss are monotonically increasing, with non-zero probabilities starting at the critical value, whereas expansion is monotonically decreasing, with the downward shift occurring at the critical value. Conversely, conflict follows a non-monotonic pattern, with a probability of zero until the critical value is reached, where it jumps to a value over 0.5, before decreasing as the value of E continues to rise.

Figure A.7: Effect of Containment Effectiveness



Note: Figures above are based on variables initialized to $T = 1$, $A = 1$, $W = 1$, $H = .5$ with E varying from 0 to 1

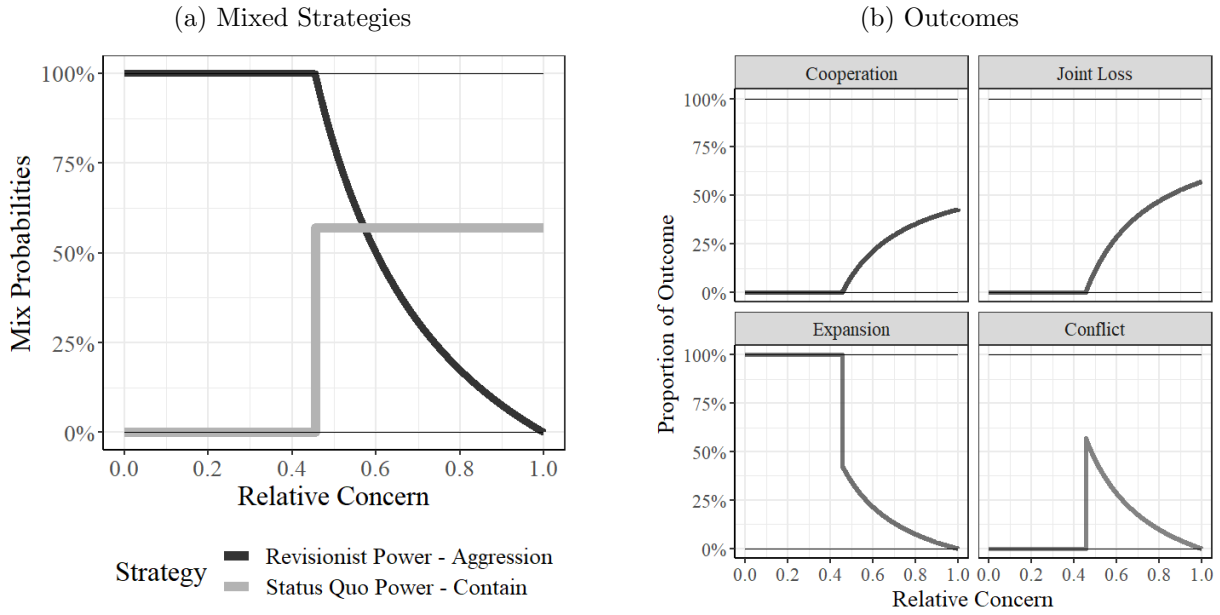
Hawkishness

We model changes in the hawkishness of the status quo power. Domestic drivers, such as changing from a dovish government to a hawkish one, are conditioning factors that affect strategic behavior. A hawkish status quo power is one that views the world through a self-help lens, and is willing to bear costs and limit its own absolute growth in order to prevent the relative growth of rivals. Conversely, a dovish power emphasizes absolute gains and prefers détente over containment, as this produces the greatest material gains.

Figure A.8 reports mixed strategies as the status quo power's concern for relative gains increases. When hegemons view the revisionist power cooperatively, both sides play pure strategies. The hegemon will not contain the revisionist power and the latter can freely pursue aggressive gains. This continues while the hegemon has some concern but remains relatively dovish. After a critical threshold is reached, however, both states adopt a mixed-strategy with the status quo power maintaining a stable middle ground level of competitiveness, while the revisionist power plays a decreasingly aggressive strategy.

The change in strategies beyond the critical value in H is quite large. The probability of conflict, which was zero prior to this point—as the status quo power never chose containment—reaches over 0.5 at the critical value before dropping at a sharp rate until it returns to zero as hawkishness reaches unity. Rising power expansion decreases monotonically over the range of H: it equals to 1 prior to the critical value, and decreases sharply thereafter. The probabilities of both cooperation and joint loss, conversely, increase monotonically, each starting at zero prior to the critical value and increasing steadily afterward.

Figure A.8: Effect of Hawkishness



Note: Variables are initialized to $T = 1$, $A = 1$, $E = .75$, $W = 1$, with H varying from 0 to 1.

Section B. Solutions for Mixed-Strategy Equilibria

Here we find the general solutions to the mixed-strategy equilibrium. "Q" represents how often the status quo power will choose to contain. It is calculated by finding the point where the expected utility for the revisionist power is equal for either strategy it chooses. "P" represents how often the revisionist power will choose to be aggressive. It is calculated by finding the point where the expected utility for the status quo power is equal for either strategy it chooses.

In cases where either p or q are below 0, greater than 1, or equal to either bound, there is a pure-strategy equilibrium for both players. The dominant strategy is determined by a simple calculation of which strategy yields greater utility for each actor knowing the other's choice.

Solution for Revisionist Power (p)

1: Equality set between the utility of Status Quo power choosing contain and détente
2: Utility functions from the game for the respective strategies are inserted and multiplied by probability p (or $1 - p$) that the revisionist power chooses aggression
3: Probability p and hawkishness h is distributed
4: All multiples of p brought to the left
5: p isolated to give solution

$$\begin{aligned} U_c^s &= U_d^s \\ p(-a + ae - w - ha + hae + hw) &= p(t - ht - a - ha) + (1 - p)(t - ht) \end{aligned}$$

$$
\begin{aligned}
-pa + pae - pw - pha + phae + phw &= pt - pht - pa - pha + t - ht - pt + pht \\
pae - pw + phae + phw &= t - ht \\
p(ae - w + hae + hw) &= t - ht \\
p &= \frac{t - ht}{ae - w + hae + hw}
\end{aligned}
$$

Solution for Status Quo Power (q)

1: Equality set between the utility of revisionist power choosing aggression and benignity
2: Utility functions from the game for the respective strategies are inserted and multiplied by probability q (or $1 - q$) that the Status Quo power chooses containment
3: Probability q is distributed
4: All multiples of q brought to the left
5: q isolated to give solution

$$
\begin{aligned}
U_a^r &= U_b^r \\
q(a - ae - w) + (1 - q)(t + a) &= (1 - q)t \\
qa - qae - qw + t + a - qt - qa &= t - qt \\
q(-ae - w) &= -a \\
q &= \frac{a}{w + ae}
\end{aligned}
$$

Section C. Solutions for Individual Parameters

Below are the solutions to each individual variable with respect to p for the status quo power, and q for the revisionist power. Each solution is followed by a table which describes the relation of each variable to the one solved with respect to effects on mixed strategy spaces.

Solutions for A

With Respect to P:
1: Equality set between the utility of Status Quo power choosing contain and détente
2: Utility functions from the game for the respective strategies are inserted and multiplied by probability p (or $1 - p$) that the revisionist power chooses aggression
3: Probability p and hawkishness h are distributed
4: All multiples of a brought to the left
5: a is isolated to give solution
6: simplification of multiples

$$
\begin{aligned}
U_c^s &= U_d^s \\
p(-ae - w - h(ae - w)) &= p(-a + t - h(a + t)) + (1 - p)(t - ht) \\
-pae - pw - phae + phw &= -pa + pt - pha - pht + t - ht - pt + pht \\
a(-pe - phe + p + ph) &= pw - phw + t - ht \\
a &= \frac{(pw - phw + t - ht)}{(-pe - phe + p + ph)} \\
a &= \frac{(1 - h)(pw + t)}{p(1 + h)(1 - e)}
\end{aligned}
$$

With Respect to Q:
1: Equality set between the utility of revisionist power choosing aggression and benignity
2: Utility functions from the game for the respective strategies are inserted and multiplied by probability q (or $1 - q$) that the Status Quo power chooses containment
3: Probability q is distributed
4: All multiples of a brought to the left
5: a is isolated to give solution

$$
\begin{aligned}
U_a^r &= U_b^r \\
q(ae - w) + (1 - q)(a + t) &= (1 - q)t \\
qae + a - qa &= qw - t + qt + t - qt \\
a(qe + 1 - q) &= qw \\
a &= \frac{qw}{qe + 1 - q}
\end{aligned}
$$

Table A.4: Effect of Other Parameter Values on Changes in A

Change	Effect on P	Effect on Q	Effect on Mixed Strategy Space
$\uparrow T$	$\uparrow$	None	$\downarrow$
$\downarrow T$	$\downarrow$	None	moderate values $\uparrow$, extreme values $\downarrow$
$\uparrow W$	$\uparrow$	$\downarrow$	moderate values $\uparrow$, extreme values $\downarrow$
$\downarrow W$	$\downarrow$	$\uparrow$	$\downarrow$
$\uparrow E$	$\downarrow$	$\downarrow$	$\uparrow$
$\downarrow E$	$\uparrow$	$\uparrow$	$\downarrow$
$\uparrow H$	$\downarrow$	None	$\uparrow$
$\downarrow H$	$\uparrow$	None	$\downarrow$

Note: Extreme values for T, in this case, are those below 0, extreme for W in this case are above 1.25

Solutions for E

With Respect to P:
1: Equality set between the utility of Status Quo power choosing contain and détente
2: Utility functions from the game for the respective strategies are inserted and multiplied by probability p (or $1-p$) that the revisionist power chooses aggression
3: Probability p and hawkishness h are distributed
4: All multiples of e brought to the left
5: e isolated to give solution

$$\begin{aligned} U_c^s &= U_d^s \\ p(-ae-w-h(ae-w)) &= p(-a+t-h(a+t))+(1-p)(t-ht) \\ -pae-pw-phae+phw &= -pa+pt-pha-pht+t-ht-pt+pht \\ e(-pa-pha) &= pw+phw-pa-pha+t-ht \\ e &= \frac{p(w+hw-a-ha)+t-ht}{-pa(1+h)} \end{aligned}$$

With Respect to Q:
1: Equality set between the utility of revisionist power choosing aggression and benignity
2: Utility functions from the game for the respective strategies are inserted and multiplied by probability q (or $1-q$) that the Status Quo power chooses containment
3: Probability q is distributed
4: All multiples of e brought to the left
5: e is isolated to give solution

$$\begin{aligned} U_a^r &= U_b^r \\ q(ae-w)+(1-q)(a+t) &= (1-q)t \\ qae+a-qa &= qw-t+qt+t-qt \\ qae &= qw-a-t+qa+qt+t+qt \\ e &= \frac{w}{a}-\frac{1}{q}-1 \end{aligned}$$

Solutions for W

With Respect to P:
1: Equality set between the utility of Status Quo power choosing contain and détente
2: Utility functions from the game for the respective strategies are inserted and multiplied by probability p (or $1-p$) that the revisionist power chooses aggression

Table A.5: Effect of Other Parameter Values on Changes in E

Change	Effect on P	Effect on Q	Effect on Mixed Strategy Space
$\uparrow A$	$\downarrow$	$\uparrow$	moderate values $\uparrow$, extreme values $\downarrow$
$\downarrow A$	$\uparrow$	$\downarrow$	$\downarrow$
$\uparrow T$	$\uparrow$	None	$\downarrow$
$\downarrow T$	$\downarrow$	None	moderate values $\uparrow$, extreme values $\downarrow$
$\uparrow W$	$\uparrow$	$\downarrow$	$\downarrow$
$\downarrow W$	$\downarrow$	$\uparrow$	moderate values $\uparrow$, extreme values $\downarrow$
$\uparrow H$	$\downarrow$	None	$\uparrow$
$\downarrow H$	$\uparrow$	None	$\downarrow$

Note: Extreme values for A, in this case, are those above 1.67, extreme values for W in this case are less than .5, and for T are those below 0

3: Probability p and hawkishness h are distributed
4: All multiples of w brought to the left
5: w is isolated to give solution

$$\begin{aligned} U_c^s &= U_d^s \\ p(-ae - w - h(ae - w)) &= p(-a + t - h(a + t)) + (1 - p)(t - ht) \\ -pae - pw - phae + phw &= -pa + pt - pha - pht + t - rt - pt + pht \\ -pw + phw &= pae + phae + pt - pa - pha + t - ht \\ w &= \frac{pae + phae - pa - pha + t - ht}{-p + ph} \end{aligned}$$

With Respect to Q:
1: Equality set between the utility of revisionist power choosing aggression and benignity
2: Utility functions from the game for the respective strategies are inserted and multiplied by probability q (or $1 - q$) that the Status Quo power chooses containment
3: Probability q is distributed
4: All multiples of w brought to the left
5: w is isolated to give solution

$$\begin{aligned} U_a^r &= U_b^r \\ q(ae - w) + (1 - q)(a + t) &= (1 - q)t \\ qae + a - qa &= qw - t + qt + t - qt \\ -wq &= -qae - a + qa \\ w &= \frac{qae + a - qa}{q} \end{aligned}$$

Table A.6: Effect of Other Parameter Values on Changes in W

Change	Effect on P	Effect on Q	Effect on Mixed Strategy Space
$\uparrow A$	$\downarrow$	$\uparrow$	$\uparrow$, moves right
$\downarrow A$	$\uparrow$	$\downarrow$	$\downarrow$
$\uparrow T$	$\uparrow$	None	$\downarrow$
$\downarrow T$	$\downarrow$	None	moderate values $\uparrow$, extreme values $\downarrow$
$\uparrow E$	$\downarrow$	$\downarrow$	$\uparrow$
$\downarrow E$	$\uparrow$	$\uparrow$	$\downarrow$
$\uparrow H$	$\downarrow$	None	$\uparrow$
$\downarrow H$	$\uparrow$	None	$\downarrow$

Note: Extreme values for T, in this case, are those below 0

Solutions for H

With Respect to P:
1: Equality set between the utility of Status Quo power choosing contain and détente
2: Utility functions from the game for the respective strategies are inserted and multiplied by probability p (or $1-p$) that the revisionist power chooses aggression
3: Probability p and hawkishness h are distributed
4: All multiples of h brought to the left
5: h is isolated to give solution

$$\begin{aligned} U_c^s &= U_d^s \\ p(-ae - w - h(ae - w)) &= p(-a + t - h(a + t)) + (1 - p)(t - ht) \\ -pae - pw - phae + phw &= -pa + pt - pha - pht + t - ht - pt + pht \\ h(-pae + pw + pa + t) &= pae + pw - pa + t \\ h &= \frac{pae + pw - pa + t}{-pae + pw + pa + t} \end{aligned}$$

With Respect to Q: DNE

Solutions for T

With Respect to P:
1: Equality set between the utility of Status Quo power choosing contain and détente
2: Utility functions from the game for the respective strategies are inserted and multiplied by probability p (or $1-p$) that the revisionist power chooses aggression

Table A.7: Effect of Other Parameter Values on Changes in H

Change	Effect on P	Effect on Q	Effect on Mixed Strategy Space
$\uparrow A$	$\downarrow$	$\uparrow$	moderate values $\uparrow$, extreme values $\downarrow$
$\downarrow A$	$\uparrow$	$\downarrow$	$\downarrow$
$\uparrow T$	$\uparrow$	None	$\downarrow$
$\downarrow$ T	$\downarrow$	None	moderate values $\uparrow$, extreme values $\downarrow$
$\uparrow W$	$\uparrow$	$\downarrow$	$\downarrow$
$\downarrow W$	$\downarrow$	$\uparrow$	moderate values $\uparrow$, extreme values $\downarrow$
$\uparrow E$	$\downarrow$	$\downarrow$	$\uparrow$
$\downarrow E$	$\uparrow$	$\uparrow$	$\downarrow$

Note: Extreme values for A, in this case, are those above 4, extreme for W in this case are below .25, and for T are those below 0

3: Probability p and hawkishness h are distributed
4: All multiples of t brought to the left
5: t is isolated to give solution

$$\begin{aligned} U_c^s &= U_d^s \\ p(-ae - w - h(ae - w)) &= p(-a + t - h(a + t)) + (1 - p)(t - ht) \\ -pae - pw - phae + phw &= -pa + pt - pha - pht + t - ht - pt + pht \\ t(h - 1) &= pae + pw + phae + phw \\ t &= \frac{pae + pw + phae + phw}{h - 1} \end{aligned}$$

With Respect to Q: DNE

Table A.8: Effect of Other Parameter Values on Changes in T

Change	Effect on P	Effect on Q	Effect on Mixed Strategy Space
$\uparrow A$	$\downarrow$	$\uparrow$	$\uparrow$, moves right
$\downarrow A$	$\uparrow$	$\downarrow$	$\downarrow$
$\uparrow W$	$\uparrow$	$\downarrow$	$\downarrow$
$\downarrow W$	$\downarrow$	$\uparrow$	moderate values $\uparrow$, extreme values $\downarrow$
$\uparrow E$	$\downarrow$	$\downarrow$	$\uparrow$
$\downarrow E$	$\uparrow$	$\uparrow$	$\downarrow$
$\uparrow H$	$\downarrow$	None	$\uparrow$
$\downarrow H$	$\uparrow$	None	$\downarrow$

Note: Extreme values for W, in this case are below .25