Coercion and Cooperation: A Balancing Act Between Established and Rising Powers

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Abstract   The rise of China and the resurgence of Russia, coupled with questions of US decline, has renewed interest in power transition dynamics. Though competition receives the most attention in public discourse, rising and established powers mix both cooperative and conflictual 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 leverage mixed strategies. The mixed strategies, in particular, highlight when rising and status quo powers are expected to bundle competitive and cooperative actions in varying proportions. The model generates a number of novel predictions, such as rising powers acting more aggressively in response to increases in economic integration and the rising costs of war. We validate the model by tracing the interactions of major powers and China during the latter's historic rise from the nineteenth century to the present.

The ongoing rise of China and resurgence of Russia has caused many to question what coming power transitions may hold in store. Does the US labeling China and Russia long-term strategic competitors[1] indicate that major power conflict is inevitable? That a protracted low conflict "Cold War" is on the horizon? Or can the US, China, and Russia peacefully coexist or even cooperate?

While the outcomes of competition and cooperation are often framed as mutually exclusive, in practice major powers often 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,[2] while at the same time cooperating over the Iranian nuclear deal.[3] 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.[4] The two powers also maintained collaborative initiatives related to climate change,[5] despite ongoing tensions around

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1. US Department of Defense 2018, 4.
2. Chyzh 2022; Norrlof 2022; US Department of State 2022.
3. Tirone and Motevalli 2022.
4. Zhou and Tobita 2023.
5. Lee 2022.

intellectual property protections, human rights, and the status of Taiwan.[6]

How can we explain rising and established powers implementing cooperative and conflictual strategies side-by-side, or changes in their distribution over time?[7] Most theories of power transition focus on the conflict side of the equation, with special attention on great power war. Some treat such wars as a near certainty,[8] while others identify conditions for peaceful interactions.[9] The underlying source of tension is similarly contested: does aggression stem from rising power's efforts to reconcile their increasing material capabilities with their international status,[10] or is it declining powers that seek confrontation while they are still in a position of strength?[11] The outcome of these interactions affect how the international system is organized[12] along with the distribution of benefits and costs for its members.[13]

Focusing on conflict at the expense of cooperation, however, results in a disconnect between our theoretical understanding of the dynamics of power transitions and the observed interactions between a hegemon and rising powers. A focus only on conflict processes does not explain, for example, why the US worked to bring China into the WTO, just a few years after the Taiwan Straights Crisis led US foreign policy elites to fear the new 'China threat.'[14] 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 providing a counter-cyclical source of capital flows to help stabilize exchange rates.[15] Finally, explanations centering on competition and rivalry are unable to explicate why successive US presidents issued 'resets' on the US–Russia relationship, even after Russian ties with their predecessors eventually soured.[16]

Competing powers, in fact, frequently walk a tightrope in their interactions with one another—mixing cooperation and competition strategies.[17] The precise nature of these interactions, and the relative mix of cooperation and competition at any given time, is highly contingent. How a hegemon chooses to engage depends, to some degree, on the policy choices and actions of the rising power. Similarly, these policy choices and actions on the part of the rising power depend, in part, on those of the existing hegemon. The expected benefits and costs of various foreign policy actions, in turn, are conditioned by the degree of economic interdependence and the cost of

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6. Mertha 2018; Congressional Research Service 2021; Spence 2013.

7. We use the terms hegemon, established power, status quo power, and declining power interchangeably.

8. Modelski 1987; Gilpin 1981; Doran 1991.

9. Organski and Kugler 1980; Kadera 2001; Lemke 2002; Mousseau 2019.

10. Volgy et al. 2011; Corbetta, Volgy, and Rhamey 2013; Renshon 2016; Ward 2017; Murray 2019; Mukherjee 2022.

11. Onea 2014; Bell and Johnson 2015; Greve and Levy 2018.

12. Organski and Kugler 1980; Ikenberry 2000; Wang et al. 2024.

13. McDonald 2015; Rhamey, Slobodchikoff, and Volgy 2015; Nieman 2016b; Beardsley et al. 2020; Rhamey and Slobodchikoff 2023; Wolford 2023.

14. Thies 2015a, 2015b.

15. Norrlof and Reich 2015.

16. Thies and Nieman 2017.

17. Edelstein 2017; Haynes 2019; Haynes and Yoder 2020; Yoder 2019.

decoupling, as well as the expected costs of direct military confrontation. The rising power's posture towards regional allies of the hegemon, and the baseline foreign policy hawkishness of the hegemon, are also important factors. Finally, a hegemon's ability to leverage its existing diplomatic and alliance networks, to contain a rising power and deny it access to needed resources, is a determinant adding a multilateral dimension.

We assess the conditions under which changing economic, military, and ideological mechanisms result in different outcomes using a game-theoretic model. The game has equilibria under which either conflict or cooperative policies dominate, but also where states employ mixed strategies. The mixed strategies, in particular, reveal conditions where a hegemon and rising power are expected to bundle competitive and cooperative actions in varying proportions. This generates a number of novel predictions. Under some reasonable conditions, for example, we expect increases in either economic integration or the costs of war to encourage rising powers to increasingly act more aggressively, though the probability of observed conflict is non-linear. There are also conditions under which increased military spending by a rising power, or increased hawkishness by the status quo power, reduces observed conflict.

We validate the model by tracing the interaction of various great powers with China during the latter's historic rise: Great Britain during the nineteenth century, the USSR in the 1960s and 70s, and the contemporaneous competition with the US. Looking at these interactions through the lens of our theoretical model reveals how changes in our key parameters affect foreign policy outcomes in a natural setting. Our analysis highlights the importance of examining the broad range of foreign policy actions and strategies to better understand the interactions between rising and status quo powers.

Power-Transition, State Strategies, and Outcomes

There are two primary strands of literature on major power competition: power transitions leading to confrontation, and grand strategies employed during it. The first focuses on how systemic characteristics frame interactions between hegemons, who favor the status quo, and rising powers, which seek to revise the system. The second outlines overarching policy frameworks that guide major power interactions.

Power-Transitions and Conflict

Theories of power transition differ on the specific conditions leading to war. A common assumption, however, is that hegemonic states set up political orders that distribute benefits in a manner that reflects their own interests.[18] This, combined with major powers having differential growth rates, creates incongruencies in the distributions of benefits and power. Gilpin argues these conditions drive change in

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18. E.g., Gilpin 1981; Kugler and Organski 1993.

the international system, producing wars which move the international system from one equilibrium to another.[19] Conversely, Organski and Kugler contend that major powers are unlikely to enter in competition with the hegemon as they are the ones who disproportionately benefit from an existing political order.[20]

Doran[21] and Thies and Nieman[22] develop similar accounts of growth differentials and benefit distributions, but add state perceptions, through national role conceptions, into their models of hegemon–rising power interaction. By incorporating both powers' perception of the other's expected behavior—and the appropriateness of their own response—these theories open up theoretical space for the effect of domestic considerations, rather than purely systemic factors. While Doran remains firmly deterministic in terms of when conflict occurs, Thies and Nieman suggest domestic factors act as an intervening variable for a state's degree of satisfaction with the current order and its subsequent actions.

Kadera extends the differential growth argument by formally incorporating conflictual interactions between hegemons and rising powers.[23] By integrating the strategic action-reaction processes of conflict and power growth, Kadera is able to identify conditions for both conflict escalation and de-escalation. Similarly, Powell assesses how the distribution of power and distribution of benefits interact.[24] Powell finds that as these distributions diverge, war becomes increasingly likely. In contrast to previous work, both Kadera and Powell paint a more complex picture of the interactions between a hegemon and rising powers, isolating the scope conditions for conflict.

Further complicating this picture is that not only do hegemons and rising powers sometimes fail to fight, but also frequently engage in cooperation instead. Cooperation between hegemons and rising powers is generally understood as arising from one of two processes: engagement[25] or a guns and butter trade-off.[26] The engagement argument centers on the idea that cooperation by a hegemon shapes the interests of the rising power, incorporating it into the existing political order. To do so, the hegemon can create institutions that constrain its own behavior, partly to demonstrate the its benign intent, while also creating a predictable shadow of the future.

Despite the positives that international institutions can create, they do not constitute a sufficient condition to avoid conflict. For one, it is not necessarily true that hegemons or rising powers have sufficiently long shadows of the future for future payoffs to affect current behavior.[27] Moreover, it may not be in the hegemon's self-interest to provide

19. Gilpin 1981.
20. Organski 1958; Organski and Kugler 1980; Kugler and Organski 1993.
21. Doran 1991.
22. Thies and Nieman 2017.
23. Kadera 2001.
24. Powell 1999.
25. Keohane 1984; Ikenberry 2000.
26. Powell 1993; Kadera and Morey 2008.
27. Edelstein 2017, 33.

stability to the system or to act benignly towards all actors within it.[28]

The guns and butter argument contends that states must balance their military spending, which provides security against rivals, with economic growth, which leads to long-term resource growth. Applied to hegemons and rising powers, this logic highlights that each must weigh the benefits of engaging in conflict now versus acquiring more resources and fighting later. Due to their differential growth rates, one would expect that hegemons may seek preventive war and rising powers may want to delay any war until they are stronger.

Seemingly, this perspective leaves little room for cooperation. Yet, Edelstein[29] and Haynes[30] offer frameworks where cooperation can occur. Edelstein argues that, in addition to the guns and butter trade-off, hegemonic states face a "now or later dilemma" and consider both the short- and long-term benefits and costs of cooperative and competitive strategies. Similarly, rising powers must weigh whether a bellicose foreign policy is worth the additional resources that may aid its rise. Edelstein also expects that states update their beliefs about their competitor's intentions based on prior interactions. Haynes develops a formal model that isolates the conditions, under which uncertainty about a rising power's intentions permits cooperative benefits for each player. Under full information, however, no cooperation occurs. These studies suggest that uncertainty about a strategic competitor's intention makes cooperation possible.[31]

Domestic features and actions may also shape rising and declining powers' threat perceptions of one another. While domestic characteristics, such as regime type, help explain whether pairs of states view each other in benign[32] or positive terms,[33] other factors also matter. One is the degree to which a state's leader favors hawkish, coercive foreign policy tools over peaceful alternatives.[34] Another is how states respond to domestic crises. Crisis responses provide external actors with information that allows them to revise their beliefs about the state's type.[35]

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28. Conybeare 1987, 59–71.
29. Edelstein 2017.
30. Haynes 2019.
31. This result is consistent with formal theoretical work on costless diplomatic communication. Sartori 2002 and Joseph 2021, for example, construct games of incomplete information where actors place different weights on how much they value different issues and use diplomacy to communicate their intentions. Sartori finds that this process can lead to increased conflict owing to efforts to protect a state's reputation. Joseph shows conflict escalation can result from states attempting to exploit asymmetries in issue salience by making aggressive offers, which are subsequently more likely to be rejected.
32. Lemke and Reed 1996; Tomz and Weeks 2013.
33. Leeds 1999; Lai and Reiter 2000; Russett and Oneal 2001.
34. Carter and Smith 2020; Kesgin 2020.
35. Goldstein, Joseph, and McManus 2023.

Foreign Policy Strategies

Hegemon–rising power interactions are also impacted by each actor's overarching grand strategy. A hegemon may employ a number of strategies to attempt to slow its decline and 'lock in' some degree of control over the nature of the international system. Some focus on the creation of binding institutions that reflect the hegemon's preferred organizing principles, with the goal that these become entrenched and continue to alter the rational cost-benefit calculation of subordinate states.[36] Others contend that hegemons engage rising states and offer 'status enhancement' to accommodate, or even co-opt the rising power into supporting the existing order.[37]

An alternative strand of research emphasizes systems of legitimacy—based on either ideological grounds or perceived success—to encourage emulation or deference to the hegemon over specific policy domains without relying exclusively on material capabilities.[38] Still another approach is strategic retrenchment, with the goal of 'declining gracefully' while maintaining influence in some key regions.[39] Finally, a hegemon may take a more confrontational stance and attempt to contain the rising power and exclude it from the benefits of the existing order[40] or even initiating a preventive war.[41]

While each strategy has its costs and benefits for order maintenance in broad terms, how rising powers, in particular, respond to these various efforts is less clear. A rising power may employ military instruments, as assumed by traditional power transition theories, but they can also respond in a number of alternative ways. First, rising powers may accept the institutions of the status quo power, work to reform them within the existing organizing framework, or attempt to create alternative institutions.[42] Provided the rising power has limited aims, accommodation and appeasement may placate their ambitions, but if their ambitions are greater, these policies only delay militarized conflict until the hegemon is weaker.[43] Second, rising power could substitute (or complement) their military strategy with ideological competition and undertake efforts to demonstrate the material superiority of their own model.[44]

Finally, rising powers also have several options to deal with strategic retrenchment which may be employed by a declining power. They may try to expand into abandoned areas[45] or maintain only limited engagement.[46] This response may also be conditional on other factors, such as ideological alignment, strategic value, and technological

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36. Keohane 1984; Ikenberry 2000.
37. Paul, Larson, and Wohlforth 2014; Paul 2016; Yoder 2019.
38. Lake 2009; Kang 2010; Lanoszka 2013; Thies 2013; Nieman 2016b; Norrlof 2010, 2014.
39. MacDonald and Parent 2011; Haynes 2015.
40. Lascurettes 2020; Nieman et al. 2021; Resnick 2022.
41. Levy 1987; Trachtenberg 2007; Bell and Johnson 2015.
42. Goddard 2009, 2018a, 2018b; Thies 2013; Stuenkel 2016; Thies and Nieman 2017; Mukherjee 2022.
43. Powell 1996.
44. Valdez 1993; Braumoeller 2012; Musgrave and Nexon 2018.
45. Mandelbaum 1988; Brooks, Ikenberry, and Wohlforth 2012/2013; Jakobsen 2022.
46. MacDonald and Parent 2011.

factors.[47]

Taken together, both status quo and rising powers face risks when determining how to interact. Rather than passively submitting to the deterministic processes that would result in war, rising and hegemonic powers can avoid conflict, and even cooperate with one another, conditional on their beliefs of the other power's goals and intentions. Such beliefs are based on domestic characteristics and the foreign policy strategies guiding each power.

A Theory of Status Quo–Rising Power Interactions

The previous section suggests that uncertainty about either power's intentions contributes to determining whether a hegemon and a rising power will cooperate or engage in conflict. Uncertainty stems not only from a state's systemic position but also from domestic features and diplomatic interactions. Yet, many of the features that drive this uncertainty are directly observable by external actors: domestic democratic processes can be tracked and responses to domestic crises seen. Moreover, states invest significant resources into inferring and attributing behavior and intentions.[48] Even characteristics such as leader dispositions can be inferred from their backgrounds[49] and updated in view of their actions.[50] As such, both established and rising powers should be able to assess their counterpart and update their beliefs in relatively short order. While a degree of uncertainty is always present—the future can never be fully known—it is not necessarily the case that states face significant uncertainty in identifying, or at least assigning, one another a general type or role (e.g., revisionist or benign, friend or foe). Nor does uncertainty necessarily explain why we observe both cooperative and conflictual policies used concurrently.

Rather than focus on the role of uncertainty, our model zeroes in on how each actor's payoff structure changes in response to the complexities introduced by economic incentives, ideological alignments, and strategic ambitions. That is, we focus on first principles in order to draw a stronger connection between the parameters of the status quo–rising power relationship and the outcome of their interactions. We expect each actor to pursue a mix of both cooperative and conflictual strategies most of the time, with the relative distribution of these changing based on the observed characteristics of the other. To capture this, we develop a game-theoretic model that identifies the conditions under which hegemons and rising powers choose specific distributions of cooperative and conflictual strategies. We then identify the distributional aspect of strategic profiles by highlighting the mixed-strategy equilibria across varying

47. Lake 2009; Nieman et al. 2021; Resnick 2022; McManus and Nieman 2019; Norrlof and Wohlforth 2019.

48. Carson and Yarhi-Milo 2017; Cormac and Aldrich 2018.

49. Carter and Smith 2020; Goldfien, Joseph, and Krcmaric 2023; Nieman and Allamong 2023.

50. Lupton 2022.

parameter values.

The Model

The model involves two players: a *status quo power* and a *rising power*. The former seeks to further entrench its position at the head of the world order, while the latter has growing material capabilities and may seek to change the existing distribution of benefits. Each player simultaneously chooses one of two actions, reflecting either a cooperative or a conflictual policy profile. The status quo power's policy action is either *contain* or *détente*. The former assumes a more aggressive posture, such as applying sanctions or deploying aid, equipment, or personnel to strengthen regional partners in order to box a rival in, while the latter is more accommodating towards the rising power. The rising power chooses whether to pursue *aggressive* expansion—strong-arming neighbors into giving it concessions—or a *benign* foreign policy, which consists of pursuing goals through non-coercive means like economic engagement.

Based on these actions, there are four potential outcomes, each with its own 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 the value of trade, investment, and other economic gains. This parameter increases with more economic interactions and decreases if hostile relations reduce business confidence or states impose restrictions on economic transactions.

For the status quo power, this gain comes at the expense of their relative position vis-à-vis the rising power. 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.[51] Status quo powers with a more liberal inclination place a low value on H and, hence, experience little to no cost. Conversely, status 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 rising power are enough to negate any benefits the status quo power receives from economic engagement.

Second, if *contain* and *benign* are played, then the actors experience joint economic loss since the status quo power's hostility precludes economic cooperation. Given the rising 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 rising power's influence owing to the rising power's aggressive overtures and the status quo power's lack of a security response. The rising power is able to make inroads in achieving strategic gains, $A \geq 0$, to the detriment of the status quo power, which

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51. The H parameter may represent a power's institutional constraints, leader dispositions, or milieu goals, e.g., establishing a reputation, promoting specific international norms or economic models. See Carter 2023 and Chyzh and Labzina 2018. By incorporating these factors, the perceived stakes can vary.

TABLE 1. *Outcomes and Payoffs for Status Quo and Rising Power Interactions.*

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

Note: Payoffs for the *Rising Power* are listed on top, with payoffs for the *Status Quo Power* on bottom.

loses an equal amount $(-A)$. The rising power's gains are the status quo power's losses, which reflects the zero-sum nature of spheres of influence or the 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 HT in the status quo power's payoff. At the same time, the status quo power continues to engage with the rising 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 rising 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 status quo and rising powers pick *contain* and *aggression*, respectively, conflict ensues. Here, the achievement of the rising power's strategic goals A is conditioned by the status quo power's containment efforts, E. 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 rising power, $-AE$. It also loses additional utility dependent on its concern for relative gains, $-HAE$.

To reflect the risk of aggressive foreign policy strategies spiraling into war, both powers' payoffs also include the cost $W \geq 0$. This cost includes not only the risk of war, but also related costs of mobilization, military exercises, and militarized incidents; military strategies that make escalation more likely, such as brinkmanship; and the employment of tactics and weapons that increase the costs of war, such as campaigns of attrition or the targeting of urban centers, and the use of high capacity guns or nuclear weapons. The costs from war escalation, however, are 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.

Table 1 presents the game in normal form, along with each player's payoffs from each outcome. Table 2 summarizes the five parameters and their constraints. We assume that the game is common knowledge between players, that utilities are observable, and that players maximize their expected utility.

TABLE 2. *Game Parameters*

Parameter	Description	Constraints
A	*Rising Power's* value in uninhibited coercive action	$0 \leq A < \infty$
T	Quantity of trade	$0 \leq T < \infty$
W	Costs of war escalation	$0 \leq W < \infty$
E	Containment Effectiveness	$0 \leq E \leq 1$
H	*Status Quo Power's* hawkishness	$0 \leq H \leq 1$

Solution and Implications

The game is solved using the Nash equilibrium concept. We focus on the solutions for the ranges of mixed strategies and pure strategies of T, A, H, and W below.[52] The full analytical solution for all equilibria are reported in the appendix.

We discuss the impact of changing these parameters on each player's strategy, holding the other parameters constant, in the next section. To illustrate the effects of changing parameters for mixed-strategy outcomes, we create counterfactual scenarios which follow the idiographic-nomothetic synthesis model.[53] The nomothetic side involves discovery and application of general rules, which are then contextualized in the idiographic side for specific dyads, assessing the plausibility of the counterfactual antecedents. The goal is to discover principles of power transition and create a set of plausible scenarios which describe how these principles manifest.

One advantage of this approach, as applied to power transition, is that it provides insights into the relative mix of cooperation and conflictual strategy profiles that competing states employ. This better reflects real-world situations, as states often choose different actions across a range of issue areas at different points in time. Thus, mixed strategies can be intuitively interpreted as ratio of cooperative and conflictual actions taken by rising and status quo powers across multiple issue areas.

For the following scenarios, we choose initial values that would best reveal the possible interaction for the parameter of interest and calculate equilibrium strategies across the spectrum of one variable.[54] Each variable has a unique effect on the optimal strategies of cooperation and conflict, resulting in a number of insights. In each case, we produce a figure that plots the mix of probabilities of the Rising Power playing aggression denoted as P and the Status Quo playing contain denoted as Q, at different values for all parameters of interest. Because probabilities cannot be below 0 or above 1, only when both strategies are between the drawn lines at 0 and 1 is there a

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52. We relegate the discussion of altering E to the appendix, as it is relatively straightforward: as E increases, the status quo power is more likely to choose contain and the rising power acts less aggressively.

53. Tetlock and Belkin 1996.

54. Ideally, states' values for T, A, and E would be endogenous to the model through a guns or butter trade-off; however, the added complexity of these maximizations creates an intractability of interactions that could be better dissected in future research. For completeness, we examine the sensitivity of the effects of each parameter in the appendix.

mixed-strategy equilibrium; otherwise, each player strictly prefers a pure-strategy.

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, 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 two bounded variables—aggression effectiveness (E) and the status quo power's hawkishness (H)—are set to values where the players choose mixed strategies. We set $H = .5$ to test a middle-ground government perspective concerned with both absolute and relative advancement. We initialize the containment effectiveness to the moderately high $E = .75$, suggesting a containment strategy that mitigates 75 percent of possible aggressive gains of the rising power. A relatively high value is reasonable given the significant effort that status quo powers take in employing forces abroad to promote their own influence and to prevent that of their rivals.[55]

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, before discussing their implications.

The Impact of Economic Interdependence

First, we explore the effect of changes in economic engagement. Economic relations are often attributed a pacifying effect, with close economic links reinforcing shared interests,[56] while severing them imposes costs on each actor and extends the range of acceptable bargains.[57] We explore whether this logic extends to positional rivals like rising and established powers.

The left-hand side of Figure 1 displays the mixed strategy probabilities of the rising 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 rising power, all else equal, with P increasing linearly, whereas the status quo power selects a consistent mix of containment Q until reaching a critical threshold, at which it plays a pure strategy of détente (i.e. $Q = 0$). The intuition is that increasing trade makes choosing a containment strategy more costly for the status quo power relative to that of a détente, resulting in a greater tolerance for aggression. Given this greater tolerance, the rising power continues to increase its own aggressive actions. This relationship—a positive effect of trade on rising power aggression, all the while the status quo power's mix of containment and

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55. Harkavy 1982; Nieman et al. 2021.
56. Danilovic and Clare 2007; Mousseau 2003, 2019; Nieman 2016a.
57. Gartzke, Li, and Boehmer 2001; McDonald 2009.

FIGURE 1. *Effect of Trade*

(a) *Mixed Strategies*   **(b)** *Outcomes*
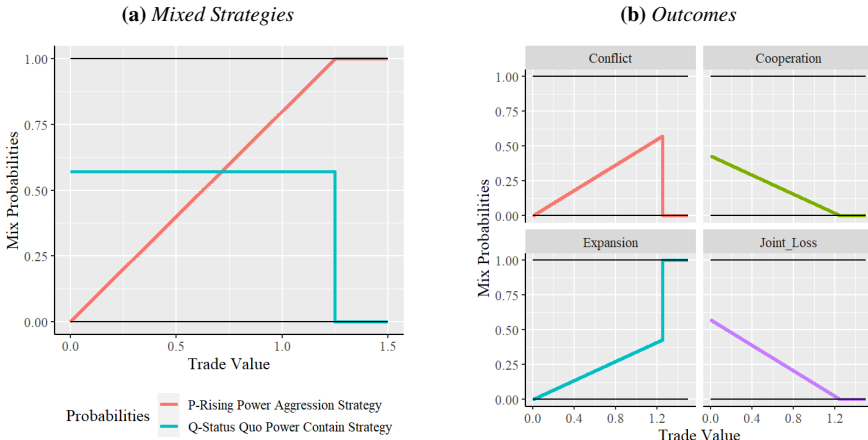
détente remains unchanged—holds until the value of trade is great enough to outweigh any benefits from containment for the status quo power. At this point, each player chooses a pure-strategy, with the rising power playing $P = 1$ (always *détente*) and the status quo power selecting $Q = 0$ (always *aggressive*).

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

Implication 1: Increases in bilateral economic relations result in: (a) an increase in the rising 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 rising power expansion.

It is worth noting that, in this scenario, the rising power's increasingly aggressive strategy from rising levels of economic interaction occurs even as the value of A remains constant, i.e. the rising power continues allocating the same proportion of resources to its military (in terms of its guns-or-butter tradeoff). If we instead assume a higher value of A, with rising powers allocating a greater proportion of their trade gains to military purposes, then the slope of P becomes flatter but remains positive. At the same time, the probability of containment Q is pushed up, until reaching the critical threshold, after which the status quo power plays only détente. In other words,

FIGURE 2. *Effect of Aggressive Capacity*

(a) *Mixed Strategies* **(b)** *Outcomes*
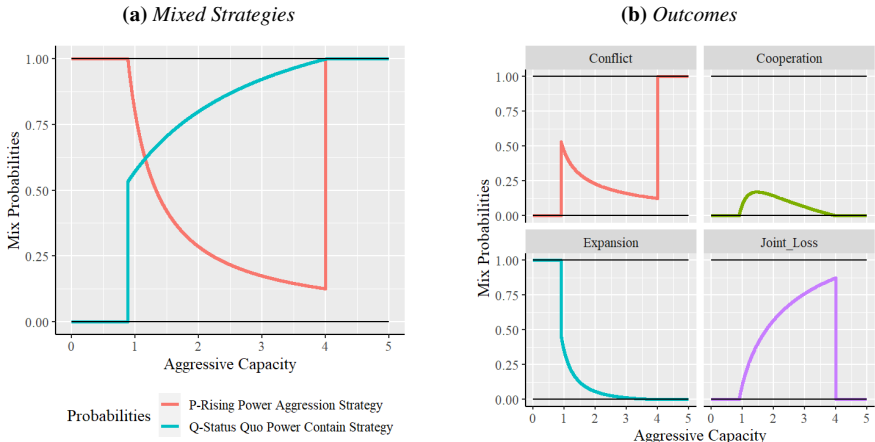
Note: Variables are initialized to $T = 1$, $E = .75$, $W = 1$, $H = .5$, with A varying from 0 to 5.

the same general relationship is observed.[58]

Changing the Rising Power's Aggressive Capacity

Next, we consider the direct effect of variation in the rising power's aggression capacity, A, on both its mix of strategies and those of the status puo power. The rising power's aggressive capacity may vary as a function of increased military size, growth 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 rising power can bully smaller neighbors without attracting any containment response from the status quo power. Here, the rising power selects a pure strategy of aggression.

Once the relative value of A surpasses that of T and W, however, the rising 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 rising power's expansion. The rising power's increased capacity vis-á-vis its neighbors induces increasingly strong responses from

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58. See the appendix for a report on each parameter's sensitivity to altering the values of other parameters.

the status quo power. The rising 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 rising power chooses aggression with monotonically decreasing probability while the status quo power selects containment with monotonically increasing probability.[59]

These strategy profiles hold for most of the parameter range, so we focus our discussion on these most likely types of interactions.[60] The probability of conflict, for instance, begins as negligible, despite the rising 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 decrease in the rate of aggression by the rising power outpaces the increase in the status quo power's use of containment.[61] The cooperation outcomes reverse most conflict trends: it is not observed for low values of A (0 to $\approx$ 0.9), before increasing and slowly declining as A increases. The rising power expansion outcome is observed with certainty for low values of A (0 to $\approx$ 0.9), after which its probability monotonically declines as A increases, while that of a joint economic loss outcome increases monotonically.[62]

Changes in the probability of observing these outcomes have important substantive foreign policy implications. If one treats the progression of increases in A as a rising power increasingly allocating its share of resources towards military production over time, then the model highlights the difficulty in using observed trends in cooperation and conflict to predict future behavior. As a rising power continues to increase in strength after reaching the critical value of $A \approx 0.9$, it may appear to act more cooperatively than its initially aggressive start. In response, the status quo power may appear as needlessly overbearing as it continues to ratchet up containment. The increase in containment, of course, is precisely why overt conflict is avoided.

Implication 2: As the rising power's aggressive capacity increases, the mixed strategy equilibrium probabilities of rising power aggression and containment are initially inversely related: (a) rising powers are decreasingly aggression; (b) status quo powers increasingly choose containment; and (c) the probability of observing the

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59. At extreme values, such that A significantly outweighs T and W, the status quo power plays a pure strategy of containment, and the rising power plays a pure strategy of aggression. This results in the conflict equilibrium. The intuition is that, while the rising power maintained positive economic gains from the status quo power when the latter played détente with a positive probability, these gains are lost once containment is always selected ($Q = 1$). Thus, the rising power receives no benefit from constraining its own behavior and instead derives positive gains only from extracting concessions from neighbors.

60. At extreme values, such as $A = 4$, we see structural breaks in the trends for the conflict and joint loss outcomes. We discuss these results in fn 61 and 62 below.

61. The decrease in the probability of conflict continues until reaching a second critical threshold, at $A = 4$, where the conflict outcome is observed with certainty owing to the rising and status quo powers playing pure strategies of aggression ($P = 1$) and containment respectively ($Q = 1$).

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

(a) *Mixed Strategies*   **(b)** *Outcomes*

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

rising power expansion outcome is monotonically decreasing.[63]

Altering the 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 locations or loss of influence.[64]

Figure 3 reports mixed strategies as the costs of war change, as well as the probabilities of observing each outcome. When costs of war are low, the status quo power begins with a pure containment strategy. The rising power responds with an aggressive strategy, as the cost of war is initially minimal, making otherwise risky strategies more tenable. The value of containment however monotonically decreases as the costs of war rise and, once war is sufficiently costly, the status quo power plays this strategy with zero probability. Due to a decrease in expected costs arising from less containment, the rising power increasingly chooses an aggressive strategy. Eventually, as the cost of war continues to increase, there is a threshold, after which the status quo power opts for a pure strategy of détente and the rising power a pure aggressive strategy.

The change in player strategies affects the probability of each observed outcome. For low values of W, conflict is the equilibrium outcome; for low to middle values of

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63. At extreme values, however, aggressive capacity overwhelms both trade and war costs, and only aggression and containment strategies are selected.
64. Mansbach and Vazquez 1981; Mitchell and Prins 1999; Hensel et al. 2008.

W, the probability of conflict is around 0.5; while under high values of W no conflict is observed. Cooperation is observed at across the middle of the value 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 probability declines until again reaching zero at high values. While the probabilities of each of the previous outcomes are non-monotonic over the range of W, the probability of rising power expansion outcome is monotonically increasing: starting as zero at low values, increasing steadily over middle values, before becoming a certainty at high values.

That the probability of a rising power expansion increases in this manner adds richness to models of brinkmanship. It shows that, as costs ratchet up, a status quo power is much more likely to cede a sphere of influence to a rising power, despite still being more powerful. One contemporary example of this scenario may be the status of Taiwan in US-Chinese 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' over a firm commitment to deterrence. China, on the other hand, has frequently taken aggressive actions towards Taiwan, entering its airspace, bombarding islands, firing rockets just off the shore of the mainland, and pursuing a plan to build bridges to Taiwanese islands, with relatively little substantive push-back from the US.

Implication 3: Increases in the cost of war associate with: (a) beyond low levels, an increasing probability of rising powers selecting aggression; (b) a monotonically decreasing probability of status quo powers choosing containment; and (c) an increasing probability of observing rising power expansion.

Varying the Degree of Status Quo Hawkishness

Finally, we model changes in the hawkishness of the status quo power. Domestic drivers, such as a shift from a dovish government to a hawkish one, are conditioning values that affect the perception of each strategy.[65] A status quo power that is more concerned with absolute gains will strictly prefer détente over containment, as this produces the greatest gains. Conversely, for a government that views the world through a self-help lens, it is often acceptable to bear costs to absolute growth to prevent the relative growth of rivals.

Figure 4 reports mixed strategies as the status quo power's concern for relative gains increases. When hegemons view the rising power cooperatively, both sides play pure strategies. The hegemon will not contain the rising 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 rising power plays a decreasingly

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65. Domestic changes that relate to a leader or new government's hawkishness affecting foreign policy is consistent with research on leadership turnover. See Wolford 2007 and Lupton 2020.

FIGURE 4. *Effect of Relative Concern*

(a) *Mixed Strategies*   **(b)** *Outcomes*
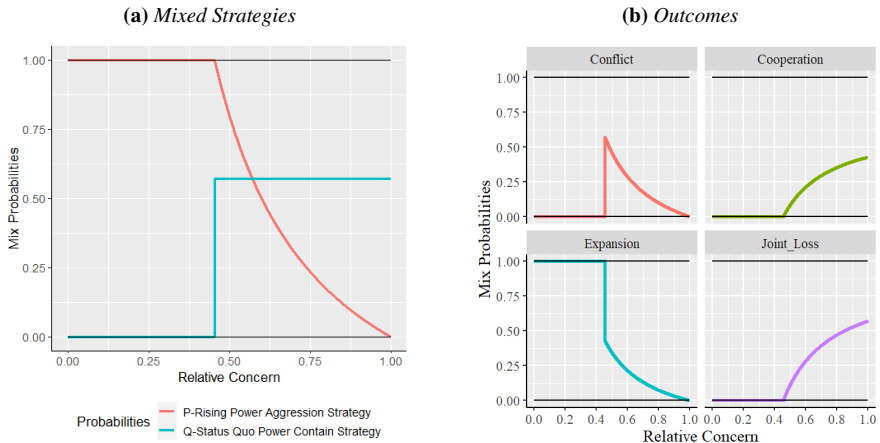
Note: Variables are initialized to $T = 1$, $A = 1$, $E = .75$, $W = 1$, with H varying from 0 to 1.

aggressive strategy.

The change in strategies beyond the critical values of 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.

Implication 4: As the status quo power increases in hawkishness: (a) the rising power selects aggression with a monotonically decreasing probability; (b) there exists a structural break that increases the probability of the status quo power playing containment in a stepwise manner; (c) the probability of observing rising power expansion decreases monotonically while both cooperation or joint loss monotonically increase.

Application to China's Historic Rise

We apply our theoretical model to the historic rise of modern China, and its interactions with Western powers, from the nineteenth century to the present day. Focusing on the same rising power's interactions with several status quo rivals allows us isolate how changes in our five key factors affect diplomatic relations. We begin our analysis by examining the effect of trade and hawkishness leading up to the First Opium War. Next, we explore how increases in the costs of war and aggressive capacity impacted the

TABLE 3. *Opium War Parameters*

Parameter	Quantity	Rationale
T	High → 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 → Moderate	China became a reputational threat

Sino-Soviet split. Lastly, we apply the theoretical framework to review contemporary Sino-American relations and outline plausible near-term trajectories, as determined by changes in US hawkishness and the effectiveness of containment.

The First Opium War

Peaceful trade relations between the Qing Empire and the UK quickly deteriorated in 1839. Our model helps illuminate the rationale for what appears to have been a spontaneous and egregious conflict. In 1800s, the two countries had a high value on trade T, the first key parameters, reported in Table 3. 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.[66] 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 would replace it. This absence of control had consequences: a massive expansion of the opium trade, forcing a Chinese crackdown on all trade—and threats made against merchants—in response.[67] At this crisis point, T would have fallen close to zero.

When news of the incident reached Britain, the ruling Whig Party had to decide how to respond. When Parliament considered the war, they were assured that the conflict would be short: China would acquiesce once the British blockaded major river entrances. There would thus be little cost, W: Chinese technology was antiquated,

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66. The UK lacked the ability to supply an invasion of the massive Chinese empire. An offensive operation by China was also unlikely, as its military budget had been eviscerated due to suppressing a domestic rebellion.

67. 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 opium they held. Lin kept trade closed to the British until all traders agreed not to deal in opium. See Platt 2019.

FIGURE 5. *1839 British and Chinese Strategy Spaces*
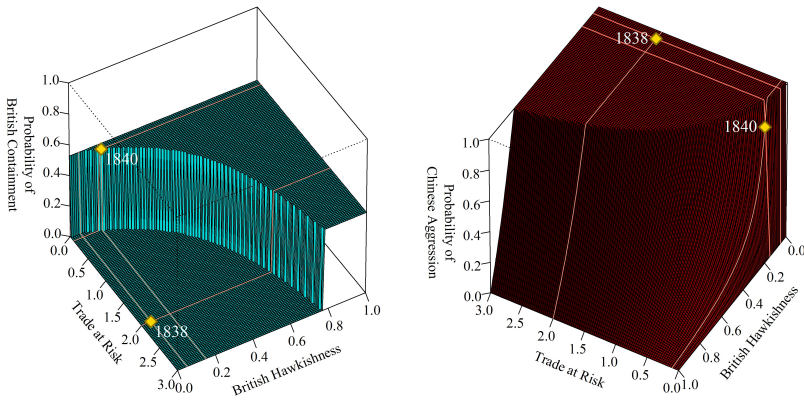
Note: The figure to the left is the British strategy space, to the right is China's strategy space. The figures above are based on variables initialized to $A = .5$, $W = .5$, $E = .9$. T varies from 0 to 3, and H varies from 0 to 1.

and Chinese junks could not challenge the Royal Navy ships-of-line. The attitude of Parliament members towards China also swayed during the debate, significantly raising H.[68]

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, it is likely trade would have continued as it had for centuries.[69] To illustrate, Figure 5 presents the model outcomes before 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 *Implications 1* and *4* from the theoretical model, both of which expect a hegemonic state to transition from a pure strategy of détente to one where containment is now played with a positive probability. Specifically, the decrease in trade catalyzed British intervention from a quiescent posture up to 1838—when trade was high—to a certainty in 1840 (in line with *Implication 1*). Likewise, the model predicts containment to be played after hawkishness reached a critical threshold in 1840, whereas it was never selected prior

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68. Critically, two of the most respected British individuals on China, Charles Elliot and George Stanton—who had both previously been inclined toward conservative, pacifist policy toward China—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. Failing to reproach China could embolden China further, they argued, and may cause the British dominions to question British primacy. See Platt 2019.

69. Platt 2019.

TABLE 4. *1962-1979 Parameters*

Parameter	Quantity	Rationale
T	Low	Trade was extremely limited by 1960
A	High $\rightarrow$ Low	China's conventional military decreasingly favored aggression
W	Low $\rightarrow$ High	Proliferation of nuclear weapons increased costs
E	High	USSR air, sea, and land proximity and superiority mitigated aggression
H	Moderate	The most immediate USSR threat became the CCP

(in line with *Implication 4*). Combined with a more gradual change in the rising power's behavior—as indicated by *Implication 1* for trade, and *Implication 4* for hawkishness—the probability of conflict increased dramatically.

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 costless. The combined increase in British hawkishness and decrease in trade, however, were sufficient to alter British strategy from a predominantly hands-off military approach to one emphasizing containment more strongly, subsequently, significantly increased the probability of conflict.

The Sino-Soviet Split

The progression of the Cold War brought about a realignment within the Communist sphere. Ideological shifts within the USSR, mutual distrust, a collapse of trade, and competing interests resulted in the USSR becoming the primary obstructing force against Chinese expansion. Understanding the dyadic dynamics of this period is critical to explaining how, over the span of a decade, the hottest conflict between great powers in the Cold War switched from the US-Soviet dyad to the Sino-Soviet dyad. Summaries of the dyad's key parameters are shown in Table 4.

Hawkishness within the Sino-Soviet dyad had already greatly increased from the mid-1950s to the mid-1970s, as the divergent paths of leadership contributed to a clash of interests.[70] A decoupling of interests precipitated economic costs to both countries, reducing trade to a fraction of its former level. Mao's Great Leap Forward initiative in 1958 decimated Chinese production, and was followed by a sudden withdrawal

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70. A growing ideological rift between Soviet leadership and Mao stemmed from Khrushchev's "de-Stalinization" program —specifically, Mao was concerned with Soviet criticism of sacrosanct political figures, and the ensuing political turmoil in Poland and Hungary. See 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. See 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.

of all Soviet specialists on July 18, 1959.[71] These blows put China far below its trade obligations to the Soviet Union. The fracturing facade of Sino-Soviet trade finally shattered in 1960 when the PRC unilaterally suspended all outstanding supply contracts and increased trade with Japan and Western Europe.

From the perspective of the model, however, the defining factors that explain the dramatic shift in the Sino-Soviet relations lay with the large changes in PRC aggressive capacity, A, and war costs, W.

Leading up to 1960, the PRC crushed the last mainland holdouts from the Chinese Civil War and normalized its external borders. A PLA experienced in military campaigns represented a renewed 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 replaced a focus on modernization of China's military industry with a guerilla-based, defense-in-depth strategy, that emphasized 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.[72] By arming a Chinese rival, the USSR had changed its strategies towards China from one of pure détente to including a heavy mix of containment, as expected by *Implication 2*. This is shown at point 1962 in Figure 6.[73]

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 a year later, the USSR rapidly expanded its arsenal.[74] By 1964, China conducted its own nuclear weapon test. The redoubled threat of China forced a reevaluation of the Soviet strategy. These dynamics are depicted in Figure 6, 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.[75] 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 continue pursuit of aggressive expansion in Southeast Asia, including against
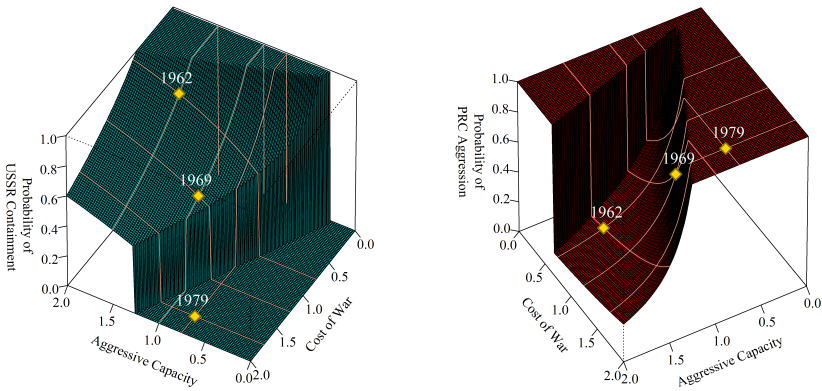
71. 174–77.

72. Chari 1979.

73. Figure 6 presents an interesting hypothetical, where minor changes in W or A could have lead to conflict much earlier.

74. Ellsberg 2017.

75. Lüthi 2008, 340–344.

FIGURE 6. *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 $T = .5$, $E = .66$, $H = .5$, A varies from 0 to 2, and W varies from 0 to 2

Soviet protégés such as Vietnam in 1979.

Contemporary US-China relations

US-China relations since the end of the Cold War have seen a mix of both cooperation and conflictual behavior. 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. Tensions have also increased as China adopted a more assertive posture in the Indo-Pacific.

Contemporary US–China interactions are often viewed through an economic lens. In addition to material benefits from trade and investments, the US saw China's 2001 entry into the WTO as a way to align the interests of the PRC with those of the US-led liberal order through economic engagement, with a goal of empowering domestic economic actors at the expense of reactionary elements.[76] This period is represented by the 2001 point in Figure 7. As suggested by *Implication 1* and illustrated through souring relations over the past 20 years, however, despite mutual gains the resulting economic integration tied the hands of the US rather than disincentivizing PRC aggression. It is unclear how economic relations between the US and China will fare as efforts to decouple gain traction.

An analysis of recent and planned military spending offers a less muddled perspective, in terms of the model's parameters, for assessing the realm of near-term forecasts. As China continues to modernize its military, its aggressive capacity, A,

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76. Mousseau 2019, 187–190.
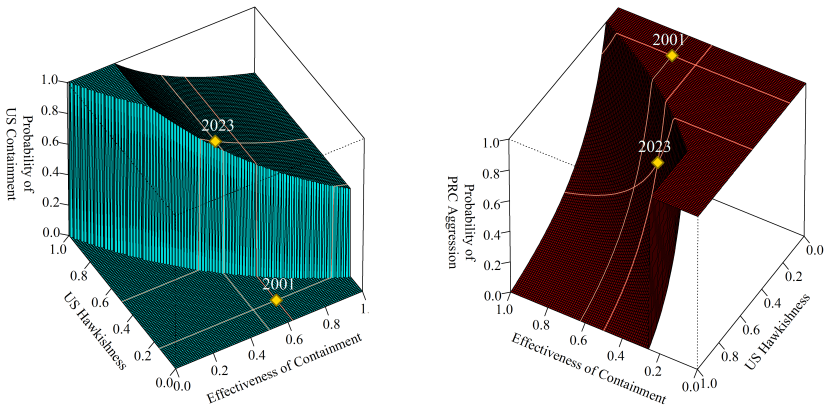
Note: The figure to the left is the American strategy space, to the right is China's strategy space. The figures above are based on variables initialized to $T = 1$, $A = 2$, $W = 1.5$, H varies from 0 to 1, and E varies from 0 to 1.

will commensurately expand. Likewise, the costs of war, W, will also increase as China expands its nuclear, naval, and air capabilities. As China's missile technology advances in accuracy, range, and destructiveness, it will increasingly challenge the US ability deter aggression, diminishing the effectiveness of containment strategies, E.[77] The US could offset its waning deterrence potential by improving its own technology, allocating more resources to the Indo-Pacific, and strengthening its cooperation with regional partners.

The extent of US hawkishness toward China is also far from determined. So far, popular sentiment for hawkishness has driven support for escalatory actions. Xi, however, could warm to the West as Mao eventually did, or be replaced by a more dovish politician under unforeseen circumstances. On the US side, there are several potential developments that could shape its bilateral relations with China: vast foreign policy differences between Biden and Trump illustrate the impact a new president can have on diplomacy. As climate change continues to intensify, American progressives may advocate for détente with China, recognizing it as a necessary partner in reducing carbon emissions.

Figure 7 shows the strategy spaces in a scenario where China's aggressive capacity and the costs of war are weighted greater than mutual economic gains. In this case, there is a region where both sides will play purely conflictual strategies: if US leadership lacks an effective containment strategy, yet is extremely hawkish such that the cost of war is largely mitigated by the desire to prevent PRC expansion. Such

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77. Stokes 2023.

conditions mirror those associated with preventative war: the hegemon cannot curb the rising power's growth, and so must either fight or be surpassed.

This scenario occurs, however, only when the hegemon is at its most hawkish. If the US is only moderately hawkish and also moderately effective at containment, such as at the point labeled 2023 in Figure 7, there is a mix of hostile and cooperative strategies by both sides. Increasing the effectiveness of US containment action in this region, moreover, reduces the probability that China pursues aggressive action and, with it, the level of conflict.[78] Following from *Implication 4*, China is also less likely to pursue aggressive actions at all levels of hawkishness, provided a sufficient level of effectiveness of containment is achieved. Likewise, if US leadership remains dovish, it will not play a containment strategy and China will pursue a pure strategy of expansion, where containment follows a tipping point logic as hawkishness increases. This outcome also covers more of the strategy space when the effectiveness of containment, E, is low. In this region, there is no conflict, as the US acquiesces.[79]

In policy terms, this means that for any hawkish US stance to be effective, the ability to punish aggression under China's Anti-Access/Area Denial (A2/AD) strategy is critical. Hawkish US governments that lack effective containment sow the seeds for conflict, whereas those with sufficient effectiveness are able to deter aggression. Effective containment strategy relies on the ability to deny and punish aggression. This requires more than just military capabilities, but access, intelligence, and cooperation from regional partners, raising the importance of coalition building. For dovish US governments, effective containment capabilities mean the difference between an equilibrium of pure Chinese aggression and a negative peace with some cooperation. Dovish governments seeking effective containment could focus on building up non-military capabilities in the coast guard, maritime domain awareness, and norms of multilateral assistance of protégés which bring up the costs to Chinese coercion.

Conclusion

Rising power interactions with major powers are often understood as following pure strategies, with a straightforward causal logic determining policy prescriptions. Drawing on recent theoretical and empirical work, we emphasize how states have a number of competing incentives that complicate this picture. In particular, status quo

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78. While forecasting future events is not the goal of the model, setting parameters to reasonable values can help identify the range and probability of possible outcomes.

79. Predicting long-term competition is complicated not only by uncertainty regarding possible US decline—both in terms of material capabilities and domestic appetite—but also by the PRC's uncertain domestic situation. Much like the slowdown in Japanese economic growth evaporated concerns of US-Japan competition in the 1980s, China faces a number of domestic challenges—large local debts, a shrinking working-age population, environmental issues, rising social security needs, and the flight of factories to Southeast Asia—which that could likewise curtail its material capability growth. A failure to address such issues is likely to have knock-on effects regarding resources able to be devoted to external influence.

and rising powers have an interest in implementing both cooperative and conflictual strategies simultaneously. To gain leverage in understanding the mix of strategies employed, we adopt a game-theoretic approach. We focus on first principles to elicit a clear connection between how economic, military, and ideological processes affect the mix of cooperative and conflictual strategies.

The game offers a number of insights into when states play competitive and cooperative strategies side-by-side, and why changes in trade, military spending, and alliance-building promote peace or bring powers closer to war. The model indicates that increasing trade and the costs of war, anemic status quo power containment tools, and either unconcerned or excessively dovish leadership create conditions for rising powers to act increasingly aggressively.[80] So, too, does increased rising power coercive capabilities.[81] Only the last factor, however, is likely to trigger a containment strategy from a status quo power, whereas the others do not.

To validate these insights, we apply them to several episodes during contemporary China's historic rise. These cases provide a basis for counterfactual analysis where relatively minor changes in key parameters could have led to alternative outcomes. Beyond global competition, the model applies equally to regional competition and other cases of revisionism. By parameterizing and emphasizing economic, military, and ideological mechanisms, the framework applies broadly, to any state seeking to revise the status quo, whether that occurs at the global, regional, or even bilateral level.

The applied cases also highlight differences in the implications derived from our theoretical model compared to those of standard power transition accounts. Power transition theory is unable to explain the First Opium War, since the power transition had already long occurred—Britain had already eclipsed the military power of the Qing and established hegemony over China's sphere of influence. Later in the Cold War, hostilities increased between China and its prior partner, the USSR, even as China's aggressive capacity decreased and the costs of war escalated. More recently, the US and China have maintained economic cooperation despite significant security tensions. These cases highlight the limits of relying solely on a 'Thycididies Trap' logic for power transitions, as joint pure conflict strategies are only one of many possible interactions. Through modeling domestic and dyadic impacts together, our model helps identify necessary and sufficient conditions for how slight changes in the mix of cooperative and conflictual strategies result in conflict or peace.

We suggest a number of policies that status quo powers can pursue to preserve their position while avoiding conflict with a rising power. The model suggests that hegemonic effectiveness in mitigating rising power aggressive expansion is central. Deploying effective containment policy requires more than just budget outlays, however; it necessitates developing regional partnerships. Moreover, an

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80. Increased trade results in aggression shown in Figure 1, while increased costs and risk of war generally result in aggression shown in Figure 3. Lower concern for relative gains results in more aggression shown in Figure 4. Reduced containment effectiveness results in more aggression shown in Figure 8.
81. Greater rising power capacity for aggression results in more aggression shown in Figure 2.

established power must work to reinforce international norms against aggression, while also continuing to demonstrate the advantages of the current order over a potential alternative, so that the members of the international system—including rising powers—prefer the existing system over a revision. Failing to perpetuate an order worth defending makes revisionism more likely and creates vulnerabilities that revisionist powers may exploit.

Additionally, status quo powers must convey a concern with relative gains. This concern is an important factor in how much aggressive expansion rising powers believe they can attempt without reprisal. Leadership requires a global presence, particularly in contested areas, and challengers must believe the hegemon will defend its control of interests, even at great cost. This means that credibly messaging concerns about rising power expansion is a critical factor when choosing what issues to speak on and how to approach competitors.

Above all, the model demonstrates that it is both rational and often desirable, to maintain a mixed strategy of competition and cooperation towards rising powers. Peace does not come from vanquishing every foe, but from a world where resources are allocated in a manner that both encourages growth and maintains security.

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Key Words

APPENDIX

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

Section A. Adjusting Containment Effectiveness

The relative effectiveness parameter captures the degree to which the status quo power is able to counteract any rising power aggression. The players' mixed strategies over varying levels of containment effectiveness are displayed on the left-hand side of Figure 8, 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 rising power, whereas when $E = 0$ a rising power is able to pursue aggressive action completely unencumbered by the status quo power. A status quo power can increase its containment effectiveness through improvements to the quality of its operational strategy—hence, mitigating the impact of a rising power's aggression. The status quo power does so by building or improving relations with and between states within the rising power's region, providing regional partners with military and defense aid, re-balancing military deployments, or through enhanced research and development and subsequent technological advancements. Conversely, a rising power can decrease containment effectiveness by improving relations with its regional neighbors, implementing more agile deployments, and through its own technology development. The development China's A2AD strategy, which increasingly boxes out the US Navy from China's coast, is exemplary of efforts 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 rising 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 rising power's behavior. For our selected values, Figure 8 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 8. *Effect of Containment Effectiveness*

(a) *Mixed Strategies*   **(b)** *Outcomes*
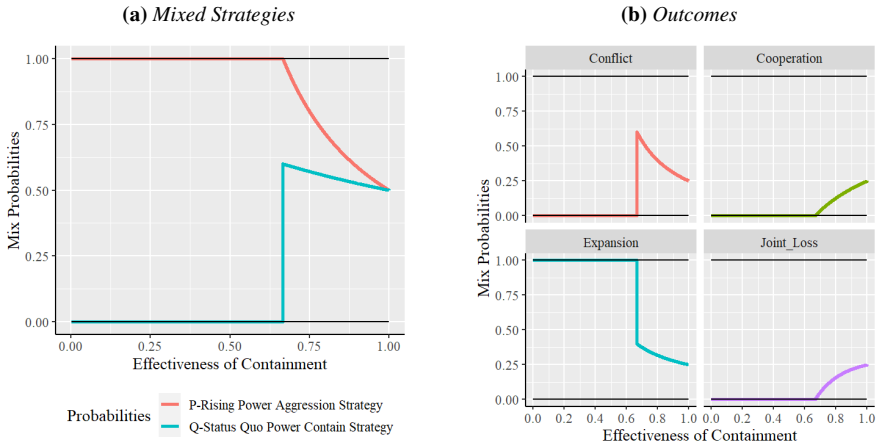
Note: Figures above are based on variables initialized to $T = 1$, $A = 1$, $W = 1$, $H = .5$ with E varying from 0 to 1

Section B. Solutions for Mixed-Strategy equilibrium

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 rising power is equal for either strategy it chooses. "P" represents how often the rising 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 Rising 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 rising 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

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

Solution for Status Quo Power (q)

1: Equality set between the utility of rising 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 Variables of the Mixed-Strategy Equilibrium

Below are the solutions to each individual variable with respect to p for the status quo power, and q for the rising power. The resulting solutions show the relationships of each variable with the rest.

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 rising 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 rising 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

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

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 rising power chooses aggression

TABLE 5. *Effect of Other Parameter Values on Changes in A*

Change	Effect on P	Effect on Q	Effect on Mixed Strategy Space
↑ T	↑	None	↓
↓ T	↓	None	moderate values ↑, extreme values ↓
↑ W	↑	↓	moderate values ↑, extreme values ↓
↓ W	↓	↑	↓
↑ E	↓	↓	↑
↓ E	↑	↑	↓
↑ H	↓	None	↑
↓ H	↑	None	↓

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

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 rising 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

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

TABLE 6. *Effect of Other Parameter Values on Changes in E*

Change	Effect on P	Effect on Q	Effect on Mixed Strategy Space
↑ A	↓	↑	moderate values ↑, extreme values ↓
↓ A	↑	↓	↓
↑ T	↑	None	↓
↓ T	↓	None	moderate values ↑, extreme values ↓
↑ W	↑	↓	↓
↓ W	↓	↑	moderate values ↑, extreme values ↓
↑ H	↓	None	↑
↓ H	↑	None	↓

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

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 rising power chooses aggression
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 rising 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 7. *Effect of Other Parameter Values on Changes in W*

Change	Effect on P	Effect on Q	Effect on Mixed Strategy Space
↑ A	↓	↑	↑, moves right
↓ A	↑	↓	↓
↑ T	↑	None	↓
↓ T	↓	None	moderate values ↑, extreme values ↓
↑ E	↓	↓	↑
↓ E	↑	↑	↓
↑ H	↓	None	↑
↓ H	↑	None	↓

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 rising 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

TABLE 8. *Effect of Other Parameter Values on Changes in H*

Change	Effect on P	Effect on Q	Effect on Mixed Strategy Space
↑ A	↓	↑	moderate values ↑, extreme values ↓
↓ A	↑	↓	↓
↑ T	↑	None	↓
↓ T	↓	None	moderate values ↑, extreme values ↓
↑ W	↑	↓	↓
↓ W	↓	↑	moderate values ↑, extreme values ↓
↑ E	↓	↓	↑
↓ E	↑	↑	↓

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

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 rising power chooses aggression
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 9. *Effect of Other Parameter Values on Changes in T*

Change	Effect on P	Effect on Q	Effect on Mixed Strategy Space
↑ A	↓	↑	↑, moves right
↓ A	↑	↓	↓
↑ W	↑	↓	↓
↓ W	↓	↑	moderate values ↑, extreme values ↓
↑ E	↓	↓	↑
↓ E	↑	↑	↓
↑ H	↓	None	↑
↓ H	↑	None	↓

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