

Deterrence and Restraint: Do Joint Military Exercises Escalate Conflict?

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Abstract

Multinational military exercises are among the most common demonstrations of military cooperation and intent. On average, one is initiated every 2.5 days. But it has often been argued that joint military exercises (JMEs) increase the risk of war. Using a relational contracting approach, we claim this view applies only to JMEs conducted outside an alliance. Exercises and alliances serve complementary functions: The former allows targeted responses to military provocations by adversaries, while the latter provides institutional constraints on partners and establishes a partnership's overall strategic limitations. In combination, alliances dampen the conflict escalation effects of exercises, deterring adversaries while simultaneously restraining partners. We test this theory using a two-stage model on directed dyadic data of JMEs from 1977 through 2003.

Keywords: joint military exercises; alliances; signaling; deterrence; restraint; relational contracting; moral hazard

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1 Introduction

In the wake of his 2018 summit with North Korean leader Kim Jong Un, U.S. President Donald Trump called for a halt to what he described as U.S.-South Korean “war games.” Military exercises between the two countries were “very provocative” and “very expensive.”¹ The Kim regime had previously stated that Vigilant Ace, a large joint military exercise intended to signal allied resolve to denuclearize the Korean peninsula, would bring the parties “to the brink of war.” In response, Washington and Seoul postponed a subsequent, annual exercise – Foal Eagle – until after the 2018 Winter Olympics.

Concerns that multinational military exercises would lead to open military engagements are not without precedent or foundation. In another case ten years prior, Georgia’s participation in Sea Breeze 2008, an exercise with 16 country participants, including five NATO members, was followed one month later by the 2008 Russia-Georgia War. In combination with other signals, Georgian President Saakashvili felt he had Western support to take increasingly assertive steps to counteract Russian support for the breakaway provinces of South Ossetia and Abkhazia. This culminated in military incursions against the capital of the self-proclaimed Republic of South Ossetia on August 8. Russian forces then officially intervened, leading to open warfare between the two sides (Driscoll and Maliniak, 2016; Lanoszka, 2018).

Yet in many cases, JMEs have not escalated conflict. NATO’s annual Exercise REFORGER never produced direct engagements between NATO and the Warsaw Pact throughout the 1970s and 1980s (Blackwill and Legro, 1989). Consequently, in this paper, we ask: Under what conditions do joint military exercises (JMEs) escalate conflict?² We use a relational contracting approach to argue that, first, outside of an alliance context, JMEs increase the likelihood of war and interstate fighting by both participants and targets. Emboldened by new capabilities and outside support, exercise participants escalate conflict. Following the spiral model (Jervis, 1976: ch. 3), their targets respond similarly. However, our theory makes a second, distinguishing claim. JMEs conducted *within* an alliance reduce escalation by both participants and adversaries. Alliances and exercises complement one another. States use the former to establish the parameters

¹“Trump says to stop ‘expensive’, ‘provocative’ South Korea war games,” *Reuters*, June 12, 2018. <https://www.reuters.com/article/us-northkorea-usa-wargames/trump-says-to-stop-expensive-provocative-south-korea-war-games-idUSKBN1J80T5>

²We use the term “joint military exercise” to align with the terminology used in D’Orazio (2013). However, these exercises are more accurately called “combined military exercises.” “Joint” relates to operations or exercises across service branches within one country, while “combined” refers to those across countries. Therefore, a combined joint exercise would involve multiple service branches each from multiple countries.

of their security relationship and constrain adventurism. They use the latter to more flexibly respond to short-term shifts in the military balance. In combination, partners can enhance their ability to restrain one another while maintaining a specific level of deterrence.

We use statistical analysis to test this theory. Following Braithwaite and Lemke (2011), we use two-stage models to, first, partial out the factors leading states to initiate conflict with one another, then run a second stage modeling the effect of JMEs on conflict escalation. Alone, JMEs increase the risk of war. But within an alliance, these exercises reduce escalation by both their participants and their targets. We subject the findings to various robustness tests. In particular, the use of a two-stage process could lead to a failure of the exclusivity assumption. Unobserved covariates could still confound our estimates, creating a false association between alliances, JMEs, and conflict that masks the “true” relationship between these variables. While we cannot address this problem directly, we use a method developed by Altonji, Elder, and Taber (2005) to assess the sensitivity of the results to unobserved factors. Generally, unobserved covariates must be several orders of magnitude stronger than our variables to wipe out the effects in both the first- and second-stage models, lending greater confidence to our results.

The following section outlines the purposes and conduct of joint military exercises, as well as the frequency of their occurrence since the 1970s. Section 3 probes this problem more deeply, leading to our theory that alliances serve to constrain adventurism by JME partners, thereby reducing and neutralizing these exercises’ inherent tendency to escalate conflict. Section 4 presents our research design and introduces the data, while Section 5 provides our statistical models and results. Section 6 concludes with a discussion of this paper’s implications for scholarly inquiry and policy.

2 Joint Military Exercises in Practice

From the examples above, joint military exercises can raise the risk of accidental or intentional war between states. Moreover, JMEs occur more frequently than other forms of military signaling that scholars associate with conflict. According to a dataset compiled by D’Orazio (2013), each year between 1974 and 2010 saw an average of just over 41 exercises, or one every 8.9 days. On average, about four countries participate in each exercise, although the largest involves 30 countries. Moreover, many of them recur. The REFORGER exercises were held each year from 1969–1993, while the Bright Star exercises between the U.S. and Egypt mentioned earlier have occurred roughly every two years since 1980. Finally, exercises can be quite large

and expensive. The 1988 REFORGER exercise cost nearly \$218 million in 2017 dollars, or more than the total arms exports of all but 18 countries for that year.³ The Bright Star exercises have often included tens of thousands of troops from dozens of participating and observer countries.

Other forms of interstate signaling occur less frequently. Since World War II, U.S. presidents – among the most traveled world leaders – have made only about four foreign trips a year (Lebovic and Saunders, 2016). In addition, they issued public statements about foreign adversaries about once every two weeks.⁴ The creation of new alliances are particularly infrequent: on average, only 2.85 are established each year.⁵ By comparison, the U.S. alone engaged in just over 41 multinational military exercises a year, or about one every nine days.

Consequently, JMEs are public and costly forms of interstate security cooperation, and, as seen in Figure 1, their frequency has risen over time. They are “sharp in,” in that their inputs – national military contributions, chain of command, exercise objectives, timing, and other considerations – are clearly defined for all participants at the outset. The U.S. Army Training and Doctrine Command Regulation 350-50-3 outlines six purposes of mission command training programs, including:⁶

1. Warfighting exercises, where troops simulate plausible defense scenarios;
2. Command exercises, where officers prepare for integrated command with Joint Staff (across military services) and geographic commands; and
3. Mission readiness exercises, where defined units test their ability to immediately carry out specific missions.

The number of troops involved depends on the mission. The smallest are typically command post exercises, where participants focus on the battle readiness of staffs to handle simulated combat situations. Actions on the “battlefield” are simulated (often via computer), and these results are fed to participating officers, who then respond and issue orders, which are again carried out via simulation. Field training

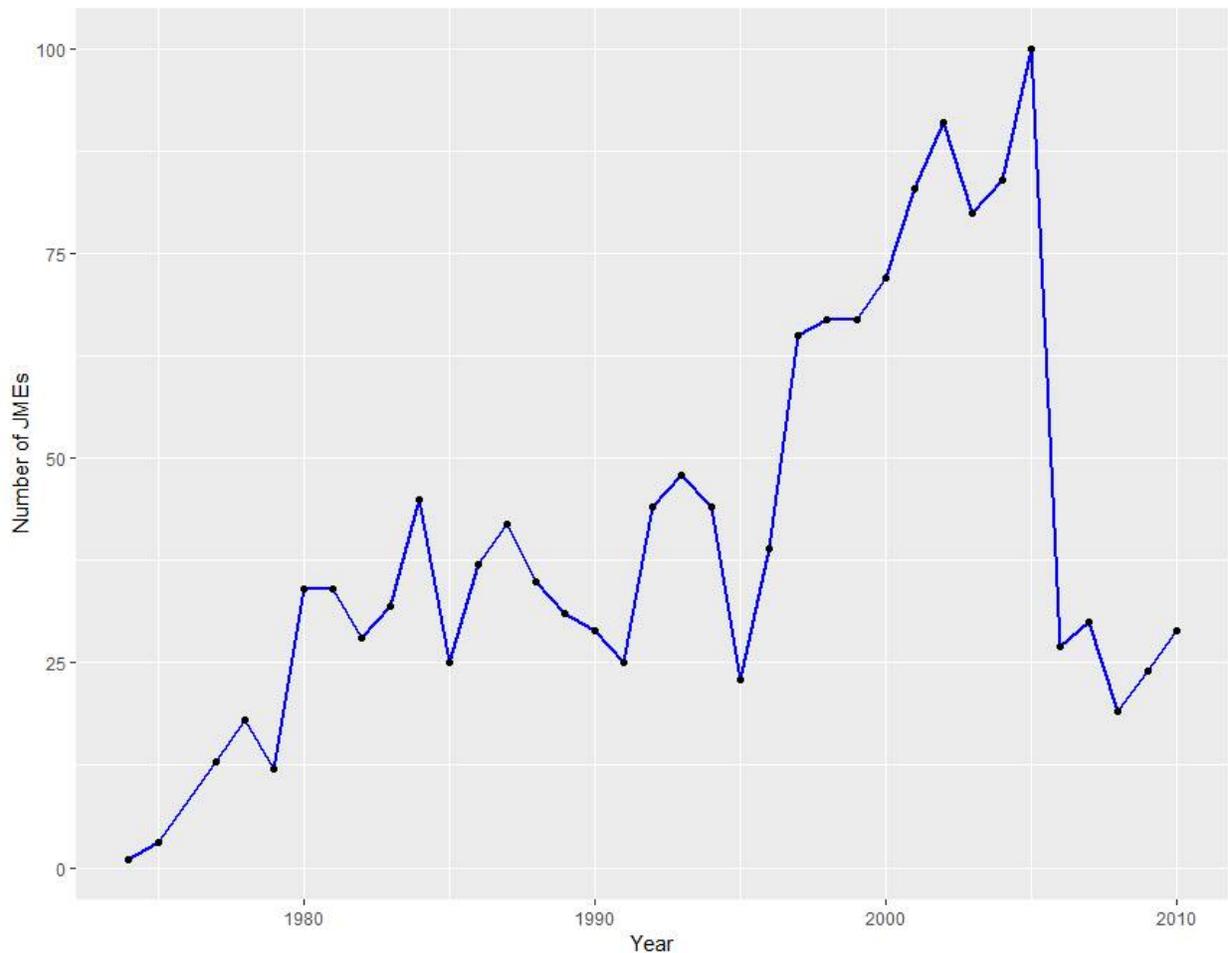
³Michael R. Gordon, “U.S. War Game in West Germany to Be Cut Back,” *New York Times*, December 14, 1989, <http://www.nytimes.com/1989/12/14/world/us-war-game-in-west-germany-to-be-cut-back.html>. Arms export data drawn from SIPRI.

⁴Data drawn from McManus (2017).

⁵Calculation made using ATOP dataset. (Leeds et al., 2002).

⁶*Mission Command Training Program* (2014).

Figure 1: Number of Joint Military Exercises by Year, 1974–2010.



exercises, by contrast, are “test runs” of often large-scale operations. They can involve thousands of troops, combat vehicles, and military and civilian transportation and logistics support, all overseen by cadres of commanding officers.

Regardless of size, joint military exercises are typically self-contained, tightly controlled and coordinated, and last between a few days to a few weeks. In the United States, the Department of Defense or the Joint Chiefs of Staff will establish an exercise’s training objectives, force and equipment requirements, and the chain of command in coordination with all international participants. FM-25-4 recommends 13-14 months of lead time to prepare for an exercise.⁷ Memoranda of Understanding (MoUs) are signed to ensure

⁷Army Field Manual 25-4: *How to Conduct Training Exercises* (1984: Table 4).

all participants understand the JME's terms, and there is a final meeting to confirm all parameters and restrictions. In addition, the exercise commander has terminal responsibility for all troops and their actions, and so is provided with extensive lists of personnel and equipment (down to the serial number). In total, JMEs are sharply delimited in their structure, purpose, and participants to ensure accountability at all levels.

But while JMEs are "sharp in," they are not "sharp out." They produce strategic effects exceeding and not managed by their operational bounds and command structure. This can be best understood through the scholarship on "arms and alliances." According to Morrow (1993), states have two general paths to generate security. The first is "arms," by which we typically mean the direct acquisition of military power solely under a single state's authority. The second is "allies," commitments of military support from one country to another.

JMEs appear to advance both paths simultaneously. Training improves warfighting performance, organizational resilience, and logistical efficacy (the "arms" pathway). Critically, this increases the likelihood of conflict escalation and war by prompting leaders to reach for military solutions to foreign policy challenges.⁸ Along the "allies" pathway, JMEs signal, at minimum, the willingness of the two countries' military forces to cooperate in specific scenarios. Moreover, as McManus and Nieman (2019) elaborate, exercises are an integral means for (particularly powerful) states to demonstrate broader alignment and support for a security partner. In 1963, for example, the United States agreed to hold an exercise with and in Saudi Arabia to challenge United Arab Republic intervention in North Yemen and deter any further incursions into nearby Saudi territory (Department of State Office of the Historian, 1995: 290-291, 300). Despite not having an alliance treaty with Riyadh, the JME implied that the United States would at minimum bolster Saudi defenses through training and material support, if not direct intervention.

By signaling support through both the arms and allies paths, exercises are doubly effective at deterring adversaries. But too much support, as Snyder (1997) discusses, can lead partners to escalate conflict through adverse behavior – activities that one partner does not want to encourage in another partner, because such an action has negative repercussions for the first state's security. Chief among these potential risks is entrapment, in which a state, emboldened by and seeking to stretch a partner's support, escalates conflict for its own individual advantage while dragging its partner into the conflict through reputational, strategic, and/or

⁸See, for example, Stares (1975); Craft (1999); Kinsella and Tillema (1995); and Krause (2004).

audience cost mechanisms. Later authors contend that entrapment is rare because states can use ambiguity, conditionality, “backing up” from their commitment, and outright renegeing to avoid being entangled in their partners’ conflicts (Kim, 2011; Benson, 2012; Beckley, 2015). However, even if states are able to avoid having to support their partners in wartime, their signals of support in peacetime may nevertheless embolden partners to act aggressively (Snyder, 1997; Cesa, 2010; Edelstein and Shiffrinson, 2018).

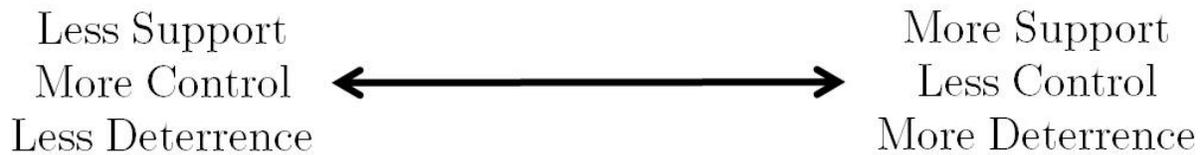
Alternatively, escalation by exercise partners can be intentional. JMEs can be used as a prelude to larger military engagements by changing the local balance of forces to gain a decisive advantage. The Zapad 2017 exercise between Russia and Belarus, for example, was one of the largest exercises since the end of the Cold War and involved 40,000 Russian and Belorussian troops to simulate conventional military operations using infantry, armor, anti-access area-denial (A2/AD), and air forces, as well as asymmetric information operations.⁹ In the wake of the Zapad exercises, for example, Russian Defense Minister Sergey Shoygu mocked NATO concerns about just such a scenario. “Western media outlets were whipping up some very incredible and frightening scenarios of the exercises. At some point, some officials, among them certain state leaders, even called them a prelude to the seizure of foreign territories.”¹⁰ This echoed concerns during the Cold War, where Soviet troop rotations – nominally at the German border for training exercises – added considerably to manpower and equipment there. Similarly, the Soviet Union worried that “Able Archer” – a U.S. nuclear forces exercise held in 1983 – would mask an American first strike.

In either case, existing theory expects that JME *targets* should avoid escalating conflicts. However, JME *participants* should be disproportionately likely to escalate them. Fundamentally, as depicted in Figure 2, exercise participants face a tradeoff between support and deterrence, on the one hand, and partnership coherence and control, on the other. Supporting partners risks escalation, but that in turn augments deterrence. Restraining partners prevents adventurism, but potentially weakens deterrence. Either choice generates strategic problems.

⁹Emily Ferris, “The True Purpose of Russia’s Zapad Military Exercises: Why Moscow Wanted to Send a Message to Minsk,” *Foreign Affairs Snapshot*, October 4, 2017, <https://www.foreignaffairs.com/articles/russia-fsu/2017-10-04/true-purpose-russias-zapad-military-exercises>. Also, Bruce McClintock and Bilyana Lilly. “Zapad 2017: What It Reveals About the Prickly Russia-Belarus Relationship.” *The National Interest*. September 12, 2017, <http://nationalinterest.org/feature/zapad-2017-what-it-reveals-about-the-prickly-russia-belarus-22271>.

¹⁰“Defense Chief Refutes West’s Baseless Fears of Zapad-2017’s Alleged ‘Aggressive Nature,’” *TASS Russian News Agency*, <http://tass.com/defense/969370>.

Figure 2: Expected Relationship between Partner Support, Control, and Adversary Deterrence, Snyder (1997).



3 Theory: Military Exercises and Alliances

We contend that states can circumvent this dilemma to simultaneously deter JME targets *and* restrain partners. They do so by embedding JMEs within alliances. We adopt a relational contracting approach, arguing that states use formal military pacts to establish the security partnership’s overall bounds and policy orientation, while conducting exercises to flexibly respond to changes in immediate and “local” strategic needs. Exercises and alliances are not additive forms of interstate security cooperation, but complementary, as they fulfill different functions within an overarching security relationship. This approach leads to different implications for conflict escalation, and it better explains how states use exercises to ameliorate concerns about alliance abandonment and defection.

To motivate our argument, Table 1 presents cross-tabulations of alliances and JMEs from the directed-dyad-year dataset used in our empirical analysis later. Over 99 percent of exercises occur within alliances. Of course, threat could jointly determine both exercises and alliances. But only 3.09 percent of alliances conduct JMEs. The data suggests that, while threats can prompt formal defensive agreements, they are not enough to get states to actually train against those threats together. This is particularly odd given that scholars and statesmen consider alliances a crucial signal of interstate support and commitment, as well as an essential response to common threats (Leeds et al., 2002; Fearon, 1997; Morrow, 1993, 2000; Leeds, 2003a; Waltz, 1979; Walt, 1987).

We draw upon the relational contracting literature and studies of social capital to explain this one-sided association between exercises and alliances (Ring and van de Ven, 1992; Nahapiet and Ghoshal, 1998; Moran, 2005). Ring and van de Ven (1992) define relational contracting as a form of sustained exchange between legally equal parties. Unlike discrete market transactions that are both sharp-in and sharp-out,

	<i>No JME</i>	<i>JME</i>
<i>Alliance</i>	151,386 (0.13)	186 (0)
<i>No Alliance</i>	1,005,118 (0.84)	32,024 (0.03)

Table 1: Cross-Tabulations for JMEs and Alliances. Share of total data in parentheses.

relational contracts are used when actors desire cooperation but cannot fully account for its inputs and effects *ex ante*. These incomplete contracting problems can scuttle cooperation, particularly if actors must account for and manage a broad of array of risks (Hart, 1995; Williamson, 1979; Klein, Crawford, and Alchian, 1978). Rather than account for all contingencies, actors use two complementary forms of institutions or interactions to structure their relationship. The first establishes the outer bounds of their cooperation, often through a loosely specified contract detailing general expectations and strategic orientations. Nahapiet and Ghoshal (1998) and Moran (2005) highlight how formal structures define and facilitate routinized tasks, much like how international institutions orient members around common expectations (Keohane, 1984).

Actors then rely upon a separate set of mechanisms to adapt the partnership by innovating joint responses to fluid, short-term challenges. As Ring and van de Ven (1992: 493) write:

Authority and control systems related to performance outcomes can be loosely specified in the contract. Incentive systems can be left adaptable to the changing needs of the specific relationship, and made independent of other systems employed by the parties.

Nahapiet and Ghoshal (1998) highlight how actions and policies leveraging local knowledge and promoting mutual learning and support are particularly helpful in facilitating cooperation under uncertainty. By employing complementary activities, relational contracts address achieve both flexibility and cohesion, although with greater governance costs.

In the business world, perhaps the most prominent relational contracts are the Japanese *keiretsu*. Companies like Toyota and Toshiba built long-term relationships with suppliers, using cross-shareholding to insulate subsidiaries from takeover and exclusive purchasing arrangements to support a central business strategy. Importantly, “Contracts governing the relationships are ambiguous, consisting of general statements and nonbinding targets. [...] Spelling out specifics, Japanese companies believe, would encourage

partners to do only what they were instructed to, and nothing more” (Aoki and Lennerfors, 2013). Instead, the central company relies upon deep but often informal contact with its suppliers to strategic alignment, product development, and quality control. For example, Toyota sets up *obeya*, large meetings where suppliers work directly with many of Toyota’s departments during the product design and engineering phases. This ensures buy-in at multiple company levels and across specialties, reducing the risk of unexpected obstacles at greater governance costs.

Joint ventures are another form of relational contracting. In 2005, computer manufacturer Dell hired FedEx to manage all of its hardware return and repair, using a traditional transactional contract with responsibilities and expectations fully specified in advance. Relational externalities consistently undermined cooperation. “Dell felt that FedEx was not proactive in driving continuous improvement and innovative solutions; FedEx was frustrated by onerous requirements that wasted resources and forced it to operate within a restrictive statement of work” (Frydinger, Hart, and Vitasek, 2019). They eventually adopted a relational contract that delineated desired outcomes, but left implementation and strategic evaluation to metrics established by joint relationship-management teams.

We argue that alliances and JMEs share a similar functional inter-relationship.¹¹ Alliances establish a security partnership’s political and strategic limits through four mechanisms. First, they define the conditions of invocation (i.e. *casus foederis*), the targeted adversary, and scope of cooperation, reducing the prospect that a partner will misperceive the strategic and political signals allies intend to send through an exercise. Second, institutionalized alliances formally incorporate allied preferences into a state’s domestic decision-making processes on foreign policy through formal consultative mechanisms and deliberative bodies, thereby restraining partners from adventurism (Schroeder, 1976; Ikenberry, 2001; Morrow, 1994; Leeds and Anac, 2005). Third, during crises, existing communication procedures facilitate coordination and moderate allied behavior, again reducing the risk of moral hazard problems (Bearce, Flanagan, and Floros, 2006). Finally, alliances extend time horizons. The long-term value of the alliance relationship is more likely to outweigh any short-term adventurism prompted by a JME. Dai (2007) argues that even minimally insti-

¹¹Indeed, the form of interstate alliance charters increasingly mirrors that of relational contracts. Rather than delineating contributions and contingencies in the text, they instead specify to whom these decisions are delegated. Prior to and following the Napoleonic Wars, for example, nearly all alliances indicated the exact number, type, and even commander nationalities for the military forces members would contribute when the *casus foederis* was invoked. Alliances gradually reduced this specificity. When modern alliances delineate member contributions in their charters, they typically “outsource” these decisions back to member states or delegate them to alliance coordinating bodies.

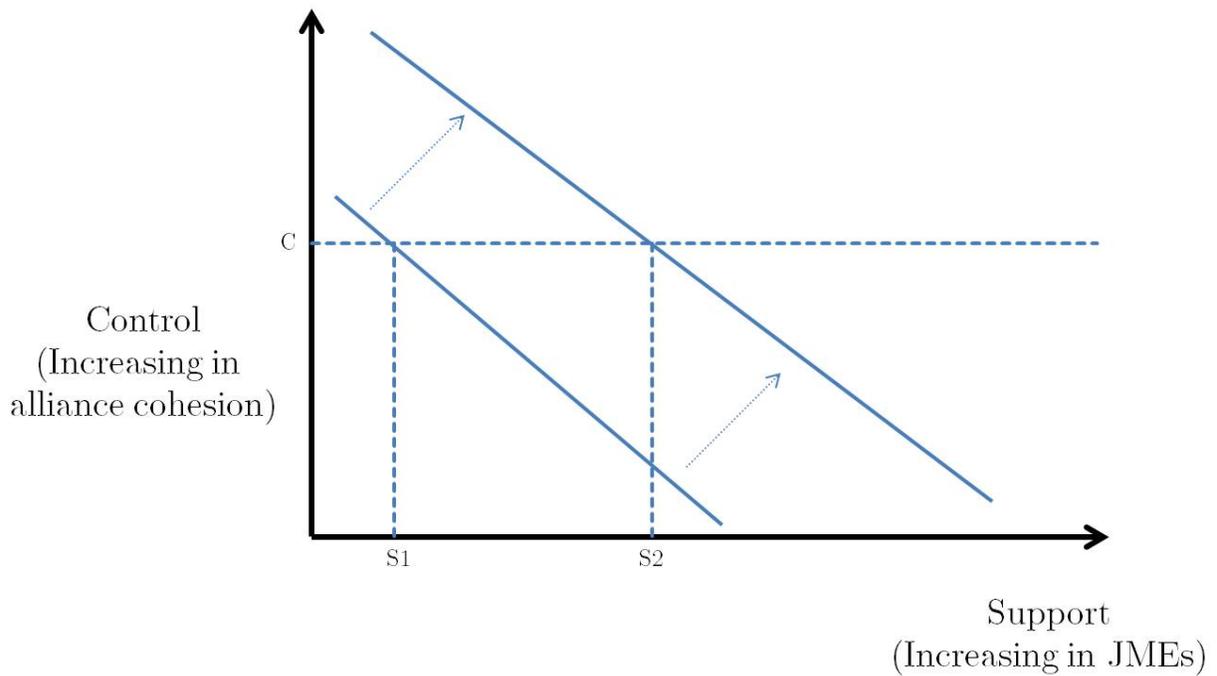
tutionalized partnerships have this effect. Overall, alliances manage and constrain the problems generated by exercises' fuzzy-out nature. Put another way, they are a necessary condition to conduct JMEs, because these pacts foster the underlying trust and possess the mechanisms necessary to manage externalities caused by exercises.

But JMEs address certain shortcomings of alliances. Security pacts are generally blunt measures of support whose formal structures rarely change over time. Indeed, only 27 of the 551 alliances between 1946 and 2016 in the Alliance Treaty Obligations and Provisions (ATOP, v4.0) dataset updated their charters after their initial founding.(Leeds et al., 2002). But members' confidence in an alliance can wax and wane, as they know that their partners' interests and intentions can change over time and are difficult to observe. This can lead to mismatches between alliance capabilities, goals, and member interests, which Johnson and Joiner (2019) associate with deterrence failure. States could create new pacts to adjust to changing strategic conditions and bolster deterrence, as Kenwick, Vasquez, and Powers (2015) find. But as mentioned, only 2.85 new such alliances are formed in any year.

Instead, states bolster existing pacts using short-term, flexible signaling mechanisms such as JMEs, state visits, public statements, and arms sales (McManus, 2014, 2017, 2018; McManus and Yarhi-Milo, 2017; McManus and Nieman, 2019). However, our relational contracting approach emphasizes how these activities, alongside alliances, perform distinctive and complementary functions within the broader security partnership. States can use exercises to better deter immediate threats or security challenges, but leverage the alliance's broader coordinating mechanisms and longer time horizons to prevent adventurism. Ring and van de Ven (1992) notes how the flexible response embodied by JMEs is specifically useful in promoting intra-group harmony and preserving relationships. Conceptually, states use certain activities to signal partner support, while using others to exert control. In contrast to Figure 2, relational contracting more closely approximates Figure 3. Although control and support are still inversely related, combining JMEs and alliances pushes the curve outward, increasing the amount of control possible for the same degree of intra-allied support. Partners can maintain deterrence levels while simultaneously preventing a wider array of moral hazard problems.

Importantly, states can calibrate their overall security relationship and exposure to entrapment and abandonment risks by selectively combining these different levers. We have emphasized the *complementary*, not

Figure 3: Relationship between Intra-Alliance Support, Control, and Deterrence under Relational Contracting Framework.



additive, relationship between alliances and exercises because states employ one to make up for deficiencies in the other. These effects *can* be additive, but in many cases, reassurance signals respond to a possible weakening of the overall security relationship (Blankenship, 2020). During the Cold War, for example, the United States instituted Exercise REFORGER in 1968 as a way to assuage concerns among NATO allies – and particularly among the Federal Republic of Germany – that the American commitment to the Continent had not changed despite the withdrawal of a small number of U.S. troops from West Germany and pressure from the U.S. Congress to dramatically cut European force levels (Blackwill and Legro, 1989: 69-71). Similarly, the U.S.-South Korean “Team Spirit” exercise began in 1976 amidst the Republic of Korea’s (ROK) concerns that the United States might abandon it, which were the result of the withdrawal of one-third of U.S. forces from the peninsula earlier in the decade coupled with a post-Vietnam War reluctance to be involved in military conflicts in Asia (Cha, 1999: 146-149; Farrell, 2009: 96).

In both of these cases, the United States used joint military exercises to offset an erstwhile weakening of the alliance brought about by troop withdrawals, coupled with U.S. efforts at rapprochement with the

Soviet Union and China. Moreover, the United States wanted to prevent West Germany and South Korea pursuing autonomous policies independent of the alliance. In West Germany's case, Washington sought to dissuade it from moving closer to the Soviet Union as part of Chancellor Willy Brandt's *Ostpolitik* initiative to normalize relations with the Communist bloc (Klitzing, 2009: 80, 91-92). As for South Korea, the United States aimed to discourage the ROK from seeking nuclear weapons, as it had attempted to do during the mid-1970s (Gul Hong, 2011).

Similarly, despite the alarm it created in NATO capitals, analysts contend that Russia pushed for the Zapad 2017 exercise to signal to Belarus that it should avoid Georgia and Ukraine's example of seeking closer economic and military ties with NATO and Western countries.¹² The exercise was prompted by intra-alliance weakness, not external threat. In a converse case, the Canadian government used alliance coordination to restrain the adverse effects of a U.S.-supported JME. The NORAD Skyhawk exercise proposed for 1959 would have grounded all U.S. and Canadian civil aviation to test air defense readiness against a massed Soviet strike. Ottawa worried that this would undermine improving East-West relations and be misinterpreted by the Soviet Union, despite personal assurances from President Eisenhower (Department of State Office of the Historian, 1993: 768-769).

In these cases, viewing exercises and alliances as additive misunderstands the security partnership's institutional and relational incentives. JMEs' effects on conflict escalation are contingent on whether they take place in the context of a preexisting military alliance. More broadly, states can use these complementary actions to successfully deter adversaries and simultaneously constrain fellow members/participants. This leads to our key hypotheses:

Hypothesis 1 (Alliance Reassurance) JMEs in an alliance will reduce the risk that a partner will escalate conflict.

Hypothesis 2 (Alliance Deterrence) JMEs in an alliance will reduce the risk that a target will escalate conflict.

¹²Emily Ferris, "The True Purpose of Russia's Zapad Military Exercises: Why Moscow Wanted to Send a Message to Minsk," *Foreign Affairs Snapshot*, October 4, 2017, <https://www.foreignaffairs.com/articles/russia-fsu/2017-10-04/true-purpose-russias-zapad-military-exercises>. Also, Bruce McClintock and Bilyana Lilly. "Zapad 2017: What It Reveals About the Prickly Russia-Belarus Relationship." *The National Interest*. September 12, 2017, <http://nationalinterest.org/feature/zapad-2017-what-it-reveals-about-the-prickly-russia-belarus-22271>.

3.1 Alternative Explanations

Our theory makes distinctive predictions from two alternative explanations: (1) the spiral model and (2) the logic of partner emboldenment. Both expect JMEs to increase the likelihood of conflict, but from different sources. First, a longstanding line of argument in the international relations literature holds that signals of resolve and capability can provoke conflict with third parties. A number of scholars, for example, argue that alliance formation can trigger the security dilemma with other states, leading them to take countermeasures such as arms buildups and forming military alliances of their own in what becomes a self-reinforcing spiral of hostility (Jervis, 1976; Senese and Vasquez, 2008). In much the same way, military exercises may be provocative because they simultaneously signal the ability and willingness of participating countries to fight together, thus encouraging adversaries to match or escalate the display.

Second, JME participants may be emboldened to behave aggressively. At a minimum, a JME demonstrates its participants' intentions to conduct specific military operations in response to certain conditions. But because of their tight operational constraints, JMEs lack institutional mechanisms to communicate the limits of these conditions and a participant's strategic intentions. This occurs even when JMEs are regularized (e.g. occurring at set intervals), as political authorization for the exercises occurs at a different level of the government and frequently happens months in advance. In total, even as they carry implications for the broader security relationship, exercises are not effective at establishing bounds on partner action and, in fact, may even be taken as unintended signals of broader commitment. This raises the risk of moral hazard, as states misperceive their expected level of external support. Moreover, as Cesa (2010) discusses, the acquisition of independent capabilities allows countries to break free of the political restraints imposed by other states. This raises the risk that even a putative ally may engage in military behavior that adversely affects one's strategic situation.

4 Research Design

This section presents our research design to determine the relationship between JMEs, alliances, and conflict. The unit of analysis is the directed-dyad-year, using all countries in the Correlates of War dataset, 1973–2003. For clarity and where relevant, Country A is the adversary or “target” of a military exercise, while Country B is the exercise participant. We adopt Braithwaite and Lemke (2011)'s recommendation to use a

two-stage model to first control for selection into conflict, and then subsequently assess the effects of JMEs and alliances on escalation. This should distinguish between exercises' specific effect on ongoing conflicts and the factors that generate conflict in the first place.

4.1 Dependent Variable: Conflict Escalation

Conflict Onset, drawn directly from the Correlates of War's Militarized Interstate Dispute (MID, v4.1) data (Palmer et al., 2015), is the dependent variable in the first stage model. We also follow them in including three independent variables for this first stage: Contiguity, Rivalry, and Minor-Minor Status.¹³ Contiguity data comes from version 3.1 of the Correlates of War's Direct Contiguity dataset (Stinnett et al., 2002).¹⁴ For rivalries, we use Klein, Goertz, and Diehl (2006), indicating whether the two states are engaged in a long-term, strategic rivalry. Finally, Minor-Minor Status is drawn from the Correlates of War's Major Power dataset.

Our first-stage equation is:

$$\ln \left(\frac{p(\text{Onset}_{i,t})}{1 - p(\text{Onset}_{i,t})} \right) = \beta_1 \text{Contiguity}_{i,t-1} + \beta_2 \text{Rivalry}_{i,t-1} + \beta_3 \text{Minor-Minor}_{i,t-1} + \epsilon_{i,t}$$

For the second-stage, we construct the dependent variable by leveraging MID's Hostility Scale for interstate conflicts. It encompasses:

1. No militarized action
2. Threat of force
3. Display of force
4. Use of force
5. War

As joint military exercises are themselves displays of force, we define *Escalation* as a dichotomous variable indicating whether an opponent responds to an exercise by using military force (Hostility Level 4) or starting/joining a war (Hostility Level 5).

¹³We ran alternative first-stage equations using all control variables described below in the first and second stages. The results are substantively, directionally, and statistically similar to those reported below.

¹⁴Correlates of War Project. Direct Contiguity Data, 1816-2006. Version 3.1.

4.2 Independent Variables

To test our theory, we must disaggregate the effects of military exercises, alliances, and exercises conducted under alliances. Consequently, our principal explanatory variables are *JME*, *Ally*, and *JME-Ally*.

We obtain data on JMEs from D’Orazio (2013), who collected data from 1970 through 2010 using content analysis of Lexis-Nexis searches. We operationalize *JME* as a count variable recording the number of multinational military exercises Country B participates in in that directed-dyad-year. Unfortunately, this data does not indicate the “target” of an exercise, in part because many exercises (chiefly) aim to improve readiness and capabilities rather than send political signals. To address this, *JME* is recorded only if the dyad is engaged in a MID. We make the critical assumption that an exercise conducted during a MID is targeted at that adversary.¹⁵

Alliance data is drawn from the Alliance Treaty Obligations and Provisions (ATOP) dataset, version 4.0 (Leeds et al., 2002). These data run from 1815-2003 and include all interstate (bilateral or multilateral) security pacts except non-aggression agreements.¹⁶ Like *JME*, *Ally* is also a count of the number of alliances Country B has in that directed-dyad-year. Following Leeds (2003b), alliances should reduce escalation by clarifying the opposing force a target would face.

Finally, *JME-Ally* is an interaction of the previous two variables indicating whether Country B had an alliance and a military exercise targeted against Country A in that directed-dyad-year. Including all three variables should separate the effects of military exercises, security pacts, and their combination on conflict escalation dynamics.

4.3 Control Variables

In the second stage equation, we include a number of controls for alternative causes of escalation. The first of these is a dummy variable indicating whether both members of the dyad are democracies. A large body of literature argues that democratic states disproportionately avoid conflict with each other and escalate disputes. (Owen, 1997; Haas, 2005, 2014; Gartzke and Weisiger, 2013). Countries are coded as democratic if they have a Polity score of 6 or higher, and data come from the Polity IV Project (Marshall and Jaggers,

¹⁵In the appendix, we test this assumption by only including exercises held in the same region as the MID. The results do not change our central finding regarding JMEs under alliances.

¹⁶This leaves defensive, offensive, consultative, and neutrality pacts. Note, during this period, the vast majority of alliances are defensive and/or consultative in nature. Virtually none have offensive or neutrality provisions.

2011; Marshall, Gurr, and Jagers, 2014).

We also control for the dyad’s capabilities and foreign policy intentions. Powerful states have greater capacity to use military force and escalate conflict. We include the dyad’s total Composite Indicator of National Capabilities (CINC) score, with data obtained from version 4.0 of the Correlates of War’s National Material Capabilities dataset (Singer, 1987). We also account for the dyad’s degree of foreign policy alignment. We proxy this through Bailey, Strezhnev, and Voeten’s (2015) re-parameterization of UN General Assembly vote similarities. We would expect countries with more closely aligned policies to avoid having conflicts and escalation.

Following the capitalist peace literature, we add a measure of dyadic trade to the model. We are agnostic about the underlying effect between interstate trade and conflict. On the one hand, Gartzke (2007), Rosecrance (1986), and Angell (1910) claim that the benefits of trade provide strong reasons to avoid conflict. On the other hand, trade itself can generate conflict, as explored by Mearsheimer (1992), Waltz (1979), and Uchitel (1993). In either case, economic exchange should influence the propensity for conflict and, subsequently, escalation.

We also include a lagged dependent variable. Prior escalation may unlock reciprocal behavior from conflict participants independent of whether a joint military exercise is held. Indeed, in those cases, exercises might be seen as de-escalatory, as states shift from using force back to demonstrations. Including the lagged dependent variable helps to account for the effect of previous conflict dynamics on future military behavior. Finally, we include year fixed effects to account for temporal heterogeneity (e.g., levels of global threat).

We add the residuals to our second-stage model, the most comprehensive version of which (and the one reported below) is:

$$\ln \left(\frac{p(\text{Escalate}_{i,t})}{1 - p(\text{Escalate}_{i,t})} \right) = \beta_1 \text{JME}_{i,t} + \beta_2 \text{Ally}_{i,t} + \beta_3 \text{JME-Ally}_{i,t} + \beta_4 \mathbf{X}_{i,t-1} + \zeta_t + \epsilon_{i,t}$$

where i indexes countries, t indexes years, $\mathbf{X}_{i,t}$ is a matrix of control variables listed above, ζ_t is a vector of year fixed effects, and $\epsilon_{i,t}$ is a stochastic error term.

5 Statistical Results: The Contingency of JMEs on Alliances

Our main results can be found in Table 2. Model 1 examines escalation by JME targets, while Model 2 examines it by participants. In Model 1, our three primary variables of interest have markedly different effects on conflict escalation, in line with our theory. Alliances alone have no statistically significant effect on escalation, complementing Braithwaite and Lemke (2011) that pacts have little influence on escalation once disputes begin. By contrast, joint military exercises are positively and significantly associated with conflict escalation. In line with the spiral model, states targeted by a multinational military exercise are likely to respond through the use of force, intensifying or deepening a dispute.

Most importantly, the result on *JME-Ally* serves as our central test of Hypothesis 1. When governed by an alliance, exercises diminish escalation by targets, in line with our theory. The combination of enhanced military capabilities (exercises) coupled with clearly conveyed political intentions (alliances) deters further belligerence from the opposing side. We use 1000-run simulations to determine substantive effects. These are small: each JME within in an alliance reduces the chance of conflict by 0.1%. However, 2003 – the final year of our dataset – saw 3,167 JMEs (within alliances). In addition, 79 allied-dyads had at least one JME a year, while 25,526 others (approximately 22.3% of all allied-dyads) had at least one every other year. According to these simulations, therefore, exercises under alliances should lead to small but widespread reductions in conflict escalation.

The control variables generally have theoretically expected effects. The coefficient on our lagged dependent variable is positive, significant, and substantively large. Prior escalation strongly induces a retaliatory, reciprocal response from adversaries. Following democratic peace theory, *Joint Democracy* is negative and significant, implying that democracies avoid escalating conflicts with each other (Owen, 1994; Maoz and Russett, 1993). By contrast, our measure of national power, *CINC*, is positive and substantively large, as stronger countries are better able to use military force and prevail.

Model 1 concentrates on the “recipient’s” (or Country A’s) behavior. Under alliances, exercises deter. But do they also restrain? To test Hypothesis 2, we must examine exercises’ effects on participants. We replace *Escalate* with *Escalate (P)*, which indicates whether a JME participant subsequently escalated conflict. Model 2 in Table 2 presents the results. Validating the “emboldenment” alternative argument, *JME* alone has a positive and significant coefficient, meaning that exercises (in the absence of an alliance) incentivize

	Model 1: Targets	Model 2: Participants
JME	0.52 * (0.17)	0.57 * (0.18)
JME–Ally	-0.38 * (0.12)	-0.52 * (0.13)
Ally	0.01 (0.01)	-0.01 (0.01)
Joint Democracy	-0.73 * (0.10)	-0.65 * (0.09)
CINC	9.11 * (1.16)	10.75 * (1.12)
UNGA	-0.06 (0.05)	-0.06 (0.05)
Trade	0.000004084 (0.000004176)	0.000004213 (0.00000381)
Lagged DV	6.60 * (0.10)	6.10 * (0.10)
Intercept	-6.94 * (0.30)	-6.90 * (0.30)
<i>N</i>	481519	481519
AIC	6831.55	7250.04
BIC	8605.11	9023.59
log <i>L</i>	-3255.78	-3465.02

* indicates significance at $p < 0.05$

Table 2: Main results for the effects of JMEs, alliances, and their interaction on conflict escalation.

escalation among participants. (This also mirrors the results on Model 1's lagged DV.)

However, the result on *JME-Ally* again support our theory. In line with Hypothesis 2, alliances restrain participant escalation and reduce moral hazard problems, possessing a negative and statistically significant effect. Further, similar to Model 1, alliances alone have no systematic effect on conflict escalation. Indeed, our relational contracting approach does not expect it to, as alliances' structural role in interstate security relations is ill-suited to managing short-term, "local" challenges. Finally, the control variables retain their signs and significance from Model 1.

We ran a variety of robustness checks on these two baseline models. All support the hypotheses that, when conducted under alliances, JMEs inhibit conflict escalation for both targets and participants. First, one version of escalation assessed by Braithwaite and Lemke (2011) combines reciprocal and escalatory responses. Adapted to our study, we add "Displays of Force" (MID Hostility Level 3) to *Escalation*. Using this new dependent variable does not change the our findings. Second and similarly, we may be failing to leverage information within the dataset by running separate models on escalation, on the one hand, and escalation-reciprocity, on the other. We use a multinomial logit model treating escalation, reciprocity, and de-escalation (MID Hostility Levels 1 and 2) as distinct levels. Using de-escalation as the baseline value, *JME-Ally* retains its negative and significant effect on *Escalation* in both recipient and participant models.

Third, conflict escalation is a rare event, occurring in only 0.15 percent of observations. We used a rare-events logit model in the second-stage to account for this. Our primary variables have identical signs and significance, as well as similar substantive effects, to the previous findings. Fourth, interstate conflict is often a multilateral process. Poast (2010) and Fordham and Poast (2016) demonstrate that we cannot recover such processes by using dyadic/bilateral units of analysis. We therefore construct a new "k-adic" dataset, subjecting it to a standard and a multinomial logit model. In both these approaches (and their target and exerciser variants), *Escalate* is negative and significant.¹⁷

Finally, the use of observational data raises concerns about selection bias. Without random assignment

¹⁷The quantitative analysis produced an additional result that does not directly affect our hypotheses, but is worth noting. We ran separate models with de-escalation as the dependent variable, defined as a shift to MID Hostility Level 1 or 2 following a JME, which is itself a MID Hostility Level 3 action. For recipient models (analogous to Model 1), neither *JME* nor *JME-Ally* are statistically associated with de-escalation, although *Ally* is. Combined with our findings above, joint military exercises may incentivize escalation (without an alliance) or prevent it (with one), but they are unlikely to cause a target to de-escalate a conflict. Similarly, in the participant models (analogous to Model 2), none of the primary variables are statistically significant. Once countries intensify a conflict through military exercises, they are unlikely to reverse the escalation ladder.

under experimental conditions, we cannot directly rule out that some omitted variable intermediates JMEs, alliances, and escalation. However, we run two processes determining the sensitivity of our results to selection effects. First, Altonji, Elder, and Taber (2005) ask: How substantively strong and significant must unobserved factors be to wipe out the effects of our main explanatory variables? If they must be several times stronger, and our controls effectively account for major alternative theoretical explanations, then we can have greater confidence in our explanation.

To formalize their process, Altonji et al. state the following condition:

$$\frac{\mathbb{E}(\epsilon|\text{Predictor} = 1) - \mathbb{E}(\epsilon|\text{Predictor} = 0)}{\text{Var}(\epsilon)} = \frac{\mathbb{E}(X'\gamma|\text{Predictor} = 1) - \mathbb{E}(X'\gamma|\text{Predictor} = 0)}{\text{Var}(X'\gamma)} \quad (1)$$

where X is the matrix of control variables for the outcome equation, γ is a vector of their coefficients, and ϵ is a vector of the residuals from the unobservables. In essence, on the left hand side, we calculate the potential effect that unobserved covariates could have on alliance participation, normalizing that for variation in the error term. On the right hand side, we do the same thing, normalizing for variation in our observed covariates. When this equality holds, a normalized shift in the distribution of unobservables would be equally as powerful as a shift in observables. Altonji et al then transform Equation 1 to ask how large the left hand side must be to explain away our predictor's effects, producing the following ratio, where β is our predictor estimate (say, alliance):

$$\frac{\hat{\beta}}{[\text{Var}(\text{Alliance})/\text{Var}(\text{Residuals})][\mathbb{E}(\epsilon|\text{Alliance} = 1) - \mathbb{E}(\epsilon|\text{Alliance} = 0)]} \quad (2)$$

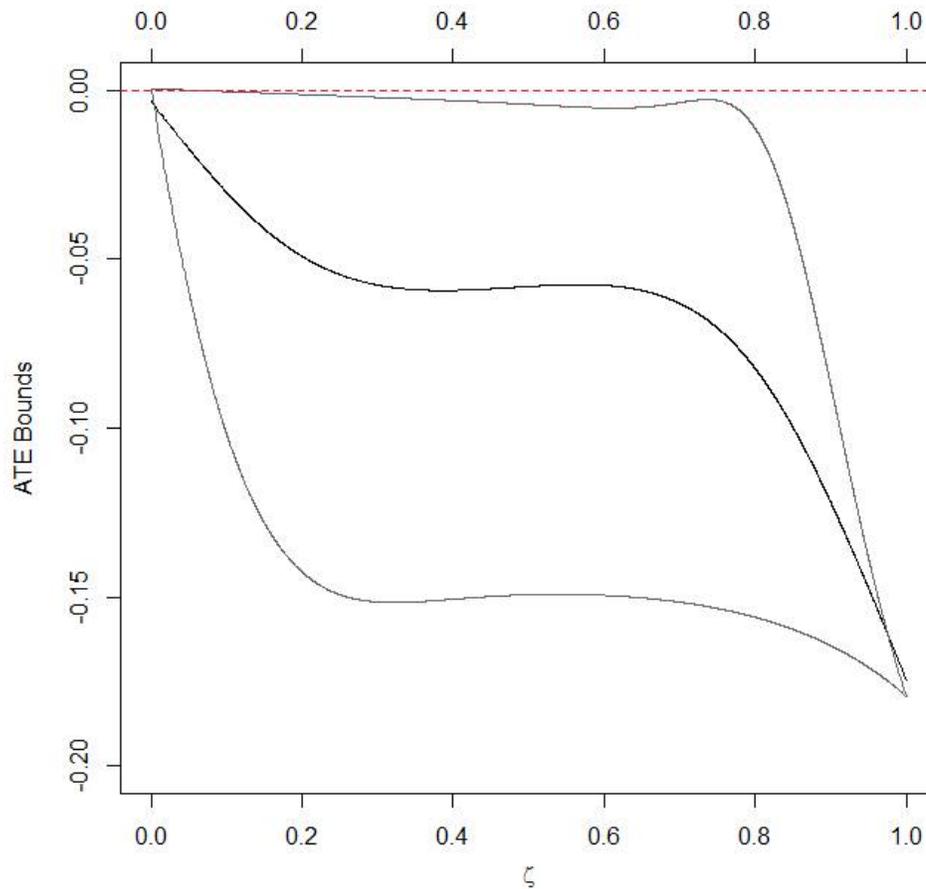
Applying this ratio, we find that (normalized) unobservables must be 3.73 times as strong as *JME-Ally* to wipe away its effect on escalation. Given that the model already controls for major alternative accounts, it is unlikely that omitted variables will undermine this result.¹⁸

As an additional check on selection bias, we apply Mebane and Poast's (2013) modification of Molinari bounds. Figure 4 visualizes this sensitivity, with the central line demarcating the estimate for the average treatment effect, and the leaf-lines surrounding it 95% posterior intervals. Formally, η is the percentage of

¹⁸Altonji, Elder, and Taber (2005) argue that an implied ratio of 3.55 strongly supports their claim, so these ratios need not be orders of magnitude larger (as they are with alliance and conditionality) to serve as a robustness check.

the data where selection into treatment does not hold. As it increases, the effect of selection bias attenuates, and Mebane and Poast’s (2013) process is agnostic about what causes selection. When selection into a *JME-Ally* is complete (i.e. when $\eta = 0$), our effects are indistinguishable from 0. But starting around $\eta = 0.1$ (i.e. 90% of the observations suffer from selection bias), these bounds are statistically distinguishable. In addition, the “flatness” of the curve between $\eta = 0.25$ and 0.65 suggests that our results are insensitive to a range of selection bias effects. The results are nearly identical using Model 2.

Figure 4: Sensitivity Analysis on JME-Ally Using Molinari Bounds.



Taken together, the results from both Models 1 and 2 support our theory. Without a governing alliance, both exercise targets and participants escalate conflict. In addition, alliances on their own have no systematic effect on escalation: While establishing the broad outlines of interstate security relationships, they are also

poorly suited to immediate signaling and managing short-term changes to the military balance. However, when undertaken by an alliance, exercises unravel Snyder's reassurance-entrapment dilemma: they can simultaneously deter adversaries while restraining partners from moral hazard.

Turning to the alternative explanations, both the spiral model and entrapment theory would predict that JMEs outside of an alliance would lead to conflict escalation. However, they would be unable to account for our main result, that exercises conducted within an alliance reduce the risk of direct military force by both partners and adversaries. Both approaches treat alliances and exercises as additive signals of support. There should be no distinction, therefore, between exercises conducted within and outside of an alliance context. Indeed, under these approaches, exercises conducted among allies should be even more likely to lead to open conflict than those performed by non-allies. Yet, our results contradict these expectations, finding that both partners and adversaries are simultaneously prevented from escalating interstate violence.

6 Conclusion

This paper asks "Under what conditions do multinational military exercises lead to interstate war?" We argue that such exercises on their own increase the risk of conflict. While they are tightly defined operationally, states have little ability to restrain a partner's adventurism within the JME's confines. However, they can mitigate this risk by conducting exercises through alliances that define the overall interstate security relationship. Security pacts that provide more information about the limits of the relationship – specifically those with higher levels of institutionalization and conditional military obligations – will be particularly likely to manage these problems and avert conflict escalation. We used a two-stage model to test the theory's implications for alliances and JMEs, as well as JMEs and conflict. The results consistently support our theory, despite a battery of robustness checks and tests of sensitivity to unobserved confounders.

This project makes several theoretical contributions. First, our paper leverages the extensive literature on relational contracting and organizational social capital to identify and examine the complementary functions of joint military exercises and alliances. David Lake has done extensive work merging these literatures – especially that of relational contracting – with international relations theory.¹⁹ But whereas Lake (1996),

¹⁹See Lake (1996, 1999, 2009, 2003), as well as Cooley and Spruyt (2009). Indeed, while relational contracting features prominently in business and management scholarship, it is likely better suited to international politics. Bamford, Ernst, and Fubini (2004) claim that, between 1999 and 2004, firms concluded over 5000 joint ventures (JV) worth over USD\$350 billion worldwide. But these numbers are dwarfed by mergers and acquisitions, which produce hierarchical transactions. According to the Institute for Mergers, Acquisitions, and Alliances, that same period saw 193,689 M&A transactions totaling over USD\$14 trillion, over 41

for example, uses relational contracting to conceptualize and define the overall relationship between two countries, this paper uses intra-organizational theory – particularly Nahapiet and Ghoshal (1998) and Moran (2005) – to unpack how states use complementary transactions *within* partnerships to manage strategic dilemmas. Future research can examine the conditions under which combinations of security signals – arms sales, leader visits, public statements, etc. – are additive, complementary, or substitutes for one another, connecting them to policy outcomes of interest. Do exercises or statements, for instance, have stronger effects in bolstering perceptions of alliance commitment, and under what conditions? Are there certain levels of arms sales that countries accept in lieu of a formal alliance guarantee?

Second, this article contributes to the literature on signals of support between security partners by suggesting that the use and effects of certain types of signals is highly contextual. In the absence of an alliance, states prefer not to engage in a JME due to concerns about unintended military escalation, while within the context of an alliance, partners can engage in JMEs with a reduced risk of conflict. Thus, we cannot understand certain types of military cooperation without controlling for the broader security dynamics and institutionalization of the relationship. In this way, our theory contributes to the growing literature on the causes and effects of interstate signals of political and military support, which in recent years has shown the effects that signals such as leaders' public statements and visits can have on strengthening deterrence (McManus, 2014, 2017, 2018) and has used composite measures of signals to construct composite measures of the strength of bilateral relationships (McManus and Nieman, 2019). Similarly, McManus and Yarhi-Milo (2017) show that the United States' choice of private versus public signals is shaped by the regime type of recipients. Our findings suggest that aside from domestic politics, the use and effectiveness of signals of support like JMEs are contingent upon the broader security relationship between the sender and recipient, and are not necessarily fungible, additive, and substitutable.

Third, our findings contribute to the debate over whether signals of support like alliances and joint military exercises are a cause of or restraint on war. On the one hand, a number of scholars argue that alliance formation can trigger the security dilemma with other states, leading them to take countermeasures

times the JV valuation.²⁰ By contrast, states rarely enter into direct hierarchies, and, in the presence of anarchy, they often rely on foundationally social forms of signaling: sunk costs, audience costs, reputations, status, prestige, and rank, as well as inter-personal judgments based on phenotypic and behavioral cues (Fearon, 1994; Snyder and Borghard, 2011; Crescenzi et al., 2012; Kuo, 2020; Holmes, 2018; Weisiger and Yarhi-Milo, 2015; Hall and Yarhi-Milo, 2012). This all suggests that a relational structure may better characterize these dynamics.

such as arms buildups and forming military alliances of their own in what becomes a self-reinforcing spiral of hostility (Jervis, 1976; Senese and Vasquez, 2008). Others similarly claim that alliances can contribute to conflict by creating moral hazard problems that encourage allies to challenge their adversaries, thus entrapping their partners into unwanted conflicts (Snyder, 1997; Posen, 2014). On the other hand, some scholars argue that alliances can deter conflict and restrain members. Indeed, a number of recent studies have shown empirical evidence that alliances have a dampening effect on conflict. Leeds (2003*b*) finds that defensive alliances reduce the probability of disputes initiated by third parties, while Fuhrmann and Sechser (2014) show that defensive alliances with a nuclear-armed power make conflict especially less likely. In terms of ally-initiated conflict, Johnson and Leeds (2011) and Fang, Johnson, and Leeds (2014) find that having a defensive alliance does not make states more likely to initiate or escalate disputes. Our results support the latter arguments, as we find that both alliances as well as joint military exercises within alliances are a deterrent to conflict initiated by both third parties and by partners.

In terms of policy implications, this study suggests that joint military exercises may not be as escalatory as they are often portrayed – provided they take place within an alliance. Our results suggest that states can use JMEs to restrain partners and deter adversaries. NATO military exercises in Eastern Europe, as well as U.S.-ROK exercises in and around the Korean Peninsula, are unlikely to make conflict with Russia or North Korea more likely. Moreover, allies need not necessarily perceive military exercises on the part of third parties as threatening.

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