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RESEARCH ARTICLE

The restraint effect of alliances on military responses during crises

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Abstract

Allied states often seek to discourage other members from engaging in unnecessary conflicts, frequently working to mitigate and de-escalate tensions during crises involving their partners. This study investigates the de-escalatory influence of alliances − referred to as the restraint effect − on state behaviour during international crises. The central question addressed is: under what conditions does the restraint effect of alliances become more pronounced? The study hypothesizes that relatively weak states allied with major powers are more likely to experience a stronger restraint effect compared to others. This hypothesis is empirically tested using multiple regression models. The findings provide evidence of an additional restraint effect associated with the presence of a major ally within defence pacts. Furthermore, the temporal analysis reveals that this effect is particularly evident during the Cold War era.

1. Introduction

The debate over whether alliances make states more aggressive remains a longstanding issue in international relations. Some scholars argue that states with alliances tend to become more adventurous and aggressive, often attributing this to the moral hazard effect (Benson *et al.* 2014; Yarhi-Milo *et al.* 2016; Ryou-Ellison and Gold 2020). Others, however, contend that allies typically seek to restrain one another, thereby preventing conflicts from escalating easily (Pressman 2008; Fang *et al.* 2014; Owsiak and Frazier 2014; Johnson 2015; Kim and Ko 2020).

Despite the extensive discussion, the specific conditions under which alliances exert their influence have not been adequately examined. The effects of alliances during crises should not be generalized, as alliances vary significantly in their nature and structure. These nuanced conditions have thus far received limited attention in the existing literature. Accordingly, this study seeks to address the question: under what specific conditions does the restraint effect of alliances become more pronounced?

This study argues that allies of major powers are more likely to experience stronger restraint from their partners. To test this hypothesis, an empirical analysis is conducted using large n data primarily derived from the International Crisis Behaviour (ICB) Project and the Alliance Treaty Obligations and Provisions (ATOP) Project (Brecher and Wilkenfeld 2000; Leeds *et al.* 2002). The results support the hypothesis, identifying asymmetric alliances as a specific condition under which the restraint effect of alliances is most impactful. This finding carries significant academic and policy implications.

The structure of this paper is as follows. The next section reviews the existing literature and elaborates on the theoretical framework, leading to the formulation of the hypothesis. The third section details the research design employed to test the hypothesis, followed by the fourth section, which presents and interprets the empirical results. The fifth section provides a discussion of specific cases, offering a more in-depth understanding of the analysis. Finally, the conclusion addresses the limitations of this study and outlines its broader implications.

2. The restraint effect of alliances in crises

2.1 Literature review

The impact of alliances on international relations has long been a topic of intense debate. Scholars have been divided on whether alliances are a force for peace or a catalyst for conflict. One side of the debate argues that alliances can exacerbate tensions and lead to war, while the other contends that alliances act as a deterrent, fostering stability, and peace. The argument that alliances facilitate war is primarily grounded in the concepts of the security dilemma and moral hazard. The security dilemma posits that actions taken by a state to enhance its security can inadvertently provoke insecurity in other states, with the formation or strengthening of alliances potentially triggering such concerns (Jervis 1978). The concept of moral hazard refers to the tendency of a state to engage in riskier behaviour when it relies on the support of its allies (Yarhi-Milo *et al.* 2016, 95). This assurance provided by a patron state can lead the client state to adopt a more aggressive posture or pursue adventurous policies in its dealings with adversaries (Benson *et al.* 2014, 308).

The Step-to-War theory expands upon the logic of the security dilemma by explaining how alliances can escalate conflicts and lead to war (Gibler and Vasquez 1998). Several empirical studies have supported the notion that alliances can promote and escalate conflicts. For instance, Singer and Small (1966) found that many wars were preceded by the formation of alliances, and subsequent research has suggested that alliances play a significant role in the expansion of conflicts (Siverson and King 1979; Siverson and Starr 1990; Vasquez and Rundlett 2016). Additionally, Vasquez (2009) argued that alliances often exacerbate hostility and tensions in pre-existing rivalries, particularly among major powers. In this context, Senese and Vasquez (2008) asserted that the presence of alliances can intensify crises rather than alleviate them.

Conversely, substantial research suggests that alliances serve as a deterrent to war and promote peace. Siverson and Tennefoss (1984) argued that alliances contribute to the creation of a balance of power, which in turn fosters peace. Similarly, numerous studies have posited that the prospect of third-party intervention, made possible by alliances, acts as a deterrent against aggression by adversaries (Morrow 1994; Sorokin 1994; Smith 1995). Empirical research has consistently shown that among various types of alliances, defence pacts have a particularly strong deterrent effect on conflicts (Leeds 2003b; Johnson and Leeds 2011; Benson 2011). Furthermore, the deterrent effects of alliances with democratic states and nuclear-armed states have also been examined, with findings supporting their role in preventing conflict (Clare 2013; Fuhrmann and Sechser 2014).

Another key argument supporting the notion that alliances promote peace centres around the concept of the restraint effect. Several studies have suggested that alliances help maintain peace by restraining the aggressive actions of their member states (Pressman 2008; Fang *et al.* 2014; Owsiak and Frazier 2014; Johnson 2015). The restraint effect is particularly significant during periods of crisis. For example, Kim and Ko (2020) discussed the restraining role of alliances in the cases of China and North Korea, emphasizing how allied states can impose sanctions or express disapproval in response to provocations. Kuo and Blankenship (2022) further explored the mechanisms through which joint military exercises reinforce alliance commitments while simultaneously exercising a restraint effect during crises. Iwanami (2023) examined the level of burden-sharing for deterrence and restraint.

The restraint effect is crucial during crises, and the specific conditions under which alliances operate can either amplify or diminish this effect. However, the variation in the restraint effect based on the

conditions or design of alliances has not been thoroughly investigated. This research aims to fill this gap by discussing and empirically analysing the conditions under which the restraint effect of alliances is most pronounced.

2.2 Why allies restrain other members

An alliance refers to a cooperative relationship between states for security purposes, involving coordination and concessions among member states. Alliances are distinct from alignments, as they are formal and written agreements, and differ from coalitions in that their cooperation begins during peacetime (Snyder 1990, 106–106; Wilkins 2012, 55–58; Beckley 2015, 14). According to the ATOP project, alliance obligations include defence, offence, non-aggression, neutrality, and consultation (Leeds *et al.* 2002). Primary mechanisms in alliance politics, such as the autonomy-security trade-off, are generally limited to defence pacts in which parties commit to providing military support. Therefore, this study limits the scope of alliances to defence pacts. When referring to forms of alliances that include all types of obligations, this study uses the term 'security cooperation'.

While a principal purpose of forming alliances is to deter and counter external threats, controlling and exerting influence over allies is also a critical benefit that states can achieve through the formation and maintenance of alliances (Snyder 1997, 43–44). When national policies are influenced by the preferences or pressures of allies, it is referred to as 'restraint'. The impact of such policy restraint, induced by alliances, is termed the restraint effect (Snyder 1984, 479). Pressman (2008, 18–41) provided examples of the South Korea-US (1953), US-Taiwan (1954), and Egypt-Syria (1964, 1966) alliances, which were primarily aimed at restraining allies from the perspectives of the US and Egypt. The main motivations for imposing restraint on an ally include the prevention of entrapment, the avoidance of effort dissipation, and the maintenance of order.

First, the motivation to avoid entrapment arises from a desire to prevent becoming embroiled in unnecessary wars as a result of an ally's actions (Owsiak and Frazier 2014, 247). If an allied state pursues adventurous or aggressive policies against an adversary, the likelihood of war increases, potentially dragging other allies into an undesired conflict (Snyder 1984, 466–468; Pressman 2008, 9). Consequently, during a crisis, other allies may feel compelled to intervene actively to mitigate the risk of such entrapment. This motivation was evident when the UK, France, and Israel invaded Egypt in 1956. At that time, the US condemned the invasion and strongly demanded the withdrawal of Israeli forces. Although not related to a crisis, the 1960 revision of the defence treaty between the US and Japan also reflected Japan's reluctance to become entangled in undesired conflicts in the Pacific region.

Second, the avoidance of effort dissipation occurs when an ally engages in a conflict with a state that is not the common adversary. In these situations, the alliance's resources and efforts are dispersed, reducing the overall effectiveness of the alliance. To prevent this, allies may impose diplomatic constraints to ensure that their collective efforts remain focused on the common enemy (Owsiak and Frazier 2014, 244). For example, during the Cold War era, Pakistan was allied with the UK and the US through the Southeast Asia Treaty Organization (SEATO) and the Central Treaty Organization (CENTO). Both the UK and the US sought to prevent Pakistan from engaging in conflict with India, as such conflict would divert Pakistan's security efforts away from countering the Communist Bloc (Jillani 1991). Although not an alliance per se, the trilateral security cooperation among South Korea, the US, and Japan has led the US to restrain both South Korea and Japan from becoming antagonistic toward each other (Yoo 2022; Hwang 2024).

Third, alliances may be formed with the primary objective of maintaining a favourable order and regional stability, which often involves exerting the restraint effect on member states. A notable example is the US forming alliances with Germany and Japan after World War II to restrain the traditional major powers through these alliances (Iwanami 2023). Similarly, the US alliances with South Korea and Taiwan, as well as China's alliance with North Korea, are rooted in such strategic considerations (Pressman 2008, 18; Cha 2010, 168–177; Kim and Ko 2020). Driven by these motivations, allies may engage in activities aimed at restraining their partners during crises, which can

manifest in forms such as mediation in disputes, public criticism of policies, or the imposition of sanctions (Melin 2011; Kim and Ko 2020).

For these reasons, states tend to restrain their allies during crises to prevent the escalation of tensions. But what actions might states take if their allies do not comply with such demands or pressure? When the stakes are high, the most common response could be threatening abandonment (Cha 2010; Gerzhoy 2015). However, this may not apply when restraining allies highly value the alliance and have no intention of coercion. In such cases, responses might be limited to condemnation or the imposition of limited sanctions (Lee *et al.* 2020). A milder but proactive response would be mediation. Alongside international organizations, allies have historically been among the most active mediators (Melin 2011; Owsiak and Frazier 2014).

2.3 When states accede to allies' restraint demands

When do states allow their foreign policy to be influenced by these attempts at restraint from their allies? In other words, why do states accept the demands of an ally at the expense of their own autonomy? Autonomy refers to a state's ability to independently pursue its domestic and international policies, and cooperation between states often entails a commitment to sacrificing some degree of this autonomy (Morrow 1987). Military cooperation through alliances necessitates close policy coordination, and in the process, it is inevitable that member states will have to concede some of their autonomy (Johnson 2022). However, the mere fact that an ally makes a demand does not automatically result in a state accepting a significant sacrifice of diplomatic autonomy during a crisis. Nonetheless, under certain conditions within an alliance, states may find it difficult to accept the consequences of their noncompliance, which can lead to a more pronounced restraint effect during crises.

The conditions that amplify the restraint effect are closely linked to the dynamics of alliance politics. These dynamics make the responses of restraining states either unacceptable or at least critical to their allies, thereby compelling compliance. Coercive responses include condemnation, sanctions, and threats of abandonment. However, not all states can easily employ such coercive measures, particularly if their allies have the capability to retaliate effectively. This implies that states capable of effectively restraining their allies possess significantly greater resources to mobilize for this purpose (Pressman 2008; Fang *et al.* 2014).[1] Alliances involving such states are often asymmetric in terms of power among their members, and this asymmetry influences allies to comply due to their security and economic interests.

First, asymmetric alliances represent a form of alliance in which the exchange mechanism between autonomy and security is highly significant. In an asymmetric alliance, the stronger state offers security to the weaker state, thereby acquiring a degree of influence over the latter's policies. In return, the weaker state cedes a portion of its autonomy in exchange for security guarantees (Morrow 1991, 1994). This exchange results in weaker parties becoming dependent on stronger parties and is asymmetric in many respects. The value of alliances is determined by what allies contribute and the availability of alternative partners (Leeds and Savun 2007, 1118). The support provided by stronger parties is often critical to the survival of weaker parties and is rarely substitutable. Conversely, the contributions of weaker parties generally do not hold equivalent value. Empirical evidence suggests that stronger parties are more likely to dishonour their commitments to allies, making their commitments relatively fragile and unreliable (Leeds 2003a; Mattes 2012). Therefore, to secure continued support and guarantee

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[1]Pressman (2008) and Fang *et al.* (2014) are two key studies that have examined the restraint effect in asymmetric alliances. The original theoretical foundation was established by Pressman (2008), while Fang *et al.* (2014) extended this theory through formal modelling and conducted a preliminary empirical test. Although their evidence provided empirical support for the theory, Fang *et al.* (2014)'s test did not fully capture the nuanced and additive effects of asymmetric alliances compared to alliances in general. The specific contributions of this study, in relation to existing research, are discussed in the concluding section.

alliance commitment, weaker states often have no choice but to comply with the demands of stronger states, even at the cost of their own autonomy (Sorokin 1994, 303)

Secondly, in asymmetric alliances, the support provided by stronger parties is not limited to military commitments during wartime. In many cases, weaker parties receive political and economic benefits from alliances with stronger states. This was particularly evident during the Cold War era, following World War II, when countries such as South Korea, Japan, Pakistan, and numerous NATO members received substantial economic support from the US. A similar situation existed within the Communist bloc, where the Soviet Union served as a powerful political and economic patron for many communist states. Under such conditions of dependency, requests made by stronger parties, including demands for restraint, become irrefutable (Melin 2011, 697). Even today, North Korea's economic dependence on China makes it vulnerable to Chinese economic sanctions (Lee *et al.* 2020).

Crises are situations in which the restraint effect can be most clearly observed. As inflection points between peace and war, crises carry greater significance than mere militarized interstate disputes (MIDs) or incidents (Brecher 1977; Gochman and Leng 1988). According to the ICB Project, international crises are defined by the following three criteria. First, there must be a direct and substantial threat to the state's critical values, which may include national sovereignty, territorial integrity, or the safety and security of its citizens. Second, the crisis must impose a severely limited timeframe for the state to respond to the emerging threat, leaving little room for deliberation. Finally, the situation must carry a high probability of escalating into military hostilities, indicating an imminent risk of armed conflict (Brecher and Wilkenfeld 2000; James and Wilkenfeld 1984).

Based on the above theoretical inference, this study posits that alliances exert a restraint effect during crises involving member states. However, this effect is not uniform across all alliances; certain conditions make the effect more pronounced. The primary condition is the asymmetry within alliances. Consequently, if the stronger state in an asymmetric alliance seeks to restrain its junior ally during a crisis, the weaker state is likely to refrain from taking military action. This leads to the following hypothesis:

Hypothesis: A relatively weaker state allied with a major power is less likely to respond militarily during a crisis.

3. Research design

This study primarily uses actor-level data from version 15 of the ICB Project, a comprehensive dataset covering crises occurring between 1918 and 2019, with a total of 1,100 observations. The actor-level data focus on 496 crises that occurred during this period at the national level, providing detailed insights into how individual states responded to each crisis, as well as the domestic and international circumstances they faced at the time (Brecher and Wilkenfeld 2000). Based on the ICB data, this study constructs two datasets: the ICB actor-level dataset with 792 observations (hereafter the actor-level data) and a directed politically relevant dyad-year dataset with 169,916 observations (hereafter the dyad-year data).[2] The temporal coverage of the actor-level data is adjusted to 1918–2016, considering the coverage of other datasets, such as the Direct Contiguity version 3.2 from the Correlates of War (COW) Project. Additionally, the dataset is limited to crises between states that are included in the COW Project's State System Membership version 2016 (Correlates of War Project 2017). This process reduced the number of observations in the actor-level data from 1,100 to 792.

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[2]Two distinct datasets are prepared for separate analyses. The actor-level dataset is used for probit regression models, which do not account for selection effects. The results of these analyses are presented in Table 3 and Model A1 in Table A1. In contrast, the dyad-year dataset is employed for Heckman selection models, which incorporate selection effects. The results based on this dataset are shown in Table 4 and Model A2 in Table A1. In the actor-level analysis, the unit of observation is based on the "actor," and all crises are treated as unique events. In the dyad-year analysis, the unit of observation is based on the "dyad," with crises occurring within the same year represented by the initial crisis of that year.

The dyad-year data are used for the selection model, which will be explained later in this section. For this dataset, the directed politically relevant dyad-year data from 1918 to 2011 was extracted using EUGene (Expected Utility Generation and Data Management Program) version 3.212 (Bennett and Stam 2000). Politically relevant dyads include those that are contiguous or those in which at least one party is a major power (Weede 1976).[3] The actor-level data were subsequently aggregated to the dyad-year level and merged with data from EUGene. In cases of multiple crises between two states within the same year, only the initial crisis was counted, as subsequent crises may be extensions of the initial one.[4] Of the 169,916 observations in the extracted dyad-year dataset, 651 were matched with the aggregated actor-level data. Since the dyad-year data are directional, both the dependent and independent variables are constructed based on information specific to Side A. The temporal range of the dyad-year data is limited to 1918–2011, considering the available extraction range of the current version of EUGene.

3.1 Dependent and independent variables

The dependent variable in this study is the military response during a crisis, which has been constructed using the 'CRISMG' (Crisis management principal technique) variable from the ICB dataset. The CRISMG variable categorizes the primary response strategies employed by a state during a crisis into several distinct categories: (1) 'Negotiation', (2) 'Adjudication or arbitration', (3) 'Mediation', (4) 'Multiple not including violence', (5) 'Non-military pressure', (6) Threat or display of military force, (7) Violent multiple means, and (8) Use of military force (Brecher *et al.* 2023).[5] For the purposes of this study, the first five categories are classified as non-military responses, reflecting diplomatic and peaceful approaches to crisis management. In contrast, the last three categories are classified as military responses, encompassing actions that involve or imply the use of force. Consequently, the dependent variable is a binary variable, where military responses are assigned a value of 1, and non-military responses are assigned a value of 0.

While the binary military response is the main dependent variable in this study, the occurrence of a crisis is also used as a dependent variable for the selection stage of the selection model. Consequently, it is included only in the dyad-year dataset. All crisis selections are derived from the ICB data, and therefore, the criteria for defining a crisis follow the definitions provided by the ICB Project. This variable is also binary: a value of 1 is assigned if there was at least one crisis between a dyad in a given year; otherwise, a value of 0 is assigned.

To test the hypothesis, this study includes one independent variable which is drawn from version 5.1 of the ATOP Project. The independent variable is the Alliance with a Major Power (hereafter referred to as MP for abbreviation). This variable is coded as 1 when the actor involved in a crisis is not a major power itself but is allied with at least one major power and 0 otherwise. The classification of major powers in this study is based on the COW State System Membership version 2016 (Correlates of War Project 2017). According to this dataset, eight states are recognized as major powers during the period between 1816 and 2016. These include the 'United States (1898–2016)', 'the United Kingdom (1816–2016)', 'France (1816–1940 and 1945–2016)', 'Germany (including the Prussian period) (1816–1918, 1925–1945, and 1991–2016)', 'Austria-Hungary (1816–1918)', 'Italy (1860–1943)', 'Russia

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[3]Political relevance based on contiguity in this study is defined as either sharing a land border, including rivers, or being less than 400 miles apart by sea (Stinnett *et al.* 2002). Although Lemke (1995) pointed out potential issues with the relevant dyad-year, a follow-up study by Lemke and Reed (2001) argued that these issues are negligible.

[4]The original actor-level dataset from 1918 to 2011 contains 1,030 observations. Of these, 276 observations involving non-state actors as opponents in a crisis were initially excluded. Subsequently, 31 observations corresponding to initial crises within the same year were also excluded. Finally, during the merging of the dyad-year data with the reduced actor-level data, 80 observations involving dyads that did not meet the conditions of political relevance were removed. As a result, the merged dataset contains 651 observations involving crises.

[5]To grasp the difference between military means, this study utilizes the category of MID (Militarized Interstate Dispute) in the COW Project.

(1816–1917 and 1922–2016)', 'China (1950–2016)', and 'Japan (1895–1945 and 1991–2016)' (Correlates of War Project 2017).[6]

3.2 Control variables

This study incorporates several control variables to account for various factors that might influence the outcome of the analysis. Some variables are included only in the selection stage, while others are included in the outcome stage. The first and foremost control variable is the simple presence of an alliance with a defence pact. This variable is included to assess the overall impact of alliances on state behaviour during crises before examining specific conditions. The defence pact variable (hereafter DP) is operationalized as a binary variable, taking a value of 1 if the actor involved in the crisis has at least one alliance with a defence pact at the time of the response and 0 if no such alliance is present.

Secondly, joint democracy is controlled for in the analysis. According to the Democratic Peace Theory, democratic states are empirically less likely to engage in conflict with one another (Russett *et al.* 1995; Oneal and Russett 2001). Therefore, this study employs the Polity5 Annual Time-Series data from the Polity Project (Marshall *et al.* 2020). The joint democracy variable (hereafter JD) is constructed as a dummy variable: if both states in a dyad have a Polity 2 score of 6 or higher, the variable is assigned a value of 1; otherwise, it is assigned a value of 0, following the coding rules used in existing studies (Mitchell 2002; Daniels and Mitchell 2017).

The third control variable is the preponderance of an actor state. An actor state's material preponderance affects its strategic calculations and may increase the likelihood of a military response. The preponderance variable used in this study is derived from the National Material Capabilities (NMC) data version 6.0 from the COW Project (Singer *et al.* 1972; Singer 1988). The NMC data include the Composite Index of National Capability (CINC) score, which measures states' material capabilities annually by aggregating military expenditures, military personnel, energy consumption, total population, urban population, and iron and steel production. To measure the relative preponderance of an actor state, the preponderance variable (hereafter Prep) is calculated $CINC_A/(CINC_A + CINC_B)$, following the coding rules of Fang *et al.* (2014).

The fourth factor to control for is contiguity. Territorial issues are among the most critical and sensitive matters between states (Gibler 2007; Gibler and Tir 2013). Consequently, sharing borders or maritime zones, such as an exclusive economic zone, may make states more prone to conflicts (Hensel 2001; Hensel *et al.* 2008; Daniels and Mitchell 2017). The contiguity variable (hereafter Contig) is derived from the Direct Contiguity version 3.2 dataset from the COW Project (Stinnett *et al.* 2002). In this study, the variable is coded as a binary indicator, where a value of 1 is assigned if a dyad shares a land or river border, or is less than 12 miles apart by sea.

The fifth control variable pertains to internal crises, related to the concept of diversionary war. Theories of diversionary war suggest that policymakers facing domestic political or economic crises may attempt to provoke external threats to rally public support for the ruling government (Baum 2002; Mitchell and Prins 2004). Thus, there are two potential sources of internal crises: economic instability and political instability. The ICB data includes the 'ECONDT' (economic status of actor) variable and the 'GVINST' (government instability) variable (Brecher *et al.* 2023). The internal crisis variable (hereafter IC) is coded as a binary indicator, taking a value of 1 if at least one form of crisis-either economic or political-exists in an actor state.

The sixth control variable associated is the Military Trigger variable. In crisis situations, interactions between threats are often reciprocal, where a state may respond to an opponent's threat or provocation with a similar or escalated action (Jervis 1978). Due to the dynamics of the security dilemma, states involved in a crisis tend to escalate their responses, which can intensify the crisis and increase the likelihood of military confrontation (Kydd 1997). Therefore, when a crisis is initiated by a military event, the subsequent response is also likely to involve military means. The ICB dataset includes the

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[6]The order of states follows the ascending order of the COW state number as listed in the State System Membership Data.

'TRIGGR' (Trigger to foreign policy crisis) variable, which categorizes the actions by an opponent that led to the crisis from the actor's perspective. The TRIGGR variable is classified into several categories, including (1) 'Verbal act', (2) 'Political act', (3) 'Economic act', (4) 'External change', (5) 'Other non-violent act', (6) Threat or display of military force, (7) Indirect use of military force, and (8) Direct use of military force (Brecher *et al.* 2023).[7] For the purposes of this study, the Military Trigger variable (hereafter MT) is operationalized as a binary variable, coded as 1 for cases where the crisis was triggered by military actions (corresponding to TRIGGR's values 6 to 8), and 0 for all other cases.

The final control variable is security cooperation, which refers to alliance relationships that include all types of obligations. This is the only variable included exclusively in the selection stage. Security cooperation with obligations has a pacifying effect between parties (Bremer 1992). The security cooperation variable (hereafter SC) is derived from the ATOP data. This variable is binary, coded as 1 if a dyad shares at least one security cooperation agreement in a given year, and 0 otherwise.[8]

3.3 Descriptive statistics and models

Table 1 presents the descriptive statistics of the independent and control variables. In Table 1, the right two columns correspond to the dyad-year data, while the left two columns pertain to the actor-level data. In the dyad-year data, the international crisis and military trigger variables have values only when a crisis has occurred. MP and DP are relevant to both the selection and outcome stages; the figures in square brackets represent the outcome stage when a crisis has occurred.

Table 2 presents the correlations between the variables in the actor-level data. The correlation matrix indicates that, while there are some expected associations between certain variables, none of these correlations are sufficiently high to raise concerns about multicollinearity. This ensures that the estimated coefficients for the independent variables are reliable and that the relationships between variables can be interpreted with confidence. However, one critical issue to consider is that, although MP and DP are not highly correlated, they are conceptually related. Observations where the value of MP is 1 are a subset of observations where the value of DP is 1, as all alliances with a major power are defence pacts. Therefore, although comparing the effects of these two variables is a focus of this study, including both in the same model may not be ideal. Consequently, this study employs several approaches to analyse the two variables: including both variables in a model (Models 3 and 5), limiting the subset to those where the value of DP equals 1 (Models 4, 6, 7, 8, and 9), and integrating the two binary variables into a single ordinal variable (Models A1 and A2).

To examine the hypothesis using the data described above, this study primarily employs probit regression for the binary dependent variable, the military response. Probit regression is particularly appropriate in this context because this study needs to account for possible selection bias. The observations in the actor-level data represent crises, and the probability of a military response may influence the sample, potentially leading to selection bias. The Heckman Selection Model (HSM) addresses this issue by calculating the Inverse Mills Ratio (IMR) from the residuals of the selection stage and incorporating it into the outcome stage, thereby correcting for selection bias (Heckman 1976). The IMR is calculated by dividing the probability density function of the residuals by their cumulative distribution function. Since this calculation requires that the residuals follow a normal distribution, probit regression is necessary.

In probit regression, residuals are unlikely to be homoscedastic, necessitating attention to the issue of heteroskedasticity. Heteroskedasticity can lead to unreliable estimates of the standard errors (SE) of coefficients, which in turn undermines the reliability of statistical significance tests in the model. To address this issue, a standard error estimation method that is consistent regardless of heteroskedasticity is required. Therefore, this study uses Heteroskedasticity-Consistent Standard Errors (HCSE) in the

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[7]In the TRIGGR variable, as with the CRISMG variable, this study utilizes the MID categorization.

[8]To clarify the distinction between SC and similar variables, MP and DP pertain to Side A's interactions with a third party, whereas SC focuses on the relationship between Side A and Side B within a dyad.

Table 1. Descriptive statistics of independent and control variables

[Crisis = 1]	Actor-level data (n = 792)		Dyad-year data (n = 169,916, n[Crisis] = 651)	
Binary variables	0(%)	1(%)	0(%)	1(%)
MP	592(74.7)	200(25.3)	115,833(68.2) [499 (76.7)]	54,083(31.8) [152 (23.3)]
DP	288(36.4)	504(36.4)	50,324(29.6) [223(34.3)]	119,592(70.4) [428(65.7)]
Internal crisis	488(61.6)	304(38.4)	[396(60.8)]	[225(39.2)]
Military trigger	266(33.6)	526(66.4)	[228(35.0)]	[423(65.0)]
Joint democracy	747(94.3)	45(5.7)	135,160(79.5)	34,756(20.5)
Contiguity	449(56.7)	343(43.3)	30,022(17.7)	139,894(82.3)
Security cooperation	518(65.4)	274(34.6)	119,808(29.5)	50108(70.5)
Continuous variables	Mean SD Min Max		Mean SD Min Max	
Preponderance	0.45 0.33 0 1		0.50 0.42 0 1	

Note: Percentages are rounded to one decimal place.

Table 2. Correlations between variables in the actor-level data

	MP	DP	JD	Prep	Contig	IC	MT
MP	1						
DP	.228	1					
JD	.134	.004	1				
Prep	−.138	.232	.001	1			
Contig	−.156	.136	−.049	.004	1		
IC	−.046	−.019	−.003	−.067	−.035	1	
MT	−.110	−.132	−.126	−.041	−.064	−.076	1

Note: Correlation coefficients are rounded to three decimal places.

estimation process (White 1980). Among the various types of HCSE, HC0, the basic form, is employed (Long and Ervin 2000).

The final statistical issue in this study is panel control. In the selection stage of the HSM, dyads and years may exhibit unobserved heterogeneity, which could introduce additional bias into the analysis. This study assumes that the heterogeneity is random and uncorrelated with the explanatory variables. Consequently, Probit Panel Regression with Random Effects (PPR-RE) is employed. To control for panel effects, this study simultaneously accounts for both dyads and years, thereby utilizing a two-way random effects model.

4. Empirical analysis

Based on the research design outlined earlier, the empirical analysis presented in Table 3 employs probit regression across four distinct models. Models 1 to 3 are conducted using the actor-level data, encompassing all 792 observations. Model 4, however, is restricted to observations where DP is assigned a value of 1, allowing the additive restraint effect of MP to be captured relative to DP. Model 1 is designed to assess the general effects of alliances on crisis behaviour. Model 2 includes MP without DP, while Model 3 includes both variables. Although MP shows a significant restraining effect in Model

Table 3. Probit regression models with the actor-level data

	Model 1 (HCSE)	Model 2 (HCSE)	Model 3 (HCSE)	Model 4 (HCSE)
Alliance with a Major Power		−.236** (.109)	−.169 (.113)	−.178 (.131)
Defence Pact	−.257** (.102)		−.211** (.105)	
Joint Democracy	−.549*** (.194)	−.494*** (.198)	−.513*** (.197)	−.572*** (.243)
Preponderance	.582*** (.148)	.453** (.145)	.536*** (.150)	.575*** (.183)
Contiguity	−.095 (.095)	−.158* (.096)	−.124 (.097)	−.176 (.119)
Internal Crisis	.079 (.095)	.066 (.096)	.069 (.096)	.125 (.121)
Military Trigger	.436*** (.099)	.439*** (.099)	.424*** (.099)	.464*** (.121)
Constant	.003 (.135)	−.017 (.135)	.060 (.141)	−.183 (.181)
Observations	792	792	792	504
McFadden R^2(Adjusted)	.050(.036)	.048(.034)	.052(.036)	.057(.037)
Log Likelihood	−496.025	−496.913	−494.926	−319.856
AIC	1,006.050	1,008.826	1,005.853	653.711

Note: *P < 0.1; **P < 0.05; ***P < 0.01.

2, this significance is lost when DP is included in Model 3. Additionally, in Model 4, MP does not exhibit a significant effect. Therefore, the simple probit models presented in Table 3 do not provide substantial support for the hypothesis of this study.

Table 4 presents the results of the HSM using the dyad-year data, incorporating both selection and outcome stages. In Table 4, only one selection stage is included because Models 5 and 6 share the same selection stage, differing only in the outcome stage. In the two-stage models, only the selection stage is panel-controlled with random effects, as the outcome stage does not have a sufficient number of observations to allow for such control. The statistical significance of the sigma in the selection stage indicates meaningful heterogeneity in the dyad-year data, supporting the use of random effects.

The outcome stage of Model 5 includes both MP and DP, while Model 6 includes only MP, restricted to the defence pact subset. In both models, MP shows a statistically significant negative effect on the military responses of an actor state, providing support for the hypothesis. Additionally, in both outcome stages, the coefficients for the Inverse Mills Ratio (IMR) are negative but not statistically significant. This suggests that military response in the outcome stage is generally negatively related to the occurrence of crises in the selection stage, which may be interpreted as a deterrence effect. However, this relationship is not statistically significant.

In terms of control variables, most demonstrate effects consistent with expectations. When considered alone, without MP, DP has a restraining effect to some extent in Models 1 and 3. The joint democracy, preponderance, and military trigger variables exhibit robust effects in the expected directions across all models, with a high level of statistical significance. However, the contiguity and internal crisis variables do not show statistical significance in most models.

5. Discussion

The findings of this study are reflected in various real-world cases. The restraint effect of alliances involving MP can be observed in the bilateral alliances between the US and its Asian partners. For

Table 4. Heckman selection models with the dyad-year data

	Model5		Model6
	Selection :PPR-RE	Outcome (HCSE)	Outcome (HCSE)
Alliance with a Major Power		−.318** (.130)	−.265* (.149)
Defence Pact	.065 (.046)	−.168 (.122)	
Joint Democracy	−.475*** (.070)	−.430*** (.211)	−.445* (.248)
Preponderance	−.215*** (.068)	.527** (.168)	.643*** (.209)
Contiguity	−.993*** (.060)	−.021 (.117)	−.080 (.140)
Security Cooperation	−.230*** (.046)		
Internal Crisis		.126 (.106)	.170 (.133)
Military Trigger		.447*** (.109)	.526*** (.132)
Constant	−2.485*** (.064)	−.616 (.467)	−.431 (.571)
Observations	169,916	651	428
Sigma	.724*** (.035)		
McFadden ^{2}(Adjusted)	–	.057(.037)	.067(.040)
IMR	–	−.175(.124)	−.199(.158)
Log Likelihood	−3,575.630	−407.192	−269.236

Note: *P < 0.1; **P < 0.05; ***P < 0.01.

Table 5. Marginal Effects of DP-MP

	Model A1				Model A2(Outcome)			
	$\hat{p}$	2.5%	97.5%	Δ%	$\hat{p}$	2.5%	97.5%	Δ%
$Pr(Y = 1 \mid DP\ MP = 0)$	.608	.513	.697		.561	.456	.662	
$Pr(Y = 1 \mid DP\ MP = 1)$	.535	.439	.629	−12.1	.501	.396	.606	−10.8
$Pr(Y = 1 \mid DP\ MP = 2)$	.464	.367	.564	−13.1	.398	.292	.512	−20.5

instance, during periods of heightened inter-Korean tension, the US has played a critical role in restraining South Korea's potential military retaliation. A notable example occurred in November 2010, when a crisis was triggered by North Korea's bombardment of Yeonpyeong Island with approximately 170 artillery shells. In response, the South Korean government prepared for a massive military retaliation. However, the US strongly objected to this course of action and successfully persuaded South Korea to moderate its response (Draudt and Warden 2017). Similarly, China has long assumed a restraining role over North Korea. This restraint was particularly evident when North Korea conducted its sixth nuclear test in 2017. In response, China strongly condemned the test and imposed additional sanctions on North Korea, including enhanced import and export controls (Kim and Kim 2022).

Although the results of the empirical analysis generally support the hypothesis and numerous illustrative cases can be identified, it has not yet been concretely tested whether MP has an additive
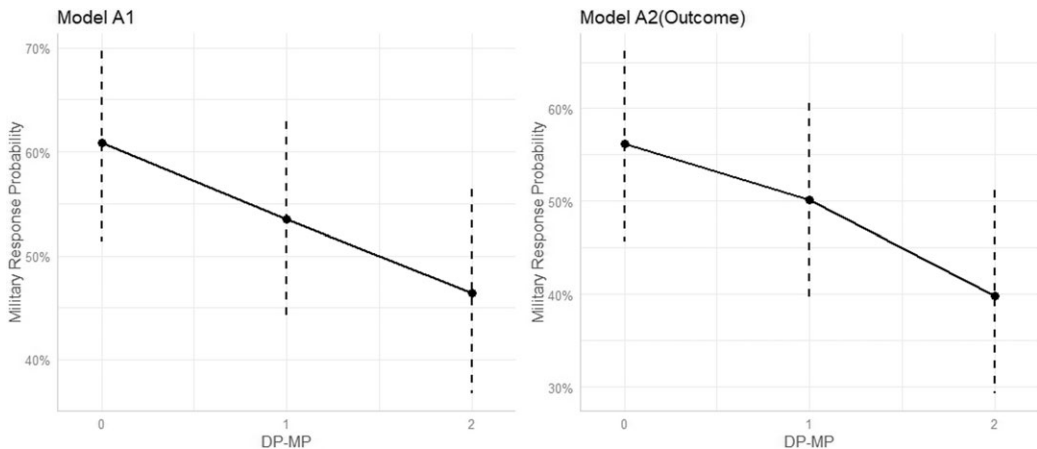
Figure 1. Changes in predicted probabilities by DP-MP.

restraint effect beyond that of DP. The interpretation of results from Models 3 and 5, which include both variables, is limited due to their strong conceptual relationship. Therefore, based on Models 3 and 5, this study develops two additional models, Models A1 and A2, by integrating the two binary variables into a single ordinal variable. This variable, named DP-MP, has three levels: 0 if a dyad shares no DP, 1 if a dyad shares DP but not MP, and 2 if a dyad shares both MP and DP. The results of Models A1 and A2 are presented in the Appendix.

Figure 1 shows the changes in predicted probabilities by DP-MP in Models A1 and A2, illustrating the marginal effects of DP-MP in the two models. The change from 0 to 1 represents the marginal effect of DP, while the change from 1 to 2 represents the marginal effect of MP. These two marginal effects clarify the restraining effect of DP alone and the additional effect of MP beyond DP. Table 5 summarizes the estimates ($\hat{p}$), 95% confidence intervals, and marginal effects ($\Delta\%$). This analysis highlights the substantive significance of DP and MP. The marginal effect of DP is –12.1% in Model A1 and –10.8% in Model A2. In contrast, the marginal effect of MP is –13.1% in Model A1 and –20.5% in Model A2. In both models, MP demonstrates a more substantive marginal effect than DP. These results further support the hypothesis with greater robustness and suggest nuanced effects for the two variables.

One more aspect to discuss is the examination of temporal effects. Although MP is a strong factor in enhancing the restraint effect, its effectiveness may depend on the value of alliances and the availability of alternative options (Leeds and Savun 2007). Thus, it can be inferred that during historical periods when security was the most crucial national value and finding a substitute for a patron ally was not viable, the restraint effect would be most pronounced. To explore this issue, this study develops three additional models presented in Table 6, with three distinct period divisions: Model 7 covers the period until the end of World War II (1918–1945); Model 8 focuses on the Cold War era (1946–1990); and Model 9 covers the post-Cold War period (1991–2011).

According to the results in Table 6, only the Cold War era (Model 8) demonstrates a restraint effect of MP among the three periods. The Cold War created a unique international environment characterized by a bipolar world. During this period, forming an alliance meant choosing between two distinct sides, each directly linked to specific political and economic ideologies (Lai and Reiter 2000). In a bipolar world, the two superpowers dominated leadership within their respective blocs, leaving other states with no viable alternative (Snyder 1990, 117–118). Therefore, it is reasonable to infer that the restraint effect of MP would be most pronounced during this period.

Another notable finding in the results is the significance of the preponderance factor in the outcome stage of Model 9. This factor is not significant in either Model 7 or Model 8. The post-Cold War period may reflect the contemporary world, where a state's own power is the most critical factor in

Table 6. Heckman selection models with temporal separation

	Model7 (1918–1945)		Model8 (1946–1990)		Model9 (1991–2011)	
	Selection: PPR-RE	Outcome (HCSE)	Selection: PPR-RE	Outcome (HCSE)	Selection: PPR-RE	Outcome (HCSE)
MP		−.170 (.405)		−.367** (.181)		.291 (.421)
Defence Pact	.151* (.085)		.089 (.077)		.140 (.142)	
Joint Democracy	−.586*** (.150)	−.344 (.625)	−.147 (.106)	−.374 (.314)	−.434*** (.165)	−.889 (.586)
Preponderance	−.380*** (.124)	.411 (.486)	−.200** (.098)	−.366 (.246)	−.013 (.160)	1.921*** (.699)
Contiguity	−.973*** (.108)	.235 (.331)	−.884*** (.084)	−.236 (.165)	−1.274*** (.170)	.062 (.443)
SC	−.150 (.097)		−.053 (.067)		−.341** (.141)	
Internal Crisis		.194 (.278)		.134 (.164)		.709 (.830)
Military Trigger		.541* (.299)		.445*** (.165)		1.084** (.537)
Constant	−2.145*** (.102)	−1.538 (1.528)	−2.729*** (.100)	.321 (.845)	−3.157*** (.228)	9.314 (8.139)
Observations	26,154	88	78,304	277	65,458	63
Sigma	−.685*** (.070)		−.805*** (.059)		−.944*** (.127)	
McFadden R^2 (Adjusted)	–	.082 (−.049)	–	.059 (.016)	–	.204 (.015)
IMR	–	−4.198 (4.461)	–	−.245 (3.303)	–	−.036 (.356)
Log Likelihood	−951.491	−55.780	−2,024.898	−174.790	−525.397	−33.666

Note: *P < 0.1; **P < 0.05; ***P < 0.01.

determining its military response during crises, and major powers have less leverage over their relatively minor partners. This suggests that the current international environment is less conducive to the restraint effect, and crises are increasingly beyond the control of allies. However, it can also be inferred that if the strategic rivalry between the US and China intensifies and international security becomes more polarized, the pattern may resemble that of Model 8, with the restraint effect of MP being revived.

6. Conclusion

This paper seeks to answer the research question, 'Under what conditions does the restraint effect of alliances become stronger?' By developing a hypothesis, this study identifies asymmetric alliances as a condition that enhances the restraint effect. Moreover, the results support the basic assumption of the study, indicating that alliances generally exert a restraining influence on member states, discouraging the use of military responses during crises. Additionally, the findings suggest that the effect of MP is not consistent over time. Under certain conditions − such as when the international system is bipolar and alternatives to a major power ally are not viable − the restraint effect becomes more pronounced.

This study makes a meaningful contribution to the field of alliance studies, particularly in relation to the restraint effect of alliances. The empirical results provide a more nuanced understanding of the

factors that enhance this effect, thereby supporting the arguments presented in existing literature (Pressman 2008; Fang *et al.* 2014; Owsiak and Frazier 2014; Johnson 2015; Kim and Ko 2020). Especially, this study builds upon Fang *et al.* (2014), an important existing study that provided empirical evidence of the restraint effect of asymmetric alliances using MIDs data. Compared to Fang *et al.* (2014), this study offers a more nuanced understanding of the restraint effect, highlighting the additive effect of MP beyond DP. Also, by employing ICB data, this study more accurately reflects the conditions of crises and escalation, as not all MIDs lead to a crisis. Mere initial MIDs by one party do not necessarily create an environment that requires a response from the other party. Additionally, the findings contribute to crisis studies by offering empirical insights into the sources of crisis escalation and providing prescriptions for de-escalation (James and Wilkenfeld 1984; Wilkenfeld and Brecher 1984; Brecher and Wilkenfeld 2000; Gartzke and Hewitt 2010; Tir 2010).

Moreover, building on the academic contributions of this study, the findings also provide valuable policy implications. In the early days of the Cold War, the US maintained an extensive network of alliances in both Europe and Asia. During that time, US restraint was highly impactful, and allies had few alternatives but to comply with US demands. Such restraint may have contributed to the precarious yet stable relationship between the two superpowers. In contrast, today, the restraint effect is not as apparent. This is because major powers in asymmetric alliances have less leverage now than during the Cold War era. However, alliances are becoming increasingly important in international politics as the strategic competition between the US and China intensifies, and conflicts in Europe and the Middle East continue to expand. Under these circumstances, many states are forced to choose sides, and the formation of alliances becomes more significant. Therefore, the restraint effect of major powers in asymmetric alliances may become pronounced once again.

This study, however, has some limitations. First, the military response, which serves as the sole dependent variable in this analysis, is not a perfect indicator of crisis escalation and war. It captures only a part of the escalation process. To gain a more comprehensive understanding of the influence of specific alliance conditions on the restraint effect, future studies should consider examining other phenomena as dependent variables. Secondly, restrained actions by allies are not limited to military responses during crises. There could also be initial military provocations preceding crises, political and economic policies that may trigger hostile reactions from opponents, and excessive military buildups, including nuclear development. All of these actions can be subject to restraint by allies. Therefore, to measure the restraint effect more accurately, multiple indicators should be used for robust analyses. The limitations of this study should be taken into account in future research.

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Appendix

Table A1. Models with DP-MP

	Model A1 (HCSE)	Model A2: outcome (HCSE)
DP-MP	−.257*** (.091)	−.292*** (.102)
Joint Democracy	−.527*** (.201)	−.454*** (.213)
Preponderance	.536*** (.150)	.539*** (.166)
Contiguity	−.122 (.097)	−.016 (.116)
Internal Crisis	.071 (.096)	.128 (.107)
Military Trigger	.427*** (.099)	.439*** (.099)
Constant	−.148 (.125)	.300 (.442)
Observations	792	651
McFadden R^2 (Adjusted)	.051(.036)	−
IMR	−	−153 (.121)
Log Likelihood	−495.083	−408.569
AIC	1,006.167	835.138

Note: *P < 0.1; **P < 0.05; ***P < 0.01.