The Disappearance of “Multilateral-Lite” Alliances

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Abstract

Multinational security partnerships with limited political, military, and economic policy coordination – what I call “multilateral-lite alliances” – once dominated regional and global security architectures, leading to both geostrategic stability and major power wars. Yet, despite this historical and theoretical importance, these alliances have gradually disappeared since the mid-20th century, until now only two remain. They are a dying breed. This paper argues that increasingly complex security environments have exacerbated the credible commitment problem. States have responded to this by either upgrading their alliance coordination mechanisms or fostering smaller partnerships. In either case, the conditions under which multilateral-lite alliances can effectively provide security are diminishing, and I use spatial survival analysis to support this argument. The paper has important implications for countries seeking to re-balance their security ties in response to emerging powers like China, Russia, and India.

1 Introduction

Interstate security alliances form a central feature of international relations, being credited with maintaining the balance of power, stabilizing interstate relations, and leading to regional or global order. Scholars have particularly focused on a special class of security partnerships which I term “multilateral-lite” alliances. Composed of three or more countries (and typically including some great powers), these bodies possess few, if any, formal policy coordination mechanisms. But despite this institutional shortcoming, mutual interest in preserving the balance of power or responding to common threats has allowed these partnerships to play a critical role in international security. For example, the Quadruple Alliance was responsible for maintaining peaceful relations among Europe’s leading countries for a significant portion of the 19th century. (Kissinger, 1973; Ikenberry, 2001) Scholars have also turned to the diplomatic and security networks leading to World War 1 to motivate studies of credible commitment, balance of power politics, and the creation of regional and global orders.

Their historical importance notwithstanding, these alliances have become exceedingly rare since World War 2. Although these bodies used to dominate regional and global security architectures, states have opted to enter either smaller or more strongly institutionalized bodies to achieve their military and political goals. Government leaders have apparently lost a once-important foreign policy tool, one that preserved a country’s latitude of action while providing military protection against common threats. Consequently, the central question of my paper is What accounts for the
general decline in the prevalence of weakly institutionalized, multinational alliances as a proportion of all security partnerships?

Understanding this decline is important for both theory and policy. Multilateral-lite partnerships have formed the empirical basis for the most prominent theories of international security.\(^1\) The focus on great powers and limited institutionalization particularly aligns with the realist paradigm and its beliefs concerning the limits of international cooperation. However, the disappearance of multilateral-lite partnerships suggests that certain foundational conditions for international security cooperation have changed. As such, understanding their decline can better illuminate the conditions under which we can appropriately extrapolate from historical cases to guide, for example, theories on entrapment and abandonment (Snyder, 1984), maintaining the balance of power (Waltz, 1979), or how best to foster stable interstate relations (Schroeder, 1976; Ikenberry, 2001; Bearce, Flanagan and Floros, 2006).

In terms of policy, many contemporary decision-makers are considering the establishment of new multilateral-lite alliances to respond to emerging neighbors such as China, India, and Brazil. These associations are attractive largely because their limited institutionalization and weak policy coordination preserve a state’s freedom of action and exact few domestic political costs. However, this article argues that whatever benefits politicians may gain from these agreements, these bodies lack the institutional mechanisms for states to consistently and credibly demonstrate their commitment to alliance goals. Within fairly “simple” security environments (i.e. those marked by low issue density, limited issue interdependence, and infrequent policy adjustments (Wallander and Keohane, 1999)), states can employ other costly signals to demonstrate their resolve and enable cooperation. Within complex security environments, however, security cooperation among multiple states requires stronger policy coordination mechanisms – with higher domestic and international costs – to demonstrate commitment. Consequently, as security challenges have become more complex, multilateral-lite alliances have increasingly failed to prevent abrogations of treaties or violations of agreed terms, leading to their gradual disappearance and replacement by either more strongly institutionalized or smaller security partnerships.

To test this theory, I employ survival analysis, exploring whether multilateral-lite alliances shorten the duration of those security partnerships which terminate due to violations by their members. Moreover, while duration models can effectively account for temporal interdependence (that is, the cumulative effect of different variables across the length of a partnership), my argument’s focus on credible commitment suggests that we must be concerned about unit interdependence. That is, one partner’s decision to abandon an alliance may prompt all other parties to withdrawal as well. Consequently, I employ the spatial survival approach of (Hays and Kachi, 2009) to directly model this interdependence. The statistical analysis draws principally upon Leeds’ Alliance Treaty Obligations and Provisions dataset (Leeds et al., 2002).

The article will proceed as follows. Section 2 will elaborate the central puzzle, and in the process, will also review the relevant theoretical literature on alliance institutional design. Section 3 offers my theory of credible commitment and the particular challenges that multilateral-lite partnerships face and, generally and increasingly, fail to resolve. Section 4 provides the statistical models used to verify my hypotheses, while the final section outlines the policy implications of this argument for contemporary debates about how to effectively manage China’s increasing political and military clout through international security institutions.

\(^1\)These include Kissinger (1973), Waltz (1979), Walt (1987), Christensen and Snyder (1990), and Fearon (1995).
2 The Disappearance of Multilateral-Lite Alliances

I define “multilateral-lite” alliances as security partnerships that are composed of three or more members and are weakly institutionalized. By this latter term, I mean that the organization possesses few – if any – formal, internal coordination mechanisms over the use of military forces and associated political, economic, and foreign policies. What coordination that does occur is typically ad hoc or, at best, takes place during regularly scheduled meetings among a persistent set of government representatives, but without clearly defined rules and procedures. However, these alliances lack permanent coordinating bodies on specific issues (like military production and financing or operational coordination), as well as staff dedicated to the implementation of treaty terms and obligations. This category has included alliances that were historically important for the maintenance of international order. The Quadruple Alliance, for example, defeated Napoleonic France and underpinned the Congress System that maintained European order throughout much of the 19th century. Although the partnership did feature yearly meetings of foreign ministers, decisions were often reached in informal discussions. The system lacked formal decision-making rules and deliberation procedures, and the only staffing available were those of the individual country representatives. The Alliance had no formal headquarters and was largely reactive, responding to various domestic political crises in Europe rather than fostering persistent peacetime policy planning. Similarly, the Triple Entente and Triple Alliance formed the two opposing sides of World War 1. Neither possessed formal policy-making procedures or other coordination mechanisms amongst allies, but they generally maintained European stability until the conflagration of the First World War.

While constituting only 9.5 percent of all security partnerships, multilateral-lite alliances have played a prominent international role in both war and peacetime. Great powers (as defined by the Correlates of War dataset) flock to these partnerships. 82.7 percent of multilateral-lite alliances included at least one of these states (43 of 52), compared to 56.3 percent more generally (303 of 538). In addition, great powers make up 42.5 percent of the membership in these alliances, as opposed to 25.9 percent of other partnerships. Moreover, these security bodies comprised over half of all alliances during the late 1800s.

In addition, multilateral-lite partnerships have served as the empirical foundation for many theories of international security. The alliances leading up to both World Wars have underpinned many realist studies of international security dynamics and warfare, including in discussions about the balance of power (Waltz, 1979), strategic responses to mutual threats (Walt, 1987), and cooperation (and the lack thereof) in moments of international crisis (Van Evera, 1986), as well as figuring into early analysis of alliance credibility and exploitative behavior (Snyder, 1984; Christensen and Snyder, 1990). Institutionalists have focused on the role that these bodies have played in stabilizing regional order. Schroeder (1976) surveys a variety of 18th and 19th century alliances and describes how multilateral-lite bodies can be used to restrain states from entrapping their allies in wars that they would prefer not to fight. Ikenberry (2001) includes the Congress System as a key case study in his analysis of how regional and global orders are created following major wars.

[FIG. 1 ABOUT HERE.]

[FIG. 2 ABOUT HERE.]

[FIG. 3 ABOUT HERE.]

However, despite their historical and theoretical prominence, this class of security partnerships
has fallen out of favor among states. We can gain a clearer picture of their decline using the ATOP dataset. (Leeds et al., 2002) Fig. 1 tracks the proportion of all alliances made up by multilateral-lite partnerships, and Fig. 2 depicts the total number of alliances by year. Starting in the 20th century, these alliances have steadily declined in prevalence, even as the number of security institutions has increased dramatically. In addition, Fig. 3 charts all other alliance organizational types. Despite the decline of multilateral-lite alliances, partnerships with more extensive policy coordination mechanisms have remained a relatively steady proportion of security institutions. Bilateral partnerships with weak policy coordination, however, have increased in number.

Put together, these observations suggest that some underlying process has (gradually) confounded multi-state security cooperation in the absence of extensive policy coordination mechanisms. Thus, this paper asks: What has caused the historical decline of weakly institutionalized, multinational alliances, and only this type of alliance?

Unfortunately, the academic literature on interstate military partnerships, while voluminous, offers limited assistance in explaining this puzzle. Most theories of alliances focus on their creation and purpose, focusing on the reasons why states make international alignments and form or join these bodies. For example, prominent studies have concluded that security partnerships are designed to combine state capabilities against mutual threats (Walt, 1987), maintain the balance of power (Waltz, 1979), share information and reduce intra-allied conflict (Schroeder, 1976; Bearce, Flanagan and Floros, 2006), or create stable and lasting international order (Ikenberry, 2001).

However, the institutional implications of these theories are often quite limited. Analyses in the realist tradition tend to eschew the importance of institutional form on state and alliance behavior. For the institutionalists, Schroeder and Bearce et al separately discuss the role that intra-allied information provisions can play in inhibiting internal conflict. However, they fail to deal more fully with the sheer variety of institutional arrangements states can adopt to achieve those ends, as well as specify under what conditions states may choose particular configurations.

Perhaps the most serious examination of alliance institutionalization is Wallander and Keohane (1999). The authors contend that states face a choice between *ad hoc* security cooperation and investing in institutions. The former is cheaper, but creating formalized alliances, while initially more expensive, ends up lowering the transaction costs of future cooperation. The durability of problems and issue density, they claim, drive institutionalization. For expected duration, the longer a security challenge is expected to last, the greater will be the benefits from lower transaction costs. Issue density refers to the interdependence of policies: Will action in one policy area impose negative security, political, or economic externalities others? If so, they argue that cooperation can achieve economies of scale, by “bundling” various policies together. Moreover, interaction is likely to be repeated in dense policy spaces, increasing the benefits from investing in institutions. Therefore, highly institutionalized alliances, according to Wallander and Keohane, manage externalities and spillovers to enable security cooperation in dense policy environments.

However, even as trade and domestic political configurations are becoming more open and complex, the proportion of highly institutionalized bodies has held relatively steady, contrary to their expectations. More importantly for this paper, Wallander and Keohane’s theory may be unable to account for the decline of multilateral-lite partnerships, for several reasons. Referring back to Figs. 1, the gradual disappearance of these bodies may prompt us to believe that issue density has increased over time. This should lead to a proliferation of alliances with more extensive coordination mechanisms to deal with policy spillovers and thereby enable security cooperation. However, as Fig. 3 depicts, multinational, weakly institutionalized alliances have largely been replaced by
bilateral counterparts. For some reason, and despite increasing trade, diplomatic, and social ties between states over the past two centuries, *ad hoc* security cooperation is still a viable policy option for states, but for two states only. Alliance institutional form appears to be motivated not solely by the management of externalities, but also questions of membership. States therefore have two options when dealing with high issue density: They can build institutions to better address spillovers, or they can reduce the number of partners to simply eliminate many policy externalities.

In considering this tradeoff, states must be concerned with credible commitment. Although they can create policy coordination mechanisms, maintaining a network of bilateral, weakly institutionalized ties may be politically cheaper and just as effective. Decision-makers must therefore be concerned that their counterparts may renege on whatever obligations they make. To remedy this problem, they can either seek to boost policy coordination and secure greater control over allied decision-making (as the French worried was the U.S. intention during the NATO negotiations) or jettison a large organization in favor of bilateral negotiations (as the current Chinese leadership prefers in its discussions of Southeast Asian security). The alliance literature has dealt with this issue in some detail. For example, Leeds, Long and Mitchell (2000) has found that over a quarter of all allies renege on their agreements.

Yet scholars have identified a number of mechanisms by which states can resolve this problem. Diplomats can employ costly signals, on the logic that only countries committed to a particular course of action will pay high costs to demonstrate their resolve. For example, Smith (1995) and Morrow (2000) both claim that the costs associated with domestic ratification of security treaties are a strong demonstration of intent that can be used to deter enemies and reassure allies. Fearon (1994) argues that states can use domestic audience costs to tie their hands. Statesmen can make public declarations of action, and – so long as their political constituencies will punish them for reneging – this will serve to deter opponents by revealing his/her resolve to undertake crisis behavior even at the cost of domestic censure. Dovetailing with this logic, Siverson and Emmons (1991) and Leeds (2003) argue that democracies are more likely to uphold their commitments. Furthermore, Miller (2003), Crescenzi et al. (2009), and Mattes (2010) each suggest different ways in which reputational concerns impel states to fulfill their obligations, although Press (2004/5) accords this factor less weight than a state’s immediate power capabilities.

These signaling methods are based on inherent state capabilities or qualities, and diplomats should presumably be able to use them to demonstrate commitment in many circumstances. Indeed, this appears to be the case with bilateral, weakly institutionalized security partnerships, which form the dominant proportion of alliances. Their proliferation would not have been possible without some guarantees of compliance. Moreover, treaties with formal institutions likely do not need to rely upon these signaling mechanisms, as policy coordination procedures exact various “costs of constraint” (Thompson, 2006) which can be used to demonstrate credibility. However, even as costly signals and institutions continue to be used, multilateral-lite alliances have disappeared. Indeed, the puzzle here is that, even as the number of alliance terminations due to member violations has decreased (See Fig. 5), multilateral-lite partnerships appear to have become more susceptible to these dangers. This observation sharpens the central puzzle of this paper, as we must consider what has caused certain commitment mechanisms to be ineffective within a multinational context. The following section will present a theory that explains this phenomenon and accounts for the decline in multilateral-lite alliances.

[FIG. 5 ABOUT HERE.]
3 Security Interdependence, Commitment, and the Decline of Multilateral-Lite Alliances

My argument, in brief, is that complex security environments undermine the effectiveness of many costly signaling mechanisms. States have responded to this by either formalizing their alliances’ policy coordination processes or reducing their size. To understand why, we must unpack three assumptions upon which the costly signaling logic rests. First, the signal must be mutually recognized as costly (and significantly and sufficiently so) by all parties. The sending party could in actuality be paying a substantial amount, but the receiving party may not always recognize those costs as a legitimate signal. It is possible that negotiating over what constitutes a costly signal could itself impose some challenges for interstate cooperation. But, so long as mutual recognition holds, countries can use reputational concerns, domestic ratification, and audience and policy costs to tease out the motivations of their counterparts and thereby initiate alliances, even within a multinational context.

Second, there are unexplored assumptions of capacity, overuse, and scale. States using audience and policy costs or reputational stakes pay a significant price to commit to a policy with sizable downside costs (and potentially benefits). Still, although these mechanisms could conceivably be used multiple times on different, or perhaps even the same, issues, it is unclear how frequently these tools can be used. How many policy positions can be tied to a state’s reputation, for example, before other states begin to doubt the sincerity of the signal? How many policy positions can domestic audiences reasonably be expected to remember and track under the audience cost logic? Moreover, these instruments are fairly blunt. In conditions requiring many small, but cumulative, policy adjustments, the cost of these mechanisms may outweigh the benefits from increased credibility. Not every decision needs the force of domestic ratification behind it (as one example), but international partners would still be more inclined to cooperate if they received some small demonstration of intent.

Third and finally, state action is assumed to be determined by an underlying motivation or game theoretic “type.” So long as other countries can determine a state’s underlying preferences, they can be assured that that state will behave in certain, predictable ways. Another way of describing this is that behavioral incentives are sufficiently static so that the revelation of type – and only that issue – is sufficient to determine a potential ally’s level of resolve and subsequent behavior. Consequently, when signals are mutually recognized and valued, if congestion is not an issue, and when incentives are stable, then the mechanisms described above can act as unambiguous signals of intent, even amongst multiple states. In these cases, security cooperation can occur simply by states agreeing to their individual and collective actions and obligations, then providing a costly signal to satisfy their partners’ apprehensions.

Complex security environments disrupt these conditions in at least three ways. First, as Wallander and Keohane discuss, high issue interdependence causes adjustments in one policy area to have subsequent and significant effects on other issues of foreign or domestic importance. Military, political, technological, and economic factors can combine in novel ways such that a complete, detailed, and effective security response is difficult – if not impossible – to develop in advance. States will have a more difficult time determining what the likely effects and costs of any particular policy choice are, and therefore the value of costly signals is attenuated as it is unclear what exactly is being agreed to. If new information comes to light, later adjustments to policy may not be backed by a costly commitment. Second, states may also face circumstances requiring many (often small)
policy accommodations in rapid succession. The pace and number of necessary policy adjustments may strain these mechanisms, as either too many issues are charged to domestic audiences, for example, or the cost of domestic ratification outweighs the gains in credibility.

Finally, this commitment problem can persist when security environments are highly fluid. Even if all members have agreed to a set of optimal alliance obligations and individual policies to meet those obligations, highly fluid security environments can change incentives such that a state may find it beneficial to either renege on its commitment or alter the policies it agreed to implement. Knowing a partner’s type is no longer a guarantee of its action, as it faces time-inconsistent incentives to agree to particular obligations in an initial period, only to renege on them once conditions have changed. For example, consider France’s early relationship with NATO. It initially demanded significant economic and military concessions – chiefly from the U.S. – for its participation in the Treaty. In exchange, it reluctantly agreed with the wider Allied interest in rehabilitating and rearming West Germany, and its territory served as the primary theater of NATO logistics and operations. However, after sufficient troops were placed in West Germany, in 1966 the French withdrew from the alliance’s command structure, reduced its political commitment with the Atlantic Council, and took greater control over any NATO infrastructure on its soil. It did so secure in the knowledge that it could gain the benefits of Allied protection without having to pay the political and economic costs of coordinated action. The Warsaw Pact was unlikely or unable to make a selective strike just on France, and NATO would likely be compelled to respond in any event.

Note that complexity is independent of an alliance’s membership size. The signaling mechanisms described above are perfectly suited to environments with stable incentives or slow decision and response cycles. States have few incentives to renege on their obligations after paying the costs of commitment, while domestic audiences can more easily monitor changes to policy and update their expectations of success. Within complex environments, however, having more members exacerbates the credible commitment challenge. Policy concessions to one partner may create political problems for another, while adjustments to constantly shifting incentives may stretch the capacity of domestic constituencies. In a bilateral context, these problems are attenuated. Monitoring and verification is generally easier among a reduced number of partners.²

In sum, this paper argues that the increasing complexity of security environments has caused greater problems for credible commitment in alliances. Some alliances have established formal policy coordination mechanisms to address this challenge, using the various costs of constraint and regular meetings to flexibly signal resolve and handle the velocity of necessary policy adjustments. In the absence of these decision-making procedures, other alliances have reduced their size to limit the externalities with which they must contend. In either case, states have fled from multilateral alliances because these bodies lack the institutional means to adequately solve the credible commitment problem amidst more fluid and complex security environments. We should thus expect that these partnerships are particularly bad, relative to other alliance organizational types, at preventing member defections and violations of agreed commitments.

²It should also be noted that many bilateral, weakly institutionalized alliances are created for the domestic political benefits they confer, rather than any interstate goal. These may also have less need for strong signaling, as discussed in Kuo (2012).
4 Research Design and Results

4.1 Design of Statistical Inquiry

A key implication of my argument is that members of multilateral-lite partnerships face greater incentives to violate their agreements than if they were participating in an alliance with alternative organizational forms. If the theory is correct, we should expect to see these treaties terminate due to member violations (and not due to more “positive” reasons like successful completion of their goals) more often than other alliance types. Consequently, the main hypothesis being tested in this paper is:

Hypothesis: Ceteris paribus, multinational, weakly institutionalized alliances will lead to higher levels of partnership failure due to violations of obligations by members, relative to all other alliances.

This section presents statistical evaluations of this hypothesis, drawing primarily from the ATOP dataset, which was used to generate many of the graphs presented above. ATOP represents a significant advance over the Correlates of War alliance database. The newer dataset provides extensive detail on the organizational and purposive characteristics of 538 alliances formed between 1815 and 2003. Although it is impossible to be certain that all alliances are accounted for, the dataset represents the most comprehensive categorization of security partnerships available. This study’s primary explanatory variable of interest is a dichotomous measure of a multilateral-lite alliance. These are defined as ATOP security partnerships which 1) have more than two members and 2) possess, at most, regular though informal meetings between government officials to manage the alliance. As a result, they do not encompass partnerships run by named management bodies with regularly scheduled meetings or permanent bureaucracies.

I employ duration models to test the underlying causal mechanism of my theory. Survival analysis is particularly useful for this question, as they can account for the cumulative effect of past political decisions and factors on alliance behavior. The unit of analysis for this approach is the alliance-member, meaning that each observation corresponds to one participant in one alliance. Therefore, individual states enter into the dataset once for each alliance in which they participate. The dependent variable for my models is an alliance’s time to failure, with failure occurring when an alliance terminates due to a member violating its treaty obligations. Partnerships that end for other reasons (for example, due to the successful completion of its objectives, a renegotiation of commitments among members, or if a member loses its political independence and can no longer participate) are treated as right-censored. The focus here is purely on whether institutional mechanisms can ensure that states fulfill their stated responsibilities and agreements.

The key explanatory variable is participation in a multilateral-lite alliance, as previously defined. The theory would expect that this institutional form increases the likelihood of member violations and therefore shortens the duration of security partnerships. In addition, a country’s level of Military Expenditures is included, as states which possess greater military capabilities can be expected to rely upon outside assistance less than their weaker counterparts. This variable is drawn from the Correlates of War dataset (Singer, Bremer and Stuckey, 1972), and, like all the variables here, its temporal range stretches from 1816 to 2003.

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3In the ATOP dataset, this is the TERM variable, with values equal to 2.
From the same dataset, *Energy Consumption* serves as a proxy for technology. The increasing complexity of security challenges could simply be a function of technological or mechanical changes, in that the production of modern military equipment requires advanced processes and integrated supply chains, all of which place greater demands on a country’s economy and political structure. (Barnett and Wendt, 1992; Biddle, 2004) However, it is *a priori* unclear whether technology facilitates or complicates security coordination. On the one hand, more efficient and widespread communication networks allow for easier cooperation across countries. On the other hand, the increasing lethality of modern weapons, and the consequent need for smaller, independently operating combat teams, suggests that effective coordination requires more, and more widespread, investment.

*Polity* scores are included given the importance of domestic institutions for the use of audience and policy costs. Ideally, the inclusion of this variable ensures that any effects of a multilateral-lite alliance are isolated from these other costly signaling mechanisms. I also control for three sources of interstate interdependence which may provide countries with better or worse outside options to alliance violations.\(^4\) The first are diplomatic connections. Extensive and deep political ties with many countries provides statesmen with greater flexibility in their alliance choices. They face fewer constraints should they abandon their allies, as they might be able to more easily find alternative security arrangements. However, their wider political networks may constrain alliance violations, as they might suffer larger reputational costs. *Diplomatic Centrality* is constructed using the social network analysis concept of degree centrality. (Wasserman and Faust, 1994) For each state, I sum the level and strength of its diplomatic connections, then divide that by the total value of all connections within the system for a given year.\(^5\)

The second is *Trade*. Large interstate economic and financial ties could provide countries with alternative sources of strategically important resources. However, unlike purely diplomatic connections, dense economic relationships often cause important domestic actors to acquire strong interests in seeing particular interstate linkages continue. Consequently, extensive ties may make it more difficult for security partners to break out of a multilateral-lite alliance. The third and final measure is *Geographic Centrality*, constructed much like diplomatic centrality. States sharing sea and land borders with a large number of neighbors may be able to opportunistically create balancing coalitions against or with particular neighbors. Consequently, geographically central states may suffer fewer costs from fluidly switching allegiances.

In sum, the explanatory variables and their sources are listed below. Summary statistics are presented in Table 1.

1. *Alliance*: A dichotomous measure of whether the state is participating in a multilateral-lite security partnership.

2. *Military Expenditures* (logged): Correlates of War dataset (Singer, Bremer and Stuckey, 1972);

3. *Energy Consumption* (logged): Correlates of War dataset (Singer, Bremer and Stuckey, 1972);

4. *Polity*: Polity2 score of political freedom, Polity IV;

5. *Diplomatic Centrality*: Constructed from Correlates of War dataset (Bayer, 2006);

\(^4\)All three are drawn from the Correlates of War dataset. (Singer, Bremer and Stuckey, 1972; Bayer, 2006)

\(^5\)Note, however, that the COW authors only observe diplomatic connections once every five years. Consequently, a particular country’s diplomatic centrality is that of its nearest, preceding COW observation year.
6. Geographic Centrality: Constructed from Correlates of War dataset (Singer, Bremer and Stuckey, 1972);

7. Trade (logged): Total national trade, Correlates of War dataset.

We might expect that the pressures for alliance failure to accumulate over time, as the weight of small violations, political impasses, and bureaucratic roadblocks exacts an ever increasing toll on a member’s actions and policies. As such, it seems appropriate to assume a Weibull distribution for the hazard function, modeling the increasing likelihood of failure across time.

In addition, I present three models for my foundational analysis. Although survival analysis accounts for temporal interdependence, my theory is explicitly concerned with state expectations about their partners’ behavior. In particular, a state’s decision to remain in an alliance depends heavily on whether its partners do so as well. A violation by one member may lead to a cascade of withdrawals, leading to interdependence in alliance duration decisions. Consequently, while Model 1 is a standard Weibull survival model, I gradually introduce corrections to address this unit interdependence through Models 2 and 3, with the latter directly modeling this interdependence and serving as my preferred analytical approach.

4.2 Statistical Results

As mentioned, Model 1 is a standard Weibull distributed survival model, serving as a baseline for analysis, with the results presented in Table 2. The first result of note is the logged scale parameter, which is statistically different from zero. This suggests that it is appropriate to assume an increasing hazard function like the Weibull distribution. Second, my main variable of interest, participation in a multilateral-lite alliance, has the theoretically-expected negative sign, but is well under significance (p-value > 0.459). States are no more likely to renege on their commitments and cause alliance failures in these partnerships versus others. Turning towards other controls, higher military expenditures, as expected, lead to an additional 2.8 percent chance of failure due to member violations, on average, while energy consumption (as a proxy for technology) has positive though insignificant effects. This last point in particular calls into question Thies (2009), who argues that alliances have become more rigid and seen fewer failures due to advances in military technology.

Of the three forms of interstate dependence, trade is positive and significant, but has only a small effect. Both diplomatic and geographic centrality decrease alliance longevity. This suggests that, although these states may suffer from higher reputational costs for reneging, countries possessing wider alignment options are more likely to violate their existing agreements.

Model 1 fails to reject the null hypothesis, providing initial support to disprove my theory. However, my argument focuses on a state’s expectations about its partners’ behavior. This introduces a level of unit interdependence for which Model 1 does not account. Unit interdependence can occur in at least two ways. The first is what I call relational interdependence. We might expect that states decide to violate their obligations depending on their political, economic, military, or even social standing relative to other alliance partners. Weak states in an alliance populated by great powers may have fewer incentives to renege, as they will find it more difficult to foster equivalently effective
security relations with other states. Alternatively, their partners may impose constraints on their participation (and possess the resources to enforce these constraints), reducing the foreign policy autonomy of weaker states. Finally, agreements among politically similar countries appear to face less domestic opposition.

Models 2 attempts to address this form of unit interdependence and, in so doing, provide stronger support for my theory. It adds a number of relational variables capturing each state’s relative affinity to its alliances. That is, for each security partnership, I find the average Polity2 score, trade level, diplomatic centrality, energy consumption, and military expenditure of its members. Then, I calculate the difference between each member’s values and the alliance average. Coefficients on these “relational” variables can then be interpreted as how much an increase in the gap between a state and its alliance average contributes to the partnership’s duration beyond the baseline hazard. Ideally, this controls for the first form of unit interdependence described above, and summary statistics for these variables are presented in Table 3.

1. Military Expenditures (relational): Correlates of War dataset (Singer, Bremer and Stuckey, 1972);
2. Energy Consumption (relational): Correlates of War dataset (Singer, Bremer and Stuckey, 1972);
3. Polity (relational): Polity2 score of political freedom, Polity IV;
4. Diplomatic Centrality (relational): Constructed from Correlates of War dataset (Bayer, 2006);
5. Trade (relational): Total national trade, Correlates of War dataset.

Model 2 provides somewhat stronger support for my theory. Again, multilateral-lite alliances have the theoretically-appropriate sign, leading to a 17 percent increase in agreement failure. However, the p-value, though marginally stronger, is still insignificant at 0.444. As before, military expenditures and geographic centrality all positively contribute to state violations, while technology now significantly boosts compliance. Interestingly, the effect of diplomatic centrality has decreased in significance, while the effect of its relational counterpart suggests that “less popular” states within an alliances are 8 percent more likely to remain within their partnerships. Politically similar allies contribute to compliance, as do more open polities, suggesting that the “one-shot” costly signaling mechanisms have some mild effects on credibility.

While a step in the right direction for my theory, Model 2 still leaves unaddressed the most important form of unit interdependence for my theory, what I term spatial interdependence. A microfoundation of my argument is that states make decisions about alliances based on the expectations and actions of their partners. They take violations of obligations as indicative of a wider lack of resolve. Consequently, even if controlling for the relative position of each state in an alliance, we must still be concerned about the interdependence of their decision, the cycle of action and response. More concretely, states will only remain in an alliance if their partners do. If one country leaves, other states may also withdraw around the same time. In the case of both CENTO and SEATO, for example, defections by one member soon led to the complete dismemberment of the partnerships. Weaker states can join with great powers for protection against a more pressing security concern (David, 1991). However, if other members begin to leave an alliance, it is a strong signal that the underlying mutual interests may no longer exist. In addition, the gains from alliance
aggregation (Lake, 1999; Bensahel, 2007) diminish with fewer members, boosting the incentives to depart or renege on commitments.

Consequently, Model 3 employs the Full Information Maximum Likelihood (FIML) estimator by Hays and Kachi (2009) for a spatial survival model. This approach explicitly models the interdependence of member participation decisions, and, in subsuming the effects of both Models 1 and 2, serves as the principal set of results for this paper. Hays and Kachi’s approach relies upon the Weibull distribution, previously verified in Model 1 to be an appropriate assumption. In addition, it has the advantage over similar methods (notably, Boehmke, Morey and Shannon (2006); Boehmke (2006); Fukumoto (2009)) in that unit interdependence is not restricted to a particular range, and the method appears better able to handle smaller datasets. The structural form of the FIML spatial survival model is:

\[ y = \rho Wy + X\beta + \lambda^{-1}\epsilon \] (1)

\[ \epsilon = \lambda[(I - \rho W)y - X\beta] \] (2)

Estimation is conducted via maximum likelihood. After manipulation to isolate the dependent variable on the left-hand side, the log-likelihood function is derived through the change-of-variables method, resulting in the following estimation equation:

\[ \log(Y) = -\lambda[(I - \rho W)Y - X_i\beta] - \epsilon^{-\lambda[(I - \rho W)Y - X_i\beta]} \] (3)

The key difference between this model and a standard Weibull model is the \( \rho Wy \) term in Eq. 4.2. \( W \) is a weighting matrix delineating the level of spatial connection between units. \( Y \) is the dependent variable, and \( \rho \) is a parameter to be estimated, capturing the overall effect of unit interdependence on alliance duration. As such, \( \rho Wy \) directly models the influence of your partners’ decisions (in this case, withdrawing from an alliance due to violations) on your own decision to do the same. Other coefficients can then be interpreted as the effect of their variables independent of how an individual state’s decisions will send policy “shocks” to their partners. As before, the unit of observation is the member-alliance, and units are considered spatially related if they participate in the same alliance. All the explanatory variables from Model 2 are included.

The first result of note is that the spatial parameter, \( \rho \), is positive and significant, suggesting that state decisions about alliance participation depend on their partners’ behavior. After accounting for this unit interdependence, multilateral-lite alliances have a strongly significant and negative effect
on treaty duration, resulting in a 44.1 percent drop in compliance versus other types of alliances. Taken together, this finding implies that multinational, weakly institutionalized partnerships lack the means to effectively coordinate and maintain participation amongst their members. Unlike, for example, NATO, which survived the withdrawal of a key state (France) because alliance institutions enabled members to renegotiate their commitments, this class of alliance has more difficulty in preventing one state’s defection from cascading into a general departure.

For the other variables, military expenditures lose some of their significance, but remain important as just above the 10 percent level (p-value > 0.109). Interestingly, trade and political openness are no longer significant, although participating in an alliance among politically similar allies continues to enhance duration. This suggests that it is not so much domestic institutions which drive costly signaling, but rather the similarity of those institutions across partners. This may provide some credence to democratic peace theory, (Doyle, 1983; Russett and Maoz, 1993; Owen, 1994) which argues that democracies do not fight each other.

Finally, greater diplomatic connections promote alliance longevity, suggesting that these states suffer higher reputational costs for defection and leading them to remain within alliances longer. Accounting for interdependent durations presumably captures some of the reputational cost suffered by a defector against its former allies. As a result, the coefficient on diplomatic centrality accounts for the effects of diplomatic connections on non-alliance partners, which serve to enforce compliance. In addition, while a state’s level of technological advancement does not significantly contribute to alliance duration, partnerships between technologically disparate countries appear to survive longer.

Consequently, while Models 1 and 2 do not support my argument, I weight Model 3’s results more strongly as it directly incorporates my theory’s focus on the interdependence of state decisions on alliance participation. In the progression from Models 1 through 3, my key variable of interest maintains the theoretically expected sign and increases in significance. Moreover, due to the cumulative structure of my approach, the fact that multilateral-lite alliances only gain significance once we control for spatial interdependence (and not just relational interdependence) provides strong support for my proposed causal mechanism. Finally, chi-squared tests of the log-likelihoods of Models 2 and 3 reveal the latter to be a stronger fit for the data.

### 4.3 Robustness Check

To further support my argument, I divided the ATOP dataset between those states joining an alliance during 1815–1899 and those joining from 1900 onwards. If my assumptions about the increasing complexity of security environments are correct, we should see multilateral-lite alliances having a neutral or even positive effect on member participation during the earlier period, as costly signaling mechanisms can still adequately solve the credible commitment problem. However, we should expect negative effects in the latter period, as increasing complexity undermines the assumptions upon which those mechanisms are based. Table 4 presents the results of four models. Models 4 and 5 are standard Weibull survival analyses for pre-1900 alliances and post-1900 alliances, respectively, while Models 6 and 7 are the spatial versions. All models include the covariates from Model 2.

[TABLE 4 ABOUT HERE.]

As anticipated, multilateral-lite alliances have a significant and positive effect on alliance durability prior to the 20th century, while negative (although less significant) effects in more modern times.
However, after accounting for spatial interdependence, we find that multilateral-lite partnerships decrease duration even during the 19th century, which is problematic for this robustness test. That said, these results are still supportive of my theory overall, as the negative effects of these alliances increases after 1900. As seen from the relative hazard ratios, 20th-century multilateral-lite treaties experience a 32.28 percent increase in their hazard rate. As before, the spatial parameter $\rho$ is also positive and significant, suggesting that other alliance studies must take greater account of unit interdependence.

The contrasting models also provide other interesting results. Looking at the spatial approaches, the level of political openness is only significant in the earlier period, although it does appear to increase longevity. Diplomatic centrality gains significance across time and extends partnership duration, while geographic centrality shifts from preventing alliance violations to enabling them. Combined with the coefficients on energy consumption, these patterns suggest that technology has had a destabilizing effect on international partnerships. While distance used to allow for stronger commitments, technology has provided additional outside options for governments. Interestingly, while the relational forms of the Polity and military expenditure variables are significant during the 19th century, only relative trade is significant in the 20th. In addition, it appears to decrease alliance duration.

5 Conclusion

The key remaining question for this analysis is what is causing the increasing complexity in security environments and, thus, the decline of multilateral-lite alliances. Thies (2009) has suggested that technology, and particularly those concerned with logistics and mobilization, were instrumental in changing alliances from loose alignments of great powers into much tighter and more institutionalized partnerships addressing both military and non-military issues. During the 18th and 19th centuries, mobilization, transportation, and operational preparation were slow affairs, allowing statesmen to adjust policies and signals relatively leisurely. With the advent of faster communications, logistics, and transport options, states required more extensive contingency planning among their allies to quickly match their adversaries’ mobilization and preparation speed. Moreover, cooperation extended not only to military affairs, but also financing, production, and public support. The denser web of interstate ties should lead to greater rigidity in alliance membership, as states seek to extract firmer demonstrations of resolve from their partners in order to successfully coordinate amidst quite fluid security environments. Indeed, as seen in Fig. 5, violations of member obligations have generally declined over time.

While not explicitly addressing this paper’s question, Biddle (2004) might concur with Thies’s assessment. However, he might point to the effects of the “modern system” on domestic social and political structures and stability. Because modern operations and tactics carry greater social, economic, and political costs than previous systems, statesmen must align a sufficient proportion of domestic groups behind an alliance to ensure that a security partnership will last. Likewise, Wallander and Keohane (1999) suggest that non-technological factors – like deeper, more interpenetrated state-society relations – may be the cause.

This study leaves it to future research to determine precisely what has led to more complex security environments. The evidence presented above suggests that this historical shift has led to the gradual decline of multilateral-lite alliances during the 20th century. While these partnerships were previously employed by great powers to maintain regional and global security architectures,
credible commitment problems have become sufficiently complex that more formalized policy co-
ordination procedures or smaller alliances are needed to effectively impel states to abide by their 
treaty obligations.

This paper advances the theoretical treatment of alliances in several ways. First, it draws renewed 
attention to the importance of organizational form in alliance studies and international security 
more generally. The rational design of institutions and its implications have been studied extensively 
in international economics (Bagwell and Staiger, 1999; Rosendorff and Milner, 2001), as well as 
covering more general issues like the breadth-depth trade-off (Downs, Rocke and Barsoom, 1998; 
Gilligan, 2004), the conditions under which states will work through institutions (Keohane, 1984; 
Abbott and Snidal, 1998), and the functions that institutions perform (Chayes and Chayes, 1995; 
Von Stein, 2005). Unfortunately, this avenue of research has largely bypassed security studies more 
generally and the subject of alliances specifically (albeit with some notable exceptions (Haftendorn, 
Keohane and Wallander, 1999; Kydd, 2001; Lake, 2001)).

Second, it complicates the alliance literature’s recent focus on costly signaling mechanisms. Though 
studies in this vein have no doubt contributed to our understanding of how domestic political 
dynamics affect interstate partnerships, this article suggests that the effectiveness of audience costs 
or reputational concerns is constrained by wider factors in the security environment. Complex 
security challenges demand more flexible and nuanced signaling mechanisms, and scholars should 
instead probe the variety of institutional arrangements states adopt to cope with these problems. 
Third, although many alliance theories assume some form of unit interdependence, it is too often 
ignored in the empirical analysis. This study demonstrates that spatial models can and should 
be used to obtain more efficient and accurate estimates of quantities of interest related to alliance 
dynamics.

These theoretical issues gain even more importance due to the policy implications of my argument. 
To focus on just one example, Asian countries are currently re-evaluating their security, diplomatic, 
and financial ties to best accommodate China’s growing economic and political clout. They have 
pursued two separate responses. The first is embodied by the ASEAN Regional Forum (ARF), a 
military consultative organization conducted largely through informal, off-the-record discussions. 
Any joint action requires consensus, meaning that allied decisions are typically weak and involve 
general agreements on approach over such issues as the South China sea dispute, rather than 
concrete policy steps each member will take. In this regard, the ARF is structured and acts 
very much like a multilateral-lite security partnership. According to Johnston (1999), these low 
commitments ensure that Beijing participates, with the hope that that very participation will 
regularize relations and ensure a “peaceful rise” by enmeshing China in non-confictual norms of 
behavior. Facing a depth-breadth tradeoff, bodies like the ASEAN Regional Forum (ARF), as well 
as a proposed northeast Asian security group based on the Six-Party Talks, opt for the latter to 
ensure that critical actors at least join in security discussions. They rely upon a gradual socialization 
process to promote greater cooperation in regional military affairs.

The alternative approach is perhaps best characterized by the 2011 American “pivot” to bolster ties 
to Asia. After a decade focused on wars, natural resources, and social upheaval in the Middle East, 
U.S. policymakers in late 2011 announced a renewed focus on its foreign policy towards the Asia-
Pacific region. This initiative included a variety of economic and trade deals (the most prominent 
being the Trans-Pacific Partnership) and – more pertinently for this analysis – a reinvigoration of 
American security ties. Built upon the network of formal, strongly institutionalized, bilateral ties 
between the U.S. and its traditional allies (e.g. Japan, South Korea, Taiwan), the pivot strengthens 
the American military presence and security coordination among a wider group of regional states.
The approach is both multinational and strongly institutionalized, with the introduction of new policy discussion and joint decision-making apparatus. Notably, China has expressed caution and a decided lack of interest in participating in any of these initiatives, marking a strong contrast with the multilateral-lite, ARF option.

This paper’s analysis suggests that, between the two, the American version offers a more credible path to regional security. China has and will continue to present a complex, multifaceted challenge to its immediate region and the globe. Its rise has had both positive and negative effects, particularly on its neighbors with whom it shares extensive trade, cultural, and political ties. Beijing therefore has ample opportunities and incentives to violate treaty obligations and seek out better terms, particularly within bilateral negotiations. To manage this complex set of incentives and challenges, any Asian security architecture should possess policy coordination mechanisms and decision-making procedures strong enough to screen states to ensure they will abide by their commitments, add institutional “teeth” to monitor their behavior, and provide flexible mechanisms to deal with new and unexpected issues and obligations. Even though this may come at the cost of painful political tradeoffs or China’s absence from the discussions, more robust policy coordination – as offered by the U.S. approach – is a stronger means of ensuring credible action and security in the Asia-Pacific region.
References


Figure 1: Proportion of Multilateral-Lite Alliances, 1815-2003 (Out of All Alliances)
Table 1: *Summary Statistics for Model 1 Variables.*

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. of Obs.</th>
<th>Mean</th>
<th>S.D.</th>
<th>Min</th>
<th>25th Percent.</th>
<th>Median</th>
<th>75th Percent.</th>
<th>Max</th>
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</thead>
<tbody>
<tr>
<td>Multilateral-Lite Alliance</td>
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<td>0.39</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
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<tr>
<td>Polity Score</td>
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<td>7.28</td>
<td>-10</td>
<td>-7</td>
<td>-1</td>
<td>8</td>
<td>10</td>
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<tr>
<td>Trade (log)</td>
<td>1388</td>
<td>7.63</td>
<td>2.49</td>
<td>-0.22</td>
<td>5.86</td>
<td>7.36</td>
<td>9.43</td>
<td>13.63</td>
</tr>
<tr>
<td>Diplomatic Centrality (log)</td>
<td>1429</td>
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<td>-4.19</td>
<td>-3.63</td>
<td>-2.55</td>
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<tr>
<td>Geographic Centrality (log)</td>
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<td>-2.71</td>
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<td>-3.28</td>
<td>-2.76</td>
<td>-2.15</td>
<td>-0.69</td>
</tr>
<tr>
<td>Military Expenditures (log)</td>
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<td>3.07</td>
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<td>10.08</td>
<td>12.38</td>
<td>14.59</td>
<td>19.21</td>
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<td>Energy Consumption (log)</td>
<td>1506</td>
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<td>7.6</td>
<td>9.78</td>
<td>11.56</td>
<td>14.85</td>
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</table>
Table 2: Survival Model Results, Pooled Data. Dependent Variable: Alliance duration until failure due to violation of member obligations. All models assume a Weibull distribution on the hazard curve with the unit of observation being the member-alliance. Model 1 fits a standard duration model, while Model 2 does the same and adds a number of relational variables, as described above. Model 3 is a spatial survival model. Each model presents the variable coefficient and relative hazard.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Coef.</th>
<th>Hazard</th>
<th>Model 2</th>
<th>Coef.</th>
<th>Hazard</th>
<th>Model 3</th>
<th>Coef.</th>
<th>Hazard</th>
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<td>.</td>
<td>-0.557</td>
<td>0.522</td>
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</tr>
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<td></td>
<td>(0.027)</td>
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<td></td>
<td>(0.026)</td>
<td>(0.216)</td>
<td></td>
<td>(0.092)</td>
<td>(0.087)</td>
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<td>0.01</td>
<td>0.014</td>
<td>.</td>
<td>-0.011</td>
<td>0.01</td>
<td>**</td>
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<tr>
<td></td>
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<td>(.002)</td>
<td></td>
<td>(.002)</td>
<td>(.014)</td>
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<td>(.006)</td>
<td>(.006)</td>
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<td>Trade (log)</td>
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<td>0.755</td>
<td>***</td>
<td>0.063</td>
<td>-0.059</td>
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</tr>
<tr>
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<td>(0.053)</td>
<td></td>
<td>(0.011)</td>
<td>(0.059)</td>
<td></td>
<td>(0.037)</td>
<td>(0.035)</td>
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<tr>
<td>Diplomatic Centrality (log)</td>
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<td>0.274</td>
<td>*</td>
<td>-0.119</td>
<td>2.269</td>
<td>***</td>
<td>0.245</td>
<td>-0.229</td>
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<td>(0.06)</td>
<td>(0.056)</td>
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<td>Geographic Centrality (log)</td>
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<td>0.672</td>
<td>***</td>
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<td>-0.165</td>
<td>0.154</td>
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<tr>
<td></td>
<td>(0.022)</td>
<td>(0.148)</td>
<td></td>
<td>(0.022)</td>
<td>(0.254)</td>
<td></td>
<td>(0.06)</td>
<td>(0.057)</td>
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</tr>
<tr>
<td>Military Expenditure (log)</td>
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<td>0.189</td>
<td>***</td>
<td>-0.051</td>
<td>1.426</td>
<td>***</td>
<td>-0.012</td>
<td>0.011</td>
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<tr>
<td></td>
<td>(0.008)</td>
<td>(0.052)</td>
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<td>(0.009)</td>
<td>(0.083)</td>
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<td>(0.029)</td>
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<tr>
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<td>.</td>
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<td>0.815</td>
<td>***</td>
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<td>(0.03)</td>
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<tr>
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<td>.</td>
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<td>-0.017</td>
<td>.</td>
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<td></td>
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<td>(0.052)</td>
<td>(0.049)</td>
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</tr>
<tr>
<td>Diplomatic Centrality (Rela.)</td>
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<td>0.359</td>
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<td>0.048</td>
<td></td>
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<tr>
<td></td>
<td>(0.031)</td>
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<td>(0.091)</td>
<td>(0.085)</td>
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<tr>
<td>Military Expenditures (Rela.)</td>
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<td>0.781</td>
<td>***</td>
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<td></td>
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<td>(0.059)</td>
<td></td>
<td>(0.038)</td>
<td>(0.036)</td>
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<tr>
<td>Energy Consumption (Rela.)</td>
<td>-0.018</td>
<td>1.129</td>
<td>0.081</td>
<td>-0.076</td>
<td>*</td>
<td></td>
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<tr>
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<td>(0.086)</td>
<td></td>
<td>(0.036)</td>
<td>(0.034)</td>
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<tr>
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<td>1.74</td>
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<td>***</td>
<td>9.306</td>
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<tr>
<td></td>
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<td>(1.014)</td>
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<td>(0.103)</td>
<td>(8.71e-6)</td>
<td></td>
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<tr>
<td>Scale (logged)</td>
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<td></td>
<td>1.932</td>
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<td></td>
<td>1.068</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.055)</td>
<td></td>
<td></td>
<td>(0.055)</td>
<td></td>
<td></td>
<td>(0.027)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \rho )</td>
<td>0.003</td>
<td>***</td>
<td></td>
<td>(.0004)</td>
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</table>

\[ \text{N = 1015} \] \[ \text{N = 1015} \] \[ \text{N = 1015} \]

*** P<0.001, ** P<0.01, * P<0.05, . P<0.1
Table 3: Summary Statistics for Additional Variables Introduced in Model 2. These variables capture the difference between a member’s value for the base variables summarized in Table 1 and the average values within the alliance it is participating in.

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. of Obs</th>
<th>Mean</th>
<th>S.D.</th>
<th>Min</th>
<th>25th Percent.</th>
<th>Median</th>
<th>75th Percent.</th>
<th>Max</th>
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</thead>
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<td>0</td>
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<td>12.76</td>
</tr>
<tr>
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<td>-0.85</td>
<td>0</td>
<td>0.84</td>
<td>6.68</td>
</tr>
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<td>0</td>
<td>0.56</td>
<td>-3.68</td>
<td>-0.23</td>
<td>0</td>
<td>0.28</td>
<td>1.66</td>
</tr>
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<td>Military Expenditures (Rela.)</td>
<td>1442</td>
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<td>-1.02</td>
<td>0</td>
<td>0.95</td>
<td>8.14</td>
</tr>
<tr>
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<td>1506</td>
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<td>2.11</td>
<td>-9.1</td>
<td>-1.23</td>
<td>0.03</td>
<td>1.22</td>
<td>8.5</td>
</tr>
</tbody>
</table>
**Table 4: Standard and Spatial Survival Models for Pre-1900 Alliances (Models 4 and 6) and Post-1900 Alliances (Models 5 and 7).**

Dependent Variable: Alliance duration until failure due to violation of member obligations.

<table>
<thead>
<tr>
<th></th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-1900, Standard</td>
<td>Post-1900, Standard</td>
<td>Pre-1900, Spatial</td>
<td>Post-1900, Spatial</td>
</tr>
<tr>
<td><strong>Alliance</strong></td>
<td><strong>Coef.</strong></td>
<td><strong>Hazard</strong></td>
<td><strong>Coef.</strong></td>
<td><strong>Hazard</strong></td>
</tr>
<tr>
<td></td>
<td>(0.039)</td>
<td>(1.259)</td>
<td>(0.028)</td>
<td>(0.193)</td>
</tr>
<tr>
<td></td>
<td><strong>0.126</strong></td>
<td><strong>-3.505</strong>*</td>
<td><strong>-0.049</strong></td>
<td><strong>0.335</strong></td>
</tr>
<tr>
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<td>(0.039)</td>
<td>(1.259)</td>
<td>(0.028)</td>
<td>(0.193)</td>
</tr>
<tr>
<td><strong>Polity</strong></td>
<td><strong>0.028</strong></td>
<td><strong>-0.774</strong>*</td>
<td><strong>0.012</strong></td>
<td><strong>-0.082</strong>*</td>
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<tr>
<td></td>
<td>(0.007)</td>
<td>(0.255)</td>
<td>(0.002)</td>
<td>(0.016)</td>
</tr>
<tr>
<td><strong>Trade (log)</strong></td>
<td><strong>-0.804</strong></td>
<td><strong>22.297</strong>*</td>
<td><strong>0.026</strong></td>
<td><strong>-0.182</strong>*</td>
</tr>
<tr>
<td></td>
<td>(0.16)</td>
<td>(5.856)</td>
<td>(0.013)</td>
<td>(0.089)</td>
</tr>
<tr>
<td><strong>Diplomatic Centrality (log)</strong></td>
<td><strong>-0.301</strong></td>
<td><strong>8.351</strong>*</td>
<td><strong>-0.138</strong></td>
<td><strong>0.948</strong>*</td>
</tr>
<tr>
<td></td>
<td>(0.113)</td>
<td>(3.944)</td>
<td>(0.026)</td>
<td>(0.177)</td>
</tr>
<tr>
<td><strong>Geographic Centrality (log)</strong></td>
<td><strong>0.402</strong></td>
<td><strong>-11.153</strong>*</td>
<td><strong>-0.038</strong></td>
<td><strong>0.626</strong>*</td>
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<td></td>
<td>(0.081)</td>
<td>(3.21)</td>
<td>(0.023)</td>
<td>(0.162)</td>
</tr>
<tr>
<td><strong>Military Expenditure (log)</strong></td>
<td><strong>0.023</strong></td>
<td><strong>-0.624</strong>*</td>
<td><strong>-0.038</strong></td>
<td><strong>0.26</strong>*</td>
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<tr>
<td></td>
<td>(0.04)</td>
<td>(1.129)</td>
<td>(0.01)</td>
<td>(0.067)</td>
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<tr>
<td><strong>Energy Consumption (log)</strong></td>
<td><strong>0.333</strong></td>
<td><strong>-9.233</strong>*</td>
<td><strong>0.028</strong></td>
<td><strong>-0.184</strong></td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(2.361)</td>
<td>(0.01)</td>
<td>(0.068)</td>
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<tr>
<td><strong>Polity (Rela.)</strong></td>
<td><strong>-0.031</strong></td>
<td><strong>0.861</strong>*</td>
<td><strong>-0.009</strong></td>
<td><strong>0.066</strong></td>
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<tr>
<td></td>
<td>(0.006)</td>
<td>(0.265)</td>
<td>(0.003)</td>
<td>(0.023)</td>
</tr>
<tr>
<td><strong>Trade (Rela.)</strong></td>
<td><strong>1.064</strong></td>
<td><strong>29.513</strong>*</td>
<td><strong>-0.016</strong></td>
<td><strong>0.12</strong></td>
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<tr>
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<td>(0.225)</td>
<td>(8.22)</td>
<td>(0.016)</td>
<td>(0.111)</td>
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<tr>
<td><strong>Diplomatic Centrality (Rela.)</strong></td>
<td><strong>0.585</strong></td>
<td><strong>-16.232</strong>*</td>
<td><strong>0.176</strong></td>
<td><strong>-1.216</strong>*</td>
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<td>(0.151)</td>
<td>(5.897)</td>
<td>(0.035)</td>
<td>(0.238)</td>
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<td><strong>Military Expenditures (Rela.)</strong></td>
<td><strong>-0.259</strong></td>
<td><strong>7.174</strong>*</td>
<td><strong>0.027</strong></td>
<td><strong>-0.186</strong></td>
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<td>(0.063)</td>
<td>(2.359)</td>
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<td>(0.08)</td>
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<td><strong>0.107</strong></td>
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<td>(0.079)</td>
<td>(3.238)</td>
<td>(0.012)</td>
<td>(0.079)</td>
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<tr>
<td><strong>Constant</strong></td>
<td><strong>3.98</strong></td>
<td><strong>-110.365</strong>*</td>
<td><strong>1.537</strong></td>
<td><strong>-10.595</strong>*</td>
</tr>
<tr>
<td></td>
<td>(1.11)</td>
<td>(33.959)</td>
<td>(0.125)</td>
<td>(1.175)</td>
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<tr>
<td><strong>Scale (logged)</strong></td>
<td><strong>3.322</strong></td>
<td><strong>3.322</strong>*</td>
<td><strong>1.937</strong></td>
<td><strong>1.937</strong>*</td>
</tr>
<tr>
<td></td>
<td>(0.208)</td>
<td>(0.208)</td>
<td>(0.058)</td>
<td>(0.058)</td>
</tr>
<tr>
<td><strong>ρ</strong></td>
<td><strong>0.016</strong></td>
<td>*</td>
<td><strong>0.003</strong></td>
<td>*******</td>
</tr>
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</table>

N = 41 N = 974 N = 41 N = 974

*** P<0.001,** P<0.01, * P<0.05, . P<0.1
Figure 2: Total Number of Alliances by Year, 1815-2003
Figure 3: Relative Proportions of Non-Multilateral-Lite Alliances, 1815-2003, Separated by Size and Level of Institutionalization
Figure 4: Number of Multilateral-Lite Alliances, 1815-2003
Figure 5: Alliance Terminations due to Member Violations by Year, 1815-2003