Introduction

Alliances are rare events. Rarer, however, is research on the effects of domestic politics on alliance formation. However, the existing (rare) literature mainly focuses on joint democracies in alliance: whether joint democracies are more likely to form alliances than are other combination of regime type (Siverson and Emmons 1991; Simon and Gartzke 1996; Lai and Ritter 2000; Leeds, Ritter, Mitchell, & Long, 2002; Gibler and Sarkees 2004; Gibler and Wolford 2006). The reason scholars have paid attention to democratic pairs rather than regime types in general is related to the distinctiveness of democratic pairs in democratic peace theory (Lai and Ritter 2000). This, in effect, has unnecessarily narrowed the scope of alliance formation research. Thus, we need to broaden our views on the topic as well as to add more researches.

Most of the research has not identified defenders and targets in alliance dyads, implicitly assuming that all states are targets of threats. Defenders and targets, of course, may have different goals to achieve when forming alliances. Identifying defenders and targets in alliances is particularly important because the majority of alliances are asymmetric (Altfeld 1984; Morrow 1991). Based on asymmetric alliances, Morrow (1991) argued that stronger states want to increase autonomy in exchange for an acceptable level of security, whereas weaker states pursue increased security, while sacrificing some autonomy. That is, alliance members have different motivations to join alliances to meet their needs. In addition, if there is no common threat, then by joining alliance a state (defender) risks being dragged into conflict that is irrelevant or less salient to her. Thus, it is necessary to disassemble the dyads of alliances and identify the role of each state to reveal the incentive structures that leaders of allied states face. Surely, defenders and targets also have different means to achieve their goals within an alliance: military capabilities for defenders and policy concessions for targets.

Meanwhile, as Lai and Ritter (2000) pointed out, there are fewer studies on the relationship between regime type and international cooperation than there are of international conflict although the two are close to inseparable. Most scholars deal with both topics in separated theories. Usually each theory is devised only for a particular or for a few cases. Therefore, if there is a comprehensive theoretical framework that can deal with both of the topics at once, it would be easier for us to understand international phenomena continuously and comprehensively. Selectorate theory is one of the few such theories (Bueno de Mesquita et al.

2004). Selectorate theory has shown the effects of regime types on the goals of war; on decision to fight wars; and on the effort level in wars (Bueno de Mesquita et al. 2004). In addition, selectorate theory has shed light on our understanding of domestic political instability such as coups and revolutions (Bueno de Mesquita and Smith 2017). Because this theory also explains international cooperation and foreign aid (Bueno de Mesquita and Smith 2009), we can expect to have an integrated understanding of international conflicts and cooperation through the theory.

This article explains the effect of domestic politics on alliance formation using the selectorate theory. One of the strengths of this theory is that it provides a tool to analyze the incentive structure of leaders, not institutions or some other "things" that cannot make choices such as to ally. Thus, the theory clearly establishes an eventual "causal link" that is easy to be overlooked in international studies (Bueno de Mesquita and Singer 1973).

My results show that as defender states become more democratic, the probability that they offer alliances increases and as targets become more autocratic, the probability that they accept alliances increases. Plus, while the literature claims that alliances are most likely between pairs of states with alike governments (Siverson and Emmons 1991; Lai and Ritter 2000; Leeds, Ritter, Mitchell and Long 2002), the theory and evidence here shows that no particular combination of regimes is especially more likely to form alliances. The general expectation in the literature, when assessed under equilibrium conditions, is unsupported because both parties can adjust their levels of demand to strike a deal. Instead, theory and evidence indicate that stronger autocratic defenders and weaker democratic targets are especially unlikely to form an alliance (the least frequency). They have the hardest time finding a deal acceptable to both the defender and the target.

The paper proceeds as follows. First, I review the literature on alliances and domestic politics. Second, I briefly explain selectorate theory. In the third section, I present a model of alliance formation. The fourth section describes the research design. Then, the results and implications follow. Lastly, I summarize the article and make suggestions for future research.

Literature

Traditionally, research on the motivations and mechanisms behind alliance formation has focused on power, particularly how an opponent's power shapes a state's reaction to a threat.

Indeed, alliances represent one of the principal strategies that states use to mitigate external threats. With that in mind, scholars of international politics have argued that in an anarchic international system, security-seeking states form alliances solely to cope with military threats from their adversaries. In forming alliances, states can aggregate their military capabilities, thereby enhancing each allied state's security. For example, Deutch and Singer (1964) argued that states seek opportunities to form alliances in order to create balance in the presence of a more powerful rival.[1] This approach is referred to as the "capability aggregation model" (Barnett and Levy 1991; Morrow 1991).

Security concerns, however, may not be the only explanation for why states form alliances (Olson and Zeckhauser (1966); Altfeld 1984; Lalman and Newman 1991; Morrow 1991; Johnson 2017). For example, Olson and Zeckhauser (1966) stressed the economic benefits of alliance formation. They argued that, through alliances, states can enhance their security (in terms of military capabilities) with less military spending. They also noted that small states can free-ride because larger states tend to assume responsibility for the security provided by the alliance, as a public good to the group's members. Altfeld (1984) contends that states will sometimes join alliances at the cost of ceding autonomy in exchange for an increase in security, a trade-off which suggests that security and autonomy are substitute goods.[2] Lalman and Newman (1991) find that, whereas 88% of allied European states increased their security through alliances, the remaining 12% saw setbacks in their security. Empirically, this suggests that there must be other reasons for states to form alliances. Morrow (1992) broadens Altfeld's model using a spatial representation of issues and interests. In Morrow's model, states can use alliances to either increase security at the expense of autonomy or sacrifice some security for greater autonomy as well as to increase states' security without sacrificing autonomy. In this sense, Morrow's model embraces both a capabilities-aggregation perspective and a potential trade-off between security and autonomy, and tests his model empirically (Bennett 1997). As Johnson (2015) noted, however, Morrow does not attempt to demonstrate that the concessions are linked to the nature of external threats that alliance members might face. Thus, Johnson (2015) develops a three-player bargaining model of alliance formation which endogenizes both external threats

[1] Walt (1987) argued that the most powerful states do not necessarily pose a threat to an international system, and thus, balance of threat, rather than power, is most important.
[2] However, he ignored the external relationship among allied parties, focusing only on internal wealth, autonomy, and security tradeoffs.

and policy concessions. He argues that the size of policy concessions is closely related to the military capabilities of the target (T) and the defender (D). In particular, he finds that states are willing to make more concessions in exchange for an alliance when they are unlikely to defeat their challengers alone and when their allies have a significant effect on their probability of winning.[3] Though it focuses only on power and reactions to threats, Johnson's (2015) research provides important insight.[4] Yet, still missing from that perspective is a theoretical consideration of the domestic political concerns that can shape international affairs.

As mentioned above, however, most research on alliance formation and domestic politics does not distinguish between defenders and targets, and even, in many cases, implicitly treats them all as targets in their empirical tests. Siverson and Emmons (1991) argued that from 1946 to 1965, joint democracies tended to ally more frequently than other regime type pairs. Simon and Gartzke (1996) corroborated Siverson and Emmons (1991), but they also argued that this pattern in alliance formation was a function of Cold War-era ideologies. That would suggest that the apparent relationship between joint democracy and alliance formation itself is rather weak, with minimal predictive power. Both of those studies, however, have limitations in investigating the causal effects of regime type on alliance formation.

Lai and Reiter (2000) represents the first study to use regression analysis to examine this relationship. They tested three existing theories of alliance formation: credible commitments, constructivism and economic interdependence. Their findings suggest that, after 1945, "similar" regime types tend to ally with each other, but joint democracy is no different from joint autocracy in this respect. Numerous empirical analyses on alliance formation and regime type have followed, but the results remain inconclusive (Leeds, Ritter, Mitchell and Long 2002; Gibler and Sarkees 2004). Those opposed to the claim that joint democracy is particularly prominent in alliance formation argue that such results are driven by a small set of multilateral alliances. However, as mentioned, the literature tends to ignore the differences between defenders and targets, which may alter the results in important ways. In addition, no deductive model has yet provided rigorous logic to the link between regime type and alliance formation in a manner that might facilitate a clearer interpretation of the empirical results.

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[3] Of course, as some scholars have argued, alliances can support and enhance trade among alliance partners. However, the effect of alliances on trade would not be the primary motivation to ally (Gowa and Mansfield 2004; Gowa 2010; Mansfield and Bronson 1997).

[4] To assess the size of concession, he counts the number of concessions, assuming that all concessions are equally weighted. This assumption, however, is unlikely as Johnson himself admitted (Johnson 2015, 673)

Beyond those concerns, Lai and Ritter (2000, 2002) and related replication studies (Leeds et al 2002; Gibler and Sarkees 2004) raise an additional issue regarding the interpretation of results. Lai and Ritter (2002) coded the dependent variable, the alliance status of a dyad, as 1 if the dyad had any type of alliance in a given year and 0 otherwise. The replication studies followed the same coding rule. Under this scenario, the dependent variable, alliance status, in fact contains two dimensions of alliance formation: the forming of an alliance and the maintaining of the alliance. The interpretation of results should thus reflect this dual dimensionality. That is, it may be more appropriate to interpret the results of Lai and Ritter (2000) as indicating that joint democracy tends to form and/or maintain alliances.

To address the principal limitations of the existing literature, this study specifies three players in alliance formation – defenders, targets and challengers – and develops a formal model of alliance formation. It also relies on a dependent variable better suited to capture the outcome of alliance "formation". Before proceeding to the model, however, it is important to review the selectorate theory, on which the model is based.

Selectorate Theory

Selectorate theory was built on the assumption that political leaders want to maximize their own primary self-interest: to stay in power. According to the theory, leaders face different incentive structures in their quest to maintain power: the regime type, determined by the size of the selectorate (S), and the size of the winning coalition (W). The selectorate represents those who have a say in choosing leaders. The winning coalition is a subset of the selectorate whose support is essential for leaders to stay in power. To retain power, incumbent leaders must acquire or maintain some critical level of support from the winning coalition; otherwise, they are deposed.

The ratio of S and W, W/S, represents the probability that a current winning coalition member can be included in a new leader's coalition. Thus, if W/S is low, the loyalty of the winning coalition members to the incumbent is high; higher probabilities suggest, conversely, that coalition members are easier to betray the incumbent and support a new leader. What drives the loyalty norm is access to private goods. Given resources at their disposal in government (R), leaders allocate the resources between public goods (g) and private goods (z). Everyone can enjoy the benefits of public goods, whereas only a select few can benefit from private goods. To buy enough support from the winning coalition in the face of a (potential) political challenger(s), leaders have to optimally choose the proportion of public goods and private goods to distribute. In a small winning coalition system, it is more efficient for leaders to provide private goods to their winning coalition members to ensure support. However, as W increases, providing public goods becomes more efficient, such that in a large wining coalition system, public goods provision prevails in the government's budget. The proportion of public and private goods provision is determined by W.

Generally, democracies represent large winning coalition systems, while autocracies have a small winning coalition size. However, W and S are continuous measures, unlike the typically discrete measures of regime type. The values of W and S thus allow us to distinguish within and across the categories of democracy and autocracy. For example, within democracy-types (larger W), a single member parliamentary system requires considerably fewer votes to win than does a two-party direct presidential electoral system. Similarly, while autocracies usually have smaller values for W, their values for S vary greatly. In a large winning coalition system, as mentioned, the loyalty of W is low: even if this winning coalition subset is excluded (sometimes approaching but not surpassing half the value of S), their utility reduction is relatively minor, as their satisfaction comes largely from public goods provision. On the contrary, in a small winning coalition system, the loyalty of W is very high, and if a member of the winning coalition is excluded from the coalition, his/her utility decreases drastically as he/she loses access to the private goods provision.

The Alliance-for-Policy Model (APM)

We now examine the potential offer of alliance by a defender state (D) to a potential target (T) facing a threat in the context of selectorate theory. As in Morrow (1994) and Johnson (2017), this study conceives of alliance deals as a tradeoff between autonomy (policy concessions) and security (formally guaranteed military assistance from the alliance). D offers alliances in exchange for policy concessions from T, and T makes the decision to accept the alliance or not, with the associated policy concessions. This paper uses the subscript D and T to index defender states and target states, respectively.

The opportunity for alliance-for-policy deals opens when D offers an alliance and T faces a threat from C in a crisis subgame. The motivation of C's threat is given without questioning because it is not the focus of this study. That is, this study does not deal with C's domestic politics.[5] Before the alliance negotiation, the leaders of D and T have initial resources R_D and R_T for the provision of public goods and private goods. A state leader has to use the resources to provide public (g) and private (z) goods in order for her winning coalition members to stay in power. The utility function of a representative winning coalition member is set as an additively separable function over the goods: $U(g, z) = v(g) + u(z)$, where $v(\cdot)$ and $u(\cdot)$ are continuous, concave functions and $u(0) = 0$. Selectorate theory sets the price of providing public goods as p, and the (implicit) price of private goods as W, the size of the winning coalition, as it characterizes the number of winning coalition members. Given R_D and R_T, the leaders of D and T have to allocate policy resources subject to the budget constraint: $pg + Wz \leq R_i, i \in \{D, T\}$ (Bueno de Mesquita and Smith. 2009).[6]

Now, if D and T strike an alliance deal, their decision to ally affects the utility function of the winning coalition. T makes policy concessions for the alliance. For convenience, APM treats the policy concessions as a public good for D, and a public bad for T. The policy concessions are treated as a binary choice ($y \in \{0,1\}$). Hence, if T makes policy concessions, the citizens of T must receive $-\sigma_T$ (or pay σ_T), whereas the citizens of D receive σ_D. Note that $\sigma_i \in [0,1]$.[7] Generally, σ_T and σ_D represent the salience of the policy issue in each country T and D, respectably. The overall features of policy concessions and related assumptions are essentially the same as in Bueno de Mesquita (2009), except that in that study the policy concession, y, has a continuous value: $y \in [0,1]$). If T rejects the deal, then $\sigma_i = 0$.

If T rejects all possible alliance deals from D, then T has to purchase weapons or otherwise simply cope with C's challenge. If T purchases weapons, it has to pay the costs for the weapons (m_T). This cost has to be paid from T's leader's discretionary resources R_T such that $m_T \in (0, R_T]$. Thus, T's winning coalition members will receive $\frac{R_T - m_T}{W_T}$ private goods and save σ_T. If T rejects the deal and decides not to buy weapons, it does nothing to increase its military capabilities. In this case, T's winning coalition members will receive $\frac{R_T}{W_T}$ without sacrificing σ_T.

[5] The nature of a territorial challenge made by C will be briefly discussed in the research design.
[6] To keep the argument simple, I omit the leader performance θ from the model but it does not affect the results (Bueno de Mesquita and Smith 2009, 316).
[7] If $\sigma_D = 0$, D does not have an incentive to form the alliance, whereas if $\sigma_T = 0$, the citizens of T do not have an incentive to reject the alliance.

But T must also cope with C's challenge with its current military capabilities (p_0).[8]

If T accepts an alliance deal from D, the security of T will increase. Security generally entails both public and private goods. For example, in a territorial dispute, if T loses territory, it may become more vulnerable to future challenges if the territory has militarily strategic importance; T may also lose national pride that is important to its leaders' domestic performance, and it may lose access to resources from the territory that are needed to satisfy T's winning coalition members. By forming alliance, T can increase its power such that it increases its probability of winning the war (p_A)[9] and possibly can deter C's challenge.

To provide security, D has to pay the costs of alliance from its discretionary resources. The costs consist of two parts: the alliance costs and the costs of war. The alliance costs (C_{aD}) entail the aggregation costs and/or the transaction costs, which include the building and maintaining of military projection capability, D's military bases in T, joint military training with the alliance partner, and special allowances for the overseas dispatch of armed forces. Thus, if an alliance forms, D's winning coalition will receive $\frac{(R_D - C_{aD})}{W_D}$ of private goods and σ_D. In case of war, the leader has to pay additional war costs (f_{aD}).[10] Since the alliance forms before war occurs in the APM, the costs of war are only incurred when there is war. Therefore, when D considers offering alliances, D should calculate the expected utility from its participation in war between T and C.

After T's decision regarding its military capabilities, C will decide whether to make a demand ($x \in \{0,1\}$) to T. If T accepts, $x = 1$. If T rejects, $x = 0$. Hence, if T's leader accept the demand, all of T's members will receive payoff $-\gamma_T$ and all of C's members will receive payoff γ_C. If D has no interest in C's challenge, then $\gamma_D = 0$. If D shares T's view regarding the issue in dispute, γ_D and γ_T have the same sign. If D has a view similar to C's on the issue in dispute, then γ_D has the opposite sign of γ_T.[11]

If the leader of T does not accept the demand, all of T and C's residents receive no payoff. If there is a war between T and C, T and C will pay the costs of war (κ_T and κ_C respectively). If T forms an alliance with D, the probability is defined as p_A. If T buys weapons, then the probability of winning becomes p_m. $p_A > p_0$ and $p_m > p_0$. Since both $p_m > p_A$ and $p_A > p_m$

[8] This can be defined as the relative military capabilities between T and C.
[9] The capabilities of D are added in favor of T in the relative power between C and T.
[10] Of course, D, as a state, also pays the cost of war κ_D. But including κ_D does not make any difference in the analysis and the results. So, for simplicity, I omit it from the equations.
[11] $\gamma_T \in (0,1]$, $\gamma_C \in (0,1]$, $\gamma_D \in [-1,1]$

are possible, those two cases will be considered when solving the game.

All states consider the effect of the alliance ex ante. Regarding the alliance formation in APM, T and D calculate the expected utility of an alliance in case of war. For example, when the condition of war obtains, the utility of alliance for D is $\gamma_D(p_A - 1) + \sigma_D + \frac{R_D - C_{aD} - f_{aD}}{W_D}$ and for T is $\gamma_T(p_A - 1) - \kappa_T - \sigma_T + \frac{R_T}{W_T}$.[12]

Aid-for-Policy Game

1. D proposes an alliance in exchange for policy concessions from T.
2. T decides whether to accept the concessions and to form the alliance, to reject the deal and to buy weapons, or to do nothing.
3. C makes a demand depending on T's decision in 2.
4. T decides whether to accept the demand by C or not. If T accepts, the status quo will change without war, but if not, a war will occur.
5. Political competition occurs in nations D and T as follows: (1) The international outcomes are revealed; (2) Leaders of D and T allocate their available resources between private goods (z) and public goods (g) depending on the international results and alliance formation; (3) Selectors choose their leader. The incumbent is deposed if any of the coalition members chooses not to support the leader; otherwise, the incumbent survives. If a new leader is chosen, Selectors receive the continuation payoff (Q).

Subgame Perfect Equilibria (SPE)

Subgame Perfect Equilibria (SPE) result from forming alliance, buying weapons and doing-nothing. Comparative statics can be determined for the payoffs depending on the probability of T winning a war, the regime type, the salience of the issues, and the costs of forming an alliance and/or war. In particular, backward induction can be used to solve the SPE, from the last decision working back toward the first decision of the tree.

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[12] For D, $0 \cdot p_A + (1 - p_A)(-\gamma_D) + \sigma_D + \frac{R_D - C_{aD} - f_{aD}}{W_D} = \gamma_D(p_A - 1) + \sigma_D + \frac{R_D - C_{aD} - f_{aD}}{W_D}$. T's utility can be calculated in the same way.

Selectorate Political Competition

With Selectorate Political Competition, incumbents are deposed if they cannot satisfy the winning coalition members. If an incumbent offers her supporters benefits from public goods and private goods that equal the rewards any challenger can credibly offer, then the winning coalition members will retain her in office. If, however, the incumbent cannot do so, then the incumbent will fail to garner enough support to stay in office. As a result, at least one winning coalition member will defect and the incumbent will be thrown out. In essence, selectors care about the expected payoff associated with a challenger taking office, Q. Q , characterized in terms of an infinitely repeated game, was provided by Bueno de Mesquita et al. (2004). A leader survives in office if $v_i(\text{g}) + u_i(z) \geq Q$. For the purpose of this study, Q need not be modeled explicitly.[13] Q is treated as a random variable with distribution $F_i(x) = \Pr_{\text{i}}(v_i(\text{g}) + u_i(z) \geq Q) = F_i(v_i(\text{g}) + u_i(z))$. Although this is a simplified representation, it captures the core arguments of the selectorate theory.

Will T accept the demand of C or choose to fight?

As noted, the prospect of leader survival is best enhanced if the leader chooses the option that generates the highest possible payoffs to the winning coalition members and the game is solved based on this criterion. First, if T chooses to do nothing to increase its military capabilities, and if the expected utility from fighting is better than accepting C's demand, T will fight. That is, T will fight if and only if $\gamma_T(p_0 - 1) - \kappa_T + \frac{R_T}{W_T} \;>\; -\gamma_T + \frac{R_T}{W_T}$, or

$$p_0\gamma_T > \kappa_T. \qquad \text{When T does nothing (1)}$$

Likewise, we can calculate the conditions under which T will fight when T has D as an alliance

[13] For simplicity and this study's purpose, leaders' performances on other issues are ignored. Considering this term does not change the substantive results of APM.

partner, and when T buys weapons.

$$p_A \gamma_T > \kappa_T. \qquad \text{When T forms alliance (2)}$$

$$p_m \gamma_T > \kappa_T. \qquad \text{When T buys weapons (3)}$$

Will C challenge or not?

To determine the conditions under which C challenges, four cases that specify T's costs of war (κ_T) must be considered:

Case 1: $\boldsymbol{\kappa_T > p_A \gamma_T}$
T never fights. Hence, C will always challenge.

Case 2: $\boldsymbol{p_m \gamma_T \leq \kappa_T < p_A \gamma_T \ (p_A > p_m)}$ or $\boldsymbol{p_A \gamma_T \leq \kappa_T < p_m \gamma_T \ (p_m > p_A)}$
In both situations, T will fight only if it forms an alliance ($p_A > p_m$) or if it buys weapons ($p_m > p_A$). When ($p_A > p_m$), T will not fight if it does nothing or buys weapons, and C will challenge T if $\gamma_C > 0$. If T has an alliance with D, C will challenge if $(1 - p_A)\gamma_C > \kappa_C$. When $p_m > p_A$, T will not fight if it does nothing or forms an alliance with D, and C will challenge T $\gamma_C > 0$. If T buys weapons, C will challenge if $(1 - p_m)\gamma_C > \kappa_C$.

Case 3: $\boldsymbol{p_0 \gamma_T \leq \kappa_T < p_m \gamma_T \ (p_A > p_m)}$ or $\boldsymbol{p_0 \gamma_T \leq \kappa_T < p_A \gamma_T \ (p_m > p_A)}$
T will fight if it has either formed an alliance or bought weapons.
Hence, if T has not formed an alliance or bought additional weapons, C will challenge if $\gamma_C > 0$. If T buys weapons, C will challenge if $(1 - p_m)\gamma_C > \kappa_C$. If T forms an alliance, C will challenge T if $(1 - p_A)\gamma_C > \kappa_C$.

Case 4: $\boldsymbol{\kappa_T < p_0 \gamma_T}$

T will always fight. If there is no alliance between T and D, C will challenge T if $(1-p_0)\gamma_C > \kappa_C$. If T buys weapons, C will challenge T if $(1-p_m)\gamma_C > \kappa_C$. If T forms an alliance with D, C will challenge if $(1-p_A)\gamma_C > \kappa_C$.

Will T accept an alliance?

T's decision depends on C's challenge and the prospective costs of fighting. C's decision to fight depends on the costs of war that C would incur. As noted, the case in which choosing an alliance is better than purchasing weapons ($p_A > p_m$) is considered separate from the case in which purchasing weapons is better than choosing an alliance ($p_A < p_m$). In particular, the costs of war for C (κ_C) determine whether C will fight or not given the relative strength of T p_0, p_m or p_A. If forming an alliance provides the same utility as buying weapons or doing nothing, T will choose not to form an alliance. If the utility of buying weapons is the same as that of doing nothing, T will choose to do nothing. Since there are too many cases to present here[14] and the calculational process remains consistent across them, I present only one substantively interesting case: when forming an alliance only deters C's challenge when $p_A > p_m$.[15] The value function numbers are not modified; they are presented as in the full solution. The full results can be found in Table 1.

An Example: If forming an alliance only deters C's challenge when $p_A > p_m$.

This case holds only when forming an alliance is better than buying weapons ($p_A > p_m$). Regardless of T's regime type, forming an alliance is easier than the case of "C always fights".[16]

[14] There are 24 cases to analyze: four cases for each power condition ($p_A \gtreqless p_M$) and three options for each case for T (alliance, weapons, doing nothing).
[15] The full proof and analysis will be provided upon request.
[16] For the autocratic T, in "C always fights" (the first case), $V_1 = (p_A - p_0)\gamma_T - \sigma_T > 0$ has to be satisfied for T to accept an alliance. In the situation of "only forming an alliance can deter a challenge" (the third case), $V_7 = (1-p_0)\gamma_T - \sigma_T + \kappa_T > 0$ has to be satisfied. Since $V_7 > V_1$ or $(1-p_A)\gamma_T + \kappa_T > 0$, the autocratic T will form an alliance more easily here. Likewise, a democratic T finds it easier to form an alliance than the first case. For the democratic T to accept an alliance, $V_2 = (p_A - p_m)\gamma_T - \sigma_T + \frac{m_T}{W_T} > 0$ has to be satisfied. In the limiting case that W_T goes to infinity, the inequality is reduced to

Condition 1) $\boldsymbol{\gamma_T(p_m - p_0) - \frac{m_T}{W_T} > 0\ (V_8 > V_7)}$

For this condition to hold, $V_7 = \gamma_T(1 - p_m) + \kappa_T - \sigma_T + \frac{m_T}{W_T} > 0$ has to be satisfied. The comparative statics of V_7 are: $\frac{dV_7}{d\gamma_T} > 0, \frac{dV_7}{dm_T} > 0, \frac{dV_7}{d\kappa_T} > 0\ \frac{dV_7}{dW_T} < 0, \frac{dV_7}{dp_m} < 0, \frac{dV_7}{d\sigma_T} < 0.$

As can be seen from the comparative statics of V_7, what cannot be determined unambiguously are the effects of the size of the winning coalition (W_T) and the value of purchasing weapons (m_T). As m_T increases, the probability that V_7's hold increases and the probability that $V_8 > V_7$ holds decreases (in contrast V_7, the sign of $\frac{m_T}{W_T}$ is negative in the condition 1)).

The limiting cases provide clearer pictures of the effect of W_T. If W_T converges to zero (absolute autocracy), the condition never holds. Therefore, in the limiting case, it is the condition for a democratic T to accept an alliance.

As γ_T, m_T, and κ_T increase, and as W_T, p_m and σ_T decrease, the probability that V_7 is greater than zero increases. It can be seen that, except for $-\sigma_T$, all the terms in V_7 are positive, including the costs of war. Thus, if an alliance can effectively deter a challenge (even though $\frac{dV_7}{dW_T} < 0$, since $\frac{m_T}{W_T}$ is positive), a democratic T would choose to join the alliance, unless the salience to T of the policy concessions issue σ_T is quite large. Of course, since $\frac{dV_7}{dW_T} < 0$, a smaller W democratic T is more likely to form an alliance than a lager W democratic T.

If buying weapons does not increase democratic T's military capabilities enough to deter C or to win a war against C, accepting an alliance is more plausible. In addition, if democratic T can save resources that would have been spent on weapons through alliance formation, the leaders of democratic T can enhance their prospects of staying in office.[17] Kimball (2010) argues that increased demand for social policy goods increase the chances of alliance formation because leaders seek greater policy allocation efficiency (Kimball 2010). In particular, Kimball shows that changes in the demand for social policy goods, operationalized as changes in the infant mortality rate, are an important cause of alliance behavior. Hence, if forming an alliance can

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$(p_A - p_m)\gamma_T - \sigma_T > 0$. In the third case, for the democratic T to accept an alliance, $V_8 = (1 - p_m)\gamma_T + \kappa_T - \sigma_T + \frac{m_T}{W_T} > 0$ has to be satisfied. Subtract V_8 with V_2, gives $(1 - p_A)\gamma_T + \kappa_T > 0$

[17] According to the selectorate theory, as W_T increases, the value of private goods decreases. Hence, in the case that W_T is very large (democracy), it is more efficient and better for the leaders of T to allocate resources to public goods provisions.

deter the challenge, the democratic T will accept an alliance unless the salience of the policy concessions issue is quite large.

Condition 2) $\boldsymbol{\gamma_T(p_m - p_0) - \frac{m_T}{W_T} \leq 0 \ (V_7 \leq V_8)}$

For this condition to hold, the inequality $V_8 = \gamma_T(1 - p_0) + \kappa_T - \sigma_T > 0$ has to be met. The comparative statics of V_8 are: $\frac{dV_8}{d\gamma_T} > 0$, $\frac{dV_8}{d\kappa_T} > 0$, $\frac{dV_8}{dp_0} < 0$, $\frac{dV_8}{d\sigma_T} < 0$. As the condition 1), we need to consider the limiting case that W_T converges to zero because if W_T goes to infinity, the condition 2) never holds.[18] Therefore, in the limiting case, it is the condition for an autocratic T to accept an alliance.

As γ_T and κ_T increase, and as p_0, and σ_T decrease, the probability that V_8 is greater than zero decreases, remembering that $V_7 = \gamma_T(1 - p_m) + \kappa_T - \sigma_T + \frac{m_T}{W_T} > 0$. In the limiting case that W_T goes to infinity, $V_7 = \gamma_T(1 - p_m) + \kappa_T - \sigma_T > 0$. In that case, V_8 is larger than the limiting case of V_7. Therefore, it is easier for an autocratic T than a democratic T to accept an alliance when forming an alliance only deters C's challenge given $p_A > p_m$.

In general, when forming an alliance is better than buying weapons ($p_A > p_m$), the conditions needed to form an alliance are not difficult to satisfy, and therefore, a democratic T can form an alliance. But if buying weapons is better, it becomes unlikely that a democratic T will accept an alliance. In the limiting case that W_T converges to zero, however, the autocratic T will still want to form an alliance. Essentially, forming an alliance for the autocratic T becomes the same as the case of "C always fights".

If both buying weapons and forming an alliance can deter C's challenge, there is no difference between the case that alliance formation is better than weapons ($p_A > p_m$) and the case that weapons are better than forming an alliance ($p_A < p_m$).

Combining all of the results, the following statements are true. If forming an alliance is better than buying weapons, both the democratic and the autocratic T will form an alliance. If buying weapons can deter the challenge, however, the democratic T will not form an alliance. The autocratic T will form an alliance even in the case where buying weapons can deter C's

[18] If W_T goes to infinity, $\frac{m_T}{W_T}$ becomes zero. Since $\gamma_T > 0$ and $(p_m - p_0) > 0$, the condition 2) cannot be less than or equal to zero.

challenge.

If comparisons are made across regimes, it becomes obvious that it is easier for an autocratic T to accept an alliance than for a democratic T to do so. The substantive difference, however, may not be discernible in terms of the number of alliances. If forming an alliance is better for D's leader's political survival, D's leader can ask for less from a democratic T. Of course, if D asks for the same level of policy concessions from a democratic and an autocratic T, the autocratic T is more likely to accept the alliance, holding other factors constant.

If buying weapons is better than forming an alliance, it is very difficult for a democratic T to accept the alliance. The democratic T will buy weapons when C always fights or when only purchasing weapons can deter the challenge. If a leader of autocratic T can save resources that would have been spent on buying weapons in the context of an alliance, she may still want to accept the alliance, even though buying weapons is better than alliance formation in terms of increasing military strength. The price of policy concessions is cheaper than buying weapons in an autocracy.

As mentioned, if D is strong enough, D may still provide more military capability than T can acquire through buying weapons. For example, assume Germany and France are allies. If Germany wished to dissolve the alliance and fill the military gap caused by the break with France, then Germany would have to purchase arms in an amount equal or nearly equal to the military capabilities that France is expected to offer in case of war.

Furthermore, if a (potential) alliance partner of T or C has highly developed weapons, it may take considerable time for T to develop the technology to counter the threat on its own, not to mention the resources that would be required to develop the technology.

Finally, in the case of a democratic T, if the leader faces domestic political issues with important bearing on her survival, the leader of democratic T may not be able to allocate enough resources to buy weapons. Therefore, although clear differences exist in the alliance formation patterns of T based on the two regime types, the principal difference may be explained by the salience of the policy concessions. As the salience of the policy concessions increases relative to other policy issues, T's acceptance of an alliance will become more difficult. This suggests that care must be taken in operationalizing the concepts of "easier" or "harder" in hypotheses.

Hypothesis 1 (H1)

H1: If W_T decreases (T becomes more autocratic), it becomes easier for T to accept an alliance. On the other hand, if W_T increases (T becomes more democratic), it becomes harder for T to accept an alliance.

As the Alliance-for-Policy model suggests, alliance formation depends not only on T but also, and perhaps more so, on D. Even though T is ready to accept an alliance, if no defender offers an alliance in exchange for the policy concessions, there can be no alliance. It is thus important to consider the first node of the game, the defender's decision.

Does D want an Alliance?

The analysis of D's decision is analogous to T's decision as previously discussed. As such, only the results of the analysis of D's decisions are presented in Table 2.[19] The results depend on whether γ_D is greater than zero when D is on the same side of T's interest regarding the issue in dispute (Case D1), or if γ_D is less than zero when D is on the same side of C's interest regarding the issue in dispute (Case D2).

Case D1: γ_D is greater than zero.

As Table 3 shows, the relative likelihood of D offering an alliance is substantively the same when alliance formation is advantageous ($p_A > p_m$) and when weapons are better ($p_m > p_A$): a democratic D is more likely to offer an alliance than an autocratic D. Of course, when an alliance is better ($p_A > p_m$), it is easier for D to offer an alliance than when weapons are better ($p_m > p_A$) in general. Even the mathematical terms remain the same across both cases of $p_A > p_m$ and $p_m > p_A$, except for the cases where only one of either an alliance or weapons can deter C's challenge.[20]

[19] The full proof and analysis will be provided upon request.

[20] In particular, if only an alliance can deter C's challenge, the inequality $V_{11} = (1 - p_m)\gamma_D + \sigma_D - \frac{c_{aD}}{W_D} > 0$ must be satisfied. The comparative statics of V_{11} are: $\frac{dV_{11}}{dW_D} > 0$, $\frac{dV_{11}}{d\gamma_D} > 0, \frac{dV_{11}}{d\sigma_D} > 0$ *and* $\frac{dV_{11}}{dp_m} < 0, \frac{dV_{11}}{dc_{aD}} < 0$. As W_D, γ_D, σ_D increases, and as p_m, c_{aD} decreases, the probability that V_{11} is greater than zero increases. If only weapons can deter the challenge, then $V_{14} = (p_A - 1)\gamma_D + \sigma_D - \frac{c_{aD}+f_{aD}}{W_D} > 0$ must hold. The comparative statics of V_{12} are: $\frac{dV_{12}}{dW_D} > 0$, $\frac{dV_{12}}{dp_A} > 0$ $\frac{dV_{12}}{d\sigma_D} > 0$, $\frac{dV_{12}}{d\gamma_D} < 0$,, $\frac{dV_{12}}{dc_{aD}} < 0$, $\frac{dV_{12}}{df_{aD}} < 0$. As W_D, p_A, σ_D increases, and as γ_D, c_{aD}, f_{aD} decreases, the probability that V_{12} is greater than zero increases.

Table 1. Decision to ally: T's Perspective

κ_C	$p_A > p_m$	κ_C	$p_A < p_m$
$(1-p_0)\gamma_C \le \kappa_C$ (C never fights)	SQ Without Alliance and weapons	$(1-p_0)\gamma_C \le \kappa_C$ (C never fights)	SQ Without Alliance and weapons
$\kappa_C < (1-p_A)\gamma_C$ (C always fights)	**Democracy** $((p_m-p_0)\gamma_T - \frac{m_T}{W_T} > 0)$ Forming Alliance: $\frac{\sigma_T}{\gamma_T} < (p_A-p_m)$ Buying Weapons: $(p_A-p_m) \le \frac{\sigma_T}{\gamma_T}$ (p_A-p_m) **Autocracy** $((p_m-p_0)\gamma_T - \frac{m_T}{W_T} \le 0)$ Form alliance: $\frac{\sigma_T}{\gamma_T} < (p_A-p_0)$ Doing Nothing: $(p_A-p_0) \le \frac{\sigma_T}{\gamma_T}$ (p_A-p_0)	$\kappa_C < (1-p_m)\gamma_C$ (C always fights)	**Democracy** Always buys weapons. **Autocracy** $((p_m-p_0)\gamma_T - \frac{m_T}{W_T} \le 0)$ Form alliance: $\frac{\sigma_T}{\gamma_T} < (p_A-p_0)$ Doing Nothing: $(p_A-p_0) \le \frac{\sigma_T}{\gamma_T}$ (p_A-p_0)
$(1-p_A)\gamma_C \le \kappa_C < (1-p_m)\gamma_C$ (Fight unless alliance)	**Democracy** $((p_m-p_0)\gamma_T - \frac{m_T}{W_T} > 0)$ Forming Alliance: $\sigma_T <$ Buying Weapons: $\le \sigma_T$ $\gamma_T(1-p_m)+\kappa_T+\frac{m_T}{W_T}$ **Autocracy** $((p_m-p_0)\gamma_T - \frac{m_T}{W_T} \le 0)$ Form alliance: $\sigma_T < \gamma_T(1-p_0)+\kappa_T$ Do nothing (unlikely): $\gamma_T(1-p_0)+\kappa_T \le \sigma_T$ $\gamma_T(1-p_0)+\kappa_T$ In the limiting cases of the alliance formation, the autocratic T will form the alliance easier than the democracy because: $\gamma_T(1-p_m)+\kappa_T < \gamma_T(1-p_0)+\kappa_T$	$(1-p_m)\gamma_C \le \kappa_C < (1-p_A)\gamma_C$ (Fight unless weapons)	**Democracy** Always buys weapons. **Autocracy** $((1-p_0)\gamma_T + \kappa_T - \frac{m_T}{W_T} \le 0)$ Form alliance: $\sigma_T < (p_A-p_0)$ Do nothing: $(p_A-p_0) \le \sigma_T$ $(p_A-p_0)\gamma_T$
$(1-p_m)\gamma_C \le \kappa_C < (1-p_0)\gamma_C)$ (Fight unless alliance or weapons)	**Democracy** Always buys weapons. **Autocracy** $(-\sigma_T + \frac{m_T}{W_T} > 0)$ Form alliance: $\sigma_T < \gamma_T(1-p_0)+\kappa_T$ Doing Nothing (unlikely): $\gamma_T(1-p_0)+\kappa_T \le \sigma_T$ $\gamma_T(1-p_0)+\kappa_T$	$(1-p_A)\gamma_C \le \kappa_C < (1-p_0)\gamma_C$ (Fight unless alliance or weapons)	**Democracy** Always buys weapons. **Autocracy** $(-\sigma_T + \frac{m_T}{W_T} > 0)$ Form alliance: $\sigma_T < \gamma_T(1-p_0)+\kappa_T$ Doing Nothing (unlikely): $\gamma_T(1-p_0)+\kappa_T \le \sigma_T$ $\gamma_T(1-p_0)+\kappa_T$

Thus, it can generally be said that when D is stronger and more democratic, the probability that D will offer an alliance increases. In the limiting case that W_D converges to zero, both V_{11} and V_{12} cannot hold because the left-hand side of the inequalities go to negative infinity. One possible interpretation is that an alliance between an extremely autocratic D and a weaker T is not actually an alliance, but rather that T is a puppet regime of D. If T is a puppet regime of an autocratic D, then even though T is formally independent, it is actually controlled by the stronger D to the extent that D can determine who should be the leader of T. Essentially, the satellite states described by that scenario do not have sovereignty even though the relationship is formally described as an "alliance".

Across the different conditions $((p_A > p_m)$ and $(p_A > p_m))$, since $V_{11} > V_{12}$,[21] it is easier for D to offer an alliance when only an alliance can deter C's challenge than when only weapons can deter the challenge. It is interesting to note that the decision of D, as well as that of T, is affected by whether an alliance is better $(p_A > p_m)$ or weapons are better $(p_A < p_m)$, because T, not D, buys the weapons.

When only an alliance can deter C's challenge $(p_A > p_m)$, it is easier for D to offer an alliance than if C always fights. However, it is also interesting to note that when only weapons can deter the challenge $(p_A < p_m)$, it becomes harder for D to offer an alliance than when C always fights. Therefore, if only weapons can deter C's challenge, D also becomes reluctant to offer an alliance. If both an alliance and weapons can deter C's challenge, then the power considerations disappear. The decision to offer an alliance depends solely on the salience of the policy concession issue, the costs of an alliance, and the regime type.

Case D2: γ_D is less than zero.

The decision to offer an alliance in Case D2 is analogous to that of Case D1. If the salience to D of the issue in dispute is on the same side as C, D can still be on the side of T if the salience of the policy concession issue is large enough. However, as D's military capabilities increase, the probability that D will offer an alliance decreases when C always fights. Even though Case D2

[21] $(1 - p_m) > (p_A - 1)$ and $-\frac{c_{aD}}{W_D} > -\frac{c_{aD}+f_{aD}}{W_D}$.

differs from Case D1 in terms of some mathematical conditions and the opposite sign for terms with γ_D, the results for D's offering an alliance are the same in both cases. Therefore, the effect of domestic political arrangements on whether or not an alliance will be offered are the same for Case D2 as for Case D1. This leads to Hypotheses 2 and 3:

Hypothesis 2 (H2)

H2: If W_D increases (D becomes more democratic), it becomes easier to offer the alliance. On the contrary, if W_D decreases (D becomes more autocratic), it becomes harder to offer the alliance.

As mentioned, Morrow (1994) suggests that powerful states are defenders and weaker states are targets. Combining Morrow's power arguments with the results of this study that democracies are more likely to be defenders and autocracies are more likely to be targets, we can derive H3.

Hypothesis 3 (H3)

H3: The alliance between a strong autocracy (the defender) and a weak democracy (the target) is the least likely.

Table 2. Decision to ally: D's Perspective ($\gamma_D > 0$)

κ_C	$p_A > p_m$		κ_C	$p_A < p_m$	
$(1-p_0)\gamma_C \leq \kappa_C$ (C never fights)	SQ Without Alliance and weapons		$(1-p_0)\gamma_C \leq \kappa_C$	SQ Without Alliance and weapons	
$\kappa_C < (1-p_A)\gamma_C$ (C always fights)	Alliance if $(p_A - p_m)\gamma_D + \sigma_D - \frac{c_{aD}+f_{aD}}{w_D} > 0$		$\kappa_C < (1-p_m)\gamma_C$ (C always fights)	Alliance if $(p_A - p_m)\gamma_D + \sigma_D - \frac{c_{aD}+f_{aD}}{w_D} > 0$	
	Democracy	Autocracy		Democracy	Democracy
	More likely	Less likely		More likely	Less likely
$(1-p_A)\gamma_C \leq \kappa_C < (1-p_0)\gamma_C$ (Fight unless alliance)	Alliance if $(1-p_m)\gamma_D + \sigma_D - \frac{c_{aD}}{w_D} > 0$		$(1-p_m)\gamma_C \leq \kappa_C < (1-p_A)\gamma_C$ (Fight unless weapons)	Alliance if $(p_A - 1)\gamma_D + \sigma_D - \frac{c_{aD}+f_{aD}}{w_D} > 0$	
	Democracy	Autocracy		Democracy	Autocracy
	More likely	Less likely		More likely	Less likely
$(1-p_m)\gamma_C \leq \kappa_C < (1-p_0)\gamma_C)$ (Fight unless alliance or weapons)	Alliance if $\sigma_D - \frac{c_{aD}}{w_D} > 0$		$(1-p_A)\gamma_C \leq \kappa_C < (1-p_0)\gamma_C$ (Fight unless alliance or weapons)	Alliance if $\sigma_D - \frac{c_{aD}}{w_D} > 0$	
	Democracy	Autocracy		Democracy	Autocracy
	More likely	Less likely		More likely	Less likely

Research Design

To identify targets and challengers, I use the concept of "alliance formation opportunity" (Deutsch and Singer 1964).[22] Johnson (2017) applies this label to the cases in which a defender and target have an opportunity to form an alliance to defend against a particular challenge in a given year, in the case of territorial disputes.[23] A target is the state that controls the territory and a challenger is the state making claims to the territory and seeking to change the status quo. Every challenger-target dyad year in which a challenger made a territorial challenge(s) to a target

[22] See also (Bueno de Mesquita and Singer 1973)

[23] Johnson (2017, 740) only focused on power relations between challengers and targets, ignoring potential defenders' powers and domestic political arrangements. Meanwhile, some studies on the relationship between regime types and alliance formation exclude critical national attributes such as national capabilities of states. I consider both domestic political arrangements of targets and defenders, and power relations among all possible participants: targets, challengers, potential defender and all the third party states' national capabilities in calculating targets' probabilities of winning.

is matched with every possible defender in the system for the year of challenge(s).[24] For data on territorial disputes, I use the Issue Correlates of War (ICOW) project dataset. [25]If the same challenger makes more than two territorial claims in a given challenger-target dyad year, it is counted as one claim.

In defining defenders, this study limits defenders to the states that are more powerful than the targets for several reasons. First, alliances with policy concessions are largely based on Security-Autonomy Trade-off theory (Morrow 1991). A more powerful target may thus not need to sacrifice its autonomy for security. Second, although a powerful target might need some (usually limited) help from a weak defender, an alliance is very costly, potentially entailing entrapments, future commitments and audience costs (Snyder 1984; Fearon 1997; Fearon 1994).

Therefore, the benefit from the power increase through an alliance with weaker defenders may not exceed the costs of the alliance for stronger targets. In addition, a powerful target may also have other much cheaper policy options than an alliance to buy or induce help from a weak defender, such as foreign aid (Bueno de Mesquita and Smith 2009). Third, allowing alliances with weak defenders can make it easy to commit a lazy induction. For example, in case of the US-Korea alliance, the alliance was made due to the territorial challenge made by North Korea in 1953. However, the US had seven cases of territorial disputes in 1953. Thus, if we allow for a weak defender, not only is the US coded as the defender of South Korea, but South Korea is also coded as the defender of the US. Even though the US's territorial disputes are collapsed into one, the US-Korea alliance was clearly not formed because of the US's territorial disputes in 1953.[26] Fourth, stronger targets cause bias in the data because powerful or big states are more likely to get involved in territorial disputes and alliances especially if they were imperial powers before. Indeed, among the cases for which the capabilities of T are greater than the capabilities of D,[27] the top three most allied states were all former empires, representing 50.2% of the 83 allied states in the dataset. Specifically, the UK, France, and Russia share 1191, 915, 677 observations, respectively, and total 2,783 observations out of the 5,547 alliance formations facing territorial

[24] The possible defenders are limited to data availability.
[25] The ICOW project contributes 6,462 unique directed dyad-years (Frederick, Hensel and Macaulay 2014).
[26] Of course, over time, the weaker may be helpful to the stronger, aside from the original motivation of the alliance. For example, the military capabilities of South Korea can be helpful to the US in containing China. However, this paper focuses on the original motivation when the alliance is formed.
[27] The capabilities are measured by the Composite Index of National Capabilities of the COW data.

disputes.[28] Meanwhile, among the cases for which the capabilities of potential D are greater or equal to that of T, the top three most allied states represent only 22.7% of the total alliance number of 54 allied states. Among them is only one major power, France. The top three are Lithuania, France, and Azerbaijan, representing 28, 26 and 26 observations, respectively.[29] Those three states appear in 80 incidents, or 22.7% of the total 353 observations.

Focusing on territorial disputes may create some concerns. First, a territorial dispute does not provide the only necessary condition for states to form alliances. However, such disputes do represent one of the most important issues for states, with well-developed datasets tracking the external threat (Johnson 2017*,* 4). In addition, as Kadera and Mitchell (2005) and Starr (2005) point out, the accumulation of such "domain specific" studies is important in scientific research. A territorial dispute is thus a good starting point for accumulating empirical evidence relevant to the theory of this paper. Second, territorial challenges and the subsequent responses from relevant states may be biased selections. Thus, while the regime type of the challenger is not relevant in the model, it seems necessary to examine the relationship between each actor's regime type and the territorial disputes. According to the selectorate theory, depending on the nature of goods, leaders of different regime types may react differently. Autocracies tend to be more concerned with private goods than are democratic regimes, whereas the opposite is true for public goods. As is the case with many other goods, territory constitutes both a public and a private good; the critical issue is how the territory is used and/or perceived. The public goods aspect of territory includes its symbolic value such as "homeland" (Wright and Diehl 2016; Goemans 2006), its strategically important locations affecting security (Senese 2005), and/or the state's reputation with respect to costly signaling to other states about the leader's resolution (Wiegand 2011). If the public goods aspects are stressed, issue indivisibility becomes an important challenge. The private goods aspects are related to material benefits such as natural resources with economic value. That is both regime types could be targets. Indeed, in the dataset, 57.5% is autocracy and 42.5% is democracy. It is important to underscore, however, that the public and private goods aspects of territory are not mutually exclusive. Challengers and targets,

[28] The next is the US and then Turkey, with 259 and 165 incidents, respectively. The frequencies thus drop remarkably from the 4th most frequent allied state. This bias toward powerful states as well as the Cold War period might explain the result that the democratic allied dyads are more frequently observed than other mixes of regime type dyads, especially in the absence of control variables (see Siverson and Emmons 1991), because most of the rich and/or big states are democracies.
[29] The next is Turkey and then Azerbaijan, with 25 and 24 incidents, respectively. Thus, the frequencies do not drop significantly from the 4th most frequent allied state.

regardless of regime type, thus have reasons to challenge and not give in easily. In any case, more arms or alliances are valuable resources in territorial wars or negotiations (Fearon 1995). For defenders, if the salience of the target itself to defenders is controlled, policy concessions typically represent the primary goal, because the salience of territorial disputes is subsumed in the salience of the target itself.[30]

Before proceeding, it is necessary to mention the effect of a rival bidder on alliance formation. Bueno de Mesquita and Smith (2016) outline the effect of the presence of a rival bidder in aid-for-policy decisions. They show that the existence of a rival bidder decreases the size, and increases the price, of policy concessions. Thus, a winning donor must pay more for weaker policy concessions than they would have had to pay without the rival bidder.

In alliance for policy deals, if competitive bidding exists for buying policy from the target, a potential defender can be affected directly by the rival bidder in two respects: reducing the size of policy concessions as in the aid deal outlined in Bueno de Mesquita and Smith (2016), and/or increasing the commitment level of a proposed alliance. Unlike the aid deal case, the scope of a defender's power (resources) cannot be increased or decreased instantly in an alliance deal. The defender can only offer different types (levels) of alliance commitments: a defense pact, non-aggression/neutrality, or an entente. Further, the level of alliance commitment affects the expected effects and costs of the alliance, with higher levels of commitment indicating higher expected costs to defenders and higher positive effects from the alliance on the deterrence or winning a war, and bargaining (Fearon 1995). Thus, for given policy concessions, the target will prefer a higher level of commitments (defense pact ≻ non-aggression/neutrality ≻ entente), and for a given alliance type, the target will prefer fewer policy concessions.

This article does not test the effects of alliance type or the size of policy concessions. Instead, the model in this research addresses the alliance formation equilibrium with deals that are acceptable to both defenders and targets. As a result, the increased level of alliance commitments and/or the reduction in policy concessions due to competitive bidding are summarized in the accepted deal. The key issue is who will be selected by targets as an alliance partner based on power and regime type, all else equal. For a target, the choice will matter *only if* multiple bidders propose exactly the same deal to the target.[31] In this case, all else equal, the

[30] The salience of the territories that challengers claimed is already high.
[31] Usually, a single winner (or a group of winners in the form of multilateral alliances such as NATO or WTO) in the competition of bidding would be chosen. So, the case of the multiple bidders would be rare.

target should choose more powerful defender. More power can be helpful both to deterrence or war, and in bargaining over the disputed goods. Regarding a defender's regime type, all else equal, the target's choice over the defender's regime type may depend on reliability. Some argue that democracies are more reliable, due to audience costs (Smith 1996). Others suggest, however, that democracies are not reliable alliance partners (Gartzke and Gleditsch 2004). In either case, the reliability should depend on the nature of the defender's honor costs: if the honor costs are more closely related to public goods, a democracy is likely to be more reliable, but if the private goods aspects of honor costs are more important, an autocratic partner may be more reliable.

Furthermore, the aspect that prevails may vary, as the public or private goods aspects of honor costs may follow the idiosyncratic nature of each defender, ε_i. The idiosyncratic nature can be taken as a random variable such that we can assume ε_i has a distribution *F*, with density *f*, with good properties such as smoothness, continuity and full support over the real space. Thus, targets may choose a defender *i* with probability F_i, all else equal. The point is, all else equal, the effect of the regime type of a defender may be random. Thus, the effect of the power of a defender in competitive bidding should boost the effect of power (or the level of commitment) in general, whereas the effect of the regime type of the defender is ambiguous.

Future studies should also investigate regime type reliability and how it varies based on the nature of honor costs in alliances. In addition, future research might test whether the levels of alliance commitments in the presence of a rival bidder are higher than they would have been with no rival bidder.

The estimation technique

Since the model I have constructed does not have a closed form solution(s), I derived the hypotheses using comparative statics in the case of the alliance formation equilibrium. The relationship between a model and reality can provide insight into the estimation technique most suitable for testing the hypotheses derived from the model.

In fact, as Satori (2003) and Myerson (2013) point out, formal models do not represent the complex reality as it is, but rather "an important piece of reality".[32] Thus, despite the value in combining a formal model with a statistical model, as in Signorino (1999), Satori (2003) writes that "there is no reason to believe that the appropriate statistical model can be derived directly from the formal model." Rather, it is possible that the forceful combination of a formal model and a statistical model may distort statistical results because a formal model is not the reality at all. In the case of Signorino (1999), as Lewis and Schultz (2003) point out, the Strategic Interaction Model (SIM) requires very strong identification assumptions such as complete information and errors that do not contain any information for determining actors' types or predicting their future behaviors.[33] In addition, at least one outcome utility must be assumed, because it cannot be estimated statistically at all.[34] Furthermore, the SIM assumes that the estimated observable (mean) payoffs are "true" or at least "consistent." The problem is that every estimated outcome inevitably has a bias in the SIM.[35] In the SIM, the bias in an estimated utility affects every subsequent probability calculation, because the probability of reaching a node is based on the difference between the estimated outcome utilities. As a result, the biased probabilities affect the estimation process exponentially, since the product of all the estimated probabilities is used for the maximum likelihood estimation. The assumptions of the SIM are so strong that the violation of each assumption seems inevitable. If all the violations of assumptions are considered at once, it is difficult to argue that the SIM is more suitable than other competitive statistical models. Rather, exiting estimation techniques with well-developed theoretical grounds, such as OLS or MLE, may provide better estimations.

For this study, I employ a statistical analysis using logit analysis. I derive hypotheses using comparative statics, under the condition that alliance formation is the equilibrium. The comparative statics in the case of alliance formation capture relations between the variables in question and the dependent variable. Therefore, logit analyses with a standard latent variable are

[32] Even Myerson wrote that "mathematical models in social science are like fables or myths that we read to get insights into the social world we live."

[33] Even though Signorino (1999, 2003) addresses many possible sources of uncertainty such as regression error, agent error, private information about outcome payoffs, none of these errors change the actions or the equilibrium of the game because the error term represents mere "mistakes" in his model. Thus, there is no way to approximate Signorino's solution concept (QRE) to Perfect Bayesian Equilibrium (Lewis and Schulz 2003).

[34] Every other outcome must be estimated through a separate statistical model.

[35] If we really want to combine a game model with a statistical model, it is not just about the structure of the models and outcome of interests, but about every possible outcome in the game model. In other words, we need a theory to construct a statistical model for each and every outcome of the game model to estimate. However, Signorino (1999) seemed not aware of it and after surveying published articles, I found that in practice, scholars using the SIM tend to choose statistical models arbitrarily for possible outcomes of their games.

appropriate.[36] Basically, the alliance deals have to be acceptable to both defenders and targets. Targets accept the alliance in exchange for policy concessions. y_{T1}^{*} represents the maximum costs of policy concessions that leaders of targets would pay for the necessary type of alliance, and y_{T2}^{*} represents the optimal costs of the policy concessions required to form the alliance. Defenders offer the policy concession deal in exchange for alliance. y_{D1}^{*} represents the maximum costs of a necessary type of alliance that leaders of defenders would pay for the optimal concession, whereas y_{D2}^{*} represents the alliance costs required to purchase the optimal concession from targets. Those are standard latent variable models with alliances. For targets, an alliance formation is observed when $y_T = y_{T2}^{*}$, only if $y_{T1}^{*} \geq y_{T2}^{*}$. For defenders, alliances are observed when $y_D = y_{D2}^{*}$, only if $y_{D1}^{*} \geq y_{D2}^{*}$.

3. The operationalization of variables

The dependent variables

The dependent variable for Hypothesis 1 and 2 is whether the target forms an alliance in a given year. The outcome is thus a dummy variable: if the target or the defender forms an alliance, it is coded as 1, and 0 otherwise in a given year. I also include data for one year after the territorial dispute, because it may take some time for states to form an alliance after a challenger poses a threat. The data set for the dependent variable relies on the alliance member level data from the Alliance Treaty Obligations and Provisions (ATOP) project (Leeds et al.2002). ATOP provides information about entry and exit dates for each alliance member for every alliance in the data set. The dependent variable is not limited to defensive alliances; all types of alliance are considered. If different challengers made different claims in a given target (potential) defender dyad year, then the (potential) target defender alliance is counted as one.

The independent variables

[36] See Bueno de Mesquita and Smith (2007, 2009), whose works take a similar approach and also uses logit analysis.

The key independent variable, the institutional arrangement, is defined in terms of the winning coalition, as in Selectorate theory (Bueno de Mesquita et.al 2004). The size of the winning coalition also matches the model's variable perfectly. Though the characteristics of the winning coalition are not exactly the same as the conventional concepts of democracy and dictatorship, the state becomes more democratic as the size of coalition gets bigger. The detailed characteristics of the winning coalition and its relationship with the size of the selectorate are delineated in Bueno de Mesquita et al (2004). They develop a five-point measure of wining coalitions: W=0, 0.25, 0.50, 0.75 and 1. W is normalized between 0 and 1, where 1 represents the most democratic countries and 0 the most autocratic. They consider states as "Mature Democracies" only in the case of W=1. The estimate of winning coalition size depends on the Polity data components REGTYPE (regime type), XRCOMP (the competitiveness of executive recruitment), XROPEN (the openness of executive recruitment), and PARCOMP (competitiveness of participation).[37] One point is added to the index of W for each of the following conditions: if the REGTYPE is non-military, if XRCOMP is greater than or equal to 2 (meaning the chief executive is not chosen by heredity or in rigged, unopposed elections), if XROPEN is greater than 2 and if PARCOMP equals 5 (indicating the presence of a competitive party system).

Note that as W_T increases, the price of policy concessions also increases and the increasing rate is more prominent in large winning coalition system. Eventually, in a sufficiently large winning coalition system, the substitution effect between the costs of policy concessions and the benefits from it makes the policy concession too expensive to buy such that no alliance deal will be acceptable. That is, there is a nonmonotonic relationship between W_T size and alliance formation as W_T increases (Bueno de Mesquita and Smith 2009, 321). Therefore, in the statistical model, I use a quadratic form of W_T to capture the nonmonotonic relationship as (Bueno de Mesquita and Smith 2009).

The probability of winning a war for each state is operationalized in the common way - the ratio of a state's military capabilities to all the relevant states' military capabilities. The probabilities of targets winning a war with challengers under the conditions of doing-nothing and

[37] Available at http://www.systemicpeace.org/polity/polity06.htm.

forming an alliance are defined as the following expressions, respectively: $p_0 = \frac{cap_T}{cap_T + cap_C}$, $p_A = \frac{cap_T + cap_D}{cap_T + cap_C + cap_D}$, where $cap_i, i \in (T, C, D)$ is the composite index of national capabilities (CINC) scores from the COW project (Altfeld and Bueno de Mesquita 1979).[38] However, in calculating the national capabilities of each state, two more things must be considered: distance and third party participation. Boulding (1962) suggested that a nation's power decreases with distance. I use the indicator of adjusted capabilities, developed by Bueno de Mesquita (1981), to capture the idea of loss of power with distance, where the decreasing rate decreases over time. The adjustments, however, are only applied to challengers and defenders' capabilities, because those states consider distances when they plan to attack or to help targets. Third party participation is considered in estimating a challenger and a target's probabilities of success. It is based not only on the capabilities of the third party, K, but also on K's intensity of preferences over a challenger and target. A defender in question is not included in K. To incorporate the capabilities and intensity of preferences into the probability of a target's winning a war, I use the formula developed by Bueno de Mesquita and Lalman (1992). The new probabilities considering distance and the third party participation are as follows:

$$p_0 = \frac{cap_T + combined\ cap_{TK}}{(cap_T + combined\ cap_{TK}) + (adjcap_C + combined\ cap_{CK})}$$

$$p_A = \frac{cap_T + combined\ cap_{TK} + adjcap_D}{(cap_T + combined\ cap_{TK}) + (adjcap_C + combined\ cap_{CK}) + adjcap_D}$$

where $adjcap_i$ represents the distance adjusted capabilities for nation i, and $combined\ cap_{iK}$ is the distance adjusted capabilities for K considering intensity of preferences. $combined\ cap_{iK}$ is calculated as follows:

$$combined\ cap_{iK} = \frac{\sum_{\forall K \neq C,T,D;\ U_T^K > U_C^K} adjcap_K (U_T^K - U_C^K)}{\sum_{\forall K \neq C,T,D} adjcap_K |U_T^K - U_C^K|}$$

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[38] For a generalized form, see (Bueno de Mesquita 1985); Most of the data for the independent variables are obtained from EUgene software (Bennett and Stam 2000) based on the Correlates of War (COW) project (Singer, Bremer and Stuckey 1972)

where, $adjcap_i = cap_i^{\log\left[\left(\frac{miles}{miles\ per\ day}\right)+(10-e)\right]}$, and e is the natural logarithm. The measurements I developed in elsewhere as well as S-score and Tau-b (T-score) are used as a measurement for the intensity of preferences (U_i^K): H-score, I-score, ϕ-score. The correlation coefficients for P_0s using the measurements are as follows.[39]

	$P_0(H)$	$P_0(I)$	$P_0(\phi)$	$P_0(S)$	$P_0(T)$
$P_0(H)$	1.0000				
$P_0(I)$	0.9376	1.0000			
$P_0(\phi)$	0.9165	0.8087	1.0000		
$P_0(S)$	0.9606	0.9367	0.8739	1.0000	
$P_0(T)$	0.7249	0.6511	0.8431	0.7179	1.0000

Table 3: Correlation coefficients of P_0s

Note that although ϕ-score is a tau-like measurement, P_0 using ϕ-score is closer to P_0s using S-like measurements. Thus, we should be careful to not generalize the approximation results. In the empirical tests, two types of powers (national capabilities) are tested: Targets' relative powers to Challengers (P_0), and Defenders' contributions to the probability of winning ($P_A - P_0$).

The control variables

Hypotheses 1 and 2 are derived from very straightforward and intuitive comparative statics the APM model. However, the terms "easier" and "harder" in Hypothesis 1 can be interpreted in two ways. First, they can be interpreted in probabilistic terms. Hence, "easier" would "more likely" and "harder" would mean "less likely." The other possible interpretation is in terms of policy concessions. Under this interpretation, "easier" would mean "requiring more policy concessions" and "harder" would mean "fewer policy concessions."

Therefore, for "easier" to be interpreted as "frequency", the relationship between

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[39] H- and I scores can successfully approximate S-score and ϕ is for Tau-b.

frequencies of alliance and more/fewer policy concessions must be clarified. Alliance deals should be acceptable to the leaders of both Defenders and Targets. Thus, in the final round of alliance negotiations, defenders should offer an acceptable amount of policy concessions to targets. What drives defenders to offer an acceptable deal? Holding other factors constant, it is the importance or salience of the policy concession from targets. Therefore, controlling for salience of targets to defenders is essential under the frequency interpretation of "easier/harder." In this study, to targets, the territorial claims mean it is already salient. Thus, the interpretation as "frequency" can be taken.

Foreign policy similarity measures can capture the probability that the two states produce similar foreign policies, the probability (frequency) that the two states share common allies, or the tendency of congruency in the two states' alliance formation. Those features are measured by the I-score, H-score and ϕ-score, respectively. Those measures may be interpreted not only as tightness of interests, how close the two states are, or the utility of War, but also as the salience of the target to the defender. The similarity of interests can be measured by the H-score, I-score or ϕ-score between the target and the defender. However, what is easily overlooked in international studies is that the relationship is not simply dyadic but triadic. Defenders should also consider their foreign policy similarity with challengers, and they must consider the opportunity costs from a relationship with challengers when they angle for policy concessions from targets in exchange for an alliance. The opportunity costs are reflected in the foreign policy similarity between defenders and challengers. Therefore, instead of simple similarity measure scores between targets and defenders, the similarity scores between defenders and challengers must be subtracted from the similarity measure of targets-defenders. That is, $S_T^D - S_C^D$ is used for the similarity measure scores, where $S_i^D, i \in \{T, C\}$ is the similarity measure score. As $(S_T^D - S_C^D)$ increases, the probability that two states form alliance should increase.

It is also important to control for the presence of an alliance that the Challenger is part of, as it may be relevant to the territorial dispute (it may encourage C's decision to challenge) and because it could affect both the Defender and the Target's decision to ally.[40] If a challenger has an alliance that is applicable to the territorial issue in disputes, the Target may find it more attractive to form an alliance with the Defender, whereas the Defender would likely ask for more policy concessions from the Target or not offer an alliance at all. The data for this variable is

40 The challengers' alliances should be offensive alliances in this case.

obtained from Johnson (2017, 741).

Regarding a target's salience to a defender, I use the indicators developed by Bueno de Mesquita and Smith (2009): DISTANCE, POPULATION, and COLONY. DISTANCE is estimated as the logarithm of the distance in miles between the capital cities of the states. POPULATION is measured as the logarithm of the prospective recipient country's population in millions. COLONY is a dummy variable coded as 1 if the target country had been a colony of the prospective defender. The idea is that "policy concessions from geographically closer, more populous countries are valued more than comparable concessions from small distant countries. Similarly, former colonies hold higher salience for defenders than do states with which they had no special prior relationship" (Bueno de Mesquita and Smith 2009, 324-325).

Results

The theory predicts that as the size of the winning coalition of a defender increases, the likelihood that the defender forms an alliance increases. On the other hand, as the size of the winning coalition of a target decreases, the likelihood that the target forms an alliance increases. Note that, as mentioned in the Research Design section, the increasing rate of the price of policy concessions becomes more prominent as the size of the winning coalition approaches 1 (i.e., a mature democracy). Thus, the size of the winning coalition of the target is nonmonontonic with alliance formation. Table 4 shows the predicted and actual relationship between regime type and alliance formation.

	Predicted relations	Actual relations
W_D	$\alpha_1 W_D$	$\alpha_2 W_D$
W_T	$-a_3(W_T + \alpha_4)^2 + \alpha_5$	$-a_6(W_T - a_7)^2 + \alpha_8$

$* \; \forall a_i, \; \alpha_i > 0$ and α_4 can be zero

Table 4: Predicted and Actual relations between regime type and alliance formation

Table 5 shows the results of the statistical model using the core variables. The results generally confirm the hypotheses of this paper across all the models. As a defender's regime type becomes more democratic (W_D increases), the probability that a defender offers an acceptable alliance increases. In particular, the odds ratios are between 2.2 to 2.9 depending on the foreign policy similarity measures. Thus, if a defender's regime type (W_D) increases by one unit, the odds ratio of the defender offering an acceptable alliance increases by between 120% and 190%.[41]

Regarding the size of the winning coalition of the target (W_T), we should be careful in interpreting the results. In general, as a target becomes more autocratic (W_T decreases), the probability that the target receives an alliance increases up to near the point at which W_T is 0.5. Below $W_T = 0.5$, however, as W_T decreases, the probability decreases again. Therefore, a decrease below $W_T = 0.5$ seems inconsistent with the theory's expectation. The reason for this is a limitation in the measurement of W. In particular, we can consider the measure of W as ordinal from mature democracy ($W = 1$) to the first category of autocracy ($W = 0.5$). However, below $W = 0.5$, W may be closer to categorical, rather than ordinal.[42] Thus, in the current measurement of W, the tendency of decreasing a decreasing value may be limited to 1 to 0.5, and below 0.5, it may not reflect the ordinality of regime types.

The target's probability of winning without an alliance with the defender (P_0) has more complicated results depending on the foreign policy similarity measures. In particular, using the I-, S- and ϕ - scores as measurements for the intensity of preferences in calculating P_0 produces contradictory but statistically significant (1% or 5% level) results. The S- and I-score case produces the result that as P_0 increases, the odds ratio of alliance formation decreases by 36.8% and 42.6%, respectively. In the case of the ϕ-score, however, the results differ: as P_0 increases, the odds ratio that an alliance is formed increases by 56.2%. The ϕ-score case is thus inconsistent with existing studies such as Jonson (2011). All other results show statistically insignificant results.

Thus, the choice of similarity measures does influence the results. The explanation for why P_0 shows inconsistent results depending on the similarity measures may be that there would be a cut-point for each target-defender dyad that determines whether they form an alliance or not.

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[41] The lowest odds ratio is from the ϕ-score-D's contribution model: 2.187. The highest odds ratio is 2.888 in the I-score-P_0 model.

42 Personal conversation with Bruce Bueno de Mesquita, who invented the measurement of W.

Above a certain level of P_0, depending on the contribution of the defender in each dyad (or the relative power of P_0 with respect to P_A), a target would not form an alliance. Therefore, different similarity measures may capture (relatively) different aspects of P_0. From below to above the cutpoint, as a target's power increases, the probability that the defender offers an alliance may increase because more powerful targets (that are still less powerful than the defender) may be more attractive to the defender.[43] In future research, an elaborate theory regarding P_0 and alliance formation should be developed. On the other hand, D's contribution shows consistent results, with expected signs and statistical significance (at the 1% level).

Similarity differences ($S_T^D - S_C^D$) also show expected results across all statistical models. If we use S_T^D only, then the relationship between S_T^D and alliance formation may change: in this case, one would not need to purchase policy concessions from close friends and it would be too expensive to buy policy concessions from natural enemies (Bueno de Mesquita and Smith 2009, 325). Unlike using S_T^D only, however, as the difference between S_T^D and S_C^D increases, the probability of forming an alliance increases. This follows because the difference, $S_T^D - S_C^D$, is not monotonically related to S_T^D. For example, if S_T^D is 0.1 and S_C^D is -0.8, then the difference is 0.9, whereas if S_T^D is 0.8 and S_C^D is 0.9, then the difference is -0.1.

Table 6 shows the results with additional salience variables. With the addition of these variables, the effect of W_D on alliance formation increases. The odds ratios of W_D in the basic models range from 2.2 to 2.8, whereas with the inclusion of the salience variables they range from 2.5 to 3.0. Thus, a one-unit increase in W_D leads to between a 150% and a 200% increase in the odds ratio of alliance formation of the defender. On the other hand, the effect of W_T does not change substantively. However, the level of statistical significance improves: some coefficients on W_T and W_T^2 reach the 5% level of significance in basic models, whereas in this case all of them are significant at the 1% level.

Regarding P_0, the ϕ-score case is no longer significant at any conventional level. The H-score case becomes statistically significant at 5% level. The statistical significance and effect of P_0 for the I-score case are improved; the statistical significance now reaches the 1% level and the odds ratio becomes – 59.5%.

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[43] The costs of war for a defender would generally decrease if a target is more powerful.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Wald Chi2(6)	64.07	87.65	57.98	83.74	328.13	329.13	52.41	82.47	560.91	560.28
VARIABLES	*Alliance*	*Alliance*	*Alliance*	*Alliance*	*Alliance*	*Alliance*	*Alliance*	*Alliance*	*Alliance*	*Alliance*
D's regime type (W_D)	1.040***	0.962***	1.060***	0.978***	0.807***	0.782***	1.056***	0.972***	0.911***	0.854***
	(0.191)	(0.196)	(0.194)	(0.197)	(0.192)	(0.197)	(0.193)	(0.198)	(0.201)	(0.201)
T's regime type (W_T)	1.663**	1.755**	1.548**	1.700**	2.823***	2.676***	1.645**	1.735**	2.094***	2.137***
	(0.858)	(0.852)	(0.849)	(0.849)	(0.874)	(0.872)	(0.844)	(0.844)	(0.857)	(0.859)
T's regime type (W_T)^2	-1.453**	-1.539**	-1.344*	-1.494**	-2.734***	-2.539***	-1.443**	-1.530**	-2.359***	-2.370***
	(0.846)	(0.840)	(0.837)	(0.840)	(0.870)	(0.862)	(0.836)	(0.837)	(0.860)	(0.860)
P_0 (H-score)	-0.206									
	(0.271)									
P_0 (I-score)			-0.555***							
			(0.209)							
P_0 (ϕ-score)					0.446**					
					(0.246)					
P_0 (S-score)							-0.459**			
							(0.256)			
P_0 (T-score)									-0.0557	
									(0.190)	
D's contribution (H-score)		2.999***								
		(0.572)								
D's contribution (I-score)				3.155***						
				(0.543)						
D's contribution (ϕ-score)						1.763***				
						(0.727)				
D's contribution (S-score)								3.147***		
								(0.541)		
D's contribution (T-score)										2.019***
										(0.619)
Similarity Difference (DT-DC) (H-score)	1.168***	1.210***								
	(0.308)	(0.251)								
Similarity Difference (DT-DC) (I-score)			0.817***	0.928***						
			(0.272)	(0.263)						
Similarity Difference (DT-DC) (ϕ-score)					2.757***	2.655***				
					(0.176)	(0.161)				
Similarity Difference (DT-DC) (S-score)							0.757**	0.887***		
							(0.339)	(0.293)		
Similarity Difference (DT-DC) (T-score)									3.578***	3.580***
									(0.159)	(0.160)
Challenger Alliance	-0.115	-0.118	-0.0976	-0.0935	0.0771	0.0294	-0.0825	-0.0745	0.0720	0.0609
	(0.153)	(0.152)	(0.150)	(0.150)	(0.152)	(0.149)	(0.151)	(0.149)	(0.154)	(0.152)
Constant	-5.645***	-5.819***	-5.333***	-5.783***	-6.463***	-6.120***	-5.406***	-5.777***	-5.931***	-5.987***
	(0.375)	(0.259)	(0.316)	(0.253)	(0.356)	(0.272)	(0.342)	(0.254)	(0.284)	(0.261)
Observations	27,985	27,985	27,985	27,985	27,985	27,985	27,985	27,985	27,985	27,985

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 5: Basic Model

The tau-b and S-score cases also become statistically significant at the 1% level, with effects similar to the I-score case.

In the model with P_0 using I-score, the presence of C's alliances applicable to territorial disputes decrease the odds ratio of alliance formation by around 20%. But all other models show statistically insignificant results.

Similarity differences ($S_T^D - S_C^D$) do not change substantially, though their efficiencies increase. All of them are now statistically significant at the 1% level.

The effects of population and distance between defenders and targets also behave in the expected manner. The larger the population, the higher the odds ratio, increasing by between 36% and 50%. The further the distance between them, the lower the odds ratio, decreasing by between 11% and 18%. Interestingly, the S-like measures show a 17-18% decrease in odds ratios, whereas the Tau-like measures show a decrease of 11-15%. Former colony does not have any statistically significant effects, but the signs are consistent with expectation. Cold War shows negative signs, meaning that states formed alliances less frequently during the Cold War compared to other periods.

This finding is explained by the fact that during the Cold War, the world was divided into two groups: pro-US and pro-USSR. Thus, either states had already formed alliances with one of the two camps or they faced limited choices in choosing alliance partners. For the models with Tau-like measurements, the Cold War period decreases the odds ratio of alliance formation by 40-46%, whereas the models with S-like measurements show decreases of 27-29%.

I do not present the results controlling for temporal dependence, which seems common practice in alliance formation studies. Here, the temporal dependency is controlled for by including t, t^2, t^3 in the statistical model, where t represents the number of years since the target formed an alliance applicable to the challenger (Carter and Signorino 2010). However, some problems exist in t because targets have had different opportunities to form alliances. If a territorial dispute erupted right after independence or the establishment of a state, then the state would not have had a chance to form an alliance at all. Where no previous applicable alliance exists, t should be infinity. Meanwhile, a state with a long history has had more chances to form alliances. Therefore, t cannot be compared across the states. Nevertheless, in the appendix, I include the results with controls for temporal dependency. The results are substantively the same as the results discussed so far.

Table 6: Models with Additional Variables

	(11)	(12)	(13)	(14)	(15)
Wald Chi2(10)	413.81	429.12	398.75	417.10	661.03
VARIABLES	*Alliance*	*Alliance*	*Alliance*	*Alliance*	*Alliance*
D's regime type (W_D)	1.055***	1.004***	1.089***	1.031***	0.959***
	(0.219)	(0.224)	(0.222)	(0.226)	(0.231)
T's regime type (W_T)	2.811***	2.873***	2.700***	2.802***	3.790***
	(0.905)	(0.901)	(0.886)	(0.892)	(0.941)
T's regime type (W_T)^2	-2.717***	-2.784***	-2.608***	-2.711***	-3.854***
	(0.904)	(0.902)	(0.887)	(0.896)	(0.944)
P0 (H-score)	-0.542**				
	(0.306)				
P0 (I-score)			-0.903***		
			(0.260)		
P0 (ϕ-score)					0.102
					(0.295)
P0 (S-score)					
P0 (T-score)					
D's contribution (H-score)		2.516***			
		(0.817)			
D's contribution (I-score)				2.818***	
				(0.759)	
D's contribution (ϕ-score)					
D's contribution (S-score)					
D's contribution (T-score)					
Similarity Difference (DT-DC) (H-score)	0.955***	1.080***			
	(0.243)	(0.208)			
Similarity Difference (DT-DC) (I-score)			0.738***	0.891***	
			(0.215)	(0.216)	
Similarity Difference (DT-DC) (ϕ-score)					2.233***
					(0.205)
Similarity Difference (DT-DC) (S-score)					
Similarity Difference (DT-DC) (T-score)					
Challenger Alliance	-0.225*	-0.190	-0.232*	-0.191	-0.0807
	(0.160)	(0.156)	(0.157)	(0.155)	(0.166)
ln(T's population)	0.416***	0.406***	0.431***	0.411***	0.328***
	(0.0443)	(0.0417)	(0.0453)	(0.0421)	(0.0517)
ln(distanceTD)	-0.198***	-0.193***	-0.199***	-0.194***	-0.161***
	(0.0205)	(0.0208)	(0.0205)	(0.0207)	(0.0227)

	(11)	(12)	(13)	(14)	(15)
Wald Chi2(10)	413.81	429.12	398.75	417.10	661.03
VARIABLES	*Alliance*	*Alliance*	*Alliance*	*Alliance*	*Alliance*
Former Colony	0.112	0.111	0.0959	0.0803	0.258
	(0.423)	(0.424)	(0.423)	(0.424)	(0.439)
Cold War	-0.333***	-0.316**	-0.332***	-0.318**	-0.500***
	(0.142)	(0.141)	(0.143)	(0.141)	(0.148)
Constant	-7.657***	-8.050***	-7.492***	-8.077***	-7.855***
	(0.486)	(0.472)	(0.465)	(0.474)	(0.510)
Observations	27,985	27,985	27,985	27,985	27,985

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6: Models with Additional Variables(Continued)

	(16)	(17)	(18)	(19)	(20)
Wald Chi2(10)	659.36	397.36	418.35	770.32	805.21
VARIABLES	*Alliance*	*Alliance*	*Alliance*	*Alliance*	*Alliance*
D's regime type (W_D)	0.936***	1.102***	1.034***	1.043***	0.922***
	(0.235)	(0.222)	(0.226)	(0.239)	(0.240)
T's regime type (W_T)	3.748***	2.762***	2.802***	3.543***	3.709***
	(0.937)	(0.888)	(0.891)	(0.926)	(0.929)
T's regime type (W_T)^2	-3.786***	-2.678***	-2.722***	-3.838***	-4.053***
	(0.937)	(0.891)	(0.898)	(0.940)	(0.943)
P0 (H-score)					
P0 (I-score)					
P0 (ϕ-score)					
P0 (S-score)		-0.871***			
		(0.300)			
P0 (T-score)				-0.806***	
				(0.231)	
D's contribution (H-score)					
D's contribution (I-score)					
D's contribution (ϕ-score)	1.312*				
	(0.973)				
D's contribution (S-score)			2.824***		
			(0.745)		
D's contribution (T-score)					1.881***
					(0.796)

	(16)	(17)	(18)	(19)	(20)
Wald Chi2(10)	659.36	397.36	418.35	770.32	805.21
VARIABLES	*Alliance*	*Alliance*	*Alliance*	*Alliance*	*Alliance*
Similarity Difference (DT-DC) (H-score)					
Similarity Difference (DT-DC) (I-score)					
Similarity Difference (DT-DC) (ϕ-score)	2.197***				
	(0.183)				
Similarity Difference (DT-DC) (S-score)		0.650***	0.854***		
		(0.257)	(0.237)		
Similarity Difference (DT-DC) (T-score)				3.140***	3.243***
				(0.199)	(0.205)
Challenger Alliance	-0.0945	-0.232	-0.171	-0.157	-0.0925
	(0.160)	(0.160)	(0.154)	(0.169)	(0.162)
ln(T's population)	0.333***	0.427***	0.409***	0.421***	0.361***
	(0.0488)	(0.0450)	(0.0418)	(0.0480)	(0.0450)
ln(distanceTD)	-0.158***	-0.200***	-0.194***	-0.119***	-0.113***
	(0.0228)	(0.0203)	(0.0206)	(0.0255)	(0.0256)
Former Colony	0.263	0.0895	0.0856	0.363	0.385
	(0.438)	(0.423)	(0.423)	(0.444)	(0.444)
Cold War	-0.490***	-0.342***	-0.324**	-0.633***	-0.605***
	(0.148)	(0.143)	(0.141)	(0.152)	(0.150)
Constant	-7.851***	-7.464***	-8.042***	-8.284***	-8.354***
	(0.508)	(0.473)	(0.469)	(0.505)	(0.498)
Observations	27,985	27,985	27,985	27,985	27,985

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

For hypothesis 3 (H3), I calculated the frequency of alliances for each regime type pair, given that defenders are more powerful than targets. Regime types are converted into dichotomous measures; if W is 0.75 or 1, it is coded as democracy, and otherwise it is coded as autocracy (Bueno de Mesquita et.at 2004, 207). I also use the "Democracy and Dictatorship (DD)" dataset (Cheibub et.al. 2010) as a robustness check.

Table 7 shows the expected frequencies of alliances with W data,[44] calculated using the combinations of marginal frequencies. For example, the expected frequency of Democratic Defender and Democratic Target is calculated by the frequency of Democratic Defenders (32.4%) times the frequency of Democratic Targets (57.4%). The outcome is 18.6%, or 63.8

[44] The time span of W is 1816-1999.

states. Note that in the expected frequencies, the autocratic defender and the democratic target pair is the least frequent.

Table 8 shows that the frequency of alliances between a more powerful Autocratic D and a weaker Democratic T (AD) is the least frequent in the observed data. Note also that the AD pairing shows the largest absolute difference between the observed and expected percentage (-3.01%). The chi-squared is 5.7216.[45] Table 9 corroborates this finding, demonstrating that the contribution of the AD pairing to the chi-squared value is the largest among all possible pairings (about 39% of the total chi-squared value). That is, as expected from H3, the AD pairing is the least frequent and also shows the largest difference between expected and observed frequencies.

D

T		Democracy	Autocracy	Total
	Democracy	63.8 (18.6%)	47.2 (13.8%)	111 (32.4%)
	Autocracy	133.2 (38.8%)	98.8 (28.8%)	232 (67.6%)
	Total	197 (57.4%)	146 (42.6%)	343 (100%)

Table 7: The Expected Frequencies of alliances (W)

D

T		Democracy	Autocracy	Total
	Democracy	74 (21.57%)	37 (10.79%)	111 (32.4%)
	Autocracy	123 (35.86%)	109 (31.78%)	232 (67.6%)
	Total	197 (57.4%)	145 (42.6%)	343 (100%)

Table 8: The Observed Frequencies of alliances (W)

[45] The P-value is 0.017, thus significant at P<0.05. Thus, the expected and observed values are significantly different.

D

T		Democracy	Autocracy	Total
	Democracy	1.6 (28.1%)	2.2 (38.6%)	3.8 (66.7%)
	Autocracy	0.8 (14%)	1.1 (19.3%)	1.9 (33.3%)
	Total	2.4 (42.1%)	3.3 (57.9%)	5.7 (100%)

Table 9: The Contribution of Each Cell to Chi-Squared (W)

Table 10 shows the expected frequencies of alliances with DD data.[46] Note that from the expected frequencies, unlike in the W dataset, the joint democracy is the least frequent.

Table 11 shows, however, that the frequency of alliances between a more powerful Autocratic D and a weaker Democratic T (AD) is the least common (6.47%) in the observed data, as expected in H3. Note that a Democratic Defender and a Democratic Target (DD) pair, as opposed to an AD pair, shows the largest absolute difference between the observed and expected percentages (9.97%).[47] The chi-squared is 19.0394.[48] Table 12 shows that the contribution of the AD pair to the chi-squared value is the second largest (about 36% of the total chi-squared value).[49] That is, as expected from H3, the AD pairing is the least frequent and also shows a significant difference between the expected and observed frequencies.

Interestingly, in the DD dataset, the observed allied pairs of similar regime type are greater than the expected ones. This may reflect the Cold War era period of data, as the time span of the DD dataset is 1946-1999. Thus, as in other research such as (Simon and Gartzke 1996), the bipolar context may have driven alliance formations. In addition, the data indicate that joint autocracy is the most frequent pairing, at nearly half of the total alliance formation. This may suggest that alliances between autocracies were frequently terminated and reconstituted during

[46] The time span of DD is 1946-1999.
[47] The difference of ADs is -6.03%.
[48] It is significant at $P<0.01$.
[49] The contribution of DD, the largest contribution, is 39.5%.

the Cold War.[50] The theory and evidence from this paper indicate that autocracies are less likely to offer alliances in exchange for policy concessions. The paper also suggests that autocracies are more likely to pursue private goods that can be directly distributed only to their core supporters, such as wealth and access to resources. Once they fulfil their initial goals in an alliance, they are more likely to leave the alliance, as they quickly demobilize their troops after winning wars (Bueno de Mesquita et al. 2004).

		D		
		Democracy	Autocracy	Total
T	Democracy	26.8 (11.6%)	29.2 (12.6%)	56 (24.2%)
	Autocracy	84.2 (36.2%)	91.8 (39.6%)	176 (75.8%)
	Total	111 (47.8%)	121 (52.2%)	232 (100%)

Table 10: The Expected Frequencies of alliances (DD)

		D		
		Democracy	Autocracy	Total
T	Democracy	41 (21.57%)	15 (6.47%)	56 (24.14%)
	Autocracy	70 (30.17%)	106 (45.69%)	176 (75.86%)
	Total	111 (47.84%)	121 (52.16%)	343 (100%)

Table 11: The Observed Frequencies of alliances (DD)

[50] Alliance reliability or duration may not be relevant here because C has made a new threat. That is, if T's alliance is still in effect and applicable to the current threat yet C still makes a threat, then the alliance fails to deter C, meaning that C believes the alliance is not strong enough or the alliance is not reliable. In this case, T may need a new alliance.

D

T		Democracy	Autocracy	Total
	Democracy	7.5 (39.5%)	6.9 (36.3%)	14.4 (75.8%)
	Autocracy	2.4 (12.6%)	2.2 (11.6%)	4.6 (24.2%)
	Total	9.9 (52.1%)	9.1 (47.9%)	19.0 (100%)

Table 12: The Contribution of Each Cell to Chi-Squared (DD)

5. Conclusion

Traditionally, mechanisms for alliance formation have focused only on power differentials, and frequently those studies address only democratic alliance pairs. This paper, however, evaluates the role of regime type in general in alliance formations. The results show that in addition to power, regime type also affects the alliance formation behaviors of states. The leaders of states face different incentives to survive in different regimes: under democracy, leaders have an incentive pay closer attention to public policies, whereas under autocracy, leaders have an incentive to provide private goods to their supporters. These differences in incentives create different opportunities for leaders, resulting in different combinations of alliance formation behaviors. In particular, this paper shows that as Defender states become more democratic, the probability that they offer (form) alliances increases, whereas as Targets become more autocratic, the probability that they accept (form) alliances increases.

In addition, apart from the common belief that a particular type of regime type pair tends to form alliances more frequently than other combinations of regime types, democratic pairs, autocratic pairs or mixed pairs, this study demonstrates that we do not clearly know whether the pairs are more likely to form alliances than other regime type pairs, because defenders and targets can adjust their bargaining leverage, in terms of both their level of commitment and their level of policy concessions. Instead, this paper asserts that alliances between powerful autocratic defenders and weak democratic targets are less likely.

In terms of future research, several questions arise from the paper. First, alliance formation in areas outside of territorial disputes should be studied. As noted, territorial disputes are one of the necessary conditions for alliances to form. To continue advancing scientific progress in the understanding of alliance formation, we need to accumulate many other "domain specific" studies. Second, in the paper, I proposed some possible hypotheses regarding the presence of rival bidders in alliance formation. Thus, a full development of the hypotheses and empirical tests might shed additional light on our understanding of states' alliance formation behaviors based on their desire to survive. Third, regime type reliability as a function of the nature of honor costs in alliances should also be investigated. Thus far, to the author's knowledge, studies have not yet examined public versus private goods as aspects of honor costs in alliance reliability. In the interest of improved understanding of alliance reliability, future studies might scrutinize the effects of these two different aspects of honor costs on the reliability of alliances.

6. Appendix

Table 13: Models with controlling Time Dependency

	(21)	(22)	(23)	(24)	(25)
Wald Chi2(13)	495.82	512.02	481.19	495.00	678.52
VARIABLES	*Alliance*	*Alliance*	*Alliance*	*Alliance*	*Alliance*
D's regime type (W_D)	1.034***	0.991***	1.069***	1.019***	0.969***
	(0.219)	(0.224)	(0.222)	(0.225)	(0.233)
T's regime type (W_T)	2.911***	2.958***	2.787***	2.883***	3.921***
	(0.899)	(0.897)	(0.878)	(0.884)	(0.967)
T's regime type (W_T)^2	-2.907***	-2.946***	-2.790***	-2.877***	-4.015***
	(0.928)	(0.926)	(0.910)	(0.917)	(0.988)
P0 (H-score)	-0.356				
	(0.303)				
P0 (I-score)			-0.641***		
			(0.266)		
P0 (ϕ-score)					0.211
					(0.287)
P0 (S-score)					
P0 (T-score)					
D's contribution (H-score)		2.367***			
		(0.851)			
D's contribution (I-score)				2.630***	
				(0.790)	
D's contribution (ϕ-score)					
D's contribution (S-score)					
D's contribution (T-score)					
Similarity Difference (DT-DC) (H-score)	1.151***	1.221***			
	(0.258)	(0.216)			
Similarity Difference (DT-DC) (I-score)			0.949***	1.056***	
			(0.233)	(0.223)	
Similarity Difference (DT-DC) (ϕ-score)					2.242***
					(0.207)
Similarity Difference (DT-DC) (S-score)					
Similarity Difference (DT-DC) (T-score)					
Challenger Alliance	-0.312**	-0.294**	-0.324**	-0.306**	-0.183
	(0.160)	(0.157)	(0.158)	(0.157)	(0.167)
ln(T's population)	0.462***	0.456***	0.476***	0.465***	0.377***

	(21)	(22)	(23)	(24)	(25)
Wald Chi2(13)	495.82	512.02	481.19	495.00	678.52
	(0.0431)	(0.0417)	(0.0439)	(0.0424)	(0.0506)
ln(distanceTD)	-0.196***	-0.190***	-0.197***	-0.191***	-0.160***
	(0.0215)	(0.0218)	(0.0215)	(0.0218)	(0.0237)
Former Colony	0.0231	0.0271	0.0163	0.00310	0.154
	(0.430)	(0.430)	(0.428)	(0.429)	(0.451)
Cold War	-0.455***	-0.448***	-0.444***	-0.445***	-0.596***
	(0.145)	(0.146)	(0.145)	(0.145)	(0.151)
Year Since Last Formation	-0.0810***	-0.0819***	-0.0782***	-0.0814***	-0.0799***
	(0.0175)	(0.0171)	(0.0179)	(0.0173)	(0.0171)
Year Since Last Formation2	0.00137***	0.00139***	0.00132***	0.00138***	0.00144***
	(0.000493)	(0.000490)	(0.000503)	(0.000498)	(0.000469)
Year Since Last Formation3	-6.87e-06**	-6.97e-06**	-6.63e-06**	-6.95e-06**	-7.55e-06***
	(3.39e-06)	(3.41e-06)	(3.46e-06)	(3.48e-06)	(3.16e-06)
Constant	-7.660***	-7.938***	-7.550***	-7.997***	-7.872***
	(0.507)	(0.483)	(0.487)	(0.486)	(0.536)
Observations	27,985	27,985	27,985	27,985	27,985

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 13: Models with controlling Time Dependency(Continued)

	(26)	(27)	(28)	(29)	(30)
Wald Chi2(13)	678.80	479.18	500.15	814.34	836.83
VARIABLES	*Alliance*	*Alliance*	*Alliance*	*Alliance*	*Alliance*
D's regime type (W_D)	0.954***	1.081***	1.022***	1.102***	0.995***
	(0.237)	(0.221)	(0.226)	(0.244)	(0.244)
T's regime type (W_T)	3.847***	2.802***	2.833***	3.591***	3.767***
	(0.960)	(0.872)	(0.879)	(0.947)	(0.951)
T's regime type (W_T)^2	-3.913***	-2.812***	-2.832***	-3.936***	-4.134***
	(0.980)	(0.905)	(0.914)	(0.985)	(0.987)
P0 (H-score)					
P0 (I-score)					
P0 (ϕ-score)					
P0 (S-score)		-0.677**			
		(0.300)			
P0 (T-score)				-0.649***	
				(0.224)	
D's contribution (H-score)					
D's contribution (I-score)					

	(26)	(27)	(28)	(29)	(30)
Wald Chi2(13)	678.80	479.18	500.15	814.34	836.83
D's contribution (ϕ-score)	1.285*				
	(0.998)				
D's contribution (S-score)			2.704***		
			(0.774)		
D's contribution (T-score)					1.860**
					(0.824)
Similarity Difference (DT-DC) (H-score)					
Similarity Difference (DT-DC) (I-score)					
Similarity Difference (DT-DC) (ϕ-score)	2.188***				
	(0.187)				
Similarity Difference (DT-DC) (S-score)		0.833***	0.980***		
		(0.270)	(0.241)		
Similarity Difference (DT-DC) (T-score)				3.121***	3.206***
				(0.202)	(0.206)
Challenger Alliance	-0.203	-0.322**	-0.283**	-0.228*	-0.191
	(0.164)	(0.160)	(0.157)	(0.172)	(0.168)
ln(T's population)	0.382***	0.471***	0.460***	0.451***	0.408***
	(0.0490)	(0.0435)	(0.0418)	(0.0476)	(0.0453)
ln(distanceTD)	-0.158***	-0.199***	-0.192***	-0.122***	-0.116***
	(0.0237)	(0.0213)	(0.0215)	(0.0263)	(0.0262)
Former Colony	0.164	0.0108	0.0102	0.262	0.284
	(0.450)	(0.428)	(0.429)	(0.453)	(0.453)
Cold War	-0.591***	-0.454***	-0.450***	-0.720***	-0.688***
	(0.152)	(0.146)	(0.146)	(0.156)	(0.154)
Year Since Last Formation	-0.0790***	-0.0766***	-0.0791***	-0.0789***	-0.0842***
	(0.0169)	(0.0177)	(0.0172)	(0.0182)	(0.0183)
Year Since Last Formation2	0.00142***	0.00128***	0.00134***	0.00155***	0.00169***
	(0.000467)	(0.000502)	(0.000497)	(0.000520)	(0.000528)
Year Since Last Formation3	-7.43e-06***	-6.42e-06**	-6.74e-06**	8.76e-06***	-9.66e-06***
	(3.17e-06)	(3.47e-06)	(3.48e-06)	(3.62e-06)	(3.72e-06)
Constant	-7.784***	-7.464***	-7.942***	-8.171***	-8.288***
	(0.523)	(0.494)	(0.479)	(0.521)	(0.514)
Observations	27,985	27,985	27,985	27,985	27,985

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

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