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Recouping after Coup-Proofing: Compromised Military Effectiveness and Strategic Substitution

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ABSTRACT

In order to counter the threat of a coup, states often undertake a number of strategies to "coup-proof" their militaries, such as creating institutional redundancy, severely limiting interbranch communications, and basing promotions on loyalty rather than merit. As a result of such policies, however, the fighting effectiveness of these armed forces is degraded, and the marginal return on military investment is greatly reduced. We argue that leaders who have coup-proofed their militaries undertake several substitution policies in order to offset their military weakness when faced with external threats. These policies include pursuing chemical, biological, or nuclear weapons and forging alliances. We find support for these theoretical predictions in quantitative tests on data with global coverage between 1970 and 2001.

KEYWORDS

Alliances; civil-military relations; international security; nuclear proliferation

For many heads of state, survival requires mastery of a balancing act. Regimes must depend on their militaries to fend off both domestic and foreign challengers but must also worry about the threat posed by their own forces. Over the last century, military-led coups d'etat deposed more political leaders than civil war, popular protests, foreign imposed regime change, and assassinations combined (Goemans, Gleditsch, and Chiozza 2009). Still, even though regimes have become keenly aware of the intrinsic threat posed by a country's own guardians, failing to create a military would invite challenges from other foes (Feaver 1999).

In order to overcome this inherent "Guardianship Dilemma," leaders have implemented a number of policies to keep their militaries in check (McMahon and Slantchev 2015). Two of the most common strategies involve (1) creating parallel military forces that are capable of counterbalancing each other, and (2) promoting officers based on ties to the political leadership. Unfortunately for political leaders, research suggests that these coup-proofing

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efforts also carry costs, as they cause armies to lose much of their effectiveness as fighting forces (Biddle and Long 2004; Pilster and Böhmelt 2011; Quinlivan 1999). Survival-seeking political leaders must therefore seek alternative measures for defense against external threats. *How do regimes compensate for the self-induced military weakness that results from coup-proofing?*

We highlight two strategies that are useful for regimes that must defend against the possibility of a military coup while also protecting against external threats. We show that political leaders can adopt other policies—"strategic substitutes"—that provide defense without requiring leaders to relax the constraints on conventional military forces instituted to protect the regime from a coup. The first substitute is the development of weapons of mass destruction (WMD), which serves as both a strategic deterrent and may give the possessor more influence in international affairs. The second strategy is to develop alliances in order to balance against the military power of other states.[1]

The analysis reveals that coup-proofed states do indeed adopt these strategic substitutes at higher rates, a finding that has numerous implications for the study of both international security and political stability. While conventional wisdom suggests that coup-proofing leaves states exposed to external threats, our analysis suggests that the outlook for security in coup-prone states may not be so dire. Where political leaders have access to adequate forms of coup-proofing and alternative sources of military power for defense, they can resolve the tension between the risk posed by external foes on one hand and the risk of a coup on the other. In this, strategic substitutes are important for regime stability, since they reduce the need to relax constraints on potentially disloyal military forces when the state is faced with serious external threats. Understanding this relationship is crucial for policymaking. If the adoption of strategic substitutes like alliances can alleviate the need to strengthen a potentially disloyal military, credible security guarantees from allies may improve the chances for regime survival in coup-prone states. Alternatively, because the military weakness created by coup-proofing leads states to adopt WMD at higher rates, policies focused on mitigating the coup-risk that necessitates constraints on the armed forces may weaken the demand for WMD and promote the elimination of weapons stockpiles.

In the remainder of the article, we outline the major determinants and forms of coup-proofing. We then discuss existing literature and illustrations from cases in the Middle East, which show how coup-proofing can be harmful to military effectiveness. Next, we explore the implications of this phenomenon, addressing how regimes seek to compensate for self-inflicted military weakness. We then introduce and evaluate quantitative tests of our

[1]We recognize that other strategies exist, such as the use of proxy forces, but data limitations prevent us from exploring these alternatives in this article.

theory, followed by a focused case comparison of Peru and Ecuador. We conclude our article with a discussion of future avenues for research.

Why and how regimes adopt coup-proofing strategies

Leaders of all stripes tend to hold tight to the reins of power in order to maintain the benefits of high office. For leaders of coup-prone countries, however, the stakes are especially high, as losing power to the military can often translate to exile, imprisonment, or even death (Chiozza and Goemans 2004). While interstate wars are increasingly rare, the rash of coups that occurred in the second half of the twentieth century showed many leaders that the biggest source of peril to their continued rule came from domestic threats, rather than foreign ones. In all, more than 450 coups have been launched against regimes around the world since 1950 (Powell and Thyne 2010). In order to survive in this context, the dictates of state security are frequently replaced by those of regime security (David 1991).

As a consequence of having fended off attempted coups, having witnessed coups occur in neighboring states, or frequently, having gained power via a coup themselves, leaders have been forced to institutionalize safeguards against these threats.[2] How do leaders protect their regimes from the threat of a coup? Broadly speaking, there are two types of tools that leaders use to lessen the likelihood of a coup: those that influence the military's ability to act against the regime, and those that affect the military's disposition to launch a coup (Powell 2012). Within this framework, we discuss two coup-proofing strategies in particular: (1) establishing barriers to communication and coordination, and (2) controlling military personnel recruitment and advancement. The latter strategy is primarily designed to influence the military's disposition, while the former reduces the risk of a coup by making it less appealing for the military to direct its coercive power against the regime.[3]

In order to inhibit malicious coordination and communication across the military, regimes often adopt "divide-and-conquer" strategies. In these states,

[2]Throughout this section, we rely on illustrative examples from the Middle East because this region is particularly relevant for our research question. Regimes in Iraq, Syria, Egypt, Libya, Iran, Tunisia, and Yemen all saw governments successfully overthrown—and in all cases but Tunisia and Iran, by their own military officers. Syria and Iraq experienced several such takeovers before a strongman finally established himself well enough to maintain power. All told, there were over 40 coup attempts in 11 countries, with 27 occurring during the 1960s alone (Brooks 1998:13, 81). The civil-military stability of Middle Eastern regimes since 1970 (that is, until the Arab Spring of 2011) can be explained by the extensive use of coup-proofing strategies in these countries (Rubin and Kearney 2001).

[3]Our approach toward factors that influence military disposition is consistent with the framework that Feaver (1999) discusses. Changing the disposition to intervene involves: "(a) adjusting the ascriptive characteristics of the military so that it will be populated by people inclined to obey, and (b) adjusting the incentives of the military so that, regardless of their nature, the members will prefer to obey" (Feaver 1999:226). The decision to focus on these strategies is warranted, given their prominence in the historical record and numerous previous studies of coup-proofing (for example, Pilster and Böhmelt 2011, 2012; Powell 2012; Quinlivan 1999).

multiple forces are created with the same primary mission. States may, for example, rely on dozens of intelligence services instead of a single cohesive organization. With intelligence organizations in particular, it appears that the main mission is not to spy on external threats, but to spy on each other and potential domestic opponents. As a result, armed forces in coup-prone countries are often characterized by massive redundancy.

A core component of the divide-and-conquer strategy is to create and develop a second armed force that the regime can use to balance against the main army. Perhaps the quintessential example of this is the creation of the Revolutionary Guards (*Pasdaran Inqilab*) in 1979, which consolidated several paramilitary groups in order to counter the influence and power of the regular Iranian Army (suspect in the Ayatollah's eyes due to its previous loyalty to the Shah). Today the *Pasdaran* is estimated to consist of 125,000 personnel, compared to 350,000 in the regular army. The *Pasdaran* has not only ground forces, but naval, marine, and air forces as well, such that its structure parallels that of the regular military (International Institute for Strategic Studies 2014:319). It is important to note that the *Pasdaran* need not be of equal size to the military in order to protect the regime. The fact that the regime can call on 125,000 armed and trained loyalists to defend it greatly raises the cost of an attempted coup, meaning that it is sufficient for the regime to create a force that undermines the army's hegemony over coercive power. One might ask why the regime did not just disband the regular army and replace it with the *Pasdaran*. Retaining only the *Pasdaran*, however, would make the regime equally vulnerable to coup attempts by that force as well. Although the army may not be as ideologically committed to the regime, it is quite contrary to its interests to see a rival force take power in a coup. In essence, creating the *Pasdaran* has given the army greater incentive to protect the regime. Of course, some degree of overlap and bureaucratic infighting is natural and found in all countries. It is the degree and purposeful design of this overlap that is outstanding in coup-proofed regimes.

A second element of this strategy is to withhold authority from the armed forces by maintaining as much direct, day-to-day control over each separate organization as possible and by delegating as little authority as possible to lower-ranking soldiers. In both cases, the result is a highly inefficient command structure. Regimes across the Middle East seek to avoid a pyramid-like chain of command common in states with civil-military comity. Within the Palestinian Authority, Arafat was the only person who commanded all of the various security apparatuses. Luft (2000:4) points out that most branches of these organizations had two commanders, equal in rank: one in the West Bank and the other in the Gaza Strip. Those regional commanders reported directly to Arafat rather than being subjected to an intermediate level of operational command or a general stafflike body. Arafat was so involved in

the minutiae of operations that he would sign checks for sums as little as $300 to members of the Tanzim paramilitary.[4] Both Libya's and Iraq's previous regimes had similar institutional structures, with all military branches reporting directly to their respective leader. Indeed, armies throughout the region are characterized by a total lack of intra- and inter-institutional communication, with branches of the armed forces generally unable to communicate directly with one another, as dictators generally demand that all such communication go through their office. Given this preference for such limited communication, joint exercises are virtually unknown in the region.

Still, try as they might, endangered political leaders are unable to make all decisions on their own. While they generally minimize delegation of authority to the greatest extent possible, they also have limited time and capacity for decision making. As a result, when they do delegate substantial authority, they give the most sensitive positions to close family members and trusted loyalists, all of whom stand to lose a great deal if the regime loses power. In Bahrain, for instance, the chief of staff and heads of every branch of the armed forces—except the navy—is from the ruling al-Khalifa family (Shapir and Magal 2011). Within regimes employing this strategy, lower-level positions are also often given to either members of the same tribe, members of the political leader's own ethnic group (if he heads a minority regime), or members of tribes that have long supported the regime (these strategies are referenced in the literature in the context of "ethnic stacking"). Whenever individuals are vetted for military appointments, merit is rarely a top consideration. Jordan's security services are still mostly led by East Bank Bedouin (who keep their eyes on the Palestinians who arrived there during the 1948 and 1967 wars and may make up a majority of the population). Similarly, Syria's Asad regime has appointed fellow Alawis to top positions throughout the military. Zisser (2001:13–25) notes how at the time of Hafiz al-Asad's death in 2000, 90% of those who had attained the rank of general were Alawi, with many senior officers coming from Asad's Kalabiyya tribe.

The costs of coup-proofing

While these coup-proofing institutions help reduce the likelihood of facing a coup, they can also be quite costly, reducing both an army's fighting effectiveness and the marginal return on military investment (Brooks 1998:10). In this section, we discuss some of the ways in which different coup-proofing strategies may influence the battlefield performance of militaries. While there

[4]"Additional Captured Documents Reveal Again the System of Money Transfers to Terrorist Squads, Personally Authorized by President Yasir Arafat, with the Deep Involvement of Marwan Barghouti," Israeli Defense Forces document TR6-498-02, June 24, 2002.

exists substantial quantitative and qualitative evidence linking the degree of civil-military comity to outcomes in conflict (Biddle and Long 2004; Brooks 1998, 2008; Pilster and Böhmelt 2011), more work remains to be done on this topic. By highlighting the consequences of certain coup-proofing strategies, this project provides a basis for further consideration of the microfoundations of coup-proofing and its influence on military effectiveness.

First, "divide-and-conquer" strategies inhibit military performance by creating parallel structures that are inherently wasteful of resources, as duplication minimizes specialization and prevents maximal coordination on the battlefield. For example, forging a strong paramilitary to keep the army in check requires diverting some of a country's tanks, armored personnel carriers (APCs), and helicopters from the main armed forces (Quinlivan 1999). A hypothetical alternative—to simply reduce the size of the military—would not alleviate the potential threat of a coup, while it would run a far greater hazard of inviting external challenges. At the same time, concentrating capacity under a larger number of commands hinders coordination, which inhibits the efficient deployment of forces. These strategies also reduce effectiveness because, as Biddle (2004) points out, the most successful armies on the modern battlefield create synergy by integrating naval, air, armor, and infantry so that each compliments the strength of the others. Such integration requires enormous direct interbranch communication and regular joint maneuvers. However, "coup-proofed" regimes allow for neither direct interbranch communication nor regular joint maneuvers because leaders are generally more concerned with how potential conspirators could use these institutional features to plot against the regime. Consequently, Pilster and Böhmelt (2011) find that states with higher "effective numbers" of military organizations perform more poorly on the battlefield (see explanation in the following).

Second, strategies designed to control the recruitment and advancement of military personnel are also likely to weaken a state's armed forces. Promotion based on loyalty rather than merit reduces the quality of military leadership and therefore the ability of military units to act dynamically on the battlefield (Reiter and Stam 1998).[5] After taking power in the Islamic Revolution, for example, Iranian leader Ayatollah Ruhollah Khomeini purged the officer corps of the Iranian military. Khomeini doubted the loyalty of these officers because they had previously acted as agents of the Shah and because their skills could be used against the new regime. In doing this, however, Khomeini deprived the military of competent leadership. When the Iraqis attacked at the outset of the Iran-Iraq War in 1980, Khomeini quickly realized this disadvantage and reinstated many of the officers who had

[5]For an alternative perspective on this issue, see McMahon and Slantchev (2015).

been purged—at least those who had not yet been killed or exiled—in order to mount a more effective defense (Segal 1988:952–953).[6]

This is not to say that Middle Eastern armies are totally ineffective. Even if hamstrung by these coup-proofing measures, they remain critical for maintaining domestic order. Indeed, almost every country's armed forces have fought a domestic insurgency some time in their recent history, including Algeria, Bahrain, Egypt, Jordan, Syria, Iraq, Iran, Libya, Sudan, Morocco, Saudi Arabia, Yemen, and Oman.[7] When tasked with putting down more recent uprisings in Libya and Syria, the militaries have proven to be formidable pillars of state control. In the Libyan revolution, had NATO not intervened, it is unclear that the rebels would have succeeded in overthrowing Qadhafi. Even in terms of external threats, Middle Eastern conventional forces are still of some minimal value, providing a degree of deterrence and coercive value.

How regimes compensate for self-induced military weakness

The preceding claim regarding reduced military effectiveness as a result of coup-proofing measures has already found initial support in recent literature (Pilster and Böhmelt 2011). We further expand this argument by suggesting that regimes that face serious external threats seek to compensate for this self-induced weakness in other ways. We focus on two substitution strategies: developing WMD and acquiring allies.

The first is the development of WMD—meaning nuclear, chemical, or biological weapons. WMD are appealing because they provide states with additional coercive force, power that may help to compensate for conventional capabilities that are constrained or degraded by coup-proofing. This is important, since the ability of states to project force and impose costs on their adversaries increases the chance of prevailing in conflict. Even where fighting does not actually occur, the amount of leverage that states possess in their affairs reflects the expected outcome of armed conflict (Fearon 1995; Wagner 2000:473). Both conventional forces and WMD can be used to hurt an enemy. From the perspective of political leaders who are concerned with coups, however, empowering conventional forces to deal with external threats is risky. If coup-proofing was instituted to reduce the chances of military disloyalty, relaxing these constraints involves trading a better defense against external threats for additional coup-risk.

For leaders concerned with the risk of a coup, acquiring WMD provides additional leverage in international bargaining without delegating additional

[6]Ironically, once the Iranians had repelled the Iraqi advance and a new cadre of military leaders had gained valuable experience, Khomeini again purged his military of officers who had previously served for the Shah.

[7]Turkey and Israel are not exceptional, as both have also faced insurgencies. See Rubin's chapter in Rubin and Kearney (2001).

power to their conventional forces. This is a key advantage, because unlike conventional forces in which power must be given to a relatively large number of individuals, control over WMD is often concentrated among small, elite cadres. These individuals can be handpicked by the regime for their loyalty and their actions closely monitored for subterfuge. In Iraq, for example, Saddam Hussein chose personnel from his hometown of Tikrit to perform many of regime's most sensitive tasks, including management of the WMD programs (al-Marashi 2002). Furthermore, the nature of WMD—especially nuclear weapons—makes it hard for potentially disloyal agents to use these munitions against the regime without causing serious damage to the state itself, thereby reducing the benefits of taking power and, with this, the utility of WMD in a coup.

Limitations on the use of WMD exist, however, whether as a result of norms or a fear of conflict escalation (Price 1997; Tannenwald 1999). Moreover, WMD are less useful for missions relating to repression and occupation, which typically require a physical troop presence. These factors prevent rulers from completely replacing their conventional military power with WMD. Still, WMD give political leaders the power to defend the state without sacrificing the precious coup-proofing mechanisms that protect the regime from a coup.

Returning again to the Middle Eastern context, four of the five countries that have seriously pursued nuclear weapons programs (Iran, Iraq, Israel, Libya, and Syria) are also highly coup-proofed. In addition, these same countries plus Egypt are known to have developed substantial chemical or biological weapons capabilities, with Syria, Libya, Egypt, Iraq, and Iran having used them in war. Egypt used chemical weapons in Yemen (1963 and 1967); Libya did so in Chad (1987); Iraq and Iran used chemical weapons against one another (1983–1984) and Iraq again against the Kurds (1988); and most recently, Syria used chemical weapons in its civil war (2013). In all of these cases, chemical weapons were used because conventional forces were performing poorly. We therefore expect that coup-proofed states will compensate for military weakness by pursuing or possessing WMDs.

H1: *Coup-proofed regimes are more likely to pursue and possess WMDs to counter external threats.*

Another strategy is to forgo the development of additional indigenous capabilities and instead to compensate for the military weakness caused by coup-proofing by acquiring new alliance partners. The security guarantees provided by allies can help states to deter potential foes by promising to involve third parties on their side of a conflict (Morrow 1991). Alliances are useful in this respect because they provide capabilities that augment domestic military power. Even if the state does not have sufficient capabilities to deter an opponent on its own, the additional strength provided by allies can help to

keep adversaries at bay. This is an especially important quality for coup-proofed regimes, since they can utilize the power provided by allies to attain security without the need to relax the constraints that help to keep their military forces loyal. Having numerous or strong allies is useful in this context, all else held equal, because they provide more of the capabilities that regimes may have sacrificed through coup-proofing. Of course, alliance commitments can be broken, and these failures typically occur at inopportune times for vulnerable states.[8] In most cases, the potential for abandonment means that states cannot rely completely on security guarantees from other states for defense. Yet we should still expect political leaders who have hamstrung their armed forces via coup-proofing to have increased demand for the capabilities that alliance commitments can provide.[9]

It is again useful to consider the behavior of regimes in the Middle East. Syria and Iraq previously were Soviet clients, and following the Soviet collapse, Syria has aligned itself with Iran. The classic example of this, however, is the Persian Gulf countries, which have a long history of using Iran to balance against Iraqi threats, or backing Iraq when Iran was deemed more threatening. When both proved incurable menaces in the late 1980s, they began allying with the United States (Lake 2009; Rubin 1999). We therefore expect that coup-proofed states will compensate for military weakness by forming alliances with other states.

H2: *Coup-proofed regimes are more likely to pursue alliances to counter external threats.*

Research design

To test these hypotheses, we build a data set that is inclusive to all state-year observations from 1970–2001.[10] For tests of Hypothesis 1, we leverage data on two different classes of weapons of mass destruction (WMD): nuclear and chemical/biological weapons. We conduct separate analyses on each type of weapons program for a variety of reasons. Pursuing nuclear weapons is a far more complicated and expensive endeavor than pursuing either biological or chemical weapons, meaning that stronger selection effects will be at work for

[8]Leeds (2003) argues that alliances commitments are most likely to be broken when the costs of formation and violation of these agreements are low or when conditions have changed significantly between when alliances are formed and when they are triggered.

[9]Frisch (2002) has argued previously for a connection between coup-proofing and alliances. Frisch's argument, however, puts causality in the opposite direction: He purports that regimes that have a great power (especially American) patron can then afford to increase the level of institutional division in their armed forces.

[10]The temporal scope is limited by the availability of data for certain key variables. The data for counterbalancing begin in 1970 (Pilster and Böhmelt 2012). Alternatively, we need to control for the threat environment, including those interactions that do not devolve into full-scale war. The most comprehensive data for measuring coercive interactions among states—the Militarized Interstate Dispute data set—is available in the form needed for our analysis only through 2001 (Ghosn, Palmer, and Bremer 2004). As a result, we have limited all tests to the 1970–2001 time frame, since this is the maximum period for which data on all variables are available.

nuclear munitions. At the same time, a country that has capacity for pursuing a nuclear program might not bother with producing a chemical or biological program because these weapons are considered inferior deterrents.

We first examine the pursuit and acquisition of nuclear weapons using information on nuclear programs from Way (2011). For the "Pursuit of Nuclear Weapons" dependent variable, observations are coded as 1 for any state-year in which nuclear weapons are pursued and 0 if there was no known nuclear weapons development program. Similarly, states that have successfully acquired and continue to possess nuclear weapons are coded as 1 for "Possession of Nuclear Weapons" and 0 otherwise. Second, we examine whether states pursue or acquire chemical or biological weapons using a data set developed by Horowitz and Narang (2014). As with the two dependent variables for nuclear weapons, we code two dichotomous variables to indicate state-years in which countries (1) have pursued chemical or biological weapons or (2) have acquired a chemical or biological weapons capability.[11] It is important to note that when states possess nuclear or chemical/biological weapons, they are censored from the sample of states that may pursue these munitions respectively.[12]

In testing our second hypothesis on allies, we use a dependent variable that measures the number of defense pacts a country has signed with other states. While alliances are formed for different reasons, our theory is focused on the acquisition of allies to compensate for vulnerability that might exist due to a coup-proofed military. As a result, we utilize the directed-dyad data from Leeds, Ritter, Mitchell, and Long (2002) to identify alliances that include a defense pact in which the primary obligations incorporate "promises to assist an ally militarily in the event of attack on the ally's sovereignty or territorial integrity." For each state-year, we sum the allies with which a state has a defense pact, producing an "Allies Count" measure that should vary with states' vulnerability.[13] If Hypothesis 2 is supported, particularly coup-proofed states have systematically higher values of the Allies Count variable than similar countries that are not as coup-proofed.

The two independent coup-proofing variables of interest are institutional redundancy and "stacking," whereby political leaders select military personnel on the basis of their political reliability. In order to measure the institutional

[11]Given the nature of WMD, in particular how hard it is for foreign intelligence and others to detect these weapons, any data are going to be suspect. This opacity should lead to primarily Type II error in the data, which should bias against findings that support our hypothesis. Moreover, Horowitz and Narang (2014) and Way (2011) have gone to great lengths to develop accurate information for chemical, biological, and nuclear weapons pursuit and acquisition.

[12]The only state-years that are censored from the analysis of weapons pursuit are those for which a state is in possession of the munitions. If states give up their nuclear or chemical/biological weapons, they are again eligible to pursue these weapons after the stockpiles have been eliminated. For example: In the case of South Africa, we again allow for the pursuit of nuclear weapons for the years following the dismantling of its stockpile.

[13]In an alternative specification, we develop a "Powerful Allies Count" measure that sums only the defense-pact allies that are materially stronger than the state of interest. Material strength is determined by comparing states' Composite Index of National Capabilities ("CINC") scores (Singer 1987). The results for these tests do not differ significantly from those presented in the following.

redundancies of military forces, we rely on the Effective Number of Forces variable (Pilster and Böhmelt 2011). The variable is a Herfindahl-Hirschman index where S_{ijt} is the share of the total ground combat capable personnel contained in each military or paramilitary organization j at time t in country i.[14]

$$\text{Effective Number } (ln)_{it} = ln\left(\frac{1}{\sum_{j} S_{ijt}^2}\right)$$

Because this variable is right skewed, we follow Pilster and Böhmelt (2012:361) by transforming it using the natural logarithm. Values for this variable range from 0 for a wholly unified military (ln[1] = 0) to 1.52 for the most disaggregated military in the data (an effective number of 4.4 for Afghanistan in 1990). This measure is helpful because it allows us to capture how leaders structure their militaries to inhibit interbranch communication and to create rival forces capable of stopping a coup.

Minority regimes are especially prone to coups and are therefore particularly likely to engage in coup-proofing. As Quinlivan (1999) notes, a key coup-proofing strategy for these regimes is "ethnic stacking"—meaning to stack the military with coethnics. This is a difficult variable to measure directly, given that militaries generally do not publish such statistics about their soldiers, especially when the issue is politically sensitive. In order to develop a measure of this construct, we proxy for ethnic stacking by creating a dichotomous variable to indicate whether the regime in power is ruled by an ethnic minority or not. Based on Wimmer, Cederman, and Min (2009), this variable is coded as 1 for any state-year in which more than 50% of the population belongs to an ethnicity that is politically powerless (for example, Syria) or discriminated against (for example, Jordan), and where ethnicity is a salient political issue. Our assumption here is that minority regimes are likely to engage in coup-proofing via ethnic stacking. This assumption is backed by an enormous wealth of literature that specifically describes how minority regimes promote coethnics to positions of power in the military in order to prevent a coup.[15]

We go one step further in establishing the concurrent validity of this measure.[16] We develop a list of the cases coded for ethnic stacking in our sample, which is presented in Table 1. For all 32 states that are coded as 1 for

[14]Such measures have a long history in comparative politics (for example, Taagepera and Shugart 1989). The Pilster and Böhmelt (2011) variable is coded using the Military Balance data from the International Institute of Strategic Studies. While some question the reliability of certain aspects of this data set (see Colgan 2011), Pilster and Böhmelt (2011) show that the states with high values for Effective Number tend to be among the states with the highest coup risk, a strong indicator of convergent validity (see also Pilster and Böhmelt 2012).

[15]See generally Enloe (1976) and Vanhanen (1999). In the Middle East, see Droz-Vincent (2011:5), Zisser (2001:13–25), al-Marashi (2002), and Bligh (2001). In Africa, see Welch (1986), Decalo (1989), Goldsworthy (1981:58), Anderson (1999:93), Good (1974:13), and N'Diaye (2002:624). In Nepal, see Nepali and Subba (2005:99). For Latin America and the Caribbean, see Enloe (1978) and Kaufman and Haklai (2008).

[16]Concurrent validity is a type of construct validity designed to assess the ability of a variable's operationalization to distinguish between groups that it should be able to distinguish between (Trochim and Donnelly 2008).

Table 1. Ethnic Stacking Cases and Supporting Literature.

Country	Time Period	Source(s)
Afghanistan	1996–2001	Sullivan (2007:96)
Angola	1975–2005	Goldsworthy (1981: Table 2)
Bahrain	1971–2005	Droz-Vincent (2011:5,7)
Bolivia	1946–2005	Lesley (1997)
Burundi	1966–1988; 1994–2001	Kaufman and Haklai (2008:751–752)
Cent. Afr. Republic	1960–1965; 1970–1993	International Monetary Fund (2004:13)
Chad	1960–1975	Harkness (2012:Appendix 1)
Congo	1964–1968; 1972–1978; 1985–1990; 1998–2005	Harkness (2012:2)
D.R. Congo	1966–2005	Ngolet (2011:13)
Ethiopia	1946–1991	Vaughan (2003:173)
Gabon	1963–1967	Decalo (1989:362–364); Goldsworthy (1981:Table 2)
Guinea	1986–2005	Goldsworthy (1981:Table 2)
Guinea- Bissau	1974–1980	Harkness (2012)
Iraq	1964–2002	al-Marashi (2002); Quinlivan (1990); Kaufman and Haklai (2008:752)
Ivory Coast	1994–1999	Goldsworthy (1981:Table 2)
Jordan	1946–2005	Bligh (2001); Droz-Vincent (2011:5)
Liberia	1946–1989	Harkness (2012:Appendix 1)
Nepal	1946–1989	Nepali and Subba (2005:99)
Niger	1960–1990; 1996–1999	Decalo (1989:363)
Nigeria	1965–1966; 1984–1998	Harkness (2012:215)
Pakistan	1947–1971	Enloe (1976:35)
Peru	1946–2005	Kruijt and Tello (2002)
Rwanda	1995–2005	Harkness (2012: Appendix 1)
Sierra Leone	1964–1967; 2002–2005	Goldsworthy (1981:58)
South Africa	1946–1993	Mills (1993)
Sri Lanka	1956–1963	Enloe (1978:270)
Sudan	1956–2005	Poggo (2002:72); Harkness (2012:64)
Syria	1970–2005	Quinlivan (1999); Zisser (2001:13-25); Kaufman and Haklai (2008:752)
Togo	1967–2005	Decalo (1989:363)
Trinidad	1962–1985; 1991–1994; 2002–2005	Enloe (1976:35)
Uganda	1966–1985	Lindemann (2011)
Zimbabwe	1965–1979	Goldsworthy (1981:Table 2); Harkness (2012:64)

Notes: State-years coded as "1" for the Minority Regime variable from 1946–2005. Codings are based on the Ethnic Power Relations data from Wimmer. Cederman and Min (2009). State-years are coded as 1 if more than fifty percent of the population is either politically powerless or discriminated against on the basis of ethnicity, and if ethnicity is considered a salient political issue. The cited literature references ethnic stacking in each country and therefore provides evidence of the validity of the Minority Regime variable even though the coding decisions form Wimmer, Cederman and Min (2009) are not necessarily due to these studies in particular.

some point during the sample period, we identify literature that references the ethnic stacking in each state to confirm that these practices did indeed take place. After this extensive review, we are quite certain that our operationalization does not suffer from Type I errors (that is, false positives). This said, some concern remains for Type II errors (that is, false negatives), as ethnic stacking most likely did take place in some countries not marked as minority regimes in our data. The problem is that in some countries, like Libya, the "ethnic stacking" is done on a tribal basis, rather than on the basis of religion (nearly everyone is Sunni

Muslim), ethnicity, or linguistic affiliation (most of the countries are Arab and Arabic speakers). We believe this dynamic is likely to bias against us, as some of these candidate countries pursued WMD or allies (Libya happened to do both).

In addition to our coup-proofing independent variables, we control for additional factors that are relevant for explaining why states may acquire WMD or form alliances. The strategic environment in which states are placed is likely to strongly influence their security policies. In particular, the strength of states' rivals influences their demand for security measures (Diehl and Goertz 2000; Lake 2009). We account for the security environment using an indicator developed by Jo and Gartzke (2007), which measures the aggregate conventional threat faced by states. The variable is based on the natural log of the summed ratio of CINC scores for a state and its rivals. Rivals are identified using data from Klein, Goertz, and Diehl (2006).[17] The variable is produced using the following equation for i states with n number of j rivals in t years:

$$\text{Rivals' Strength}_{it} = ln\left(\sum_{j=1}^{n}\frac{CINC_{jt}}{CINC_{it}} + 1\right)$$

Dependencies among states are also an important determinant of security policy (Lake 2009) and matter for theoretical as well as statistical reasons. South Korea's nuclear proliferation decisions, for example, hinged on its relationship with the United States (Mazarr 1995). Similarly, the security policies of states in Eastern Europe during the Cold War must be considered in the context of their relationship with the Soviet Union. In order to account for these dependencies, we include dichotomous variables denoting whether or not a state has an alliance promising defense with each of the permanent five members of the United Nations Security Council. In addition, this strategy helps to control partly for the biases that might exist in the analysis of state-year data when states' actions are contingent on the expected behavior of the other actors in the international system.[18] While we do not account for all international ties, the relationships between states and superpowers are typically among the most important in terms of their impact on state behavior. These security relationships are likely related to both our key independent and dependent variables, which is why we control for these potential confounds.

In addition to external features of states' security environments, the existing economic and military strength of states likely plays a role in their decisions to arm or ally (Morrow 1991; Singh and Way 2004). As a result, we include states' CINC scores in each test to control for their material strength (Singer 1987). Extant research also focuses on the relationship

[17]We adopt the most expansive view of militarized competition and include the dyad-years for states that undertake interactions labeled as "isolated" in the Klein et al. (2006) data within the set of potential rivals.

[18]We conduct similar analysis on tests that omit these dependency variables. The results are largely consistent in terms of the direction and statistical significance of the key regressors.

between the level of democracy (or autocracy) and states' security policies (for example, Fordham and Walker 2005; Gartzke and Gleditsch 2004; Gaubatz 1996). We follow convention by accounting for democracy using states' Polity2 scores. The ordinal scale for this variable ranges from –10 for states with the most autocratic regimes to +10 for states run by the most democratic forms of government (Marshall and Jaggers 2012).

The geographical context in which states operate is also important. Natural resources can both lead to armed conflict between states and provide regimes with easily divertible rents (Caselli, Morelli, and Rohner 2012). We account for this dynamic using a dichotomous variable that is coded as 1 for countries when at least one-third of their export revenues are from oil and 0 otherwise (Fearon and Laitin 2003).[19] The extent to which states' territory is mountainous also influences their ability to project force (Boulding 1962). We therefore include a variable developed by Fearon and Laitin (2003) that measures the proportion of a state's territory consisting of mountainous terrain. The variable is log transformed because the data on mountainous terrain are right-skewed.[20] In addition, while the discussion up to this point largely focuses on the Middle East, we believe coup-proofing and strategic substitution to be global phenomena. In order to show this, we include a dichotomous variable in our global data set to control for whether a state is in the Middle East (including North Africa) or elsewhere in the world.

Analysis

For tests of the dichotomous dependent variables indicating the pursuit and possession of nuclear or chemical/biological weapons, we use generalized estimating equation (GEE) logistic regression. The GEE model is built specifically for the analysis of time-series cross-sectional data and allows us to account for dependence within panels (Zorn 2001). Each GEE model is run with an independent correlation structure. We account for autocorrelation in the GEE logistic regression models by including three "Time Count" variables, which are cubic polynomials measuring years since a state actively pursued or possessed the two classes of WMD respectively (Carter and Signorino 2010). Negative binomial regression is required for tests of states' Allies Count because this dependent variable is an overdispersed count variable. A one-year lag of the Allies Count dependent variable is included to control for temporal dependence.

We first assess results from the tests of Hypothesis 1, which predicts that coup-proofed states will be more likely to pursue and possess WMD. Table 2 presents

[19]For both the Oil and Mountainous Terrain, ln variables, we extend the figures for 1999 (the last year of Fearon and Laitin's data) through 2001.

[20]The percentage of mountainous terrain is multiplied by 100, such that a state with mountains on half of its territory is represented as 50% before the log transformation, rather than 0.5.

Table 2. GEE Logistic Regression on Nuclear Weapons Substitution Strategy.

	Pursue Nuclear Weapons				Possess Nuclear Weapons			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Effective Number, ln	1.189*		1.132*	0.597	7.091***		6.428***	11.485†
	(0.573)		(0.572)	(0.621)	(1.476)		(1.535)	(6.090)
Minority Regime		1.203	0.956	−0.979		4.433***	2.241*	−63.465*
		(0.909)	(0.601)	(0.781)		(0.901)	(0.879)	(26.628)
E.N., ln × Min. Reg.				4.124*				70.164*
				(1.286)				(29.387)
Rivals' Strength	0.157	0.209	0.106	0.128	0.217	0.316	0.343†	−0.002
	(0.130)	(0.140)	(0.146)	(0.148)	(0.231)	(0.197)	(0.203)	(0.273)
Polity2	−0.012	0.015	−0.016	−0.013	0.215*	0.163*	0.188*	0.581†
	(0.048)	(0.049)	(0.049)	(0.050)	(0.087)	(0.071)	(0.095)	(0.311)
Oil	0.852*	0.383	0.753	1.042*	−2.380*	−3.930*	−2.393*	−2.895*
	(0.396)	(0.630)	(0.413)	(0.439;	(0.966)	(1.836)	(1.221)	(1.386)
CINC	74.090***	75.289***	76.759***	76.179***	149.521***	132.921***	151.155***	242.480†
	(20.103)	(22.451)	(20.352)	(20.648)	(34.497)	(38.279)	(36.526)	(124.181)
Mountainous Torrain. ln	0.221	0.380**	0.270†	0.271†	−0.588	0.132	−0.687	−0.191
	(0.150)	(0.142)	(0.148)	(0.144)	(0.385)	(0.266)	(0.433)	(0.422)
Middle East	1.624*	2.230**	1.685**	2.010**	5.878***	4.441***	6.397***	8.741*
	(0.644)	(0.686)	(0.610)	(0.650)	(1.543)	(1.253)	(1.525)	(3.422)
Ally of United States	1.674†	2.857***	1.939**	2.343**	4.217***	3.589*	4.951***	6.971***
	(0.884)	(0.791)	(0.745)	(0.751)	(1.242)	(1.474)	(0.924)	(2.059)
Ally of Great Britain	−1.008	−1.693	−1.101	−1.195	−3.593	−2.724	−3.796	−7.421**
	(1.309)	(1.448)	(1.340)	(1.304)	(2.744)	(2.100)	(2.877)	(2.780)
Ally of Russia/USSR	0.204	0.956	0.259	0.471	2.866	3.002†	3.374†	4.326*
	(0.729)	(0.664)	(0.669)	(0.603)	(1.908)	(1.695)	(1.771)	(1.726)
Ally of France	1.901†	2.194†	2.134*	1.963†	0.197	1.136	0.313	−0.379
	(1.016)	(1.137)	(1.050)	(1.050)	(0.979)	(1.193)	(1.156)	(0.821)
Ally of China	4.409***	5.111***	4.696***	4.951***	1.363†	4.509***	1.767*	1.126
	(1.182)	(1.126)	(1.153)	(1.186)	(0.801)	(1.082)	(0.766)	(1.221)

(*Continued*)

Table 2. (Continued).

	Pursue Nuclear Weapons				Possess Nuclear Weapons			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Time Count	−2.250***	−2.160***	−2.226***	−2.232***	−2.551**	−2.256**	−2.303*	−2.941**
	(0.420)	(0.408)	(0.408)	(0.417)	(0.947)	(0.735)	(0.980)	(1.109)
Time Count^2	0.116***	0.110***	0.114***	0.114***	0.098**	0.087*	0.088*	0.100*
	(0.023)	(0.021)	(0.022)	(0.022)	(0.037)	(0.034)	(0.038)	(0.041)
Time Count^3	−0.002***	−0.002***	−0.002***	−0.002***	−0.001**	−0.001*	−0.001*	−0.001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Intercept	−2.053**	−3.145***	−2.383***	−2.482***	−6.031***	−4.514***	−6.460***	−12.600*
	(0.665)	(0.558)	(0.564)	(0.584)	(1.694)	(1.141)	(1.591)	(6.366)
N	3774	4235	3774	3774	3907	4458	3997	3997
Wald χ^2	346.65***	375.47***	328.87***	350.71***	153.95***	108.02***	173.59***	238.15***

Significance Levels: †$(p \leq 0.1)$, *$(p \leq 0.05)$, **$(p \leq 0.01)$, ***$(p \leq 0.001)$.

Robust standard errors clustered by state are presented in parentheses.

Notes: Results for General Estimation Equation (GEE) logistic regression tests. Models 1–4 utilize a dependent variable indicating whether states are *pursuing* nuclear weapons. Models 5–8 are tests on a dependent variable that denotes whether or not a state has already *acquired* nuclear weapons. Once states have acquired nuclear weapons, they are omitted from the sample of state-years for which nuclear weapons can be pursued. The tests are inclusive to state-years from 1970–2001. Each GEE model assumes an independent correlation structure. In order to account for autocorrelation, all models are run with polynomial time variables counting years since a state had an pursued or possessed nuclear weapons.

GEE logistic regression results for tests of Pursuit of Nuclear Weapons (columns 1–4) and Possession of Nuclear Weapons (columns 5–8). In support of the hypothesis, results for the Pursuit tests show a positive and statistically significant relationship between Effective Number (*ln*) and the likelihood of pursuing nuclear weapons (see models 1 and 3). Figure 1 shows the effect of Effective Number (*ln*) from model 1. We illustrate our results within a plausible context by holding control variables constant at the values for Iraq in 1986, during a crucial period in the country's WMD efforts.[21] The plot then demonstrates how variation in the fractionalization of states' militaries changes the predicted probability of Nuclear Weapons Pursuit in a context similar to the Iraq case. A rug at the bottom of the plot shows the distribution of Effective Number (ln) across the sample of state-years. Both axes are transformed using the natural logarithm, though axis labels denoting the nontransformed values are used for the ease of interpretation. Going from a completely unified set of military forces to the sample mean of 1.7 effective forces raises the likelihood of Nuclear Weapons Pursuit by approximately four percentage points. A transition from the sample

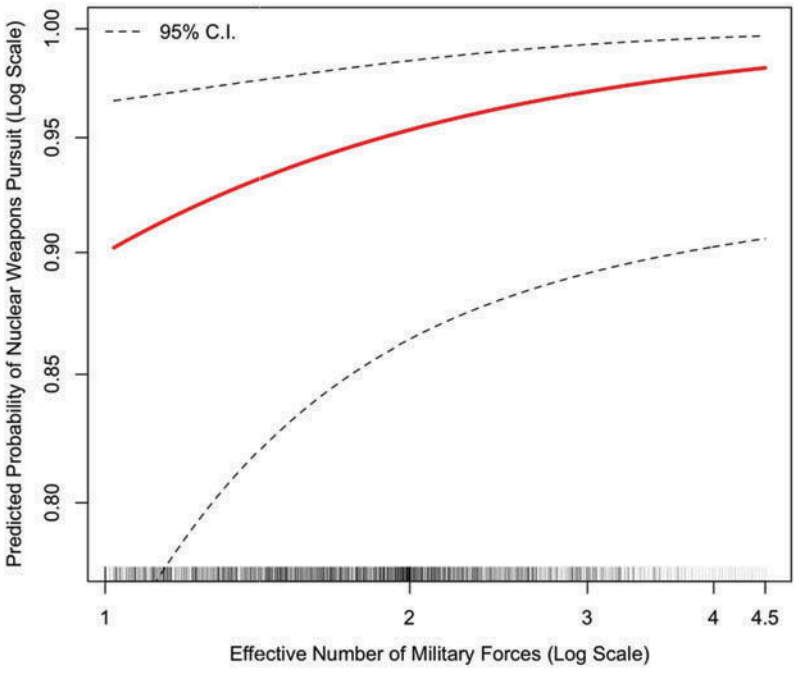

Figure 1. Relationship between effective number and nuclear weapons pursuit.

[21]Iraqi President Saddam Hussein feared that growing the country's conventional forces to face the country's Iranian enemy would endanger the regime from within. The Iraqi government began ordering the use of chemical weapons—the only WMD available to the regime at that time—to augment its conventional forces, which were trying desperately to cope with a dangerous enemy (Hiro 1991).

minimum (1 effective force) to the maximum (4.4 forces) raises the predicted probability by approximately eight percentage points.

If coup-proofing leads to the adoption of strategic substitutes, one might expect this relationship to be stronger in places where multiple forms of coup-proofing are instituted. Model 4 contains an interaction term assessing the combined, conditional effect of Effective Number (*ln*) and Minority Regime.[22] This interaction term shows that states with relatively fractionalized militaries are even more likely to pursue nuclear weapons if they have also engaged in ethnic stacking. However, when the effect of Minority Regime is considered on its own, coefficients are statistically insignificant, suggesting a weaker direct relationship between ethnic stacking and the pursuit of nuclear munitions.

The Minority Regime variable does have a positive and statistically significant effect on the likelihood that states will Possess Nuclear Weapons (see models 6 and 7). Using the same covariate values from Iraq in 1986, model 6 predicts that the Minority Regimes are 56 percentage points more likely than non-Minority Regimes to acquire nuclear munitions.[23] This effect of Minority Regime on Nuclear Weapons Possession is due largely to the influence of South Africa, which possessed nuclear weapons, and the fact that a large majority of non-Minority Regimes lack them. Because South Africa is so important for this result, the case is worthy of some additional discussion. During Apartheid, South Africa relied heavily on ethnic stacking to maintain power and prevented non-Whites from serving in combat roles within the armed forces (Enloe 1975). After all, an army representative of the state's population could not have been trusted to safeguard the regime. As our theory predicts, the Apartheid regime developed nuclear, chemical, and biological weapons to increase its coercive power. However, when the minority regime ended, so did the country's secret nuclear program, as well as its biological weapons program (Reiss 1995).[24]

States with a higher Effective Number (*ln*) are also more likely to Possess Nuclear Weapons (models 5 and 7). This relationship is shown in Figure 2, a plot that illustrates predicted probabilities from model 5 based on covariate values from Iraq in 1986. The plot shows that fully unified militaries rarely possess nuclear weapons—a predicted probability near zero—while the most fractionalized forces have an approximately 16% chance of acquiring nuclear weapons. The interaction term representing the conditional effect of both types of coup-proofing combined is included in model 8. Results suggest that

[22]For more on interaction terms, see Brambor, Clark, and Golder (2006).

[23]The predicted probability of Nuclear Weapons Possession for Nuclear Weapons in Minority Regimes is 98.4% versus 42.6% for non-Minority Regime states.

[24]While some might counter that South African Defense Forces were considered highly effective relative to their neighbors, this does not mean that they could not have been even more effective had they been able to draw from a larger pool of talent.

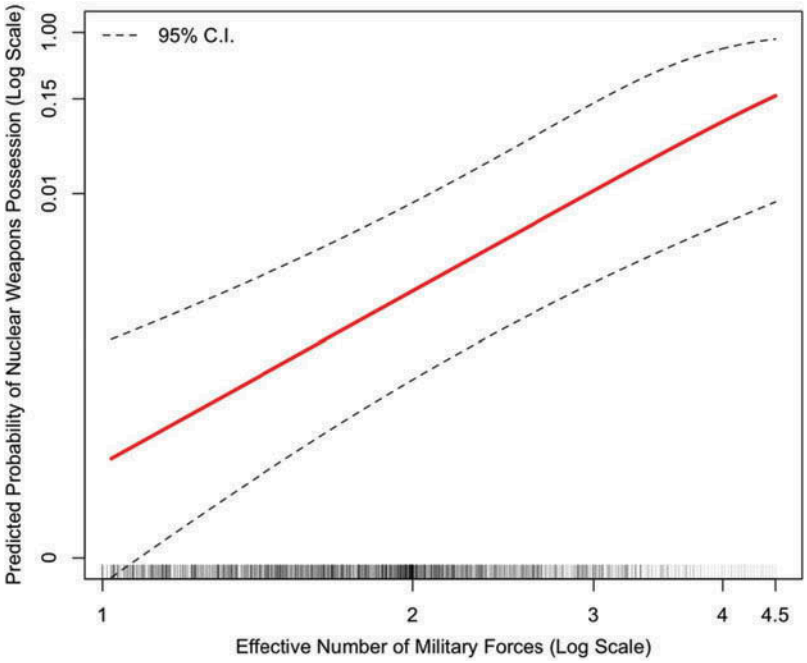

Figure 2. Relationship between effective number and nuclear weapons possession.

states with particularly fractionalized militaries are more likely to possess nuclear weapons if these states are also a Minority Regime with an ethnically stacked fighting force. South Africa, for example, had an ethnically stacked military that was also quite divided.[25]

Table 3 shows the results of tests on the pursuit (models 1–4) and possession (models 5–8) of chemical or biological weapons. These tests provide additional, albeit qualified, support for Hypothesis 1. States with a higher Effective Number of military forces are indeed more likely to pursue chemical or biological weapons (model 3), a result that is significant at the $p < .10$ level. When the effects of Effective Number (*ln*) and Minority Regime are considered separately, model 3 predicts that increasing the fractionalization of the military from a completely unified force to a force with the sample mean of effective units (1.7) raises the predicted probability of Chemical/Biological Weapons pursuit by approximately two percentage points.[26] Going

[25]This relationship is not driven by the need for additional forces to maintain a WMD stockpile. The Effective Number (ln) variable is based on the number of ground combat-capable troops within different branches of the military. The measure is not inclusive to personnel whose primary job is to maintain the weapons or to personnel like pilots and submariners who are tasked with employing air- or sea-launched munitions. In addition, the vast majority of ground troops in WMD-armed militaries train for and conduct conventional warfare. Even among the few ground combat organizations capable of employing WMD, most are tasked primarily with conventional kinetic warfare. As a result, the pursuit and possession of WMD should not strongly influence the distribution of personnel that the Effective Number (ln) variable measures.

[26]This comparison is again made with covariate values set to Iraq in 1986.

Table 3. GEE Logistic Regression on Chemical/Biological Weapons Substitution Strategy.

	Pursue Chemical/Biological Weapons				Possess Chemical/Biological Weapons			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Effective Number, ln	0.868		0.899†	1.089†	0.013		−1.064	−1.045
	(0.548)		(0.540)	(0.595)	(0.940)		(0.975)	(1.051)
Minority Regime		0.296	0.436	1.508†		2.689*	2.482†	2.516
		(0.448)	(0.438)	(0.820)		(1.359)	(1.402)	(2.093)
E.N., ln × Min. Reg.				−1.999†				−0.056
				(1.212)				(2.182)
Rivals' Strength	0.220**	0.205**	0.211*	0.229*	0.538**	0.922***	0.739*	0.740*
	(0.083)	(0.079)	(0.085)	(0.090)	(0.190)	(0.220)	(0.291)	(0.297)
Polity2	−0.080***	−0.082***	−0.078***	−0.079***	−0.115	−0.206†	−0.169	−0.168
	(0.021)	(0.024)	(0.021)	(0.021)	(0.086)	(0.122)	(0.122)	(0.117)
Oil	0.006	−0.207	−0.087	−0.136	−1.287	−1.514†	−0.958	−0.949
	(0.380)	(0.441)	(0.396)	(0.387)	(1.048)	(0.884)	(1.150)	(1.166)
CINC	50.563*	44.912*	52.412*	53.826**	261.962	265.393	265.932	265.724
	(19.923)	(20.584)	(20.488)	(20.560)	(184.380)	(143.021)	(168.314)	(167.689)
Mountainous Terrain, ln	0.370**	0.283*	0.373**	0.384**	−0.098	0.119	0.177	0.177
	(0.117)	(0.113)	(0.117)	(0.118)	(0.293)	(0.335)	(0.386)	(0.386)
Middle East	0.612	0.865†	0.576	0.512	7.501	6.656†	6.745	6.733
	(0.493)	(0.473)	(0.475)	(0.469)	(5.735)	(3.682)	(4.635)	(4.667)
Ally of United States	0.105	0.594	0.073	0.049	−4.815	−2.430	−3.563	−3.550
	(0.438)	(0.467)	(0.445)	(0.442)	(4.593)	(3.765)	(4.065)	(4.105)
Ally of Great Britain	−2.052	−2.367†	−2.086	−2.061	2.058	1.945	2.530	2.518
	(1.311)	(1.217)	(1.306)	(1.315)	(1.988)	(1.627)	(1.878)	(1.885)
Ally of Russia/USSR	−0.001	0.268	−0.028	−0.008	−0.289	−0.579	−1.051	−1.052
	(0.426)	(0.417)	(0.428)	(0.435)	(0.814)	(0.632)	(0.748)	(0.759)
Ally of France	1.666	1.538	1.751	1.792	2.006	1.319	1.444	1.454
	(1.209)	(1.186)	(1.199)	(1.199	(2.913)	(2.894)	(2.867)	(2.922)
Ally of China	2.152**	2.176*	2.224**	2.193**	6.389	6.783**	7.527*	7.527*
	(0.764)	(0.676)	(0.748)	(0.751)	(4.276)	(2.571)	(3.340)	(3.339)

(*Continued*)

Table 3. (Continued).

	Pursue Chemical/Biological Weapons				Possess Chemical/Biological Weapons			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Time Count	−2.307***	−2.182***	−2.293***	−2.298***	−2.914***	−2.572***	−2.754***	−2.755***
	(0.392)	(0.343)	(0.391)	(0.389)	(0.810)	(0.520)	(0.603)	(0.603)
Time Count^2	0.104***	0.099***	0.103***	0.103***	0.126***	0.108***	0.117***	0.117***
	(0.019)	(0.017)	(0.019)	(0.019)	(0.042)	(0.025)	(0.028)	(0.028)
Time Count^3	−0.001***	−0.001***	−0.001***	−0.001***	−0.002**	−0.001***	−0.001***	−0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Intercept	−0.195	0.135	−0.251	−0.402	0.482	−1.550	−0.430	−0.435
	(0.431)	(0.403)	(0.435)	(0.461)	(0.786)	(1.012)	(1.151)	(1.186)
N	3485	3941	3485	3485	3842	4298	3842	3842
Wald χ^2	485.40***	592.36***	500.47***	498.15***	210.51***	243.33***	192.54***	195.73***

Significance Levels: †$(p \leq 0.1)$, *$(p \leq 0.05)$, **$(p \leq 0.01)$, ***$(p \leq 0.001)$.

Robust standard errors clustered by state are presented in parentheses.

Notes: Results for General Estimation Equation (GEE) logistic regression tests. Models 1–4 utilize a dependent variable indicating whether states are *pursuing* chemical or biological weapons. Models 5–8 are tests on a dependent variable that denotes whether or not a state has already *acquired* chemical or biological weapons. Once states have acquired chemical or biological weapons, they are omitted from the sample of state-years for which chemical or biological weapons can be pursued. The tests are inclusive to state-years from 1970–2001. Each GEE model assumes an independent correlation structure. In order to account for autocorrelation, all models are run with polynomial time variables counting years since a state had an pursued or possessed chemical or biological weapons.

from a fully unified force to the most extensively divided force in the data produces more than a three-percentage-point increase in the predicted probability of pursuit. However, the interaction term in model 4 suggests that this effect largely disappears in places where the state is governed by a Minority Regime. The coefficients for Minority Regime in models 2 and 3 are positive but not significantly different from zero. Minority regimes are, however, more likely to possess chemical or biological weapons. Chemical and biological weapons are lucrative for many minority regimes, since in contrast to nuclear weapons, they can be developed with little investment and low technical capacity. Since GDP per capita for minority regimes is about US $1,700 as opposed to US$4,800 for nonminority regimes, there should be little surprise that these states often prefer chemical and biological weapons. Interestingly, the two minority regimes in the data set who did possess both adequate financial resources and technical prowess (Iraq and South Africa) also pursued nuclear weapons.

It is important to note, however, that chemical and biological weapons can also be used to repress populations that may not support the minority regime. Saddam Hussein demonstrated this when he used chemical munitions against Iraqi Kurds during the Al-Anfal Campaign of 1986–1989 (Rabil 2002). Some scholars suggest that the South African regime developed chemical and biological agents, at least in part, to help control an unruly population (Gould and Folb 2011). In this context, chemical and biological weapons may serve the dual purpose of both coup-proofing and facilitating state-sanctioned repression of domestic threats to the regime.

We next consider results for Hypothesis 2. Table 4 presents negative binomial regressions, which test if coup-proofing is associated with the number of alliance partners. The Minority Regime variable is significant and positive across all models in which it is included (models 2–4), providing support for the hypothesis. In contrast, Effective Number (*ln*) has a statistically insignificant effect on states' Allies Count in models 1–3. However, the coefficient for the Effective Number (*ln*) variable is positive and significant in the fourth model, which includes an interaction term to indicate combined coup-proofing strategies. In this context, Effective Number (*ln*) increases the Allies Count of states that are not governed by Minority Regimes. The interaction term, however, suggests that states with particularly divided militaries and Minority Regimes actually have a *lower* number of defense pacts. In the online appendix that accompanies this article, we reestimate these negative binomial models with time-varying intercepts and drop the lagged dependent variable from the models. Such a model requires a Bayesian approach, so we also reestimate Bayesian version of the models in Table 4. In all eight of these alternative models we find support for our key hypotheses.

Table 4. Negative Binomial Regression of Substitution with Allies.

	Count of Defense Pacts			
	(1)	(2)	(3)	(4)
Effective Number, ln	0.063		0.065	0.107*
	(0.040)		(0.040)	(0.043)
Minority Regime		0.089**	0.115***	0.242***
		(0.032)	(0.031)	(0.055)
E.N., ln × Min. Reg.				−0.277**
				(0.090)
Rivals' Strength	−0.036***	−0.037***	−0.040***	−0.038***
	(0.011)	(0.010)	(0.011)	(0.011)
Polity2	−0.038***	−0.035***	−0.038***	−0.037***
	(0.003)	(0.003)	(0.003)	(0.003)
Oil	0.001	−0.018	−0.004	−0.008
	(0.032)	(0.032)	(0.032)	(0.032)
CINC	−7.800***	−6.900***	−7.747***	−7.850***
	(1.400)	(1.411)	(1.403)	(1.407)
Mountainous Terrain, ln	−0.123***	−0.134***	−0.122***	−0.123***
	(0.011)	(0.011)	(0.011)	(0.011)
Middle East	0.223***	0.280***	0.220***	0.211***
	(0.046)	(0.047)	(0.045)	(0.045)
Ally of United States	−0.022	0.010	−0.014	−0.017
	(0.094)	(0.087)	(0.094)	(0.093)
Ally of Great Britain	0.295***	0.272***	0.291***	0.285***
	(0.074)	(0.072)	(0.073)	(0.073)
Ally of Russia/USSR	0.395***	0.473***	0.400***	0.399***
	(0.039)	(0.041)	(0.040)	(0.040)
Ally of France	0.784***	0.772***	0.796***	0.804***
	(0.057)	(0.054)	(0.056)	(0.056)
Ally of China	0.587***	0.649***	0.603***	0.599***
	(0.089)	(0.090)	(0.089)	(0.089)
$\text{Defense Pacts}_{t-1}$	0.129***	0.134***	0.128***	0.128***
	(0.004)	(0.004)	(0.004)	(0.004)
Intercept	0.261***	0.173***	0.248***	0.228***
	(0.048)	(0.046)	(0.048)	(0.049)
α, ln	−1.357***	−1.216***	−1.365***	−1.366***
	(0.081)	(0.072)	(0.082)	(0.082)
N	3900	4301	3900	3900
Wald χ^2	6424.51***	6814.77***	6443.33***	6457.56***

Significance Levels: †($p \leq 0.1$), *($p \leq 0.05$), **($p \leq 0.01$), ***($p \leq 0.001$).
Each model utilizes robust standard errors.
Notes: Results for negative binomial regression tests. The dependent variable counts the number of countries each state has a defense pact with in a given year. The sample is inclusive to all states in the international system from 1970–2001.

Focused case comparison

In all, the quantitative analysis suggests that several important facets of states' security policies are influenced by their coup-proofing choices. In order to assess the robustness of these results, we augment our analysis by qualitatively examining the predicted dynamics in the context of Peru and Ecuador —which fought limited border wars in 1941, 1981, and 1995. Since at least 1980, Peru has had a total population more than twice that of Ecuador (17.7 million versus 8 million in 1981; 23.5 million versus 11.5 million in 1995),

while gross domestic product (GDP) per capita has been similar (US$3,100 for Peru and US$3,650 for Ecuador in 1981; US$3,850 versus US$4,150 in 1995). Over this period, Peru outspent its smaller neighbor on defense: In 1981, it spent over four times as much (US$887 million versus US$248 million) and fielded an army four times larger (157,000 troops versus 34,000). While Ecuador closed these gaps somewhat over the following 15 years, a substantial gap in both defense spending and the size of the army remained (in 1995, Peru outspent Ecuador by 39% and fielded an army twice the size of Ecuador).

Despite the shared international threat represented by the conflict along the shared border of these countries, from 1988–1995, it was only Peru that was suspected of pursuing chemical weapons. We have found no evidence that Ecuador ever pursued WMD. Moreover, Peru was even accused by Ecuadorian generals of using planes to deploy chemical weapons against Ecuadorean positions during their brief 1995 war—a conflict where Ecuadorian forces seem to have had greater battlefield success despite the smaller size of their military.[27]

As our argument and empirical evidence suggest, the difference in the choice to pursue WMD between these two countries is driven in part by differences in their coup-proofing strategies. Traditionally, Peru's government and the military were closely interlinked, with some 51 of the country's 72 presidents having emerged from the upper echelon of the military over its first 180 years of independence (Kruijt and Tello 2002:35). By the 1960s, however, a cadre of concerned military officers led by General Velasco became disillusioned with the dysfunctional civilian leadership and undertook a coup d'etat in order to institute a set of major societal and economic reforms aimed at improving the lives of disenfranchised groups in the country's periphery. Peru was then ruled by a military junta from 1968 until 1980, when it returned power to a civilian president. In addition to facing growing threats from domestic terrorist groups (Shining Path communists and the Túpac Amaru Revolutionary Movement or MRTA), civilian presidents remained wary of the armed forces. The Belaunde government, which had been overthrown by the military in 1968, did not deploy the army to confront these

[27]The claim of Peruvian use comes from Reuters Television, February 10, 1995, Ref: 605160364, "Peru: Ecuador Claims to Have Shot Down Two Peruvian Planes Attacking Its Military Posts." Peru's military officially denied having used chemical weapons in its conflict with Ecuador. Peru, Joint Command of the Armed Forces, Official communique No. 011 CCFFAA, Lima, February 24, 1995, as cited by the ICRC (https://www.icrc.org/customary-ihl/eng/docs/v2 cou pe rule74). For sources that do include Peru among suspected proliferators, see Horowitz and Narang (2014) and the Office of Technology Assessment, Appendix 2-A: Sources on Tables Listing Countries of Chemical and Biological Weapon Concern Proliferation of Weapons of Mass Destruction: Assessing the Risks, OTA-ISC-559 (1993) (http://www.wws.princeton.edu/cgi-bin/byteserv.prl/ ota/disk1/1993/9341/934105.PDF). It should be noted that there is some doubt whether Peru did, in fact, pursue chemical weapons, and few sources on the topic include Peru as a likely proliferator. We consulted several of the top CW experts on this question, but none could definitively confirm or disconfirm whether Peru had a program. One fact that cast some doubt is that Peru did not disclose a CW program when it ratified the CWC.

groups for the first two years because it "did not trust the armed forces and thought it better to keep them quiet" (Kruijt and Tello 2002:43–44). The concern of military intervention was at moments so great that when Alberto Fujimori was elected to power in 1990, on his first day of office he dismissed his military general command. Still fearful of a coup, in 1991 Fujimori ushered through a law that gave him the right to appoint senior military commanders (Kruijt and Tello 2002:46–48).[28]

Similarly, while Ecuador has one of the most unified force structures in the data set, with an average effective number of 1.16 for the 1980–1996 period, Peru's force is far more divided, with an average effective number of 2.0 for the same period. Interestingly, Peru's forces were relatively unified until 1985 (the average effective number was 1.58), but its effective number then jumped to 2.24. Again, only three years later, Peru is suspected of having begun pursuing a chemical weapons program, which is a behavior consistent with our argument.

Conclusion

As recent events in Egypt, Mali, Niger, Guinea, Madagascar, Papua New Guinea, and Guinea Bissau demonstrate, coups d'etat remain a real threat to the leaders of many states. However, some of the most common coup-proofing strategies are associated with decreased military effectiveness (for example, Biddle and Long 2004; Pilster and Böhmelt 2011; Quinlivan 1999), which conventional wisdom suggests should make states vulnerable to international opponents and possibly even domestic enemies as well. We show that regimes compensate for the self-induced military weakness by substituting for an effective military with WMDs or alliance partners. While other strategies such as the use of proxy forces may be an effective policy substitute, data limitations prevented us from exploring this alternative.

The results have implications for scholars interested in the design of authoritarian security forces. First, where sufficient strategic substitutes exist, political leaders can compensate for a military weakened by coup-proofing by adopting other means of defense. This is important for the security of political leaders as well as states' residents, who are also put at risk during conflict. Second, one of our key findings corresponds to research on institutional explanations for military victory. Democracies tend to win military contests more often because they have more allies on average than nondemocratic states, but nondemocracies also are more likely to win conflicts when they have more allies (Graham, Gartzke, and Fariss Forthcoming). The results from our analysis suggest that coup-prone

[28]In terms of "ethnic stacking," it should also be noted that until 2006, Peru was essentially a minority regime, whereby indigenous peoples and Afro-Peruvians were almost entirely disenfranchised from political and economic power, as well as from the upper echelons of the military.

states like autocracies recognize this relationship, at least implicitly, and therefore attempt to increase the number of allies they have to avoid defeat on the battlefield. Additional research on the diplomacy used to create new alliance partners would help clarify the relationship among domestic institutions, alliance structures, and foreign policy outcomes. Third, while existing work focuses on the consequences of ethnic stacking in minority regimes for internal stability (for example, Enloe 1978; Kaufman and Haklai 2008), our study shows that regimes can adopt strategies that provide defense against foreign threats as well. Overall, we hope that this study serves as a stepping-stone for other scholars interested in further understanding the intersection between civil-military relations and world affairs.

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References

al-Marashi, Ibrahim. (2002) Iraq's Security and Intelligence Network: A Guide and Analysis. *Middle East Review of International Affairs* (MERIA) *Journal* 6(3):1–13.

Anderson, G. Norman. (1999) *Sudan in Crisis: The Failure of Democracy*. Gainesville, FL: University Press of Florida.

Biddle, Stephen. (2004) *Military Power: Explaining Victory and Defeat in Modern War*. Princeton, NJ: Princeton University Press.

Biddle, Stephen, and Stephen Long. (2004) Democracy and Military Effectiveness: A Deeper Look. *Journal of Conflict Resolution* 48(4):535–546.

Bligh, Alexander. (2001) The Jordanian Army: Between Domestic and External Challenges. *Middle East Review of International Affairs* (MERIA) *Journal* 5(2):13–20.

Boulding, Kenneth. (1962) *Conflict and Defense*. New York: Harper & Row.

Brambor, Thomas, William Clark, and Matt Golder. (2006) Understanding Interaction Models: Improving Empirical Analyses. *Political Analysis* 14(1):63–82.

Brooks, Risa A. (1998) *Political-Military Relations and the Stability of Arab Regimes*. Adelphi Paper, No. 324. Oxford and New York: Oxford University Press for the International Institute for Strategic Studies.

Brooks, Risa A. (2008) *Shaping Strategy: The Civil-Military Politics of Strategic Assessment*. Princeton, NJ: Princeton University Press.

Carter, David B., and Curt S. Signorino. (2010) Back to the Future: Modeling Temporal Dependence in Binary Data. *Political Analysis* 18(3):271–292.

Caselli, Francesco, Massimo Morelli, and Dominic Rohner. (2012) The Geography of Inter-State Resource Wars. Working Paper.

Chiozza, Giacomo, and H. E. Goemans. (2004) International Conflict and the Tenure of Leaders: Is War Still Ex Post Inefficient? *American Journal of Political Science* 48 (3):604–619.

Colgan, Jeff. (2011) Venezuela and Military Expenditure Data. *Journal of Peace Research* 48 (4):547–556.

David, Steven. (1991) Explaining Third World Alignments. *World Politics* 43(2):233–256.

Decalo, Samuel. (1989) Modalities of Civil-Military Stability in Africa. *Journal of Modern African Studies* 27(4):547–578.

Diehl, Paul F., and Gary Goertz. (2000) *War and Peace in International Rivalry*. Ann Arbor, MI: University of Michigan Press.

Droz-Vincent, Philippe. (2011) A Return of Armies to the Forefront of Arab Politics? *Istituto Affari Internazionali Working Papers* 11(21):1–10.

Enloe, Cynthia H. (1975) Ethnic Factors in the Evolution of the South African Military. *Issue: A Journal of Opinion* 5(4):21–28.

Enloe, Cynthia H. (1976) Ethnicity and Militarization: Factors Shaping the Roles of Police in Third World Nations. *Studies in Comparative International Development* 11(3):25–38.

Enloe, Cynthia H. (1978) Ethnicity, Bureaucracy and State-Building in Africa and Latin America. *Ethnic and Racial Studies* 1(3):336–351.

Fearon, James D. (1995) Rationalist Explanations for War. *International Organization* 49 (3):379–414.

Fearon, James D., and David Laitin. (2003) Ethnicity, Insurgency and Civil War. *American Political Science Review* 97(1):75–90.

Feaver, Peter. (1999) Civil-Military Relations. *Annual Review of Political Science* 2:211–241.

Fordham, Benjamin O., and Thomas C. Walker. (2005) Kantian Liberalism, Regime Type, and Military Resource Allocation: Do Democracies Spend Less? *International Studies Quarterly* 49:141–157.

Frisch, Hillel. (2002) Explaining Third World Security Structures. *Journal of Strategic Studies* 25(3):161–190.

Gartzke, Erik, and Kristian S. Gleditsch. (2004) Why Democracies May Actually Be Less Reliable Allies. *American Journal of Political Science* 48(4):775–795.

Gaubatz, Kurt Taylor. (1996) Democratic States and Commitment in International Relations. *International Organization* 50(1):109–139.

Ghosn, Faten, Glenn Palmer, and Stuart Bremer. (2004) The MID3 Data Set, 1993–2001: Procedures, Coding Rules, and Description. *Conflict Management and Peace Science* 21:133–154.

Ghura, Dhaneshwar, and Benoit Mercereau. (2004) *Political Instability and Growth: The Central African Republic*, Volume 4. International Monetary Fund Working Paper. Available at http://www.imf.org/external/pubs/ft/wp/2004/wp0480.pdf.

Goemans, Henk E., Kristian Skrede Gleditsch, and Giacomo Chiozza. (2009) Introducing Archigos: A Data Set of Political Leaders. *Journal of Peace Research* 46(2):269–283.

Goldsworthy, David. (1981) Civilian Control of the Military in Black Africa. *African Affairs* 80(318):49–74.

Good, Kenneth. (1974) Settler Colonialism in Rhodesia. *African Affairs* 73(290):10–36.

Gould, Chandre, and Peter Folb. (2011) The South African Chemical and Biological Warfare Program: An Overview. *The Nonproliferation Review* 7(3):10–23.

Graham, Benjamin A. T., Erik Gartzke, and Christopher J. Fariss. (Forthcoming) The Bar Fight Theory of International Conflict: Regime Type, Coalition Size, and Victory. *Political Science Research and Methods*. Available at: http://dx.doi.org/10.1017/psrm.2015.52

Harkness, Kristen. (2012) The Origins of Civil Military Relations: Ethnic Armies and the Development of Coup Traps. Unpublished doctoral dissertation. Princeton University.

Hiro, Dilip. (1991) *The Longest War*. New York: Routledge.

Horowitz, Michael, and Neil Narang. (2014) Poor Man's Atomic Bomb? Exploring the Relationship between "Weapons of Mass Destruction." *Journal of Conflict Resolution* 58 (3):509–535.

International Institute for Strategic Studies. (2014) Middle East and North Africa. In *The Military Balance*. London: International Institute for Strategic Studies.

Jo, Dong-Joon, and Erik Gartzke. (2007) Determinants of Nuclear Weapons Proliferation. *Journal of Conflict Resolution* 51(1):167–194.

Kaufman, Eric, and Oded Haklai. (2008) Dominant Ethnicity: From Minority to Majority. *Nations and Nationalism* 14(4):743–767.

Klein, James P., Gary Goertz, and Paul F Diehl. (2006) The New Rivalry Dataset: Procedures and Patterns. *Journal of Peace Research* 43(3):331–348.

Kruijt, Dirk, and Maria Del Pilar Tello. (2002) Peruvian Military Politics: From the 1960s to the Present. In *Political Armies: The Military and Nation Building in the Age of Democracy*, edited by Kees Koonings and Dirk Kruijt. London: Zed Books.

Lake, David A. (2009) *Hierarchy in International Relations*. Ithaca, NY: Cornell University Press.

Leeds, Brett Ashley. (2003) Alliance Reliability in Times of War: Explaining State Decisions to Violate Treaties. *International Organization* 57:801–827.

Leeds, Brett Ashley, Jeffrey M. Ritter, Sara McLaughlin Mitchell, and Andrew G. Long. (2002) Alliance Treaty Obligations and Provisions, 1815–1944. *International Interactions* 28:237–260.

Lesley, Gill. (1997) Creating Citizens, Making Men: The Military and Masculinity in Bolivia. *Cultural Anthropology* 12(4):527–550.

Lindemann, Stefan. (2011) The Ethnic Politics of Coup Avoidance: Evidence from Zambia and Uganda. *African Spectrum* 2:3–41.

Luft, Gal. (2000) Palestinian Military Performance and the 2000 Intifada. *Middle East Review of International Affairs* (MERIA) *Journal* 4(4). Available at http://www.rubincenter.org/2000/12/luft-2000-12-01/.

Marshall, Monty, and Keith Jaggers. (2012) Polity IV Project: Political Regime Characteristics and Transitions, 1800–2007. Center for Systematic Peace. Available at http://www.systemicpeace.org.

Mazarr, Michael J. (1995) *North Korea and the Bomb: A Case Study in Nonproliferation*. New York: St. Martin's Press.

McMahon, R. Blake, and Branislav L. Slantchev. (2015) The Guardianship Dilemma: Regime Security through and from the Armed Forces. *American Political Science Review* 109 (2):297–313.

Mills, Greg. (1993) Armed Forces in Post-Apartheid South Africa. *Survival: Global Politics and Strategy* 35(3):78–96.

Morrow, James D. (1991) Alliances and Asymmetry: An Alternative to the Capability Aggregation Model of Alliances. *American Journal of Political Science* 35(4):904–933.

N'Diaye, Boubacar. (2002) How Not to Institutionalize Civilian Control: Kenya's Coup Prevention Strategies, 1964–1997. *Armed Forces and Society* 28(4):619–640.

Nepali, Prakash, and Phanindra Subba. (2005) Civil-Military Relations and the Maoist Insurgency on Nepal. *Small Wars and Insurgencies* 16(1):83–110.

Ngolet, François. (2011) *Crisis in the Congo: The Rise and Fall of Laurent Kabila*. New York: Palgrave Macmillan.

Pilster, Ulrich, and Tobias Böhmelt. (2011) Coup-Proofing and Military Effectiveness in Interstate Wars, 1965–1999. *Conflict Management and Peace Science* 28(4):331–350.

Pilster, Ulrich, and Tobias Böhmelt. (2012) Do Democracies Engage Less in Coup Proofing? On the Relationship between Regime Type and Civil-Military Relations. *Foreign Policy Analysis* 8(4):355–371.

Poggo, Scopas. (2002) General Ibrahim Abboud's Military Administration in the Sudan, 1958–1964: Implementation of the Programs of Islamization and Arabization in the Southern Sudan. *Northeast African Studies* 9(1):67–101.

Powell, Jonathan. (2012) Determinants of the Attempting and Outcome of Coups d'Etat. *Journal of Conflict Resolution* 56(6):1017–1040.

Powell, Jonathan M., and Clayton L. Thyne. (2010) Global Instances of Coups from 1950 to 2009: A New Dataset. *Journal of Peace Research* 48(2):249–259.

Price, Richard M. (1997) *The Chemical Weapons Taboo*. Ithaca, NY: Cornell University Press.

Quinlivan, James T. (1999) Coup-Proofing: Its Practice and Consequences in the Middle East. *International Security* 24(2):131–165.

Rabil, Robert G. (2002) Operation "Termination of Traitors": The Iraqi Regime through its Documents. *Middle East Review of International Affairs* (MERIA) *Journal* 6(3):14–24.

Reiss, Michael. (1995) *Bridled Ambition: Why Countries Constrain Their Nuclear Capabilities*. Washington, DC: Woodrow Wilson Center Press.

Reiter, Dan, and Allan C. Stam. (1998) Democracy and Battlefield Effectiveness. *Journal of Conflict Resolution* 42(3):259–277.

Rubin, Barry. (1999) The Persian Gulf after the Cold War: Old Pattern, New Era. *Middle East Review of International Affairs* (MERIA) *Journal* 3(2):64–72.

Rubin, Barry, and Thomas A. Kearney. (2001) *Armed Forces in the Contemporary Middle East: Politics and Strategy*. London: Frank Cass.

Segal, David. (1988) The Iran-Iraq War: A Military Analysis. *Foreign Affairs* 66(5):946–963.

Shapir, Yiftah S., and Tamir Magal. (2011) Review of Armed Forces. In *Strategic Survey for Israel 2011*, edited by Anat Kurz and Shlomo Brom. Tel Aviv: Institute for National Security Studies.

Singer, J. David. (1987) Reconstructing the Correlates of War Dataset on Material Capabilities of States, 1816–1985. *International Interactions* 14(2):115–132.
Singh, Sonali, and Christopher Way. (2004) The Correlates of Nuclear Proliferation. *Journal of Conflict Resolution* 48(6):859–885.
Sullivan, Daniel P. (2007) Tinder, Spark, Oxygen, and Fuel: The Mysterious Rise of the Taliban. *Journal of Peace Research* 44(1):93–108.
Taagepera, Rein, and Matthew Soberg Shugart. (1989) *Seats and Votes: The Effects and Determinants of Electoral Systems*. New Haven, CT: Yale University Press.
Tannenwald, Nina. (1999) The Nuclear Taboo: The United States and the Normative Basis of Nuclear Non-Use. *International Organization* 53(3):433–468.
Trochim, William M. K., and James P. Donnelly. (2008) *Research Methods Knowledge Base*. Third Edition. Mason, OH: Atomic Dog.
Vanhanen, Tatu. (1999) *Ethnic Conflicts Explained by Ethnic Nepotism*. Stamford, CT: JAI Press.
Vaughan, Sarah. (2003) Ethnicity and Power in Ethiopia. Unpublished Doctoral Dissertation. The University of Edinburgh.
Wagner, R. Harrison. (2000) Bargaining and War. *American Journal of Political Science* 44 (3):469–484.
Way, Christopher. (2011). Nuclear Proliferation Dates. Available at http://falcon.arts.cornell.edu/crw12/.
Welch, Claude E. (1986) Ethnic Factors in African Armies. *Ethnic and Racial Studies* 9 (3):321–333.
Wimmer, Andreas, Lars-Erik Cederman, and Brian Min. (2009) Ethnic Politics and Armed Conflict: A Configurational Analysis of a New Global Dataset. *American Sociological Review* 74(2):316–337.
Zisser, Eyal. (2001) *Asad's Legacy: Syria in Transition*. New York, NY: New York University Press.
Zorn, Christopher. (2001) Generalized Estimating Equation Models for Correlated Data: A Review with Applications. *American Journal of Political Science* 45(2):470–490.