

# Coup-Proofing and Military Effectiveness in Interstate Wars, 1967–99

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This study examines the influence of civil–military relations on military effectiveness. More specifically, we investigate how coup-proofing, that is, the strategies and tactics employed to prevent the military from seizing power, affects battlefield performance. The main argument claims that coup-proofing has a negative impact on soldiers' leadership qualities, initiative, and the ability to coordinate different military units. Ultimately, the higher a country's coup-proofing efforts relative to its opponent, the worse its effectiveness on the battlefield. We test this hypothesis using data on battlefield outcomes and coup-proofing between 1967 and 1999.

**KEYWORDS:** civil–military relations, coup-proofing, military effectiveness

Rang wai bi xian an nei

(Chiang Kai-Shek)

(First pacify the interior then resist the external [threat])

How do civil–military relations influence military effectiveness? The existing literature offers contradictory answers. On one hand, some scholars argue that low levels of civilian intervention induce stagnant military doctrines, which reflect the armed forces' organizational biases instead of geostrategic or technological requirements (see e.g. Posen, 1984). On the other hand, military practitioners frequently contend that autonomy is necessary for effectiveness (see e.g. Feaver, 1999). Similarly, another body of the literature shows how civilian intervention in the form of coup-proofing, that is, the strategies and tactics employed to prevent the military from seizing power, can deteriorate a country's battlefield performance (see e.g. Biddle and Zirkle, 1996).

Against this background, our study seeks to make a twofold contribution. First, we demonstrate that coup-proofing actually does affect military effectiveness negatively. Previous quantitative studies do not measure coup-proofing per se, but try to capture general instability in civil–military relations, assuming that this phenomenon is

positively related to coup-proofing (see Biddle and Long, 2004; Reiter and Stam, 2002). We measure coup-proofing directly and examine its relationship with military effectiveness in a quantitative multivariate framework using newly compiled data. Second, we also develop a measure of coup-proofing that we believe is more appropriate than previous operationalizations for explaining variance in military effectiveness.

The article proceeds in five steps. We first provide an overview of the literature on civil–military relations and military effectiveness. We then argue that coup-proofing has a negative impact on soldiers' leadership qualities, initiative skills, and the ability to coordinate different military units, which in turn negatively influences a country's performance on the battlefield. Third, we outline our data on battlefield outcomes and coup-proofing in 1967–99 and the variables used in the empirical analysis, before testing our theory and demonstrating the robustness of our findings. The article concludes with a discussion of our research.

### **Civil–Military Relations and Military Effectiveness: An Overview**

Although the literature increasingly pays attention to the determinants of military effectiveness, studies pertaining to the influence of civil–military relations on military effectiveness are still scarce (Feaver, 1999; Nielsen, 2005). Nevertheless, existing research has produced interesting insights. A first body of research focuses on the determinants of countries' choices of suitable military doctrines. Snyder (1984) argues that a lack of civilian control and intervention can exacerbate the bias of military organizations toward offensive doctrines. This may have severe implications for a country's military effectiveness when the prevailing military technology favors the defense. He finds support for his argument in the military doctrines of European major powers before 1914. Similarly, Posen (1984) tests the hypothesis that a lack of civilian intervention leads to stagnant military doctrines, which are disintegrated with the political aspects of a country's grand strategy. He finds evidence for this claim in British, French, and German inter-war military doctrines. Finally, Avant (1993) compares British and US counter-insurgency doctrines to show how divided civilian principals can fail to overcome the parochial biases of their military.

Surprisingly, existing qualitative studies that directly address the relationship between civil–military relations and military effectiveness show a less positive image of the effects of civilian intervention. Biddle and Zirkle (1996), for example, argue that tactics employed to prevent the military from seizing power explain the differing abilities of the North Vietnamese and the Iraqi armies to utilize air defense technologies. Similarly, Brooks (2003a) shows how coup-proofing has negatively affected Arab military performance. Finally, Brooks (2006) explains the rise in Egyptian military effectiveness between 1967 and 1973 by the possibility to forgo coup-proofing techniques once the power struggle between the civilian and military leadership was over in that country.

Quantitative studies also point to the detrimental effects of coup-proofing on military effectiveness. Reiter and Stam (2002) argue that officers' leadership skills are more advanced in democratic countries. As democratic political leaders do not have to fear being overthrown by their militaries, coup-proofing becomes less important than merit or skill for the promotion of officers. In their empirical analysis, they show that armies of more democratic countries are significantly

more likely to see higher levels of officer leadership on the battlefield. More recently, Biddle and Long (2004) also claim that state leaders' attempts to subordinate their armies have a detrimental impact on military effectiveness. They use the number of coups a state experienced in the years prior to a military engagement to operationalize civil–military relations and show a significantly negative influence of this variable on military effectiveness.

In sum, existing studies highlight that civil–military relations influence military effectiveness. Qualitative work, however, tends to be restricted in its empirical domain. Moreover, the two qualitative bodies reach essentially opposing conclusions regarding the consequences of civilian intervention on military effectiveness. Quantitative research stresses the detrimental impacts of coup-proofing as a special aspect of civil–military relations, but only offers indirect measurements of the concept. Instead of measuring coup-proofing per se, indicators capture general instability in civil–military relations, assuming that this phenomenon is positively related to coup-proofing. On one hand, Reiter and Stam's (2002) approach assumes that more democratic countries have more harmonious civil–military relations and less need to engage in coup-proofing. This neglects evidence that both consolidated democracies and autocracies may be less prone to military coups and political instability than mixed regime types (see Hegre et al., 2001; Goldstone et al., 2010; Powell, 2010; but see also Vreeland, 2008).

On the other hand, Biddle and Long's (2004) assumption that coup-proofing rises with the number of coups a country experienced in the recent past is also problematic. Coups are rare events. If leaders only worried about subordinating their militaries after recent coups, most states would not invest in coup-proofing. Iraq, for example, did not experience any coup attempts five years prior to both Gulf Wars, although many scholars emphasized its problematic civil–military relations as a central determinant for its poor military performance (see Biddle and Zirkle, 1996; Hosmer, 2007). Moreover, empirical evidence indicates a negative relationship between the number of coups a country experienced in recent years and its current level of coup-proofing (Belkin and Schofer, 2003). Implementing a strategy of coup-proofing is a long-term endeavor; if a country saw a military coup in the recent past, this might indicate that its leaders have not yet implemented sufficient measures to subordinate their armed forces.

## **Military Effectiveness and Coup-Proofing**

### ***Military Effectiveness and Force Employment***

We understand that a country's military is effective to the extent that it employs its forces to destroy the enemy's military while preserving its own troops—holding situational (role as attacker or defender) and environmental factors (natural barriers such as mountains, forests, or the weather), force size, and weapon technology constant (Biddle, 2004; Dupuy, 1992).<sup>1</sup> Three implications follow. First, military

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<sup>1</sup>We focus on the operational and the tactical level of military activity. A military operation consists of a series of interconnected battles, engagements, or air strikes fought in the realization of strategic ends. The tactical level refers to the individual battles, engagements, or air strikes.

effectiveness is an inherently dyadic concept, that is, it can only be assessed in relation to the opponent an army is facing (see Biddle, 2001; Mearsheimer, 1983; Pollack, 2002). Second, military effectiveness is related to, but conceptually distinct from victory and defeat on the battlefield. An army might be highly effective but still lose battles, operations, or entire campaigns. Judgments of military effectiveness have to focus on the costs a military organization incurs and the costs it inflicts on its opponent(s) in the course of trying to fulfill a mission (Millet et al., 1988; Pollack, 2002). Third, effective force employment is the primary element of military effectiveness. While force size, situational, environmental, and technological factors may well influence battle outcomes, an effective military utilizes these conditions for effectively employing its forces in order to destroy its enemy (Brooks, 2006; Dupuy, 1992; Millet et al., 1988).

But what are the hallmarks of successful force employment? Since World War I, military organizations have developed a stable body of “modern” tactics and operations for conducting meaningful military actions in the face of a lethal battlefield. First, modern offensive and defensive tactics reduce exposure to overwhelming hostile firepower by maneuvering in independent and dispersed small units, which use the territory for cover and concealment. Defenders thereby do not provide targets, which attackers could easily identify and then either circumvent or attack; attackers use this approach to reduce their exposure to the defender’s firepower. Another feature of modern system tactics is the combination of arms with different comparative advantages. In the offense, tanks, for instance, have significant advantages over foot soldiers in armor and fire-power, but they are easy to identify and destroy by the opponent’s infantry. Combining tanks with dismounted infantry substantially enhances their protection against this kind of threat. Defenders use direct fire weapons such as machine guns to slow down enemy movement, while the indirect fire of artillery and mortars is employed for gradual attrition (see Biddle, 1998, 2004; English and Gudmundsson, 1994; House, 1984).

Second, modern offensive operations concentrate forces at a small part of the frontier for achieving local superiority to break through. Reserves are then poured through the created gap to cause the defender’s collapse by destroying the supply, command, and control systems at its rear. Afterwards, the resistance of the remaining disorganized defender troops can easily be broken. The principles of modern defensive operations, that is, defensive depth, counter-attacks, and the employment of reserves, derive from the problem of containing a breakthrough attempt. The deeper the range of defensive positions an attacker has to pass for a successful breakthrough, the higher the likelihood that the coordination between attacking troops fails. This makes the attacker vulnerable to counter-attacks conducted by the defender’s mobile reserves (see Biddle, 1998, 2004; House, 1984; Mearsheimer, 1982b).

What are the mechanisms for implementing modern system tactics and operations? First, commanders’ initiative and leadership are crucial. At the tactical level, cover, concealment, dispersion, and small-unit maneuvers require unit commanders down to the section level to adapt their soldiers’ movements to the territory. At the operational level, a breakthrough through hostile defense lines depends on local commanders dealing quickly with unexpected events without detailed guidance from their superiors. Defense in depth also builds upon officers’ initiative and

leadership abilities as it requires independent maneuvering in small and dispersed units (see Biddle, 1998, 2001; English and Gudmundsson, 1994).

Moreover, the ability of different units to coordinate each others' activity is central for the implementation of modern system tactics and operations. At the tactical level, combined-arms integration requires the armed forces to align the needs of different weapon systems in terms of employment, re-supply, and maintenance. At the operational level, coordination is necessary to ensure the effective movement of reserves, whether they reinforce counter concentrations against attacker forces or pour through holes in defenders' lines. Both can only be achieved through joint peacetime training in the form of daily practice and periodic large-scale exercise (see Biddle, 2004; House, 1984; Mearsheimer, 1982a).

### ***Force Employment and Institutional Coup-Proofing***

Political leaders employ a variety of institutional strategies in order to subordinate their military and prevent it from seizing power. First, state leaders fearing coups tend to intervene in recruitment, promotion, and assignment procedures. They exploit family, ethnic, or religious loyalties for recruiting soldiers to gain insurance against coups (Quinlivan, 1999). To illustrate this, Togolese president Eyadema Gnassingbe did not only allocate the vast majority of officer positions to ethnic Kabye, which comprise about 20% of the Togolese population, but also ensured that senior commanders came from his own natal village within the Kabye's home region (Decalo, 1989). Similarly, primary criteria for the promotion of officers in coup-proof states are affiliation and loyalty – not merit or expertise. For example, no regional defense commander appointed by Saddam Hussein in 2003 had any substantial military background (Hosmer, 2007). In terms of assignments, capable, but potentially disloyal junior officers are frequently entrenched in long-term assignments, where they tend to lose their military qualifications, while senior commanders are rotated on a regular basis to prevent them from developing close ties with their troops (see Brooks, 2003a).

In addition, leaders fearing coups tend to stress their direct and personal control over the armed forces, institutionalizing assertive command systems where “central commanders have constrained the autonomy of lower-level operators and asserted control over operations” (Feaver, 1992: 168f). Zairian dictator Mobutu, for instance, dissolved his entire general staff in order to bring smaller military formations under the direct control of the political leadership (Kisangani, 2000).

Finally, coup-proofing divides a country's military manpower into rivaling organizations, inducing an artificial balance between these institutions. This “counterbalancing” technique not only seeks to create rivalries between existing military units, but also establishes paramilitary organizations with command structures outside the regular army. As a result, any military unit trying to overthrow the regime can be balanced by the independent coercive capacities of sufficiently large and well-equipped military or paramilitary forces that are loyal to the political leadership (Quinlivan, 1999). Gabon's leader Omar Bongo, for example, established a presidential guard under his direct personal control to suppress any potential coup; the elite unit was bigger and much better equipped than the regular army

(Decalo, 1989). Similarly, following a mutiny of soldiers in 1980, the Maltese government transferred major units of its armed forces into a newly established "Task Force" and additionally created a new paramilitary corps, "Id-Dejma," which was roughly equal, if not superior, to the army in terms of size and equipment (Warrington, 1998: 189f).

These coup-proofing strategies prevent effective force employment through their detrimental effect on soldiers' leadership qualities and initiative, and the ability to coordinate different parts of the armed forces. First, the recruitment, promotion, and assignment procedures on the basis of loyalty and ethnic affiliation in coup-proof armies explicitly discourage the acquisition and development of leadership qualities and the exercise of initiative (see Biddle and Long, 2004; Brooks, 2003b). The fact that Syrian commanders down to the level of junior officers were mainly selected by religious affiliation in the 1960s and 1970s resulted in units incompetently led and incapable of independently maneuvering. During the Syrian offensive operation on the Golan Heights in 1973, for instance, the destruction of one armored vehicle in a tank formation usually led to collisions and traffic jams that offered the Israelis a target-rich environment. Syrian armored columns did not stop trying to bypass the destroyed vehicles, but simply kept driving forward as ordered (Pollack, 2002). Similarly, Syrian units on the Golan Heights in 1967 were solely focused on forward defense and proved incapable of maneuvering to confront the Israeli attackers who were outflanking and bypassing them (Pollack, 2002).

Second, the assertive command systems in coup-proof states hamper individual initiative and leadership (see Biddle and Long, 2004; Brooks, 2003b). Two examples are offered by the 1991 Gulf War. Although a break through the Iraqi lines in Kuwait was quickly achieved by the Saudi troops of the Joint Forces Command East, they failed to rapidly exploit this opportunity, advancing much slower than the US marine divisions that carried the main thrust of the attack and faced heavier resistance. The major reason for this was that the Saudi forces were referring to the commander of the Arab coalition forces for basically any decision (Pollack, 2002). On the Iraqi side, the commander of the reserve brigade that was stationed in the sector of the US breakthrough refused to counter-attack, since the request for assistance did not come from his own divisional command, but from the division directly under attack by coalition forces (Pollack, 2002).

Finally, training practices in coup-proof states tend to have harmful effects on battlefield performances. Leaders fearing coups divide their militaries and therefore also frequently prevent different units from training together (Pascal et al., 1979). An example is offered by the Libyan military performance in Chad during the 1980s. Fearing military coups, Gaddafi not only forbade the military using live ammunition for its training, but also prevented any military exercise above the company or (occasionally) the battalion level (Pollack, 2002). Libyan infantry, armor, and artillery consequently proved incapable of coordinating their activities. Libyan infantrymen were, for instance, incapable of fighting dismounted to protect the tanks accompanying them from the highly mobile Chadian anti-tank weaponry (Pollack, 2002). A typical French junior officer in the 1980s, on the other

hand, had usually been trained in different units to enable him to control armor, anti-tank, and infantry platoons (House, 1984).

In sum, we expect coup-proofing to impede a military organization's ability to implement modern operational art and tactics. The ultimate impact of coup-proofing on military effectiveness, however, depends on the opponent a country is facing. Military effectiveness is, as outlined above, an inherently dyadic concept. For example, the Iraqi forces' deficiencies in implementing modern system defensive operational art and tactics did not have severe consequences when fighting Iranian offensives—a country that was also highly coup-proof and therefore rather incapable of implementing modern system offensives. This changed, however, once the Iraqi forces were confronted with the US military—an organization that does not have to face the impact of coup-proofing.<sup>2</sup> Taken together, this enables us to formulate the following hypothesis:

*Hypothesis:* The higher the coup-proofing efforts of a country relative to its opponent on the battlefield, the lower its military effectiveness.

## **Research Design**

### ***Data***

The unit of analysis in our empirical analyses is an attacker-defender pair in a given military engagement, for example, Iranian forces attacking Iraq in 1981's Susangard-Ahwaz offensive. We use Biddle and Long's (2004) modified version of the US army's CDB90 data, covering 58 battles from 1967 to 1982.

Note, however, that these data may comprise several problems. First, coding errors and the lack of transparency in the CDB90 data have been discussed extensively (e.g. Biddle and Long, 2004; Brooks, 2003b). We do not expect this problem to be too serious, however, since we do not rely on any of the explanatory variables of the CDB90 data. Random measurement error in the dependent variable does not bias coefficient estimates, but only leads to inefficiency (see Gujarati, 2004). Moreover, the confidence in our findings is increased as our analysis is restricted to a post-1945 sample (Ramsay, 2008).

Second, the CDB90 data do not contain information on all interstate wars after 1945. After merging the CDB90 data with our data on coup-proofing, the modified sample from Biddle and Long (2004) would only cover military engagements from

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<sup>2</sup> A reviewer pointed out that a non-relational hypothesis might be more appropriate as coup-proofing is a monadic process taking place within a state. We address this point in the robustness section below, but note that we disagree for two reasons. First, relational hypothesis and variable construction are in accordance with previous quantitative research on battlefield effectiveness, which usually assumes that hypothesis testing with a dependent variable measured in comparative terms is more efficient with relationally formulated hypotheses and variables (Reiter and Stam, 2002). Second, our data consist of attacker-defender pairs in given military engagements. Against this setup, a monadic hypothesis would only be appropriate if we had no theoretical reason to assume that the effect of a specific factor is the same for attackers and defenders. However, we make an explicit theoretical argument that coup-proofing has a detrimental impact on military effectiveness for both attackers and defenders.

the Six Days War, the Yom Kippur War, and the 1982 Lebanon War. We therefore used Clodfelter's (2008) encyclopedia and collected data on the outcomes of military engagements in interstate wars from 1965 to 1999.<sup>3</sup> Our final data consist of 108 observations, that is, attacker-defender pairs in military engagements between 1965 and 1999.

### ***Dependent Variable: Military Effectiveness***

We defined military effectiveness as a country's ability to employ its military for destroying the opponent's forces while preserving its own troops. Hence, the loss exchange ratio (*LER*) for a given military engagement, that is, attacker *a*'s casualties divided by defender *d*'s casualties, is a suitable operationalization (Biddle and Long, 2004). The *LER* offers two additional advantages. First, the military engagements in the final data vary significantly in the number of troops involved. The *LER* enables us to control for these different scales of each military engagement (Biddle, 2004; Dupuy, 1992). Second, the *LER* is a more nuanced measure of military outcomes than a simple victory/defeat classification and does not depend on subjective codings (Biddle and Long, 2004).<sup>4</sup> We use the logged version of this variable to account for its skewed distribution. Higher values of the logged *LER* represent less beneficial outcomes for the attacker.

### ***Developing a Measurement of Coup-Proofing***

Although leaders may substitute different techniques to a certain degree, the counterbalancing of forces is likely to be an element of any coup-proofing approach. Counterbalancing has the advantage that it not only manipulates the military's disposition to intervene, but also checks the ability of any military organization to conduct a coup. The domestic balance of power cannot be ignored by coup plotters (Belkin, 2005).<sup>5</sup> We therefore estimate a state's degree of coup-proofing by its level

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<sup>3</sup> More specifically, we gathered information on military engagements in the Vietnam War, the Second Kashmir War in 1965, the War of Attrition (1969 and 1970), the Football War in 1969, the Bangladesh War in 1971, the Vietnam–Cambodia War, the Ethiopia–Somalia War, the Uganda–Tanzania War, the Sino-Vietnamese War in 1979, the Iran–Iraq War, the Falklands War, the Chad–Libya War in 1987, the 1991 Gulf War, the Ethiopia–Eritrea War (since 1998), and the 1999 Kashmir War. We did not apply specific selection criteria, such as coding one battle from each specific war listed in Clodfelter (2008), but retrieved all information that was available in that source. Note that our succeeding analyses are constrained to 1967–1999 due to data availability limitations.

<sup>4</sup> There is a strong relationship between our operationalization of military effectiveness and victory and defeat on the battlefield. In the 376 20th-century battles coded in the CDB90 data, attackers incurred on average 1.948 casualties for each defender killed. Attackers that managed to obtain more favorable loss exchange ratios won about 77% of their battles, while attackers that incurred more than 1.948 soldiers killed per defender killed won only about 38% of their military engagements.

<sup>5</sup> Empirical studies also support the “ubiquity” of counterbalancing in portfolios of coup-proofing strategies. All sub-Saharan African states that did not experience a military coup

of counterbalancing. Belkin and Schofer's pioneering research (2003, 2005) suggests a two-dimensional measure. The authors count a country's number of military and paramilitary organizations, calculate the ratio of troop members in the paramilitary vs. the regular military, and then combine these two figures in an index.

We believe, however, that their measure can be improved. Belkin and Schofer's index incorporates all military and paramilitary organizations, including navy and air force units. Following this logic, a country with a navy and air force is more engaged in counterbalancing than a nation without. It does not appear plausible, however, that leaders create these forces with the purpose of using their coercive capacities to balance military units aiming at overthrowing the regime. Navies and air forces are only of limited suitability in the conduct or prevention of a coup. Coups d'état usually do not—at least if they proceed as planned—involve the large-scale use of direct force. Instead, they employ infantry units for the seizure of key public buildings, such as airports or presidential palaces, and the arrest or execution of high-ranking politicians. The purpose is to quickly gain control and ensure the support of the existing state apparatus, not to destroy it. Neither tactical bombing of a country's capital nor the shelling of naval towns seems suitable for achieving these goals (Janowitz, 1964; Luttwak, 1968). A similar logic holds for the prevention of military coups, as the central idea behind counterbalancing “is to prevent troops from moving on the centers of the regime, a task best accomplished by a ground-based (parallel) military” (Quinlivan, 1999: 142). A measure of counterbalancing—and consequently coup-proofing—should therefore focus on ground-based forces, as these are the only forces whose independent coercive capacities can be used to balance any military unit considering or trying to overthrow the regime.

Furthermore, a measure that includes air and naval forces would pick up two different sets of circumstances, both of which may be related to battle outcomes: counterbalancing and whether a country possesses various instruments of power projection. While we expect counterbalancing to be negatively related to military effectiveness, there is also evidence that countries capable of combining sea, air, and ground troops might create decisive synergies on the battlefield (see Posen, 2003). Combining these two phenomena into one measure might consequently result in an inhomogeneous index that shows no relationship with battlefield performances (see also Goertz, 2008).

Taking this into account, we devise a new measure of counterbalancing. We construct a measure that incorporates information on both the number of rivaling military organizations and their respective strengths to capture the degree to which a state divides its military manpower into rivaling organization.<sup>6</sup> In a first

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by 1980, for instance, had created various rivaling military and paramilitary organizations (Goldsworthy, 1980). Similarly, the creation of various paramilitary organizations has been identified as one of the central causes of regime stability in the 1960s and 1970s (Janowitz, 1977).

<sup>6</sup> A measure of counterbalancing should incorporate both kinds of information. If a military unit trying to conduct a coup is supposed to be balanced by units loyal to the leadership, these forces have to be sufficiently large to possess an independent coercive capacity (see

step, we identified all ground-combat compatible military organizations of a country using the “Military Balance” statistics from the International Institute for Strategic Studies (1967–1999) and various secondary sources. In terms of the regular forces, army and marine corps troops, for instance, are considered ground-combat compatible—unlike navy or air force units. When compiling the data on paramilitary organizations, we did not consider “coast guards”, and any organizations referring to the terms “port”, “aviation”, “maritime”, “marine police”, “air police”, “air wing”, or “naval” in their names. When a navy included marine units, or paratroopers were allocated to an air force, we considered only these units to be ground-combat compatible. Afterwards, we gathered information on the personnel in each of these organizations, focusing on regulars and active reserves, but excluding standing reserve forces. We then operationalized the degree to which country  $i$  engages in counterbalancing in year  $t$  with  $i$ 's effective number of ground-combat compatible military organizations (see Laakso and Taagepera, 1979):

$$C_{it} = \frac{1}{\sum_j s_{jit}^2} \quad (1)$$

where  $s_{jit}$  is the personnel share of the ground-combat compatible military or paramilitary organizations  $j$  in country  $i$  in a battle-year  $t$ . A  $C_{it}$ -value of 1 consequently stands for only one effective ground-combat military organization, while higher values signify that rivaling military organizations do exist. The higher the value of that measure, the higher the effective number of military organizations in a country. This in turn indicates higher coup-proofing efforts in the form of creating an artificial balance between various rivaling military organizations.

In order to account for the dyadic nature of our hypothesis, we created the following item:

$$\text{Coup-Proofing} = \frac{C_{at}}{C_{at} + C_{dt}} \quad (2)$$

where *Coup-Proofing* is the ratio of the counterbalancing value of attacker  $a$  in year  $t$  and the sum of both belligerents' (attacker  $a$  and defender  $d$ ) counterbalancing values in year  $t$ . The higher the value of this variable, the higher the attacker's portion of the total effective number of rivaling military organizations. Put differently, the higher *Coup-Proofing*, the higher the attacker's engagement in coup-proofing relative to the defender. We expect *Coup-Proofing* to be positively signed.

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Quinlivan, 1999). A country that possesses a presidential guard of, for example, 1,000 men in addition to an army of 99,000 troops should consequently not receive the same value on our counterbalancing measure as a country that possesses two equally-sized military organizations of 50,000 men each. We would like to thank an anonymous reviewer for helping us clarifying this point.

### **Control Variables**

A military is effective to the extent that it employs force to destroy the enemy while preserving its own troops—holding force size, weapon technology, and environmental and situational factors constant. Consequently, in our empirical analysis we need to control for these three determinants and variables apart from coup-proofing that influence force employment.

In terms of force size and technology, we follow Reiter and Stam (2002) and consider three variables for the overall balance of capabilities. First, we include the attacker's and defender's composite national capabilities index. A second set of controls measures technological sophistication by considering the attacker's and defender's military spending per soldier. Finally, two dummy variables control for whether an attacker or a defender received support from foreign troops.

Regarding environmental factors, we include Reiter and Stam's (2002) terrain variable that measures the ease with which vehicles can move in a battle environment. It ranges between 0.3 (jungles or mountainous terrain) and 1.2 (open surfaces). Attackers become more vulnerable relative to defenders the less cover the terrain offers, as they have to move while defenders usually have some possibility of digging themselves in all kinds of territories. We therefore expect this variable to be positively signed.

We also control for several determinants of force employment (see Biddle and Long, 2004). First, we consider the attacker and the defender's *polity2* scores to capture belligerents' regime types (Marshall and Jaggers, 2002). We also control for the influence of human capital by including variables for the attacker's and defender's average years of secondary schooling in the total population over 15 years (see Barro and Lee, 2000).<sup>7</sup> Third, culture could contribute to differences in force employment (Biddle and Long, 2004). Hence, we incorporate a series of dummy variables for the attacker's and the defender's cultural background (Gartzke and Gleditsch, 2006). These binary items are directional, for example, *Jewish-Muslim* stands for a Jewish attacker and a Muslim defender in a given military engagement.

Finally, we claimed that our operationalization of coup-proofing is more suitable than Biddle and Long's (2004) number-of-coups approach or Belkin and Schofer's counterbalancing index (2003, 2005). In order to demonstrate this empirically, we generated two variables indicating whether the defender or the attacker experienced more coups d'état five years prior to a military engagement, replicating Biddle and Long (B/L). Information on coups was obtained from the Coup d'État Events Data (Marshall and Marshall, 2007). We also created a dyadic counterbalancing index based on Belkin and Schofer's (B/S) approach. We use these variables to re-estimate our core models reported below, that is, our *Coup-Proofing* is either replaced by B/L's variables or the B/S item. This allows a comparison of the different operationalizations.

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<sup>7</sup> Note, however, that we lack data for a substantial part of our cases: only 80 out of 108 observations are covered by the human capital variables.

## Empirical Analyses

Owing to the scale of the dependent variable, we employ OLS regression to test our hypothesis. We cluster the standard errors on directed dyads to account for intra-group error correlations, since several attacker-defender pairs are represented multiple times in different military engagements in our data. Table 1 provides estimates for three models. Model 1 is our baseline model, the second model additionally includes the cultural dummies, while Model 3 also controls for human capital.

Several interesting findings emerge with regard to the control covariates. Attackers fighting with the support of allies seem to incur fewer soldiers killed per defender killed. *Attacker Allies* has a negative sign and is statistically significant in Models 1 and 2. In terms of environmental factors, terrain that offers less cover

*Table 1.* OLS Regression of the Impact of Coup-Proofing on Military Effectiveness

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>
Coup-Proofing	5.145 (2.311)**	4.361 (1.414)***	6.780 (2.158)***
Attacker Capability	-5.728 (9.011)	1.938 (29.407)	52.819 (41.313)
Defender Capability	7.764 (21.958)	11.622 (69.080)	143.726 (75.715)*
Attacker Technology	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
Defender Technology	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)**
Attacker Allies	-1.492 (0.652)**	-1.864 (0.793)**	0.900 (0.687)
Defender Allies	0.290 (0.310)	-0.301 (0.307)	-0.968 (0.386)**
Terrain	0.348 (1.574)	4.391 (0.924)***	5.319 (1.065)***
Attacker Democracy	-0.035 (0.037)	-0.385 (0.130)***	-0.402 (0.090)***
Defender Democracy	0.098 (0.041)**	-0.142 (0.141)	-0.256 (0.110)**
Attacker Human Capital			-0.025 (0.500)
Defender Human Capital			0.883 (0.358)**
Christian–Christian		-1.651 (1.156)	0.246 (0.634)
Christian–Muslim		-4.731 (2.629)*	-11.029 (5.319)*
Christian–Buddhist		3.007 (5.163)	
Muslim–Muslim		-5.310 (2.215)**	-4.870 (1.803)**
Muslim–Christian		-2.828 (2.236)	
Muslim–Jewish		-1.053 (1.096)	-1.882 (0.233)***
Muslim–Hindu		0.208 (4.674)	-6.260 (3.277)*
Jewish–Muslim		0.679 (1.257)	1.832 (0.703)**
Buddhist–Buddhist		-0.171 (2.644)	
Hindu–Muslim		2.915 (1.855)	1.015 (2.007)
Animist–Christian		-8.093 (2.068)***	-5.883 (1.230)***
Constant	-3.214 (2.203)	0.574 (3.028)	-1.504 (1.935)
N	100	100	74
R <sup>2</sup> (AIC)	0.507 (3.019)	0.750 (2.621)	0.822 (2.362)
R <sup>2</sup> (AIC) Democracy only	0.457 (3.096)	0.724 (2.698)	0.775 (2.573)
R <sup>2</sup> (AIC) B/L	0.460 (3.130)	0.729 (2.720)	0.804 (2.490)
R <sup>2</sup> (AIC) B/S	0.469 (3.094)	0.731 (2.695)	0.822 (2.362)

Note: robust standard errors clustered on the directed dyad in parentheses; \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1% (two-tailed); B/L signifies Biddle and Long's (2004) binary civil–military relations variables instead of our coup-proofing measure; B/S signifies Belkin and Schofer's (2005) coup-proofing variable instead of our coup-proofing measure; some binary cultural variables are dropped in Model 3 due to a lack of variance.

seems to create disadvantages for attackers. Regarding the control variables associated with force employment, we obtain some evidence for the claim that more democratic attackers are more effective on the battlefield. This finding is interesting as it is in line with Reiter and Stam (2002), but contradicts Biddle and Long (2004), who actually find more democratic countries to be less militarily effective once they control for civil–military relations, human capital, and culture. Furthermore, we also find that defenders with higher levels of human capital incur fewer casualties per attacker killed. Finally, in terms of the cultural variables, we obtain significant and consistent findings for *Christian–Muslim*, *Muslim–Muslim*, and *Animist–Christian*.<sup>8</sup>

Turning to the variable of main interest, our hypothesis receives strong support as the coefficient estimates for *Coup-Proofing* are positive and significant throughout all models. The higher the attacker’s effective number of ground-combat compatible organizations relative to the defender, the higher the number of attackers killed per defender killed. Furthermore, our operationalization outperforms other approaches in terms of explained variance. We re-estimated all models using the same sample, but either leaving out the coup-proofing variable entirely (thereby implying that advantages or disadvantages generated by coup-proofing can be captured by the democracy variables) or employing B/L’s (2004) or B/S’s (2005) measures of coup-proofing. Comparisons of the  $R^2$  and the Akaike Information Criterion (AIC) show that our operationalization achieves a better goodness of fit. On average, we obtain  $R^2$  values that are higher by about 4.1% than the “democracy only” models, 2.9% higher than B/L and 1.9% higher than the B/S models.<sup>9</sup>

Figure 1 depicts the relationship between coup-proofing and military effectiveness. The left panel displays simulated expected values and their 95% confidence interval as a function of *Coup-Proofing*, while the right panel shows a scatter plot of the logged *LER* vs. *Coup-Proofing*. Figure 1 highlights in consistency with our hypothesis that the higher the attacker’s effective number of ground-combat compatible organizations relative to the defender, the more casualties attackers tend to incur for each defender killed. When moving from the minimum of *Coup-Proofing* (0.298) to its maximum (0.671), the predicted logged *LER* increases by about 1.889 on average. This corresponds to an increase in the predicted *LER* from about 0.264 defenders killed per attacker killed to about 1.748.

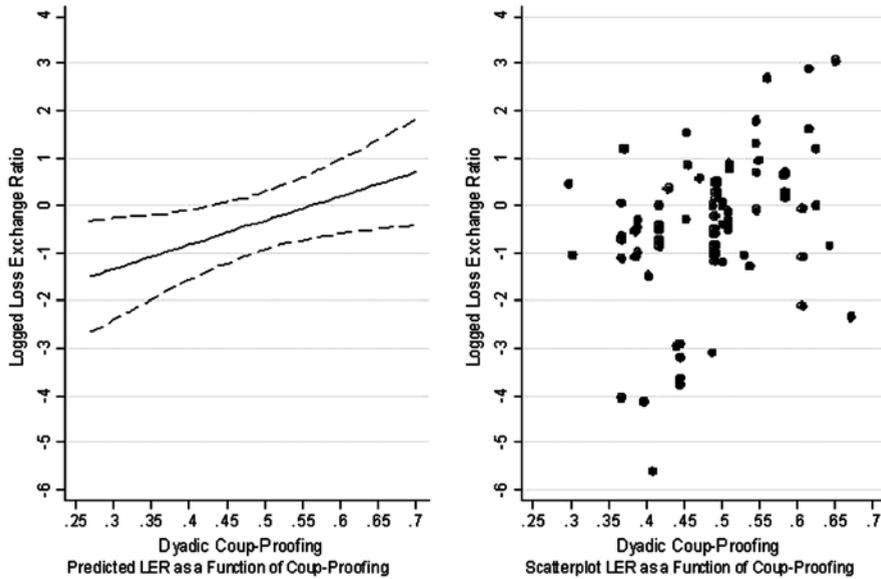
The effectiveness of Jordanian and Syrian defenders against Israeli forces in 1967 illustrates the validity of our findings. Both countries faced a similar task as they had to defend heavily fortified positions in the West Bank and the Golan Heights, respectively.<sup>10</sup> Nevertheless, Jordanian defenders proved significantly

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<sup>8</sup> The results for the Animist–Christian variable, however, are driven by a single Tanzanian–Ugandan military engagement.

<sup>9</sup> In addition, the coefficient estimates employing B/L’s number-of-coups variables only attain conventional levels of significance for the attacker variable in Model 3. The B/S variable has the predicted positive sign throughout all estimations, but is insignificant except in Model 3.

<sup>10</sup> The values of the control variables do not imply any Jordanian advantages when compared to Syria.



*Figure 1.* Coup-Proofing and Military Effectiveness

Simulations are based on the estimated coefficient and variance–covariance matrices from Model 1. All covariates are held at their mean or median, respectively.

more effective against Israeli attackers: in the five Israel–Jordan military engagements in 1967, Jordanian defenders inflicted on average 1.09 times the casualties that they incurred on Israeli attackers, while the Israeli–Syrian *LER* in six military engagements has a value of about 0.270 ( $p < 0.1$ ; two-tailed t-test).

Jordan, on one hand, had rather harmonious civil–military relations. Although King Hussein reacted to domestic turmoil in the 1960s by centralizing command procedures and favoring Bedouin officers over Palestinians for promotions, the armed forces’ loyalty to the king was given. Promotions were largely based on merit, and military training enhanced leadership, initiative, and combined-arms fighting. No palace guards, people’s militias or other paramilitary organizations were created during that time (Pollack, 1996). Jordan’s effective number of ground-combat compatible organizations therefore equals 1 in 1967.

Syria, on the other hand, heavily engaged in coup-proofing during the late 1960s (Pollack, 2002). After the “Military Committee” seized power in 1963, various efforts were initiated to prevent other military factions from gaining influence. Promotions were based on membership in the Baath party or affiliation to the Alawi religious group; senior commanders were rotated on a regular basis. The Syrian leadership also maintained a highly centralized command system, foregoing division-level military organizations to prevent military commanders from becoming too powerful. Finally, the Syrian leadership exacerbated existing divisions within the military and created new and strengthened existing paramilitary

organizations (Pollack, 1996). As of 1967, Syria had a national guard (People's Army) of about 150,000 men and a gendarmerie of about 8,000 troops—next to its regular army of about 50,000 soldiers ( $C_{\text{Syria}, 1967} = 1.575$ ).

As a result, Jordan was much more capable than Syria of implementing a modern system defense against the formidable Israeli Defense Forces, which did not suffer from the detrimental consequences of coup-proofing ( $C_{\text{Israel}, 1967} = 1.0$ ). At the operational level, Jordanian commanders made a proficient use of reserves to resist Israeli breakthroughs, while the Syrian reserves continuously failed to counter-attack Israeli penetrations (Pollack, 2002). At the tactical level, Syrian junior officers frequently displayed a complete lack of leadership skills and even abandoned their own troops (Pollack, 2002). Jordanian junior officers, on the other hand, demonstrated some proficiency in implementing and leading small-unit maneuvers (Pollack, 2002). Although both Jordan and Syria lost all their military engagements against Israel and the war as such since they did not attain their strategic goals of defending the West Bank and the Golan Heights, respectively, Jordanian defenders clearly demonstrated a higher degree of military effectiveness than their Syrian counterparts.

## **Robustness**

A variety of robustness checks, summarized in Table 2, strengthen the confidence in our empirical results.<sup>11</sup> First, previous studies on coup-proofing often examine military performances in the Arab–Israeli wars. We consequently re-ran our estimation, excluding all military engagements involving Israel (Model 4). *Coup-Proofing* remains positive and significant.

Second, in order to demonstrate that our results are not dependent on any specific construction of *Coup-Proofing*, we estimated our models using separate variables for the attacker's and the defender's effective number of ground-combat compatible organizations (Model 5). This does not have any substantial effect on our findings, however, as the coefficient estimates for both variables have the correct signs and are significant.

Third, several tests indicated that the variance of the error term does not follow a constant pattern, meaning that our models might suffer from heteroskedasticity. Other tests for model misspecification show that the detected heteroskedasticity might result from omitted variables. We therefore estimated a fixed effects model with dummy variables for the 24 attacker-defender nationality pairs to capture the influences of unobserved determinants of military effectiveness (Model 6). The coup-proofing variable remains correctly signed and significant.

Fourth, in order to ensure that our estimations are not driven by outliers, we re-estimated our models without those observations that had an absolute “dfbeta” value higher than  $2 / \sqrt{n}$  for *Coup-Proofing* (Model 7). We also employed regular robust standard errors and robust standard errors clustered on wars to show that our results do not hinge on the estimator of the standard errors. Both estimations did not alter the substance of our findings.

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<sup>11</sup> Owing to space limitations, we only report estimations based on the baseline model, but the core results essentially stay the same for all models summarized in Table 1.

*Table 2. Robustness OLS Regression of the Impact of Coup-Proofing on Military Effectiveness*

	<i>Model 4 (Israeli Wars Excluded)</i>	<i>Model 5 (Monadic Coup-Proofing Measures)</i>	<i>Model 6 (Fixed-Effects Setup)</i>	<i>Model 7 (Influential Observations Excluded)</i>
Coup-Proofing Attacker	6.225 (3.553)*	0.677 (0.389)*	6.313 (2.681)**	5.039 (1.192)***
Coup-Proofing Defender		-0.993 (0.450)**		
Coup-Proofing Attacker Capability	3.288 (7.376)	-3.518 (8.965)	214.003 (44.605)***	-15.418 (4.856)***
Coup-Proofing Defender Capability	54.418 (43.498)	30.862 (28.048)	683.670 (353.987)*	-15.350 (14.331)
Technology Attacker	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Technology Defender	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)**	0.000 (0.000)
Technology Attacker Allies	-2.635 (0.707)***	-1.446 (0.595)**	0.315 (0.784)	-1.873 (0.424)***
Technology Defender Allies	-1.092 (2.151)	0.360 (0.340)	-1.098 (0.700)	0.266 (0.161)
Terrain Attacker	-0.513 (1.986)	0.367 (1.559)	8.810 (5.898)	-1.204 (0.837)
Terrain Defender	-0.060 (0.058)	-0.049 (0.040)	1.467 (0.920)	-0.027 (0.025)
Democracy Defender	-0.072 (0.082)	0.090 (0.039)**	-0.086 (0.231)	0.123 (0.028)***
Democracy Constant	-2.035 (3.503)	-0.124 (1.941)	-81.813 (31.648)**	-1.770 (1.176)
N	40	100	100	89
R <sup>2</sup> (AIC)	0.585 (3.759)	0.524 (3.003)	0.867 (2.407)	0.728 (2.174)
R <sup>2</sup> (AIC)	0.526 (3.842)	0.457 (3.096)	0.852 (2.499)	0.699 (2.273)
Democracy only				
R <sup>2</sup> (AIC) B/L	0.530 (3.934)	0.460 (3.130)	0.856 (2.509)	0.700 (2.317)
R <sup>2</sup> (AIC) B/S	0.544 (3.855)	0.491 (3.071)	0.853 (2.512)	0.709 (2.203)

Robust standard errors clustered on the directed dyad in parentheses; dummy variables for unique attacker-defender nationality pairs not reported in Model 6, but considered for the estimation; \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1% (two-tailed); B/L signifies Biddle and Long's (2004) binary civil-military relations variables instead of our coup-proofing measure; B/S signifies Belkin and Schofer's (2005) coup-proofing variable instead of our coup-proofing measure.

Fifth, we calculated the variance inflation factors (VIFs) for our models in order to check if multicollinearity influences the precision of our coefficient estimates. The estimates show, however, that our coup-proofing variable is largely not collinear with other variables as its VIFs never exceed the value of 3.98 (Model 3).

Finally, comparisons of the  $R^2$  and the AIC values show that our operationalization also achieves a better goodness of fit throughout the reported robustness checks.

## **Conclusion**

This article has sought to demonstrate that coup-proofing has a negative impact on military effectiveness. We argued that coup-proofing limits soldiers' leadership skills and initiative, and undermines coordination between different military units. Our theory receives empirical support using newly compiled data on coup-proofing and battle outcomes in 1967–1999.

The contribution to the literature is twofold. First, we demonstrated that coup-proofing actually affects military effectiveness negatively using a large-N multivariate research design. Indicators used in previous quantitative studies did not measure coup-proofing per se, but captured general instability in civil–military relations instead. Second, we think that the empirical measure developed is closer to the actual mechanisms by which political leaders try to prevent their military from seizing power, as it focuses on the kinds of military and paramilitary units that are most relevant for the conduct or the prevention of coups: ground-combat compatible troops.

Our results also have important implications for research on military doctrines. Most of the work in this tradition assumes that political leaders focus on external threats resulting from an anarchic international environment. Civilian intervention is deemed necessary for overcoming the parochial interests of military organizations in the interest of a country's grand-strategic goals. Against the background of our research, however, political leaders face a dilemma. To paraphrase Chiang Kai-Shek, should they pacify the interior or focus on the external threat? Coup-proofing protects leaders from domestic threats as military coups become less likely. Simultaneously, coup-proofing harms military effectiveness and therefore makes leaders more vulnerable to external threats.

Even though the empirical analysis provides support for our argument, questions remain. First, it has been argued that some coup-proofing techniques improve military effectiveness by forcing the military to focus on its external mission. As our empirical analysis indicates, this does not seem to hold on average, but further research could be insightful. Second, future research might consider coup-proofing as a dependent variable. Empirical research still has to support a negative relationship between democracy and coup-proofing. Finally, coup-proofing could be employed as an independent variable by quantitative studies on the role of military power that have not yet explicitly considered civil–military relations as an explanatory item.

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