Self-Reinforcing Civilian Control:
A Measurement-Based Analysis of
Civil-Military Relations

ABSTRACT

How do civilians prevent their militaries from engaging in politics? Scholars are divided in their answer to this question, with some highlighting the constraining effects of political institutions and others emphasizing the importance of norms of civilian control. We integrate these two approaches and develop a dynamic theory of civilian control, arguing that control over the military is achieved once civilianized institutions are adopted and sufficient time has passed to permit: (1) the development of a shared norm of civilian control within the military; and (2) learning among military elites that fosters a belief that civilian rule is robust to military challenges. As a result, civilian control is self-reinforcing. We evaluate these claims by developing a latent variable model that tests for the presence of self-reinforcing institutional dynamics. We generate estimates of civilian control for all countries, 1945-2010 and find strong support for our expectations.

In the summer of 2016, Turkish military personnel seized control of the Bosphorus bridges as jets flew overhead in Ankara. Members of the armed forces were attempting to oust President Recep Tayyip Erdŏgan from office. Although it quickly failed, the coup attempt took many by surprise. The years of rampant military intervention in politics appeared to have been over in Turkey. The previous two decades were characterized by stable civilian rule, enough time to suggest that the democratic regime should have consolidated itself from such challenges (Huntington, 1993; Svolik, 2015). The conventional wisdom was that Erdŏgan successfully defanged the military as a source of political opposition (Hannah, 2016; The Economist, 2016). Yet, as these events demonstrate, the military is seldom tamed easily. Why were observers so surprised by the Turkish coup attempt and why does control of the military remain tenuous in regimes where seemingly strong civilian institutions have been established?

These questions are central to our understanding of civilian control, defined here in terms of the extent to which civilians dominate political decision-making within a polity, and the robustness of this dominance to military involvement in politics.[1] Existing answers to this question broadly originate from two theoretical frameworks. The first is institutionalist and understands civilian control as an outcome behavior emerging from civilian and military elites pursuing unique interests within a fixed institutional setting. Civilian control is achieved when the structure of political institutions is such that the preferences of civilian elites dominate those of the military. This approach links civilian control with political regimes where civilians enjoy a monopoly on de facto, if not de jure authority over members of the armed forces.[2] While this provides a robust and generalizable means of understanding civilian control across polities, it ignores the fact that

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[1] For definitions of civilian control relating to civil-military preference divergence and policy implementation and compliance see Feaver (1999, 2003), and Desch (1999).

[2] For qualitative examples of institutional typologies of civilian control see Nordlinger (1977); Stepan (1988); Welch (1976); and Colton (1979). The quantitative literature has employed a variety of regime type indicators and indexes to capture this construct (Poe and Tate, 1994; Lai and Slater, 2006; Sechser, 2004; Weeks, 2008, 2012; Talmadge, 2015). Game theoretic treatments of civil-military interactions as a single-iteration game also assume a fixed institutional setting, though recent work has begun to incorporate temporal dynamics into formal models of military coups (Little, 2016).

political institutions typically become increasingly robust with time (Svolik, 2015; Little, 2016).

The second approach emphasizes the importance of intersubjective norms in conditioning the behavior of military elites. When present, these norms define acceptable actions among military personnel, delineate the civilian and military spheres, and proscribe military intervention in politics (Huntington, 1957; Finer, 1988; Welch, 1976). The normative approach ascribes less importance to the structure of political institutions. For example, when taking account of the factors inhibiting military involvement in politics Finer (1988) argues the most important is "the armed forces' acceptance of the principle of civil supremacy" (28). While these treatments often emphasize military training and tradition, few attempts have been made to identify whether and how norms of civilian control will emerge socially over time. As a result, this work has been criticized for tautology – norms are often assumed to exist when civilian control is high and to be absent when it is low (Feaver, 1999). When viewed in conjunction with the institutional lens, there is also little consensus about how the importance of norms should be weighed against that of institution building.

Though often juxtaposed with one another, we present a dynamic theory of civilian control that integrates elements of both the normative and institutionalist theories to generate predictions about how robust civilian control emerges within a fixed institutional setting over time. In so doing, we integrate theories of social norm emergence (Axelrod, 1986) and a growing body of research that evaluates how individual experiences and learning shape political decision-making (Little, 2016; Horowitz and Stam, 2014; White, 2017). We argue that civilian control of the military is reflected both in the structure of political institutions and in the continuously updating beliefs of military elites about whether increased involvement in politics will succeed. The history of civil-military interactions serves as a heuristic through which these beliefs are updated. At the birth of a political regime institutions dictate civilian control, as norms and beliefs regarding civil-military relations are often weakly formed. In regimes where the armed forces have been removed from political institutions, civilian control becomes more robust with time as an increasing proportion

of military elites: (1) internalize norms of civilian control that proscribe military involvement in politics; (2) observe their colleagues' continued abstention from politics; and (3) become more pessimistic about challenging the status quo level of civilian control based on these observations. In short, civilian control is self-reinforcing and emerges as the result of an interaction between civil-military institutional structures and dynamic patterns of norms and learning.

This elaboration of existing theory helps explain the collapse of civilian rule in regimes where it might otherwise seem puzzling. While there were several proximate causes of the Turkish coup attempt, each interacted within an environment where civilian institutions had been established but insufficient time had passed for strong norms of civilian rule to develop. Turkish military elites therefore attempted to leverage the historical precedent for military intervention to muster support for a coup.

Testing theories of civilian control is inherently difficult because they relate to a concept that is not observed directly. We address these challenges by presenting and validating two latent variable models of civilian control. Both treat civilian control as an unobserved trait whose value is inferred based on a series of civil-military relations criteria. The first model parallels the institutionalist approach dominant in the literature and generates civilian control estimates based on a regime's contemporaneous institutional features. The second is used to test whether civilian control is self-reinforcing and whether a country's history of civil-military relations contributes to civilian control in addition to institutions. While we lack comprehensive individual-level data on the beliefs of military elites across time and space, if elites do update their beliefs as predicted, these effects will be observed building over time. We therefore construct and present a novel dynamic latent variable modeling strategy specifically designed to test whether civilian control strengthens as it persists. The principal advantage of this approach is that it provides a model-based solution for integrating institutional and historical components of civilian control and determining the relative importance of each in estimating the underlying trait. An empirical evaluation of these models strongly supports the dynamic theory's prediction that civilian control is self-reinforcing.

We make several contributions: first, our results indicate that civilian control is indeed a product of both history and institutions, indicating a need for further integration of the normative and institutional approaches in future research. Second, we find that civilian control over the military is achieved over longer time horizons than one might infer based on coup occurrence alone. Research on regime consolidation indicates that leaders are insulated from coup risk after a regime has survived for about twenty years (Huntington, 1993; Svolik, 2015). Civilian control, however, continues to strengthen long after this point. In fact, civilian control over the military begins to reinforce most quickly after about three to four decades of persistent civilian rule. This delay corresponds with research on cohort effects in military institutions, which suggest significant time must occur for socialization processes to trickle up the ranks of the armed forces (White, 2017). Understanding that civilian control cements slowly also informs the study of coups and democratization. While coups typically result in autocratic rule and increased state-sanctioned violence (Derpanopoulos et al., 2016), an increasing minority of coups have resulted in democracy (Marinov and Goemans, 2013; Thyne and Powell, 2016; Bell, 2016). Knowing that civilian control is self-reinforcing indicates that even democratizing coups may be pyrrhic victories, as newly established regimes are exposed to an increased risk of subsequent military incursions into politics.

Third, while the primary motivation of this analysis is substantive, we also introduce a dynamic item response theory model that incorporates drift into the estimation of the latent trait. Though used to test for self-reinforcing processes in civil-military relations, this innovation can be broadly applied to other areas where learning or norm emergence perpetuate self-reinforcing (or self-undermining) dynamics in other latent traits. Many political institutions follow predictable patterns of endogenous growth or decay (Grief and Laitin, 2004) and our modeling innovations can be easily transplanted to the study of other latent traits such as democracy or judicial independence.

Fourth, we introduce and validate continuous, annual estimates of civilian control. To date, much of the international relations and comparative politics literature have relied on discrete indicators of regime type and coup occurrence. While these indicators are well suited to the study

of military rule and coups, they risk concept stretching and measurement error when used to study civilian control more broadly (Feaver, 1999; Narang and Talmadge, 2017). Our measures have wide temporal coverage and are available for both democracies and autocracies, opening the door for a broader range of theory testing within the field of civil-military relations.

Conceptual Domain: Civilian Control of Regime Politics

Our conceptual definition is centered around two factors: the extent to which civilians dominate political decision-making, and the robustness of this dominance to backsliding through increased military involvement in politics. While civilian control has been defined myriad ways,[3] ours is closest to those found within the study of domestic political institutions, which often defines civilian control around the military's place in a regime's top seats of power.[4] We depart from these studies by also considering how robust this dominance is to future military incursions to more directly account for the fact that civilian elites sometimes dominate regime politics, but contend with a politically powerful military. In this sense we are broadly concerned with civilian control of political regimes, rather than more granular definitions of civilian control relating to whether the military faithfully carries out the orders issued by civilians (Desch, 1999; Feaver, 2003).

It is also useful to discuss what is left out of this conceptual domain. First, for conceptual traction, we limit our concern to the military's actual involvement in directly formulating policy, and therefore do not consider the perceived scope or prerogatives of the military in politics.[5] Second, while a wide literature has examined civilian control with regard to coup-proofing activities[6]

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[3]See Feaver (1996) and Desch (1999) for discussions.

[4]Sechser (2004) defines civilian control based on whether military or civilians have de facto or de jure control of the government. Weeks (2012) expands on this by operationalizing military involvement in politics based primarily on the civilian or military identity of the regime leader, the military's involvement in the executive cabinet or politburo-equivalent positions, and whether the military is involved in non-security decision-making.

[5]Stepan (1988) for example defines civilian control in part through the military's prerogatives, or perceived domains of influence. When operationalizing prerogatives, however, Stepan (1988) relies heavily on institutional indicators similar to those we employ below.

[6]See Quinlivan (1999), Powell (2014), Böhmelt and Pilster (2015), Carey, Colaresi and Mitchell (2016), and De Bruin (2017).

we do not incorporate these factors into our definition of civilian control because doing so would conflate means and ends. Further, coup-proofing likely shares an indeterminate relationship with civilian control, since it is observed only when the military is sufficiently powerful to warrant these strategies, but not so powerful that they can prevent their implementation (Sudduth, 2017). Third, though others incorporate civil-military conflict or coup occurrence into their definitions of civilian control, we do not, as civil-military conflict is again shares an indeterminate relationship with control. Civil-military conflict and coups can be absent when the military dominates politics, and low-levels of civil-military strife can exist even in regimes where civilian dominance of the regime is unchallenged.[7]

Studying this dimension of civilian control is important for at least two reasons. First, despite being the apparent guardians of the state, the armed forces are often the single greatest threat to regime survival. The military is responsible for about three in every four cases of democratic regime failure in the post-World War II era (Marinov and Goemans, 2013, 801). During this time, the military was also involved in about sixty percent of all extra-constitutional leadership changes in autocracies (Svolik, 2012). Once politically active, the armed forces are unlikely to remain in the barracks. Since 1950, a state experiencing an attempted coup will go on to experience an average of four subsequent attempts (Powell and Thyne, 2011). Second, civilian control of the military determines how states manage security threats. Weak control of the military has been linked with bellicose foreign policy strategies (Snyder, 1984; Posen, 1986; Sechser, 2004; Lai and Slater, 2006; Weeks, 2012); poor strategic assessment and battlefield collapse (Brooks, 2008; Talmadge, 2015); human rights abuse (Poe and Tate, 1994; Davenport, 2007); and civil conflict (Roessler, 2011; De Bruin, 2014).

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[7]In Appendix 11 and 12 we present empirical evidence that civilian control is distinct from coups and coup-proofing activities.

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A Dynamic Theory of Civilian Control

We begin by conceptualizing civil-military relations as an institutional arrangement that encompasses the formal and informal rules and constraints linking civilian and military elites in political decision-making, including the organizational structures that facilitate interactions between these groups. We make two assumptions. First, we assume that civilian and military elites have distinct political preferences. This is driven partly by the organizational incentives of the military. Like many organizations, the armed forces attempt to reduce uncertainty and, by extension, the degree to which outside actors can interfere with military operations (Snyder, 1984; Posen, 1986). Military elites also have powerful incentives to secure resources from the societies in which they reside and military elites often (though not always) seek higher levels of resource allocation than civilian elites would be inclined to provide them. Additionally, a combination of training and selection likely cause military elites to take a distinct view of domestic and international politics (Feaver, 1999; Feaver and Gelpi, 2003). Second, we conceive of civilian control as a unidimensional spectrum of conditions that emerge from within a given civil-military relationship. When civilian control is high, civilian preferences strictly dominate those of military elites. When civilian control is low the opposite is true.

Two factors matter in determining which outcome obtains. First the structure of political institutions determine whose preferences are given a privileged position in political decision making. When high-level political offices are dominated by civilian elites, civilians are better able to assert their preferences. When regimes are run by military strongmen or through collegial military rule civilian preferences are relegated. The second component of civilian control centers on the individual and collective beliefs military personnel hold about whether they could or should deviate from the status quo arrangement. Whenever contemplating increased involvement in politics, military elites estimate whether they would receive sufficient support from their colleagues or society at large (Geddes, 1999; Singh, 2014; Thyne and Powell, 2016). The level of civilian

control is therefore driven in part by the common conjecture, or the extent to which these actors can correctly anticipate each other's strategies.

Common conjecture is informed by shared cultural assumptions and collective experiences (Morrow, 1994). Cultural assumptions broadly refer to collective beliefs within a society, including norms of appropriate behavior that, under certain conditions, determine the set of behaviors that individuals comply with. Some norms and assumptions change very little over time, while others are dynamic and emerge in conjunction with collective experiences. Within the context of civil-military relations, cultural assumptions related to the norms of civilian control and legitimacy (or illegitimacy) of military rule inform whether military elites believe they should intervene in politics and whether they would receive support when doing so. With regard to collective experiences, a growing body of research suggest that individuals learn from and act upon past experience and personal history, which act as heuristics in strategic decision-making (Horowitz and Stam, 2014; White, 2017). When contemplating intervention into politics, military elites will consider recent civil-military interactions to evaluate whether they might succeed or fail in challenging the status quo level of civilian control. Persistent civilian control will cause military elites to revise down their estimates of whether they could receive sufficient support from their colleagues or from society to undermine civilian rule. Thus, both norms derived from cultural assumptions and learning from collective experiences are shaped together with the history of civil-military interactions.

The remainder of this section outlines these dynamic mechanisms in detail. Though it is useful to discuss norm emergence and learning processes separately, they are not mutually exclusive phenomena. Each interact with one another, causing military elites to update their beliefs in a predictable manner – as civilian rule persists, military elites will become less likely to attempt

to engage in politics.[8] Some are less likely to do so because they have internalize a norm of civilian control and ascribed it with moral or ideational value. Others may not have internalized the norm, but are deterred from violating it because they have observed their colleagues behavior and become pessimistic about their ability to successfully intervene in politics. In this sense, civilian control is a social norm, or a predictable pattern of expected behavior that individuals have learned to adhere to through repeated interactions (Young, 1996; Sen and Airiau, 2007). Though it is possible in principal to assess what proportion of individuals fall into either group, we concern ourselves primarily with the regime-level consequences of these dynamic processes.

The Norm of Civilian Control

We define a norm of civilian control as a shared expectation among military elites that proscribes military involvement in politics, particularly through the implicit or explicit use of coercive force. Given the inherent threat armed forces might pose toward political elites, it is no wonder that the latter attempt to develop these norms at the birth of virtually any civilian regime. Whether they succeed is determined by three mechanisms: (1) internalization; (2) social proof; and (3) deterrence (Axelrod, 1986).

A critical component of norm emergence is norm internalization, where some proportion of society has accepted a norm on moral or ideational grounds. A norm of civilian control is internalized when military elites are opposed to intervening in politics even if the net material gain for doing so is positive. When successful, military training and tradition are instrumental in the process of internalization, conditioning collective attitudes toward military incursions into politics (Nordlinger, 1977, 67). Given the need for cohesion and subordination within the armed forces, it is no wonder that training and norm inculcation are critical components of armed service across

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[8]We are agnostic as to whether these beliefs are updated optimally or subject to cognitive biases (Tversky and Kahneman, 1974). For example, if civilian control was successfully challenged in the recent past, military elites may become overly optimistic about their ability to do so again in the future. Conversely, civilian control may sometimes benefit from group attribution error, whereby a military elite observes his or her colleagues abstaining from political activities and falsely concluding that this is reflective of individual-level preferences.

time and space. In regimes where civilians dominate political decision-making these traditions almost always include subordination to civilian authority and the clear delineation of civil and military spheres.

Whether military training and conditioning achieves these ends is related to the second mechanism, "social proof." This refers to the notion that individuals tend to view a behavior more favorably by the extent to which they observe other individuals performing this behavior (Cialdini, 1985). Over time, cues emerging from social proof will strengthen as the number of interactions among individuals grows. As a result, individuals increasingly conform to this behavior. The emergence of a norm of civilian control therefore depends on the history of civil-military interactions within a state – the longer the armed forces have abstained from politics, the more likely military personnel are to interpret this behavior as socially desirable. By contrast, when coups and intervention have occurred in the recent past, norms against such action will often weaken or collapse. In this sense, behavioral norms are subject to "cohort effects" – groups of military officers adopt similar beliefs and expectations based on their shared experiences (White, 2017).

As norms of civilian control are developing (or failing to develop) within the military, similar processes occur within civil-society at large as citizens update their beliefs regarding the normative value of civilian control. In some states, military intervention into politics is a relatively common mode of leadership change and is necessarily viewed as illegitimate. As civilian rule persists, citizens become increasingly likely to accept the norm of an apolitical military and will therefore be less likely to support coup attempts or military rule. When there is little precedent for military rule, would-be coup plotters may risk a crisis of legitimacy should they attempt to intervene in politics (Powell and Thyne, 2011).

As a growing proportion of individuals act in accordance with a norm, the third mechanism emerges: deterrence. Would-be violators must consider whether they are likely to be sanctioned by their colleagues should they attempt to undermine or overthrow civilian rule. It need not be

the case that all or even most of the military and citizenry internalize the norm of civilian control for the norm to be enforced effectively. The majority of military elites, for example, may be more concerned with the physical safety of their subordinate officers than they are with supporting civilian control or military intervention in politics.

Nevertheless, if even a small proportion of the armed forces are believed to have internalized the norm of civilian control, this may be sufficient to drastically increase the perceived costs of challenging civilian control. Singh (2014) structures coup decision-making as a coordination game and argues that coups are more likely to succeed when rebelling officers issue fait accompli to fence sitters. While the majority of military elites may be concerned with the material safety of themselves and their subordinates, if even a small proportion of military elites has either internalized or is perceived to have internalized norms of civilian control this will make such fait accompli less effective. Thus, even perceptions of norm internalization can be enough to deter a coup attempt.

The norm of civilian control therefore develops in predictable ways with regard to the history of interactions between civilian and military elites. When a political regime is in its infancy, the norm of civilian control is typically weak because insufficient time has passed for these mechanisms to develop. At this stage, economic or political crises may provide windows of opportunity for military elites to increase their political power at the expense of civilian elites. When these interventions occur, the norm of civilian control is often weakened if not eradicated and the process of norm emergence starts anew. As time persists without such crises, however, an increasing proportion of the military and society accepts the legitimacy of civilian rule, making civilian control more robust to exogenous shocks that would otherwise lead to its weakening or collapse.

Learning and Regime Strength

Learning processes among military elites also impact the strength of civilian control. Little (2016) provides perhaps the most comprehensive treatment of learning in civil-military relations, mod-

eling coup occurrence as a potential outcome of a repeated coordination game. He argues that a regime's strength becomes increasingly apparent with age. As time persists, military elites therefore conclude that a regime is robust to internal challenges and become increasingly pessimistic about their ability to muster the support necessary for a successful coup. For Little (2016), it is not norms that condition this behavior per se, but regime strength as an incrementally revealed trait that results in a diminished probability of coups.

Yet, military elites learn from more than just coup behavior. When evaluating regime strength, they not only take into account whether the regime has survived previous challenges, but also the extent to which civilian elites rely on the military to face these challenges. Often, leaders survive in office by relying on the military to manage internal and external challenges – the regime survives precisely because it yields political power to the military. This reliance provides the military with bargaining leverage that renders civilians less capable of suppressing challenges from the military (Feaver, 1996; Svolik, 2012). Typically, this reliance also begets lower levels of military involvement in politics, such as military elites occupying high level positions in the executive cabinet. Under these conditions, civilian elites may remain in power and even avoid coups, but civilian control will not strengthen over time the way it does among regimes where civilians dominate politics.

Learning also shapes military involvement in politics short of coups. The Philippines, for example, did not experience its first coup until 1986, but civilian control remained weak and the military politicized in the decades prior: in 1950, the military took charge of the judicial system when habeas corpus was temporarily suspended; during his presidency, Ramón Magsaysay actively sought to supplant civilian elites with current or former members of the armed forces; in 1972, President Ferdinand Marcos declared martial law and the military became increasingly integrated into executive political institutions. Knowing that the regime was dependent on the armed forces likely contributed to an optimism that members of the military could effectively maintain or increase their involvement in politics. In the Philippines, these precedents for military

involvement in politics helped pave the way for six successive coup attempts in the following two decades (Kessler, 1989). Learning therefore functions as a second time-dependent mechanism that has the potential to reinforce civilian control. When civilians have remained in power without being challenged by or relying upon the armed forces, military elites will become increasingly pessimistic about their ability to deviate from this status quo.

Expectations

The dynamic theory of civilian control predicts that the strength of civilian control is impacted by both the structure of political institutions and the history of civil-military relations. Civilian control is therefore self-reinforcing, strengthening as it persists.[9] When a regime has remained civilianized and there is little direct military involvement in politics some military elites internalize norms of civilian control, while others are deterred from the apparent strength of a regime and the adherence of their colleagues to the status quo level of control.[10] Empirically, this means that a regime where civilian rule has persisted should be less likely to experience backsliding in terms of military involvement in politics. In the extreme, such backsliding may take the form of reversion to military rule. More commonly, backsliding may take the form of the military securing more policy-making powers through direct or indirect representation in regime institutions. In this sense, civilian control is a continuous concept, not a condition – even after the military is completely removed from politics, civilian control becomes increasingly robust as the probability of future military involvement in politics diminishes.[11]

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[9] Our theory is targeted at explaining temporal dynamics in civilianized regimes. We leave aside the question of whether military regimes follow unique dynamics and which mechanisms underly these dynamics. We do, however, provide a brief empirical overview of non-civilianized regimes in Appendix 11, finding that historic dynamics exert less impact on the level of civilian control in these regimes than for civilianized regimes.

[10]Note also that civilian control may strengthen at differential rates across time. The measurement strategy introduced in the following section accommodates this possibility.

[11]Svolik (2015) develops a similar theoretical argument about democratic regimes becoming increasingly robust to coups over time. Svolik assumes that regimes ultimately achieve complete consolidation. By contrast, we treat civilian control as continuous, rather than discrete, with the probability of military involvement in politics diminishing, but not necessarily reaching zero with the passage of time.

A central implication of this theory is that measuring civilian control requires accounting for both the balance of institutional power between civilian and military elites and the history of civil-military relations. This contrasts with the standard institutionalist approach, which measures civilian control or regime type by focusing only on the contemporaneous features of a political regime (Weeks, 2008; Lai and Slater, 2006; Sechser, 2004; Geddes, Wright and Frantz, 2014; Cheibub, Gandhi and Vreeland, 2010; Hadenius and Teorell, 2007). We therefore test this expectation through a measurement-based analysis of civilian control to determine whether endogenizing institutional and historical factors produces a more valid measure of civilian control.

Empirical Strategy

Testing this theory is challenging because it makes predictions about how endogenous institutional elements impact the temporal dynamics of civilian control, a trait one cannot observe directly. These difficulties in measurement are partly to blame for a dearth of empirical analyses of civil-military relations (Narang and Talmadge, 2017). We address this issue by measuring civilian control using latent variable modeling techniques. This approach assumes that civilian control is not observed directly, but can instead be estimated based on observable indicators of military involvement in politics. We construct two measurement models, one which comports with the expectations of the dynamic theory of civilian control, and one which follows convention by measuring civilian control using a state's contemporaneous institutional features. We test which theory better accords with reality in a comparative validation analysis.

Data

Both models generate estimates using ten empirical indicators linked with civilian control. Given its nature, civilian control is most clearly observed when it is violated or absent. This is reflected in our indicators which relate to various forms of military involvement in politics. These are

obtained from various data sources and provide information on: whether political elites have served in and/or maintain ties with the armed services; whether a given regime was preceded by a military regime or had its leader come to office with the aid of the military; and the extent to which executive political power is concentrated in military institutions. These indicators vary in the extent of information they convey about the underlying trait, and in whether they identify mild or severe violations of civilian control – this feature of the data is leveraged by the modeling framework introduced in the following section.

Leader Military Experience categorizes regime leaders based on the extent to which they were involved in the armed services prior to taking office. This information comes from the Horowitz and Stam (2014) data, and categorize leaders into three groups: (1) those with no military experience; (2) those who served in the military; and (3) those who had careers in the military. Examining experience is also important because military leaders often shed their uniforms before retaining office, despite maintaining close political ties to the military (Nordlinger, 1977, 3). When political leaders are routinely drawn from the military, this is indicative of a poor delineation between civilian and military spheres and that political institutions are not fully civilianized.

Military Leader indicates whether the chief executive of a political regime actively holds a military rank in their title. This comes from the Database of Political Institutions (DPI) (Beck et al., 2001). Unlike the previous indicator, this suggests an active connection to the armed forces. Note also that holding a military rank in office does not necessarily indicate formal military service per se. Regardless of whether it is inherited from a rebel organization, the presence of a military rank in a regime leader's title indicates that links to the military are being used to legitimize political power and that civilian rule is not fully established.

Military Participation in Government is an ordinal measure of the extent to which *active duty* military personnel are represented in national cabinets or state councils (White, 2017). In these cases, the armed forces can exploit this position as a means of directly affecting foreign policy, budgetary decisions, and political decisions more broadly. This measure captures whether

there are: (1) no active duty military personnel in the national cabinet; (2) one military member of cabinet; or (3) multiple military members of cabinet.

Military Entry records whether the military was involved in the chief executive's entry into office (Svolik, 2012, 149). While this often results in military rule, military elites also sometimes appoint a civilian leader to create the illusion of civilian rule. In these instances, however, the military remains highly influential in executive decision making and retains the ability to depose the executive, should it chose to do so.

The final set of indicators capture the extent to which military organizations are embedded in regime infrastructure. *Military Involvement in Politics* is obtained from Svolik (2012, 32-34) and classifies autocratic regimes into four types of increasing military involvement in politics: (1) none; (2) indirect; (3) personal; and (4) corporate. Next, the Weeks (2012) *Militarism Index* uses existing data on autocratic regimes to arrange authoritarian regimes based on the following traits: whether the regime leader is or has been a high ranking military officer; whether the military holds high-level cabinet positions; whether the military high command is consulted primarily about security matters; whether the majority of cabinet ministers are from the military; and whether the regime itself is characterized by military rule (39).[12]

Four indicators of regime type are incorporated into the analysis. Each of these use different classification criteria, but relates to the same underlying concept, military rule, a clear manifestation of failed or non-existent civilian control. First, the Geddes, Wright and Frantz (2014) *GWF Military Regime* indicator identifies instances of military rule as those where the armed forces exert control over leadership selection, national security decisions, and policy-making more broadly. Note that this pertains to collegial military rule and excludes cases where leaders from the military have established personalist rule. Second, the Cheibub, Gandhi and Vreeland (2010) CGV Military Regime is an indicator of whether the leader of an autocratic regime is a current or past member of

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[12] For computational ease, the original eleven category index is collapsed into a five categories when it is incorporated into the model discussed in the next section.

the armed forces. Unlike the GWF indicator, this does not attempt to distinguish between collegial military rule and personal military rule. Third, *ARD Military Regime* comes from the Authoritarian Regimes Data Set and classifies military regimes as those in which political power is maintained through the actual or threatened use of military force (Hadenius and Teorell, 2007). Finally, we include *Prior Military Regime* to classify instances where a regime was preceded by military rule. This is coded using the GWF classification of military rule, and is intended to capture situations where the standing regime inherits a politically powerful military.

Modeling Strategy

We test our theoretical expectations using two competing item response theory (IRT) models of civilian control. IRT models are a type of latent variable model that provide a principled means of combining information from observable "manifest variables", or "items", to generate estimates of an unobserved trait. In this application, each of the variables outlined in the previous section, y_{itj}, are the observable manifestations of civilian control while θ_{it} is the latent trait of interest. Each item is indexed $j = 1, \ldots, J$ and is observed at the country-year level. Our units, indexed $i = 1, \ldots, N$, are political regimes (democracies and autocracies) as defined by the Geddes, Wright and Frantz (2014) data. Time is measured as the number of years a political regime has existed and is indexed $t = 1, \ldots, T$. K_j is the total number of values that each item y_j can take on, such that $K_j = 2$ if item j is dichotomous and $K_j > 2$ if item J is ordered. The IRT model is presented as a series of probability distributions in Equation 1.[13]

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[13]We make a trivial modification to the traditional ordered logit link function so that higher values among the manifest indicators correspond to lower values of the latent trait.

$$P[y_{ij} = 1] = \Lambda(\alpha_{j1} + \beta_j \theta_{it})$$

$$\vdots \quad \vdots$$

$$P[y_{ij} = k] = \Lambda(\alpha_{jk} + \beta_j \theta_{it}) - \Lambda(\alpha_{jk-1} + \beta_j \theta_{it}) \tag{1}$$

$$\vdots \quad \vdots$$

$$P[y_{ij} = K_j] = 1 - \Lambda(\alpha_{jK-1} + \beta_j \theta_{it})$$

where $\Lambda(.)$ is the logistic cumulative distribution function. The likelihood function is given in Equation 2.

$$\mathcal{L}(\beta, \alpha, \theta | y) = \prod_{i=1}^{N} \prod_{t=1}^{T} \prod_{j=1}^{J} \left[\Lambda\left(\alpha_{jy_{itj}} + \beta_j \theta_{it}\right) - \Lambda\left(\alpha_{jy_{itj}-1} + \beta_j \theta_{it}\right) \right] \tag{2}$$

α_j, the item "difficulty" parameter(s), relates to the proportion of observations in each category of the manifest variables when the latent trait is equal to zero. β_j is the item "discrimination" parameter and corresponds to the extent to which a change in the value of one of the manifest variables corresponds to a change in the latent trait (Jackman, 2009, 455). These item-specific parameters account for the fact that the indicators in the previous section have different relationships with civilian control.[14]

Many of the indicators described in the previous section have different temporal domains and some are only coded for autocracies. One core advantage of this modeling strategy is that estimates of θ_{it} are generated even when some subset of the indicators are missing. Missing data may increase the uncertainty in the latent trait, but does not lead to a loss of country-year observations. Thus, estimates of civilian control remain comparable across time and space, regardless of what subset of indicators is observed.

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[14] While the substantive analysis conducted here is primarily concerned with the θ, β_j and α_J are reported in Appendix 4.

We begin by outlining the differences in parameterization between our two models and then identify how these strategies map on to competing expectations about civilian control. Like all IRT models, identification constraints are required for each. One cannot estimate the equations above due to location, scale, and rotational invariance – various linear transformation of θ, β, and α can fit the data equally well. We resolve this issue through Bayesian priors assigned to θ and β. The prior $\beta_j \sim Gamma(4, 3)$ restricts the values of the discrimination parameter to be positive, with increases on the values of each indicator y_j corresponding to lower values of the latent trait. This reflects the prior belief that each of the traits outlined in the previous section are linked with lower levels of civilian control. To resolve location and scale invariance, both models anchor estimates using a standard normal distribution.

The first model, henceforth referred to as the static model assigns all country-years the same prior, $\theta_{it} \sim Normal(0, 1)$. Because all observations are given the same prior, only the values of the manifest indicators determine the placement of units across the latent space. The second model has the more difficult task of incorporating history into the measurement of civilian control and accommodating the possibility that civilian control is self-reinforcing. One standard approach is to incorporate dynamics through the assignment of a random walk prior to the latent trait, such that in the first time period a unit enters the data its latent trait is assigned the prior $\theta_{it=1} \sim Normal(0, 1)$, and in each subsequent time period the prior is $\theta_{it \neq 1} \sim Normal(\theta_{it-1}, \sigma)$, where σ is the innovation variance pooled across each unit's time series (Reuning, Kenwick and Fariss, 2018). This strategy is common but makes the assumption that the best expectation for a unit's value on the latent trait is centered on the previous time period's estimate. This is problematic when modeling processes that follow more complex dynamics, such as that posited by our theory of civilian control, which anticipates the latent trait will systematically increase over time for some units, conditional on their institutional features.

We therefore make several modifications to the standard approach. The first step is to determine the subset of countries where civilian control is expected to self-reinforce. We do so

by constructing a dichotomous indicator C, which is equal to 1 for civilianized regimes and 0 for non-civilianized regimes. A regime is civilianized if the following conditions are met: the regime leader does not hold a rank while in office according to the DPI data; the regime is not classified as military by GWF, CGV, or ARD; and the regime has the lowest score on the *Military Involvement in Politics* scale and Weeks *Militarism Index*. Defining civilianized regimes in this way is intended to determine when the conditions for self-reinforcing control are met, not to capture regimes where the military has been removed from politics in every feasible dimension. A civilianized regime may have still been preceded by military rule, had the standing leader come to power with the aid of the military, have leader with military experience, or have military members of cabinet.

The next step is to adjust the standard dynamic prior to accommodate and test the expectation that civilian control strengthens as it persists. We do so using the following prior specification:

$$
\theta_{it=1} \sim N(0, 1)
$$
$$
\theta_{it \neq 1} \sim N(\theta_{it-1} + C_{t-1}\delta_{t^*}, \sigma_\theta)
$$

(3)

When a regime was not civilized in the previous period $(C_{t-1} = 0)$ temporal dynamics follow a standard random walk prior: the prior on the latent trait is centered around last year's estimate. This reflects reflecting an assumption that civilian control is unlikely to self-reinforce when the military is involved in politics. When a regime was civilianized in the previous period $(C_{t-1} = 1)$ a drift parameter δ is added to the prior for each subsequent year of civilian rule. We do not provide the model with prior information about the sign δ, which can be positive, negative, or equal to zero.[15] δ will be positive if the probability of observing a manifestation of military involvement in politics decreases with subsequent years of civilianized rule, either because the values on these indicators are decreasing or because they are already low and the probability of reversion diminishes. Our

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[15] An alternative modeling strategy would be to include regime age as a continuous indicator. We adopt the dynamic drift approach because it does not require that we specify the functional form of the relationship between regime age and the latent trait.

theory anticipates that this value will generally be positive. When this is the case, civilian control will increase as the duration of time from the transition to civilian control has increased.

It is also possible that the extent of drift will vary as a function of the duration of time since the military was subordinate under a civilian regime. It may be for example that civilian control self-reinforces shortly after civilianization but that these effects taper off, or that civilian control only begins to self-reinforce after a regime has been civilianized for several decades. We therefore allow the extent of drift to vary with the amount of time a regime has remained civilianized, indexed $t^* = 1, \ldots, T^*$. Thus, δ_{t^*} is a vector of length T^*, with a single drift parameter estimated for each subsequent year of civilian rule. δ_{t^*} is given the following dynamic prior:

$$
\begin{aligned}
\delta_{t^*=1} &\sim N(0, 1) \\
\delta_{t^* \neq 1} &\sim N(\delta_{t^*-1}, \sigma_\delta)
\end{aligned}
\tag{4}
$$

where σ_δ is the innovation variance of the drift parameter. Though we expect δ will typically be positive, this model structure incorporates the possibility that civilian control is not self-reinforcing $\delta = 0$ or even self-undermining $\delta < 0$. The zero-centered prior for $\delta_{t^*=1}$ is conservative in the sense that it does not provide the model with information suggesting there is positive or negative drift. All remaining priors of the dynamic drift model mirror those of the static model, as reported in Table 1.

Though the same data are used to estimate both the static and dynamic model, the difference in the prior distributions assigned in each model reflects different theoretical expectations about civilian control. Because the static model assigns the same prior to every country year, only the values of the manifest indicators will differentiate observations on the latent scale. The model does not directly account for the history of civilian control outside the information conveyed in these items. This is consistent with conventional measurement practices in the quantitative literature on political institutions and civil-military relations; a series of coding rules are used to classify

Table 1: Summary of Prior Distributions for Model Parameters

Parameter	Static model	Drift model
Country Year Latent Variable, first year	$\theta_{it=1} \sim Normal(0,1)$	$\theta_{it=1} \sim Normal(0,1)$
Country Year Latent Variable, all other years	$\theta_{it\neq1} \sim Normal(0,1)$	$\theta_{it\neq1} \sim N(\theta_{it-1} + C_{t-1}\delta_{t^*}, \sigma_\theta)$
Drift Parameter, first year		$\delta_{t^*=1} \sim N(0,1)$
Drift Parameter, all other years		$\delta_{t^*\neq1} \sim N(\delta_{t^*-1}, \sigma_\delta)$
Innovation Variance(s)		$\sigma \sim Caughy(0,2.5)$
Difficulty parameter (constant)	$\alpha_{jk} \sim Normal(0,10)$	$\alpha_{jk} \sim Normal(0,10)$
Discrimination parameter (slope)	$\beta_j \sim Gamma(4,2)$	$\beta_j \sim Gamma(4,2)$

political institutions based on their observable features at a given time each year.[16] This assumes that contemporaneous institutional features are all that matter for civilian control and therefore that highly civilianized institutions are a sufficient condition for civilian control. This approach is dominant in the empirical literature on civil-military relations. No measure or proxy measure for civilian control treats time as a substantively meaningful component of civilian control. Instead, common practices are to treat time as a separate and atheoretical nuisance parameter through the inclusion of a "years since last event" (often coup) indicator. Although the inclusion of such a time variable might improve model fit, it's effects are not attributed to any substantive meaning.

The drift model, by contrast, incorporates history both through the drift parameter and the dynamic prior structure, which smooths estimates of the latent trait over time. Among non-civilianized regimes, this smoothing allows instances of military involvement in politics to reverberate throughout a country's history, accommodating the possibility that military interventions serve as a focal point that begets future intervention. Among civilianized regimes, if the drift parameter is positive, the model will generate increasingly high estimates of civilian control as a civilianized regime ages. Observations that have historically been low on each of the military intervention indicators will therefore produce higher estimates of civilian control. This makes the drift model be better suited to capture civilian control if this concept is indeed self-reinforcing,

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[16]In our model, manifest variables recorded on December 31 are lagged by one year.

since it allows for the presence of high civilian control in the past to contribute to our belief that civilian control will remain high in the future.[17]

Comparing Model Estimates

After obtaining parameter estimates, it is necessary to determine whether each model is generating estimates consistent with theoretical expectations. That is, the static model should produce estimates of civilian control determined by the current institutional features of a regime, while the drift model should be consistent with the dynamic theory of civilian control by generating estimates that both take history into account and assigning higher values of civilian control to states with a history of military abstention from politics.

We begin by evaluating the distribution of civilian control scores for the population of country years. The left panel of Figure 1 overlays density plots from each model: the static model (grey) generates similar, high estimates for a large proportion of country-years in the data. These are observations that do not meet any of the criteria for military intervention in politics contained in the manifest variables. By contrast, the civilian control estimates from the drift model (blue) show much wider variation for this group of observations. Specifically, the static model treats observations with very high levels of civilian control as homogeneous; the drift model assigns higher estimates for countries that have remained in a state of high civilian control for longer periods of time. This is shown in the right panel of Figure 1, which features a scatter plot of model estimates stratified by regime age, displayed in red. Regimes with highly civilianized institutions receive similar scores from the static model, while the dynamic assigns higher values to regimes that have remained high for much of their history.

Next, we examine the scores among civilianized regimes specifically in Figure 2, which

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[17] Both models are run on a high performance computing server with RStan using a Neal's Funnel corrected parameterization. To achieve convergence and sufficient sample sizes, four chains were run for 3,000 iterations, with a 1,000 warmup.
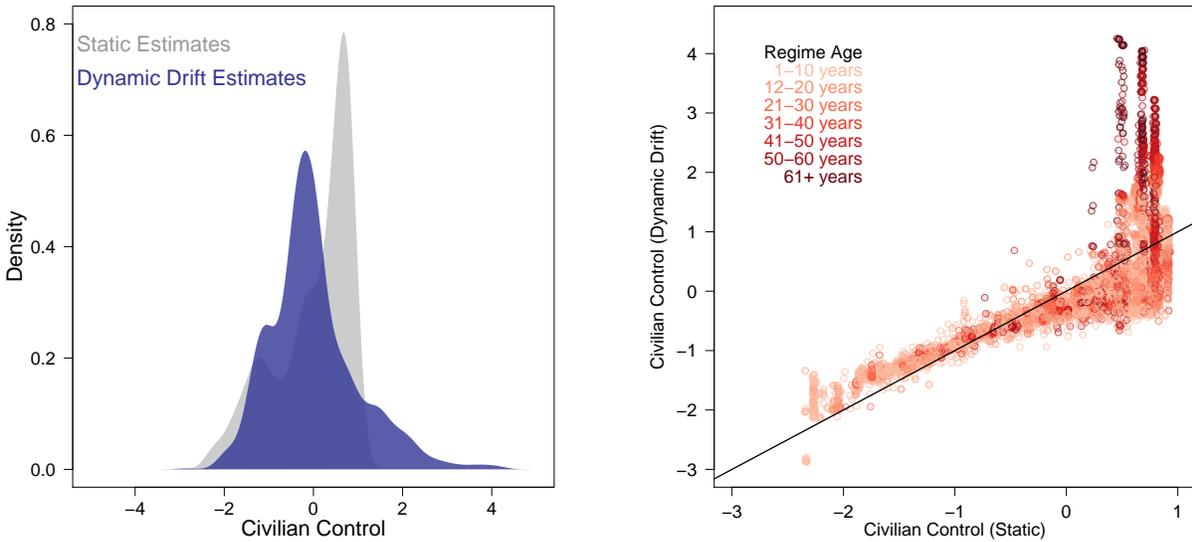
Figure 1: Distribution of Mean Posterior Estimates of Civilian Control
Note: The left panel displays densities of mean posterior estimates of the static and dynamic drift models. The right panel displays a scatter plot of the static and dynamic drift model, stratified by age (displayed in red). Regime age is measured using GWF data.

displays the mean control score among civilianized regimes stratified by the number of years a particular country has remained civilianized. Recall that the static, institutionalist view expects that the maximum level of civilian control is achieved when civilians dominate political decision-making and that history is not a necessary condition for high civilian control to be achieved. This expectation is borne out in the static model estimates. Once civilianized, regimes receive a similar, high[18] score that varies little with the length of time a regime has remained in this state. The drift model does uncover evidence of positive drift, which are reflected in estimates that are relatively low when a civilianized regime is young, and increase steadily as time progresses.[19]

Further, civilian control strengthens at an increasing rate after about thirty years of civilian rule. The fact that the rate of acceleration increases around this time is consistent with research

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[18] The maximum observed civilian control score in the static model is about 0.94.

[19] The raw drift parameter estimates are reported in Appendix 3 and are consistent with the pattern observed in Figure 2.
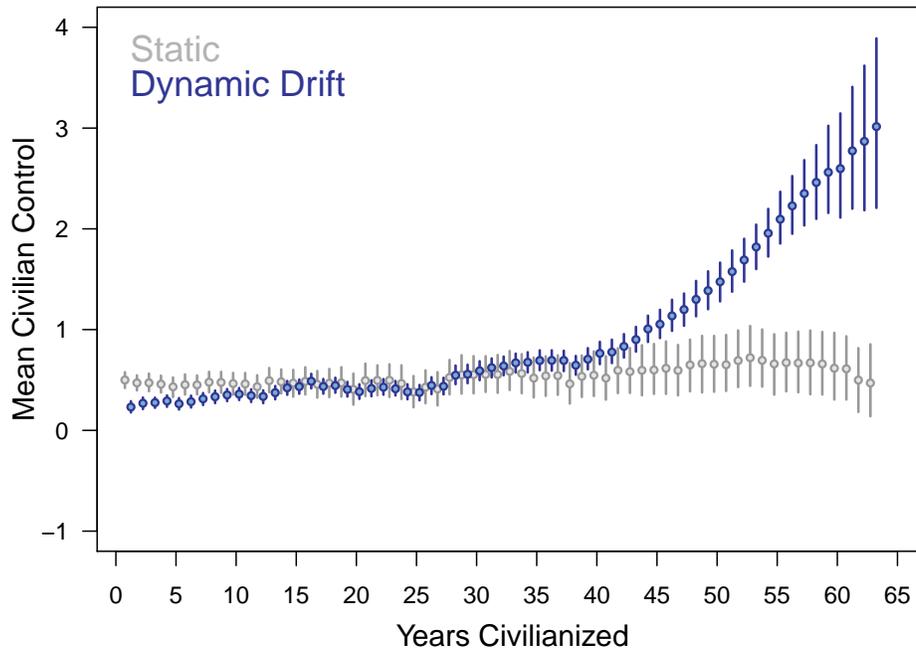
Figure 2: Mean Estimates of Civilian Control for Civilianized Regimes

Note: Plots display mean estimates of civilian control from the static (grey) and drift (blue) model for civilianized regimes. The drift model produces a self-reinforcing pattern of civilian control, while the static model does not.

that finds regimes typically consolidate themselves against the risk of coups after their first two decades of existence (Svolik, 2015). The delay in achieving self-reinforcing control is also consistent with Nordlinger's (1977) conjecture on civil-military traditions, stating "It usually takes at least a generation to socialize men into a given set of attitudes and considerably longer for these attitudes to develop into group tradition." It is also consistent with White's (2017) theory of "crisis generations" where the effects of shared experience experiences of an officer corps begin impacting civil-military relations only once this cohort proceeds through the ranks. These results suggest that norms and learning require a similar incubation period, as elites in a civilianized regime proceed through the ranks and share similar normative and behavioral experiences.

Comparative Validation

Having determined that the static and drift model comport with our competing theoretical expectations, we now proceed to a comparative validation exercise. Within a validation framework, these measures are analogous to hypotheses generated by competing theories of civilian control (Adcock and Collier, 2001). To determine which better accords with reality, we conduct a battery of analyses. First, we evaluate which model better fits the data through a series of in-sample and out-of-sample posterior predictive checks. Second, we conduct a brief analysis of concurrent validity by evaluating the level of civilian control in Turkey in 2010. Third, we establish nomological validity by determining which is better able to forecast military coup attempts. Across all analyses both measures pass baseline validity checks, but the drift model consistently outperforms the static model.

Predictive Validity: Posterior Predictive Checks

One common method of validation is to determine how well each model can reproduce the data that was used to estimate model parameters in the first place through posterior predictive checks (Gelman and Hill, 2007). This is not done to test a causal hypothesis between the indicators, but as a means of model checking. If a model fits the data well, it should be able to accurately reproduce the observed data using the parameter estimates generated by the model. This procedure begins by taking a set of draws–denoted d–of the posterior distributions of the latent trait, θ_{itd}, and the item specific parameters α_{jd}, β_{jd} and generating a prediction for each observed manifest indicator $\hat{y}_{itjd}$ for every country-item-year and comparing these predictions to the observed values y_{itj}. For each set of draws we evaluate predictive accuracy by computing the percentage of each observation correctly predicted for each item (PCP_{js}). We compare the models in the left panel of Figure 3 by displaying the distribution of differences in the PCP values produced by each model such that positive values correspond to superior performance by the drift model and negative
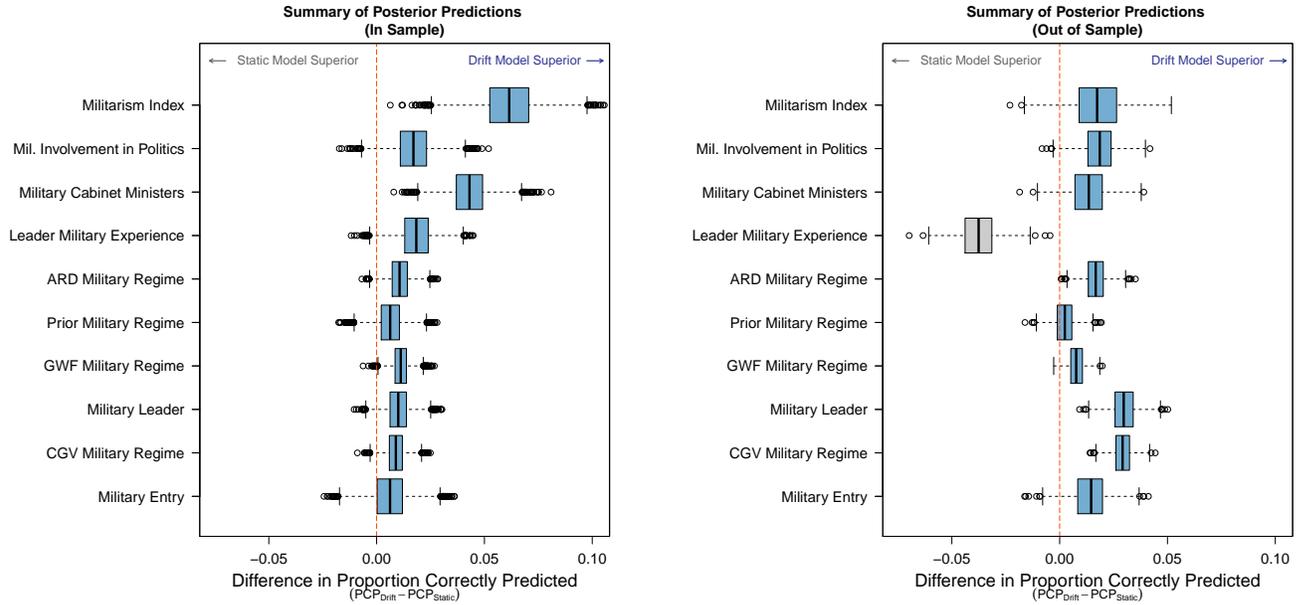
Figure 3: Summary of Posterior Predictive Checks

Note: Plots display each model's relative ability to accurately predict manifest indicators using parameter estimates. Box plots summarize the distribution of the difference in the percent of observed indicators correctly predicted by each model across one thousand draws from the posterior distributions generated by each model. Positive values correspond to superior fit by the drift model, negative values correspond to the opposite. The left panel reports in-sample posterior predictions, while the right panel reports model performance in leave-one-item-out cross validation.

values correspond to superior performance by the static model. Across all items, the drift model outperforms the static model, indicating superior model fit.

As a second step, we evaluate each model's out of sample performance. We do so by conducting leave-one-item-out cross validation.[20] In this procedure, we iteratively drop one of the manifest indicator, generate the static and drift models with the remaining indicators, and then regress the held out indicator on 1,000 draws of the civilian control estimates produced by each model. The results are reported in the right panel of Figure 3. We again find that the drift model generally outperforms the static model. The lone exception is the leader military experience indicator, which is better predicted by the static model. Even in this case, however, the in-sample fit of the drift model (omitting leader military experience) outperforms that of the static model (see

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[20] We conducted an initial evaluation using the Widely Available Information Criteria (WAIC) and LOO statistics outlined by Vehtari, Gelman and Gabry (2016), which approximate model performance in leave on out cross validation. Although the drift model produced superior estimates in each case, standard diagnostics indicated that these statistics may not be reliable, in which case alternative cross-validation procedures are preferred.

Appendix 5). This exception notwithstanding, the results as a whole provide strong evidence that the drift model outperforms the static model.[21]

Case Validation: Comparing 2010 Civilian Control Estimates

Concurrent validity is defined by a measure's ability to distinguish between groups that it should theoretically be able to distinguish between (Trochim and Donnelly, 2008). Within this context, two relevant groups would be states that are or are not at risk of experiencing a coup d'état. Often it is difficult to distinguish between these groups, but with the benefit of hindsight we now know that the Turkish regime was more prone to a coup than it may have otherwise appeared. As previously stated, this was not conventional wisdom prior to the coup with many concluding that President Erdŏgan firmly controlled the armed forces in 2016, after having removed military personnel and allies from much of the Turkish regime and purging the military of political adversaries (Hannah, 2016; The Economist, 2016). We find this conventional wisdom is reflected in the static model estimates. Because Turkey had removed the military from its political institutions, it received the lowest possible value for each of the variables capturing military involvement in politics outlined above. As a result, the static model assigns Turkey the highest possible civilian control score (Figure 4, top panel). One would therefore conclude that Turkey is better grouped with states like Saudi Arabia, Iraq, Canada, and Costa Rica–states that had all adopted civilianized institutions– than it is with states like Myanmar or Thailand where the military is actively involved in politics.

Yet, Turkey also had a tradition of military involvement in politics and there had been relatively little time for norms of civilian control to solidify or for sufficient learning to take place. These processes are more fully captured by the drift model, which assigns an intermediate civilian control score to Turkey (4, bottom panel). Turkey's estimate is now probabilistically lower than Saudi Arabia, Canada, and Costa Rica's estimates, though still higher than states like Myanmar or Thailand. Iraq's shift is also notable – the drift model now treats Iraq as more similar to Thailand

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[21] The raw PCP values are reported for each model in Appendix 5.

than it is to other civilianized regimes, reflecting the tenuous state of civil-military relations there (De Bruin, 2014).

A few substantive conclusions are warranted here. First, the disparity in model estimates provides insight into why some analysts prematurely concluded civilian control was robust in Turkey – they were implicitly adopting the static modeling assumptions in assigning greater importance to the presence of institutions rather than civil-military history. Second, while the coup in Turkey remains surprising even in light of the drift model estimates, the drift approach provides some insight into why the coup unfolded the way it did. Military elites were eager to legitimize their coup attempt by drawing upon the historic perception that the military serves a guardian of democracy in Turkey, stating in a news broadcast that the coup was intended to "reinstate constitutional order" (Srivastava et al., 2016). The fact that norms were not fully formed and regime strength was not clearly observed also provides an explanation for why the coup appeared poorly planned or ill-fated – military elites were in a difficult strategic environment and ultimately miscalculated by initiating a coup. Third, and most relevant to the present analysis, the drift model is better able to classify the data into coup prone and could-consolidated regimes. We further unpack this relationship in the following section.

Nomological Validity: Forecasting Coups d'etat, 2011-2017

Evaluations of nomological validity begin with an assumption that a hypothesized relationship is true and then assessing whether a measure is capable of reproducing this relationship (Adcock and Collier, 2001). While many relationships within the field of civil-military relations are hotly debated and therefore poorly suited to assess nomological validity, we continue to focus on the empirical link between civilian control and attempted coups d'état. Though weak civilian control is related to coup occurrence, coups themselves are an empirically distinct concept that result from a breakdown of civil-military bargaining. We therefore evaluate how well the 2010 estimates of civilian control perform forecasting coup attempts, 2011-2017. This design clearly separates the
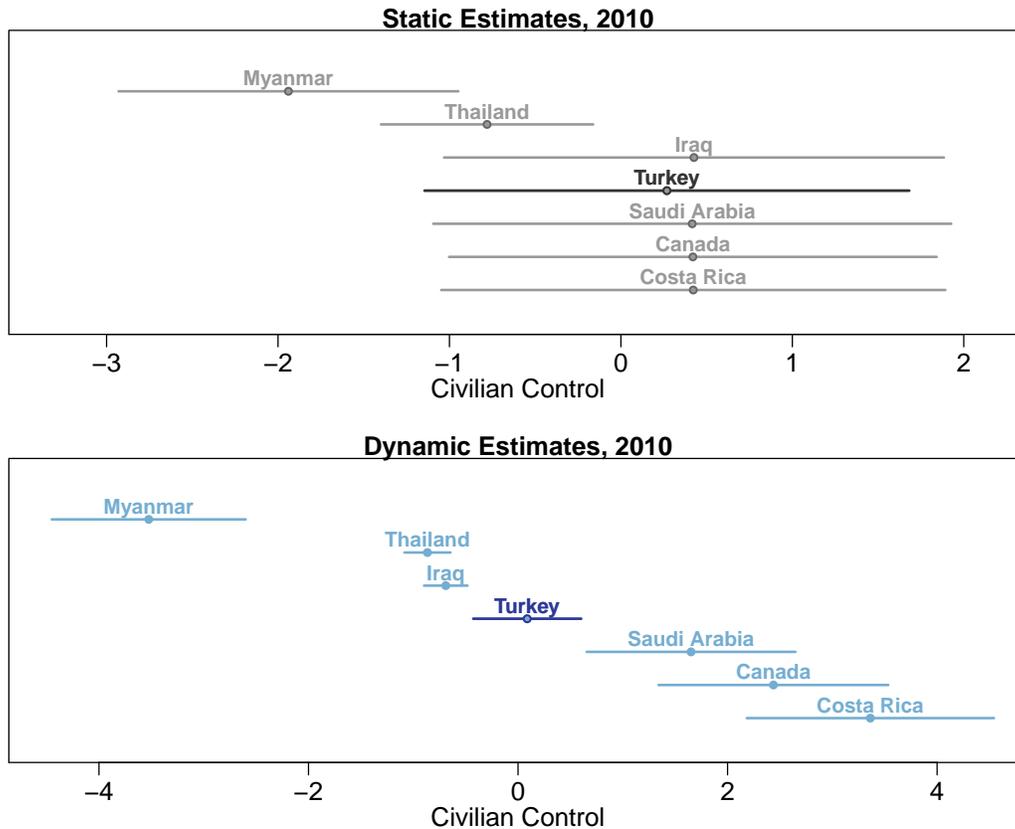
Static Estimates, 2010

Dynamic Estimates, 2010

Figure 4: Civilian Control in 2010 – Comparing Turkey

Note: Figure reports latent estimates from the static (top panel) and drift (bottom panel) models.

data used to generate the civilian control scores and the data coups and in doing so establishes clear sequence between cause and effect while avoiding problems of over-fitting.

We perform 10-fold cross-validation using each of the competing measures. Our data consist of 149 countries. The dependent variable is whether a country experienced a coup attempt between 2011 and 2017 according to the Powell and Thyne (2011) data and the independent variable is a country's civilian control score in 2010 using either the static or drift model estimates.[22] We begin

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[22]Our choice of a bivariate model specification reflects our goal to validate each measure, rather than develop an optimal model of coup forecasting per se.
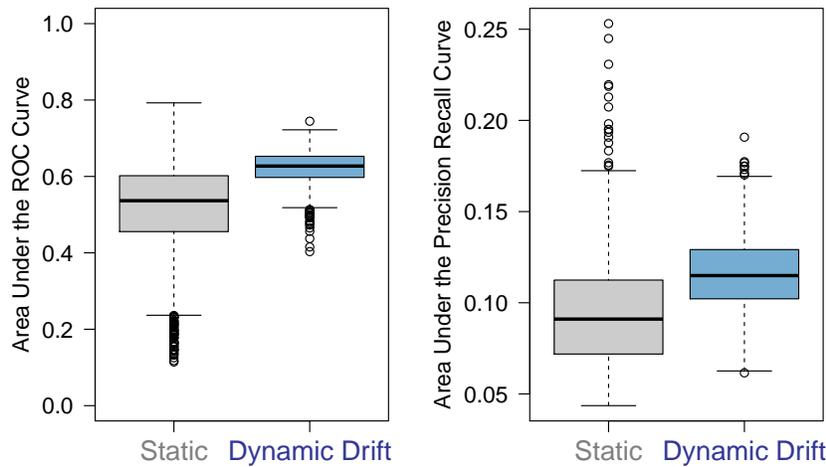
Figure 5: Measurement Model Performance in Forecasting

Note: Figure compares results of a cross-validation procedure comparing the static and drift model's ability to predict coup attempts (2011-2017) using either the static or drift model's 2010 civilian control estimates. Box plots report the distribution of values of the area under the precision recall curve and receiver operating characteristic curves across 1,000 simulated draws from the posterior distributions from each measurement model – high values correspond to improved forecasting performance. The drift model outperforms the static model in either metric and the difference in mean estimates is significant at the $p < .05$ in each case.

by randomly partitioning into ten groups and then iteratively training logit regression models of coup onset on nine of these partitions. The parameter estimates from this model is then used to generate predicted probabilities of coup attempts for the held out partition. To incorporate uncertainty in the latent trait and ensure we have not divided the data into idiosyncratic partitions we repeat this procedure 1,000 times, each time taking a separate draw from the posterior distributions for civilian control and randomly dividing the data into new partitions. In each iteration, we compute two common forecasting metrics: area under the receiver operating characteristic (ROC) curve; and area under the precision recall curve (PRC). The area under the ROC curve captures model performance in terms of a forecasting model's true positive rate (recall) and false positive rate, while the area under the PRC curve does so using the true positive rate and a model's precision, in this case the proportion of a model's correct coup attempt predictions to the total number of coups it predicted.

Figure 5 displays the distribution scores for the area under the ROC and PRC curves across

the 1,000 iterations for each model. The mean estimate for the drift model is higher across both of these metrics, corresponding to superior model forecasting accuracy. The difference in means is significant in each case. There is also much more variance in the static model's performance. In some simulations the static model outperforms the drift model. This is reflective of the greater uncertainty conveyed in the static model's estimates. En aggregate, however, the drift model produces forecasts of coup attempts that are both more accurate and more reliable than those obtained by the static model. There are limits to what we can infer based on nomological validation tests alone and these results pertain to a relatively small subset of country years. Nevertheless, in conjunction with the findings in the previous section these results offer additional support for the dynamic theory of civilian control.

Additional Analyses and Robustness Checks

The supplementary files associated with this manuscript contain auxiliary information and robustness tests of our analyses. This includes: additional details on our manifest indicators (Appendix 1); the correlation among these indicators (Appendix 2); a discussion of the raw drift parameter estimates and item-specific parameters (Appendix 3 and 4); and figures omitted from the main text (Appendix 5-7). Robustness analyses include: an assessment of results using alternative definitions of civilianized regimes (Appendix 8); model estimates omitting the Cold War era (Appendix 9); an evaluation of drift in non-civilianized regimes (Appendix 10). Appendix 11 compares our civilian control scores to a "years since last coup" indicator. As expected, the static and drift control scores are related to, but not determined by years since the last coup, with a correlations of 0.304 and 0.389, respectively. Finally, in Appendix 12 we compare our measures to existing coup-proofing indicators. We confirm our assumption that civilian control and coup proofing are distinct concepts – the correlation between our measures and standard coup-proofing indicators never exceeds a magnitude of 0.12. We also uncover some evidence that the drift model tends to

assign lower estimates of civilian control to regimes that coup-proof suggesting that coup-proofing is not strongly related to self-reinforcing control.

Conclusion

This paper opened by asking why political elites often fail to control the military after developing seemingly robust civilian institutions. The conventional approach to answering this, and similar questions relating to civilian control has been to treat this concept as the product of institutional arrangements alone. The answer provided here, however, suggests that amending this approach to incorporate the historic impact of norms and learning provides for a more complete understanding of civilian control. As norms and shared expectations are developed, civilian control becomes increasingly robust. In short, civilian control is self-reinforcing. This explains why civilian control sometimes seems to breakdown prematurely – leaders have developed civilianized institutions, but have had insufficient time for civilian control to calcify.

That history matters for the emergence of civilian control is unlikely to surprise many political scientists and historians of civil-military relations, yet conventional analyses often neglect these factors in their theoretical and empirical treatments of civil-military relations. Beyond these theoretical insights, the measure produced here can be of use to a variety of studies in international relations and comparative politics concerned with civil-military relations. Their utility for forecasting coup attempts has already been proven. In addition, the measures uncover significant variation in civilian control both within and across regime types (See Appendix 7). Their granularity also improves the ability of researchers to test for interactive or non-linear relationships.

We close by noting three areas for future research. First, this piece focused on one particular dimension of civilian control relating to the military's propensity toward overt, extreme, and illegal interventions in politics. Beyond this basic degree of subordination, civilian leaders also often struggle to ensure that the armed forces can also be expected to faithfully and fully carry out the

orders they are given (Desch, 1999; Feaver, 2003). This more operational form of civilian control may or may not be subject to the same patterns and processes described here. Nevertheless, the measurement and validation strategies developed here can be extended to answer these questions as scholars continue to collect more nuanced and comprehensive data on civil-military relationships.

Second, while this work established that civilian control is a self-reinforcing process and identified the development of norms and learning as the most likely mechanisms driving this relationship, more research is necessary to unpack the micro-foundations of this theory. Specifically, the framework outlined here generates expectations at the state-level regarding individual beliefs, but less is known about the biases and heuristics used by military elites. Individual-level analyses are necessary to further unpack this puzzle.

Third, the dynamic measurement approach introduced here assumes that civilian control will reinforce similarly across civilianized regimes. As more civil-military relations data become available, however, researchers can adapt this modeling approach to determine whether particular institutional arrangements or strategies of civilian control allow civilian control to self-reinforce more quickly in some contexts, but more slowly in others.

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