

# THE DEMAND FOR MILITARY EXPENDITURE IN AUTHORITARIAN REGIMES

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*(Received 14 January 2014; in final form 12 May 2014)*

This paper examines whether there are systematic differences in military spending between different types of autocratic regimes. We view military expenditure as an instrument a dictator can exploit in order to stay in power. How he utilises this instrument depends on the institutional set-up of his regime. We distinguish between military regimes, single party states and personalist regimes, and predict that military regimes should have the highest, whereas personalist dictatorships should have the lowest level of military spending. Using panel data on 64 dictatorships from 1960 to 2000, we find empirical evidence that our hypotheses are not rejected.

*Keywords:* Military expenditure; Authoritarian regimes; Institutions; Political economy

## 1. INTRODUCTION

This paper examines whether there are systematic differences in military spending between different types of autocratic regimes. While papers on the determinants of military expenditures have considered the effect of regime type (e.g. Hewitt 1992; Dunne and Perlo-Freeman 2003; Goldsmith 2003; Fordham and Walker 2005; Acemoglu, Ticchi, and Vindigni 2010), this variable has generally been identified using indices that rank countries on some scale from perfect democracy to absolute autocracy (e.g. Polity IV, Freedom House Index, etc.). However, these measures ignore the substantial differences between various forms of democracy and autocracy. According to Gleditsch and Ward (1997, 380), ‘vastly different temporal, spatial, and social contexts support the same autocracy scale value’. For example, the Chinese communist regime, the Burmese military dictatorship, and the monarchy of the United Arab Emirates have all at some point in time held the same Polity IV score, yet the institutional differences between these three dictatorships could not be more pronounced.

According to Geddes (1999, 6), ‘different kinds of authoritarianism differ from each other as much as they differ from democracy. They draw on different groups to staff government offices and different segments of society for support. They have different procedures for making decisions, different characteristic forms of intra-elite factionalism and competition, different ways of choosing leaders and handling succession, and different ways of responding to society and opposition’. Understanding these differences is crucial: research in

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comparative politics has revealed that qualitative differences across autocracies help to explain variation on a wide variety of outcomes (e.g. Geddes 2003; Weeks 2008; Wright 2008; Aksoy, Carter, and Wright 2011).

This paper attempts to unpack one particular aspect of the differences between forms of autocracy: military expenditure. We view military expenditure as an instrument a dictator can exploit in order to stay in power. How he utilises this instrument depends on the institutional set-up of his regime. We distinguish between military regimes, single party states and personalist regimes and argue that military regimes should be expected to have the highest military spending.

This paper is structured as follows: In Section 2, we review the relevant literature; in Section 3, we develop the theoretical argument as to why different types of dictatorships should spend different amounts on the military; we describe our data in Section 4, present our methodology and empirical results in Section 5, and conclude in Section 6.

## 2. LITERATURE REVIEW

Studying military expenditures is important for many reasons. Military expenditure has been shown to impact on economic growth and development, as well as other economic variables such as international debt or corruption (see e.g. Dunne, Smith, and Willenbockel 2005; Aizenman and Glick 2006; Collier and Hoeffler 2006; Lin and Ali 2009; Pieroni 2009; Smyth and Narayan 2009; Dunne and Smith 2010; Heo 2010; Alptekin and Levine 2011; Kollias and Paleologou 2013). Moreover, research has found that there may exist a trade-off between spending on the military and other areas such as health and education, the so-called guns-vs-butter trade-off (see e.g. Russett 1969; Deger 1985; Palmer 1990).

Studying military expenditures in the context of different regime types is important because institutional set-ups affect the way military expenditures are determined. For example, scholars have argued that democracies are likely to spend less on the military because democratic leaders are accountable to the broader public who generally tend to prioritise social spending (Rosh 1988; Hewitt 1992). In addition, scholars have found evidence that democratic leaders are more risk-averse towards war in general than dictators are (Bueno de Mesquita, Siverson, and Smith 1999). Finally, autocracies often lack popular legitimacy, relying instead on the military to maintain power. Not only are autocracies more likely to experience violent uprising, they are also more inclined than democracies to meet it with large-scale force, which in turn should lead to higher expenditures on the military. These ideas are supported by empirical evidence – see e.g. Hewitt 1992; Dunne and Perlo-Freeman 2003; Goldsmith 2003; Fordham and Walker 2005; Acemoglu, Ticchi, and Vindigni 2010, who find that dictatorships spend more on the military than democracies do.

A recent study by Albalade, Bel, and Ferran (2012) explores the effects of government form, electoral rules, concentration of parliamentary parties, and ideology on military expenditure and find that there are differences in military spending patterns between different types of democracies. This nuanced examination of different forms of democracy gives new insights into the determinants of military expenditure. If differences between various forms of democracy are significant in explaining patterns in military expenditure, differences between various forms of autocracies may be even more pronounced: usually, in democracies, civil–military relations are relatively straightforward, characterised by what Huntington defines as ‘objective civilian control’ (Huntington 1995). In contrast, civil–military relations

in autocracies vary substantially according to the type of authoritarian regime. For example, Huntington differentiates between (i) military regimes, in which ‘no civilian control exists and military leaders and organisations often perform functions only distantly related to normal military mission’ (Huntington 1995, 10); (ii) personal dictatorships, in which ‘the ruler does everything he can to ensure that the military is permeated by and controlled by his cronies and agents, that it is divided against itself, and that it serves his purpose of keeping a tight grip on power’<sup>1</sup> and (iii) one-party states in which ‘the military is viewed as the instrument of the party, military officers have to be party members, political commissars and party cells parallel the normal military chain of command, and ultimate loyalty is to the party rather than the state’.<sup>2</sup>

Nevertheless, the differences in military spending between different types of autocracies remain underexamined. One paper by Kim, Kim, and Lee (2013), examines whether military regimes spend more on the military than other political regimes. They distinguish between military, civilian and monarchic regimes, and find that military regimes do, in fact, spend more on the military. In this paper, we argue that the categories of civilian and monarchic regimes do not go far enough in dissecting institutional differences between autocracies. Both personalist regimes and single party states may be considered civilian regimes, yet as Huntington pointed out, the differences between these regime types could not be more extreme. Moreover, as we will see in the next paragraphs, our theoretical arguments, and our empirical strategy stand in sharp contrast to their work.<sup>3</sup>

### 3. THEORY

Before we set out our argument as to why military expenditures should differ systematically between various forms of autocracy, it must be emphasised that the aim of this paper is not to explain in full how dictators survive, but rather to explore in more detail the particular relationship between dictators and their militaries. Thus, we largely ignore the role of the masses in overthrowing dictators, though we acknowledge their (growing) importance. We argue that whether a revolution is successful or not depends on the dictator’s ability to command the loyalty of the military. This was most recently illustrated in Egypt, where Mubarak’s fate was determined by the military’s choice to side with the people in 2011, as was his successor Morsi’s fate, when the military ousted him in 2013. Given the importance of the military’s loyalty for a dictator’s survival, we consider it paramount to explore this particular relationship.

We begin with the assumption, first proposed by Tullock (1987), that all dictators seek to stay in power, yet are at constant risk of being deposed. Tullock argues that most of the time the threat to a dictator’s power comes from officials of high rank. This argument was fleshed out by Bueno de Mesquita et al. (2005) and Haber (2006), who identify the so-called selectorate or launching organisations as the key to a dictator’s survival. While

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<sup>1</sup>See Huntington (1995).

<sup>2</sup>See Huntington (1995).

<sup>3</sup>In addition, there are a number of issues regarding the econometrics in this paper: the authors address the issue of serial correlation using the Prais–Winsten approach. This is not suitable for panel data. In particular, it imposes the restriction that the long-run effect of the variables is the same as the short-run effect, which is implausible. A large amount of the serial correlation may come from the fixed effects, which they exclude, and the rest from dynamics, and heterogeneity bias. The problem is indicated by their rho around 0.9.

other strands of the literature have focused on the role of the masses in overthrowing dictatorships,<sup>4</sup> Svolik (2009, 478) finds that ‘an overwhelming majority of authoritarian leaders lose power as a result of a successful coup rather than a popular uprising’. Examining ‘all 316 authoritarian leaders who held office for at least one day and lost power by non-constitutional means between 1945 and 2002’,<sup>5</sup> he finds that 32 were removed by a popular uprising, 30 stepped down under public pressure to democratise, 20 lost power through an assassination that was not part of a coup or a popular uprising and 16 were removed by foreign intervention. The remaining 205 dictators – more than two-thirds of the sample – were removed by government insiders, such as other government members or members of the military or the security forces. Thus, in order to stay in power, the dictator needs to control his elite.

We continue our argument by suggesting, as Wintrobe (1998) did, that dictators have two instruments for staying in power: repression and co-option. Successful repression requires the loyalty of the military. Yet, as Acemoglu, Ticchi, and Vindigni (2010, 2) argue, ‘creating a powerful military is a double-edged sword for the elite. On the one hand, a more powerful military is more effective in preventing transitions to democracy. On the other hand, a more powerful military necessitates either greater concessions to the military or raises the risk of a military takeover’. Thus, controlling the military is of paramount importance for a dictator’s survival.

There are various instruments a dictator can utilise to keep his military in check. These range from recruitment along family or tribal lines, as well as promotions, rotations, retirements, mass purges and executions, to ideological indoctrination, the creation of paramilitary forces and logistics control.<sup>6</sup> Another crucial tool is military expenditure. Nordlinger (1977), Collier and Hoeffler (2006), and Acemoglu, Ticchi, and Vindigni (2010) suggest that paying soldiers an ‘efficiency wage’<sup>7</sup> will prevent military takeovers. This idea is supported by empirical evidence from Leon (2012), who finds a negative monotonic relationship between a country’s military spending and the probability that it experiences a coup d’état. Powell (2012), using military spending per soldier, also finds that soldiers that are better funded (i.e. with higher military spending per capita) appear to be more content with the status quo and are thus less likely to attempt a coup. Finally, Collier and Hoeffler (2006) claim that the relationship between military spending and the risk of coups is actually non-monotonic or U-shaped: both low and high military spending may positively affect the likelihood of military takeovers, because high military spending affects the power and the influence of the armed forces. Despite some subtle differences in the choice of the appropriate measure of ‘buying off’ the military, they all generally point to a negative relationship between the risk of military takeovers and the level of defence spending. We argue that the precise instruments at a dictator’s disposal, as well as the choice of instrument, depend on the institutional set-up of his regime, and in particular whether the regime is military, single-party or personalist. In the following sub-section, we define these regime types and outline the choices the dictator faces in each of them.

<sup>4</sup>Gandhi and Przeworski (2006), Acemoglu and Robinson (2001), and Boix (2003) identify the possibility of a popular uprising as the central threat to a dictator’s power. The events sweeping the Arab World since December 2010 clearly demonstrate that the masses have the power to oust dictators. Their role is becoming increasingly important as social media enables citizens to overcome the coordination problem that has often been cited in the literature as a major hurdle to bringing about revolutions (for example Acemoglu and Robinson 2001).

<sup>5</sup>Ibid, 477.

<sup>6</sup>“Logistics control” refers to the oversight of and control over the garrison and movements of military units, access to ammunition and fuel, and supervision of field training exercises’ (Hashim 2003, 21).

<sup>7</sup>See Acemoglu, Ticchi, and Vindigni (2010), 2.

### 3.1. Regime Types

#### 3.1.1. *Military regimes*

According to Geddes (2003, 51), ‘in military regimes, a group of officers decides who will rule and exercises some influence on policy’. The elite comprises the officer corps of the armed forces, over which it exercises full control. This puts the leader (i.e. the chairman of the junta) in a precarious position: Ezrow and Franz (2011) find that military regimes are the most likely to experience a military coup, while Fjelde (2010) finds that military regimes run the highest risk of civil conflict. Thus, in military regimes we expect large concessions to the military in the form of higher military spending in an attempt to buy its loyalty.

Moreover, military regimes are more likely to resort to repression: on the one hand, they have a comparative advantage in repression – this being the expertise of the military (Davenport 2007). Military regimes have full access to troops and weaponry, and can thus resort to force and repression more systematically than civilian regimes (Bratton and Van de Walle 1994). On the other hand, they lack institutions for efficient co-optation, such as political parties, and thus have few alternatives to repression. This increased reliance on repression as a means of staying in power, which necessitates a military that is in good shape, is another reason one might expect higher military spending in military regimes.

#### 3.1.2. *Single-party states*

Geddes (2003, 51) defines single-party states as ‘regimes, [in which] one party dominates access to political office and control over policy, though other parties may exist and compete as minor players in elections’. The existence of a party allows the regime to gather support among the civilian population (Wright and Escribà-Folch, 2012) and incorporate a larger proportion of the population into the political process (Davenport 2007). Furthermore, the party organisation is a strong and influential institutional structure which is able to monitor all groups in the society. Finally, single-party states possess the institutions (for example legislatures) to deal with demands from competing groups of power (including the military) without challenging the foundations of the regime (Gandhi and Przeworski 2006). These features of single-party states decrease the need to resort to repression.

As Huntington (1995) pointed out, in single-party states, the military is viewed as the instrument of the party and is completely subordinated to it. Various measures are taken to ensure its loyalty: military officers have to be party members and soldiers are promoted according to their loyalty to the party. Prospects for career advancement in the armed forces are dependent on the willingness of military officers to identify themselves with the party. Offers of selective benefits to reward support, combined with the credible threat that these privileges depend on individuals’ loyalty, serve as a strong deterrent against challenges and defections (Wintrobe 1998). Furthermore, soldiers are indoctrinated with party ideology and often party functionaries are embedded in the armed forces to guard against subversive behaviour (Frantz and Ezrow 2011). For example, in Iran, ‘Islamic Commissars’ were assigned to the joint staff down to the platoon level and were responsible for the ideological and political education of the troops. In China under Mao, party propaganda was an important aspect of training (Whitson 1969) and remains an important means of controlling People’s Liberation Army (PLA) today (Koh 2000). In addition, single-party regimes often

have large non-military intelligence organizations which ensure a wide and pervasive control of the society at large, including the armed forces (Lai and Slater 2006).

The interference of the party at all levels of the military structure makes it difficult for the armed forces to challenge the regime, while the single-party apparatus can easily suppress the opposition within the state apparatus itself (Slater 2003). Because single party states are able to subordinate the armed forces to the party apparatus, they have less of a need to buy its loyalty. Moreover, since the party allows the regime to gather support among the civilian population, there is less need to resort to state repression than in regimes without mass-based parties. Therefore, we should expect a lower level of military expenditure in single-party regimes than military regimes.

### 3.1.3. *Personalist regimes*

Geddes (2003, 13) characterises personalist regimes by ‘the concentration of decision-making and coercive power in the hands of one person, unfettered by a party central committee or institutionalized military decision-making process’. ‘Personalist regimes differ from both military and single-party in that access to office and the fruits of office depend much on the discretion of an individual leader’ (Geddes (2003, 51). A personalist dictator is able to surround himself with associates, friends and family members, as was the case in the Philippines under Ferdinand Marcos or the Dominican Republic under Rafael Trujillo (Frantz and Ezrow 2011). He mobilises political support by bestowing some material rewards and private goods to a narrow group of regime insiders (Bratton and Van de Walle 1994).

Personalist regimes may have militaries and parties, but these institutions are not sufficiently autonomous.<sup>8</sup> Often the military is kept weak intentionally through frequent rotations and purges, preventing generals from building personal power bases with factions of the military. For example, in Iraq, a particularly interesting episode was the purging of war heroes in the aftermath of the Iran-Iraq war because Saddam Hussein feared that certain officers, by distinguishing themselves in the battlefield, had become too popular amongst the armed forces (Hashim 2003). In addition, militaries in personalist regimes are often ill equipped. Instead, personalist dictators tend to favour paramilitary forces, recruited from groups most loyal to him and heavily indoctrinated. In fact, some personalist regimes have multiple paramilitary forces – Gaddafi had no less than 11 – and the role of each is to check to others.

This survival strategy has proven to be quite successful: the empirical evidence suggests that elites in personalist dictatorships have the greatest difficulty ousting dictators, and therefore personalist dictators face the lowest risk of being overthrown in any given year (Frantz and Ezrow 2011). In Chad, for example, effort to topple Idriss Deby failed due to lack of elite unity. Lukashenko in Belarus and Antonio Salazar in Portugal represent similar situations (Frantz and Ezrow 2011).

Because power is concentrated in the hands on one individual and because the military is institutionally weak and has little to no bargaining power in personalist dictatorships, we expect the lowest military spending in this regime type.

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<sup>8</sup>See Bratton and Van de Walle (1994).

## 4. DATA

### 4.1. Military Expenditure

The arguably best data on military expenditures is supplied by the Stockholm International Peace Research Institute (SIPRI). Unfortunately, SIPRI does not provide data before 1988. However, years before then are interesting for our research, as they yield so many more examples of dictatorships. The Correlates of War (COW) National Material Capabilities database supplies data on military expenditures from 1960 onwards. Unfortunately, these data are somewhat problematic because they are compiled from different sources without precise attention to the compatibility of these sources.<sup>9</sup> Following Nordhaus, Oneal, and Russett (2009), we use COW data from 1960 to 1987 and SIPRI data from 1988 to 2000. COW data are in current USD. We transform them into constant USD using the US CPI with 2005 as the base year. SIPRI data are in constant 2008 USD. We transform all data into percentages of GDP using GDP figures (in constant 2000 USD) from the World Bank World Development Indicators to get a measure of military burden. To account for potential discrepancies between the two data-sets,<sup>10</sup> we include a dummy which equals 1 when the source is SIPRI and zero when the source is COW to capture the effect of using the different sources. This dummy must be interpreted carefully. In addition to picking up differences in the sources, it will pick up a ‘Cold War effect’ because the SIPRI data corresponds with the post-Cold War era. As an additional robustness check, we run separate regressions on the SIPRI and COW data-sets alone to check whether our results hold.

More generally, it must always be noted that data on military spending are notoriously inaccurate. According to SIPRI, there are three major problems in particular: *reliability*, *comparability* and *validity*. Problems with the *reliability* of data occur because official sources do not always disclose information accurately. By its very nature, military expenditure is an item that governments may prefer to conceal. In many countries the official data only cover a part of total military expenditure. Important items can be hidden under non-military budget headings or can even be financed entirely outside the government budget. Furthermore, *comparisons* between the data of different countries are complicated by the fact that countries have varying definitions of what comprises military spending, and these definitions may even vary over time. Finally, the problem of *validity* arises because military expenditure does not necessarily reflect military strength or capability. While military expenditure undoubtedly impacts on military capability, other factors, such as the balance between personnel and equipment, the technological level of military equipment, and the state of maintenance and repair play an important role too (Stålenheim, Perdomo, and Skons 2008). These considerations must be kept in mind when interpreting results.

### 4.2. Regime Types

The Polity Score (Gurr, Marshall, and Jagers 2009) measures the level of democracy in a country according to a 21-point scale ranging from -10 (fully institutionalised autocracy) to +10 (consolidated democracy). It consists of six component measures that record key qualities of executive recruitment, constraints on executive authority and political competition. We include Polity IV in our regressions because it has been found to be an important determinant of military spending. However, we argue that this measure does not go far enough

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<sup>9</sup>For example, they may have varying definitions of military expenditures, e.g. they include/exclude paramilitary spending, pensions, spending on R&D, etc.

<sup>10</sup>See Appendix 1 for an in-depth examination of the differences between the two data-sets.

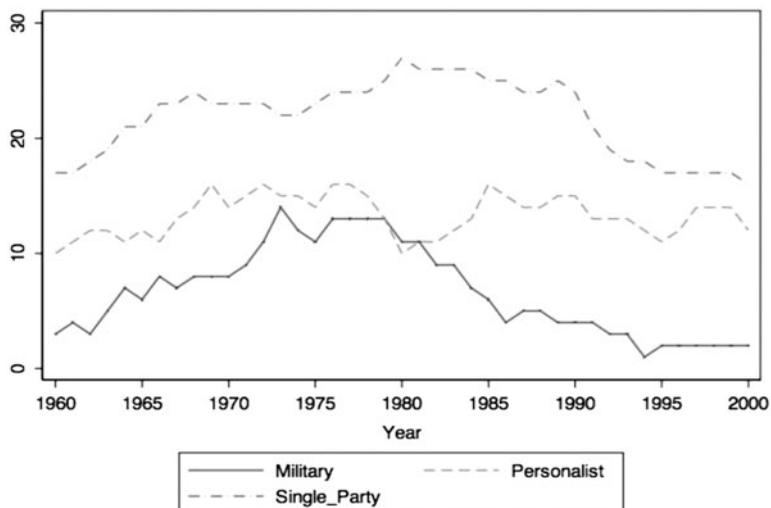


FIGURE I Number of pure regimes by type (hybrid regimes are excluded)

in dissecting important institutional differences between types of dictatorships. As Geddes, Wright, and Frantz (2012, 16) point out, ‘Polity scores measure regime characteristics, but they do not identify the group that selects leaders and implements policy changes’. We hypothesise that it is precisely these differences that determine a dictator’s relationship with the military, and hence military spending.

Hence, in addition to Polity IV, we use a categorisation provided by Geddes, Wright, and Frantz (2012) to measure the effect of regime type on military spending. The authors categorise dictatorships into personalist, dominant-party, military, monarchic, oligarchic, indirect military or hybrid regimes based on who controls policy, leadership selection and the security apparatus. Our theory focuses on the three most prevalent regime types, military, single-party and personalist, and we drop the other regime types from our sample. Developing a theory that encompasses all regime categories may be interesting for further research. However, testing hypothesis relating to regime types for which there are only a few observations may not make empirical sense.<sup>11</sup>

Figure I shows the number of country that fall into each of the three regime types by year. Single-party states are the most prevalent form of autocracy through the whole period, though the number declined following the end of the Cold War. Military regimes, though less frequent, also appear to have peaked in the 1970s at the height of the Cold War, then decline in its aftermath. The peak during the 1970s can partially be explained by the frequent coups in Latin America. Moreover, as Geddes, Wright, and Frantz (2012, 8) point out, ‘these developments most likely reflect the strategic support of dictatorships in various regions of the world to advance US and Soviet geo-political agendas’. The number of personalist regimes, on the other hand, remains relatively constant and is even slightly higher towards the end of the sample compared with the beginning of the period. It should be

<sup>11</sup>For example, only two countries, Egypt and Syria, fall into the hybrid category ‘triple threat’. While these countries make fascinating case studies, it does not make sense to test empirically any hypothesis regarding a triple threat from a single-party, strong military and dictator with personalist tendencies with only two observations.

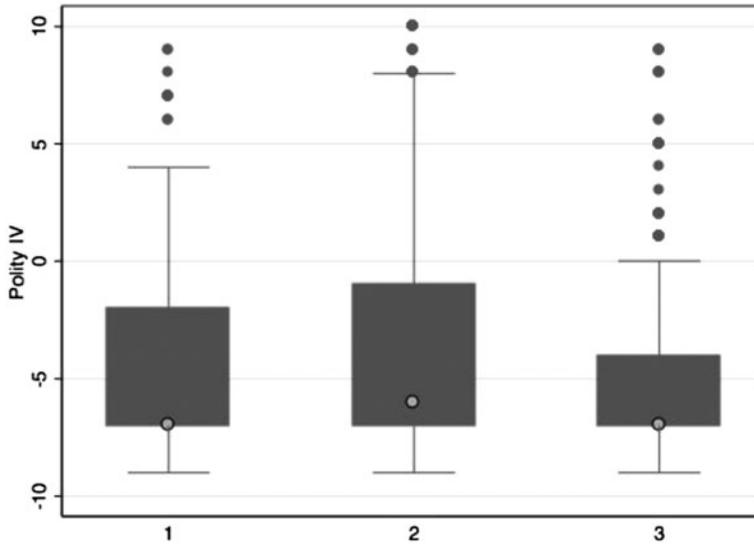


FIGURE II Autocratic regime types and Polity IV  
*Note:* Legend. 1 = Military, 2 = Party, 3 = Personal.

noted that, given the above observations, the pre-1990s sample has a somewhat different balance of regime types than a post-1990s sample.

As we stressed in the introduction, regime types and the Polity IV tell a different story about the infrastructure of an autocracy. Figure II shows the substantial variations in the Polity score across regime types and within each of them. Single party regimes receive the highest score, however they also display a substantial variation within this category, as evidenced by the size of the box and the position of the least and greatest values (−9 to +9, excluding the outliers). Personalist dictatorships receive the lowest score, and display a smaller, but still important, degree of variation across the combined Polity IV. As Geddes, Wright, and Frantz (2012, 9) point out, ‘this probably says more about what the creators of Polity scores chose to measure than it does about anything else’. Furthermore, it must be noted that Geddes, Wright, and Frantz’s (2012) data-set only contains observations on dictatorships, while non-autocratic countries are excluded. Countries which have transitioned to democracy or are experiencing a spell of democracy between years of dictatorship are not observed in those particular years. Thus, we are dealing with an unbalanced panel.

It is worth mentioning in more detail the paper by Kim, Kim, and Lee (2013), which makes use of a different data-set to explore a similar question. The authors use the data-set by Cheibub, Gandhi, and Vreeland (2010), which differentiate between monarchies, military regimes and a residual category, which they refer to as ‘civilian regimes’. We think that grouping all non-monarchic and non-military regimes into one category conflates important differences between regimes. As set out above, single-party states and personalist regime have very different ways of dealing with the military. In addition, Geddes, Wright, and Frantz (2012) point out a number of problems with the CGV data-set. For example, while GWF codes regimes as military when dictators govern in collaboration, CGV codes as military all autocracies led by men who have ever been officers. Why this may be problematic for our research is illustrated by an example cited by Geddes, Wright, and Frantz (2012): ‘This means that the Ugandan dictatorship led by Idi Amin from 1971 to 1979 is coded as military by CGV but personalist in our data-set because Amin marginalized the military

TABLE I Summary Statistics

Variable	Obs	<i>M</i>	SD	Min	Max
Burden (SIPRI)	376	4.233419	4.383934	0.001858	50.24831
Burden (COW)	1461	7.215286	13.82617	0	139.8255
Burden (mixed sources)	1471	7.102561	13.81389	0	139.8255
Polity IV	1647	-4.44202	4.486663	-9	10
Military	1648	0.164442	0.370789	0	1
Single party	1648	0.51699	0.499863	0	1
Personalist	1648	0.318568	0.466063	0	1
Interstate war	1647	0.022465	0.148236	0	1
Intrastate war	1647	0.099575	0.299523	0	1
GDP per capita	1485	1404.765	2337.105	72.32493	23018.66
Population total	1648	4.05E+07	1.53E+08	612,851	1.26E+09
Openness	1591	62.8	51.10219	4.262921	398.9536

from highest level decision making'.<sup>12</sup> Given that our theory specifically mentions the marginalisation of the military in personalist regimes, this example suggests that for the purpose of this research using the CGV data-set could lead to inaccurate results.

#### 4.3. Other Data

Dummy variables on wars – internal and external – are from the Correlates of War Project. COW defines war as sustained combat, involving organised armed forces, resulting in a minimum of 1000 battle-related deaths (Sarkees 2011). Intra-state (civil) wars refer to those that predominantly take place within the recognised territory of a state. Inter-state wars refer to those that take place between states. Finally, we collected data on GDP (in 2000 constant US Dollars) and total population from the World Bank World Development Indicators; and data on openness, defined as exports plus imports divided by GDP (in 2005 constant US Dollars) from the Penn World Table. Table I outlines the summary statistics for these variables. Moreover Appendix 2 shows the list of countries included in our analysis.

## 5. METHODOLOGY AND EMPIRICAL RESULTS

Following the literature on the determinants of military expenditures (see e.g. Dunne and Perlo-Freeman 2003), we regress the log of military burden on the regime type dummies, Polity IV, internal war, external war, log GDP per capita, log population and log openness. GDP per capita is a measure of wealth, while population is a measure of size. Both variables are expected to have a positive on military spending. Openness is a proxy for economic integration. The rationale behind the inclusion of this variable is that the more open a country is, the more peaceful will be its relationships with other countries, and therefore the less need it has for defence spending. However, the opposite has been argued for developing countries: the level of economic integration may, in fact, be a source of discontent, as dependence on the world market renders their economies more vulnerable to fluctuations in world prices. In addition, the benefits of trade only accrue to certain groups (i.e. the elites).

<sup>12</sup>See Geddes, Wright, and Frantz (2012), 17–18.

TABLE II Estimation Results

Dependent variable is	(1) Fixed effects	(2) Pooled OLS	(3) Fixed effects	(4) Fixed effects
Military burden	Mixed sources <sup>a</sup>	Mixed sources	SIPRI <sup>b</sup>	COW <sup>c</sup>
Military	0.651** (3.01)	0.0694 (0.34)	Omitted By STATA	0.728*** (3.62)
Single party	0.121 (0.43)	0.607 (1.62)	Omitted By STATA	0.156 (0.45)
Polity IV	-0.0108 (-0.98)	-0.0165 (-1.03)	-0.0107 (-0.78)	-0.0167 (-1.57)
Interstate war	0.0611 (0.19)	0.549 (1.60)	-0.593*** (-5.19)	0.0495 (0.14)
Intrastate war	0.434*** (4.45)	0.584* (2.60)	0.066 (0.57)	0.577*** (5.08)
Log GDP per Capita	-0.416 (-0.90)	-0.123 (-0.91)	-0.712 (-1.62)	-0.35 (-0.78)
Log population	0.801*** (3.67)	0.0241 (0.18)	-0.226 (-0.37)	0.11 (0.64)
Log openness	0.0928 (0.69)	0.0650 (0.24)	0.364 (1.73)	0.0887 (0.64)
Source dummy	-0.673*** (-4.73)	-0.443* (-2.45)		
Constant	-9.415* (-2.39)	1.122 (0.52)	7.735 (0.87)	1.131 (0.33)
<i>N</i>	1415	1415	374	1405
Groups	64	N/A	46	64
R-Sq within	0.1944	N/A	0.1049	0.1041
R-Sq between	0	N/A	0.009	0.002
R-Sq overall	0.0091	0.1041	0.0036	0.016
AIC	2468.654	4619.96	198.1498	2501.162

Notes: *t* statistics in parentheses.

<sup>a</sup>Mixed sources: Correlates of War 1960–1987, SIPRI 1988–2000.

<sup>b</sup>SIPRI: 1988–2000.

<sup>c</sup>COW: 1960–2000.

\**p* < 0.01.

\*\**p* < 0.05.

\*\*\**p* < 0.001.

In anticipation of resulting internal dissent developing countries may become more militarised with increasing openness (Rosh 1988). Internal and external wars pick up immediate threats. A country engaged in war will not only give greater priority to military spending as a matter of urgency, but will also need to restock arms and ammunition used in fighting.

We transform military burden, GDP per capita, population and openness into logs to scale down the variance and reduce the effect of outliers. As mentioned above, we restrict regime type to include only personalist dictatorships, one-party states and military regimes.

Our baseline model is a fixed effects model<sup>13</sup> estimated with the combined data from SIPRI and COW. We control for groupwise heteroscedasticity and serial correlation by

<sup>13</sup>We confirm the appropriateness of the fixed effects (FE) model over the random effects (RE) model by performing a Hausman test. RE impose the orthogonality condition that regressors are uncorrelated with the error. The Hausman test tests whether this condition is valid. Under the null, both RE and FE are consistent, but RE is efficient. Under the alternative, only FE is consistent. We obtain a *p*-value of 0.000, suggesting that we must reject the null and FE is therefore the better model.

TABLE III *F*-tests for Differences in Regime Type

	Test	$H_0$	$H_A$	<i>p</i> -value
FE, mixed sources	<i>F</i> -test	Military-single party = 0	Military-single party $\neq$ 0	0.037
Pooled, mixed sources	<i>F</i> -test	Military-single party = 0	Military-single party $\neq$ 0	0.163
FE, COW	<i>F</i> -test	Military-single party = 0	Military-single party $\neq$ 0	0.039

reporting robust standard errors clustered on countries. As mentioned above, the combination of the SIPRI and COW data-sets is somewhat problematic. Although Nordhaus, Russett, and Oneal (2012) set a precedent for this procedure, we additionally control for differences in the datasets with a dummy that equals one from 1988 onwards when the data source is SIPRI. Moreover, we run separate regressions on the SIPRI and COW data-sets alone as additional robustness checks. Table II summarises these results. Overall, the variables are consistent with recent studies on the determinants of military spending, although the selection of a sub-sample of autocratic regimes only and the combination of clusters at country level and fixed effects make some of the control variable insignificant at conventional levels.

Military regimes appear to spend more on the military than single-party states, which, in turn, spend more than personalist regimes. Moreover, the difference between military regimes and single-party states is statistically significant (see Table III). This pattern holds across all our regressions, excepting the fixed effects model run on SIPRI data alone. In this model, the regime type dummies are subsumed in the fixed effects and dropped from the regression. This is easily explained by the fact that this regression uses a much smaller sub-sample (1988–2000) and thus features substantially less within variation. This illustrates the value added of bringing in the COW data-set: by looking at a longer period, we are able to make use of the additional within variation. Moreover, the results using only COW data are very close to the model which uses combined sources, demonstrating that these results are robust. Thus, we find support for our hypothesis that military regimes spend more on the military than other forms of dictatorships. Moreover, we find evidence that single-party states spend more on the military than personalist regimes. This is consistent with our priors.

In addition, we find that the effect of Polity IV, while of the expected sign, is, in fact, insignificant. Once we account for the type of dictatorship, the effect of the degree of democratisation disappears. This suggests that the institutional set-up within a regime is important in explaining military expenditures. Significant results are obtained for intrastate war (except in regression 3 using only SIPRI data) and the log of population in regression (1). Perhaps, because of the divergent views on whether and how trade influence military spending, the log of trade is consistently insignificant. Similarly, the log of GDP per capita fails to achieve significance, which is not entirely surprising given the exclusion of democratic (and thus more developed) countries from the sample. The results for interstate war are less intuitive: the coefficient is negative and insignificant in models (1), (2) and (4), but positive and significant in model (3). We suspect that this may be because in model (3), we use only SIPRI data, which is only available from 1988 onwards, and our sample size is thus not only significantly smaller (374 observation vs. 1415 observation in our baseline model), but also comprises only post-Cold War years. A closer look at the data reveals that there are only 37 countries in our data-set that experienced interwar, of which only one country falls into the post-1988 period (this country is Iran, which was involved in the Iran-Iraq war

from 1980 to 1988). Because this single observation represents an outlier, the OLS technique will treat it as a dummy, which explains why this variable is highly significant.

Finally, the source dummy is highly significant in explaining military expenditures. As mentioned above, this dummy must be interpreted with caution: because the SIPRI data corresponds with the post-Cold War era, the dummy may, in fact, be picking up a 'Cold War effect' rather than an inconsistency between data-sets. In fact, given that the results using only COW data are very close to the model which uses combined sources, the former seems more likely. With the exception of model (3), where the fixed effects subsume the military regime dummy, the Akaike's information criteria suggest that model (1) fits the data better than the models (2) and (4), with larger AIC.<sup>14</sup>

Our first and perhaps main result suggests that regimes ruled by military leaders are more prone to provide resources to the armed forces in the form of military spending. We claim that two simultaneous, yet interrelated mechanisms can elicit this pattern. On one hand, the cohesion typically observed in the armed forces and the strong corporate interests make it natural for the leader to redistribute private benefits to the member of its club, namely the military. On the other hand, as most military regimes have been brought into power through military takeovers, military spending is one instrument in the ruler's toolkit to reduce the incentives to stage a new coup. Moreover, the dictator needs the active cooperation of the military to successful repress attempts by the broader population to violently overthrow him. Military spending is an important tool that state leaders can use to get the necessary support from the armed forces. Put differently, dictators need to ensure the loyalty of the military through the optimal manipulation of military spending. Although factual evidence and the visual inspection of a data-set on military spending would suggest that single party regimes, such as the Soviet Union or China, have historically invested a large amount of resources on defence, we find that single-party regimes spend less on the military than military regimes. We explain this by the presence of a mass-based party, which characterises virtually all single party regimes and allows civil leaders to co-opt and target political opponents selectively, makes them more resilient to internal as well as external challenges. Incumbents in single-party autocracies are better equipped than military regimes to co-opt and subordinate potential threats to political control, including the armed forces.

Note that we are not claiming a casual impact of regime type on military spending. A positive relation between defence spending and (in particular) military regimes can also arise from causality running both ways. A military coup, and therefore the installation of a military regime, can be decided by expectations on future military spending growth prospects. However, note that this particular instance of reverse causality is far from obvious: if anything, we should expect a negative impact of military spending on coups d'état. As we said, and unsurprisingly, empirical studies find a negative relationship between a country's military spending and the probability that it experiences a coup. If this is the case, the bias is negative. We nevertheless acknowledge this issue and only claim that, conditional on regime type, we find that military regimes are the biggest spender on the military, followed by single-party regimes. While our OLS estimator is biased (although the direction of the bias is not clear-cut), we provide the best linear unbiased predictor of military spending conditional on having a certain type of regime.

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<sup>14</sup>As robustness checks we have included country-specific linear trends and a number of additional control variables i.e. Militarised Interstate Disputes data on hostility levels. Results hold to the inclusion of these variables. Due to space limitations these data are not presented here, but are available upon request from the authors.

## 6. CONCLUSION

Following the so-called ‘Arab Spring’, scholarly research on civil–military relations has become one of the fastest growing areas in political science. Our paper explores empirically whether there are differences in military expenditures between different forms of dictatorship: military regimes, one-party states and personalist dictatorships. In order to understand how the institutional setting of autocracies affects the military budget, one has to understand the nature of the threats facing dictators, and the instruments available to him to preserve his power. We argue that the form of autocracy affects the military–ruler relationships, and in particular the role of the ruler in keeping the military in check (i.e. co-option) and the role of the military as repressive agent (i.e. repression). We derive a logic of authoritarianism that generates a typology of sorts – three different institutional arrangements – each with its own implications for the role and influence of the armed forces.

Using a widely accepted model of military spending, we show the relevance of autocratic institutions to patterns of defence spending. In particular, the importance of the military in the institutional infrastructure is found to increase the military’s chances for acquiring more resources and to cause more generous allocations to the armed forces. In particular, we find that military regimes have the highest level military spending, while personalist regimes exhibit the lowest. This is consistent with our theory, which suggests that one-party states and personalist dictators have alternative ways of checking the military and need not buy the support of the military to the extent that military regimes do.

A study of military spending in different forms of autocracy yields some interesting insights about the nature of the civil–military relations and has a number of relevant policy implications. In developing countries, the armed forces can play two important roles: they are pivotal in bringing about institutional change, and they may be involved in the policy setting after a successful coup. Without an understanding of the importance of the military apparatus in autocratic regimes, it is difficult to understand how institutions and economic outcomes interact. Many governments of developing countries face considerable risk of a coup d’état perpetrated by their own military. The phenomenon was acute in South America in the 1970s and it has been a recurrent phenomenon in Africa and in part of the south-east Asia since the end of the Cold War. Despite several scholarly attempts to disentangle the nexus military allocations – risk of coups, the question of whether and how military spending is responsible for the rising of autocratic regimes – brought into power through military coups – remains open. Therefore, this study has important implications for coup-proofing. Civil–military relations are also crucial with regard to military effectiveness (Pilster and Bohmelt 2011). Military spending is one possible dimension along which we can measure the civilian control of the military organisation. Finally, as we highlighted above, military spending may have adverse consequences on the level of economic growth, particularly in less-developed countries. A review of the relevant literature suggests that the disparity in research findings may result from an over-reliance on the Polity IV score and too few attempts to account for qualitative differences among autocratic regimes. The analysis presented in this paper, albeit tentative, demonstrates that studies of the impact of regime type on military spending must work from a more sophisticated conception of authoritarianism.

## ACKNOWLEDGEMENTS

We are grateful to Ron Smith for his advices and help in this research. We wish to thank Natasha Ezrow, Kristian Gleditsch, Sam Perlo-Freeman, and Petros Sekeris for useful discussions, as well as seminar and conference participants at Birkbeck College, the University of Bristol and the University of Amsterdam for valuable comments on earlier versions of the manuscript. The constructive input and suggestions of an anonymous referee is also gratefully acknowledged. The responsibility for any remaining errors or omissions is our own.

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**APPENDIX 1. DATA**

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**APPENDIX 2. LIST OF COUNTRIES IN SAMPLE**

Albania, Algeria, Angola, Argentina, Bangladesh, Benin, Bolivia, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, China, Republic of Congo, Cote d'Ivoire, Dominican Republic, Ecuador, Ethiopia, Ghana, Greece, Guatemala, Guinea, Guinea-Bissau, Honduras, Hungary, Indonesia, Iran, Kenya, South Korea, Laos, Lesotho, Liberia, Madagascar, Malawi, Malaysia, Mali, Mauritania, Mexico, Mongolia, Mozambique, Nicaragua, Niger, Nigeria, Pakistan, Peru, Philippines, Poland, Portugal, Rwanda, Senegal, Sierra Leon, Singapore, South Africa, Spain, Sudan, Tanzania, Thailand, Togo, Tunisia, Turkey, Uganda, Uruguay, Zambia, Zimbabwe.