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Military Expenditures and Political Regimes: An Analysis Using Global Data, 1963-2001

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Abstract

This paper examines the determinants of military expenditures with a special focus on political regimes for more than 130 countries for the period of 1963-2001 by employing a dynamic panel data analysis. The paper aims at contributing to the literature by utilizing a recently constructed political regimes data set and considering income inequality, a key variable that has not received substantial attention in the context of political regimes, growth and military expenditures. Covering a large set of countries and an extended time period, the paper reveals further evidence on the linkage between democracy and military expenditures. Our results yield two crucial facts. First, social democratic political regimes have a tendency to spend less on armaments as a share of the national income; compared to social democracy all other political regimes are likely to have higher military burdens, confirming previous findings of the negative relationship between level of democracy and military burden. Second, the analysis shows that higher income inequality, regardless of the model specification and inequality measure, is associated with lower military burden.

JEL Classification: C33, H56

Key Words: Military expenditure, income inequality, terror, political regime, democracy, dictatorship

Introduction

This paper aims at analyzing the determinants of military expenditures with a special focus on political regimes for over 130 countries during the period of 1963-2001 by using a dynamic panel data analysis. There are different theories that explain the relationship between military expenditures and political regimes, going back to Immanuel Kant's wisdom that reduced military spending would promote peace and prosperity as countries avoid conflict spirals and devote resources to social spending. Mostly using the Polity database, a vast empirical literature has shown the negative relationship between level of democracy and military expenditures. However, there are two shortcomings of this literature. First, only one classification, on a binomial or continuous variable, is used for political regimes in most of these studies, ignoring clear differences between political regimes that cannot be ranked on this type of continuum. Second, the role of income inequality, as a crucial control variable due to its possible linkage with military expenditures, has been ignored in the context of military expenditures and political regimes. Considering these two issues, in this study we utilize a recent political regime data set that separates out political regime by type beyond the categories of democracy and dictatorship. The classification we use includes the categories social democracy, dictatorship, military dictatorship, civil war, one-party democracy, communist, Islamic republic, European colony, and conservative democracy. These are qualitatively different regimes that each has distinct characteristics pertaining to government ideology and government expenditure. We also incorporate two different measures of income inequality in order to better understand the military expenditure-political regime nexus. In addition to confirming some expected results yielded by earlier studies (such as the positive relationship between military expenditures overall and

military expenditures of foes and internal and external threats) our findings show the negative relationship between military burden and the military expenditures of allies, growth and income inequality. Also, regardless of the model specifications, we found a significant, negative relationship between democracy and military burden based on our political regime data set.

Following this section we provide a brief literature survey on the nexus of military expenditures-political regimes. Section 3 introduces data and methodology. Section 4 presents results and discussion. Finally, the last section is reserved to summarize our findings.

2. Military Expenditures and Political Regimes

There are several ways in which scholars have theorized a relationship between military expenditures and political regimes. Fordham & Walker (2005) discuss the wisdom of liberals following Immanuel Kant, who reasoned that reduced military spending would promote peace and prosperity as countries avoid conflict spirals and devote resources to social spending.

Another way in which theory frames the relationship between political regime/democracy and military spending is through the concept of the "peace dividend." Rota (2011) writes that the relationship in between democracy and military spending, with regard to the "peace dividend," is complex, and references Alesina & Spoalore (2005, 2006), who propose a model in which the peace dividend is not as large as might be expected due to the spread of democracy, since democracy can result in a higher number of nations, leading to more chances of regional conflict. Hess & Orphanides (2001) also find that democratization does not necessarily produce the so-called "peace dividend" and that wars may be just as prevalent under democratic regimes.

The negative relationship between democracy and military spending has also been underscored in work by Harrison & Wold (2012), who assert that democracies impose more constraints on government, which reduces the probability of war and military expenditure. The authors also write that democracy also enhances state ability to raise public finance in the case of war. Bove & Brauner (2011) reference Nordlinger (1977) and other political scientists (such as Sprout & Sprout (1968) who make the case that democratic rulers who wish to be re-elected have an incentive to increase social spending and reduce military budgets to please the populace. Goldsmith extends this theory, stating that democratic leaders are less likely to use force against opposition, resulting in less use of the military and lower levels of military spending (Goldsmith 2003).

De Masi & Lorie (1989) assert that a number of political, economic, and strategic factors influence military spending. These interact at different levels—at the national, regional, and global levels, and may include domestic or external security risks, political regime, existence of a local arms industry, level of regional conflict, and membership in a global power bloc.

A body of literature examines the impact of political regimes on military regimes using empirical data. Most empirical tests have found that democratic or liberal regimes spend less on the military than autocratic regimes. Mulligan, Gil & Martin (2004) find that countries that are not democratic spend on average 2% more of GDP on military, whether they are Communist or non-Communist nations. Eloranta & Andreev (2006) find a moderately negative relationship between democracy and military expenditures looking at the period between 1870 and 1938. Fordham & Walker (2005) obtain a similar result—that liberal states engage in less military spending than autocracies, examining the period from 1816 to 1997. Goldsmith (2003) finds the same result and

uses it as evidence supporting liberal peace theory. Looking at all states covered by the Correlates of War (COW) data set from 1886 to 1989, Goldsmith finds that democracies spend less on defense than non-democratic states. Goldsmith (2007), using spatial econometrics, confirms this result. This negative relationship is also found in Hewitt (1992), Dunne, Perlo-Freeman & Smith (2003, 2008), Collier & Hoffler (2004, 2007a, 2007b), Nordhaus, Oneal & Russett (2012), Habibi (1994), and Garfinkel (1994). In studies analyzing mainly developing nations, several scholars, including Nordlinger (1970), Schmitter (1971), and O'Leary & Coplin (1975), have looked at the relationship of military versus civilian rule to military spending levels, finding that military regimes do indeed devote more public resources to military spending.

However, not all studies come to the same conclusion. Rota (2011) finds that democracy and military spending are positively correlated before World War I and negatively correlated after World War I. Baliga, Lucca & Sjöström (2011) find that limited democracies are more war-oriented than autocracies. Dudley & Montmarquette (1981) use a sample of 38 developed and developing countries for the years 1960, 1970 and 1975. They find that political regime, designated by being a multi-party democracy or not, has no impact on military spending.

Studies that focus mainly on developing nations have been criticized. Research on developing nations by McKinlay & Cohan (1975, 1976) and by Jackman (1976) refutes prior conclusions that regime-type influences military spending. Rota (2011) also notes that these studies neglect more advanced countries because their policy regime measures do not distinguish between different levels of democracy.

Further, there is some criticism of the studies on political regime and military spending where political regime uses only one classification, on a binomial or continuous variable, of political regime. Most often, the Polity project regime classification database is used, which ranks democracies and autocracies on a spectrum using a continuous variable. However, there are clear differences between political regimes that cannot be ranked on this type of continuum, which we shall discuss below. Different types of autocracies (military dictatorships versus non-military dictatorships, for example) and different types of democracies (social democracies versus non-social democracies, for example) result in different political decisions and dynamics and therefore different levels of military spending.

Other studies incorporate other measures of regime type in the analysis of military spending. Bove & Brauner (2011) examines differences in autocratic regimes, categorizing the regimes as Personalist, Single party, Monarchy and Military authoritarian regimes, and finds that military regimes have the highest levels of military spending. Russett & Oneal (2001) find that the transition from authoritarian to democratic regimes in Latin America results in reduced military spending. Tongur & Elveren (2012) use the Hsu (2010) database to find that social democratic political regimes have significantly lower military expenditures, and that Communist nations, nations in civil war, and conservative democracies tend to spend more on the military as a share of central government expenditures. McKinlay & Cohan (1975, 1976) and Schmitter (1971) distinguish between civilian and military regime types of regimes to find that military regimes spend more on the military. Albalate, Bel & Elias (2012) separate democracies themselves into two types,

presidential and parliamentary democracies, and find that military spending in the former is higher than the latter.

There are a number of competing theories to explain the military expenditure pattern of countries (Goldsmith 2003). In other words, there are "many context-dependent influences on any given state's defense burden" (Goldsmith 2003: 560). However, if there are some general influences, then these effects can be captured across a range of data, covering a large number of countries and a long time period as in this paper (Goldsmith 2003). In line with this reasoning we therefore follow a general approach to the issue to see if higher democracy is associated with a lower military burden (i.e. liberal theory) by considering commonly used variables across the literature.

3. Data and Methodology

3.1 Data

Dependent Variable

In line with major studies we take the military expenditure-to-GDP ratio, *MILGDP*, as our dependent variable, indicating the defence burden[1]. We derive this variable based on a data set, the logarithm of military spending in constant dollars measured with purchasing power parities (PPP) and the logarithm of real GDP, provided by Nordhaus, Oneal & Russett (2012). From 1989 onward

[1] Goldsmith (2003) states that military expenditures may properly represent military power in a state, but does not necessarily measure defense effort per se, since the military expenditure variable does not control for state resources. Hence defense is some proportion of military expenditures as compared to GDP. Using this ratio allows comparison of countries over time, and prevents disjoints related to exchange or inflation rates.

we use Stockholm International Peace Research Institute's (SIPRI) data[2] as it is the most reliable and commonly used data set. We obtained the data for the rest of the period from the Correlates of War (COW). However, as the SIPRI no longer posts data for the Cold War years and was sometimes criticized for underestimating the spending of communist countries we use the COW numbers for those years. Also, in contrast to the other report, COW shows a large decline in China's military spending between 1985 and 1988. Therefore, we raise the estimates to be consistent with SIPRI's for 1988.

Military Size

Following Ali (2007) and Tongur & Elveren (forthcoming) we take the size of army into account by (i.e. number of military person per 1000 people), *AF*, provided by the COW.

Arms Races

The arms race, a possible explanation of the military expenditure, is introduced by Richardson (1960). However, empirical works have showed that the arms race model does not hold for the majority of cases (Oren 1994; Rota 2011). Therefore, this perspective has been replaced by the 'Security Web' concept (Rosh, 1988) and by the concept of an external enemy threat (Dunne & Perlo-Freeman 2003a,b) and that of neighbors (Collier & Hoffler 2004). In this context, we do not hesitate to borrow two more variables from Nordhaus, Oneal & Russett (2012), specifically, *the logarithms of weighted military expenditures of foes and that of friend*, military spending of allies (FRIENDS), and military spending of potential enemies (FOES), respectively.

Internal and External Threat

As an indicator of internal threat we consider terrorism, whose data set is provided by the Global Terrorism Database. However, in addition to usual measure, *number of terrorist events*, we also consider *the number of people wounded or killed* in these events as an alternative measure for terrorism. To capture the external threat, besides the 'civil war' within the political regimes we also incorporate *war* and *conflict* dummies based on the Militarized Interstate Dispute Data of the COW[3]. Here, while we take *war* as defined war in the original data set, we on the other hand define *conflict* as war or the use of force in in disputes.

Inequality Indicators

There are four distinct approaches that account for the relationship between military spending and income inequality (Lin & Ali 2009). First, the Keynesian view finds that military expenditures expand higher aggregate demand and employment, thereby boosting the economy. Keynesian spending benefits the poor relatively more than the rich, thereby improving income distribution. Second, defense-related jobs normally pay better than other types of jobs, which means that inter-sectoral pay gaps widen as military expenditures increase (Ali 2007). Third, because military personnel may incorporate relatively less-skilled labor, military R&D expenditures benefit more highly skilled workers. Therefore there is a tradeoff between the forces that equalize wages and those that increase wage gaps (Lin & Ali 2009). Finally, for governments, higher military spending

[3] Some major studies also utilize COW data set for interstate war, such as Goldsmith (2003) and Fordham & Walker (2005) among many others.

results in lower levels of funds for education, health, and social transfers, which would otherwise improve income distribution.

While Lin & Ali (2009), in a panel Granger analysis, found no causality between military expenditures and income inequality, several studies found that higher military expenditures exacerbate income inequality (Abell 1994; Seiglie 1997; Ali 2007, 2012; Vadlamannati 2008; Hirnissa, Habibullah & Baharom 2009; Kentor, Jorgenson & Kick 2012; and Tongur & Elveren forthcoming).

We incorporate two inequality measures. The first variable, the THEIL, is the industrial pay inequality index (UTIP-UNIDO) obtained from the University of Texas Inequality Project (UTIP). To calculate the Theil T Statistic (Theil 1972), UTIP computes the pay inequality index for 156 countries for the 1963-2002 period. The UTIP group also calculated the Estimated Household Income Inequality (EHII) by incorporating the UTIP-UNIDO and Deininger-Squire (1996) data sets into a Gini format (please see UTIP and Galbraith & Kum (2005) for further information about calculation). We use these measures because we consider manufacturing pay inequality to be an appropriate indicator of the overall income inequality in line with the extensive discussions in Galbraith and Conceição (2001) and Galbraith and Kum (2005).

Economic Indicator

Since economic growth has an effect on military spending as discussed by a vast literature we use the GDP growth rate as a control variable, provided by the World Bank.

Political Regimes

We use a more recent database for regime classification—Hsu (2010) found on the UTIP website, since most existing classifications classify democracy and autocracy on continua or as a single binomial variable. The dichotomous classification type has been found in Cheibub & Gandhi (2004), who divide regime types between authoritarian and democratic, based on data taken from Przeworkski et al. (2000).

Continuous classifications of degree of democracy treat both types of regimes as having one characteristic—democracy, whereas in reality, there are qualitatively different types of democratic regimes and different types of autocratic regimes. The Polity database, created by Gurr (1974) and Gurr, Jaggers & Moore (1990), makes use of the democracy continuum, using political participation, government recruitment, and degree of democratic constraint on the chief executive. Other commonly used continua measures include Freedom House (2004) and Vanhanen (2000). Freedom House ranks degree of democracy by examining election outcomes and balance of power. Vanhanen measures degree of democracy using percentage votes for smaller parties and percentage of adults voting in elections as the basis for the ranking. Hadenius & Teorell (2007) use the Polity/Freedom House database to sub-classify regimes in terms of hereditary succession, use of military force, and the presence or absence of popular elections into twenty types of sub-regimes.[4,5]

Rather than using the dichotomous or continuous regime classifications, directly or indirectly, we adopt a new regime typology that distinguishes between regime types that are internally similar. Hsu (2010) uses categorical variables to classify different regimes based on the

[4] The World Bank Database (Beck, Keefer & Clarke 2006) measures many aspects of party types and electoral competitiveness without creating a regime classification per se.

[5] Bollen's (1980, 1991, 1993) dataset, 12 Cross-National Indicators of Liberal Democracy 1950-1990, uses a number of indicators that have been criticized for including both subjective and objective indicators that are inconsistent.

type of government (as opposed to criteria regarding elections, political liberties, etc). The database does not rank democracy or autocracy in terms of degree.

The database makes use of nine regime types to categorize our data: social democracies, conservative democracies, one-party democracies, European colonies, Communist regimes, Islamic republics, military dictatorships, dictatorships, and civil war. Democracies in our database—whether social, conservative, or one-party democracies—are based on regimes that hold fair elections for the chief executive office and the legislative body. Social democracies are those that have a relatively large welfare state, while conservative democracies are those that have a relatively small welfare state. One-party democracies are those that do not allow opposition parties from winning elections. European colonies are countries that are governed externally. Communist regimes and Islamic republics are classified by their own governments as such, and we simply follow their classification. Power-based authoritarian regimes in which the military holds most of the political power are classified as military dictatorships, while those in which the military does not hold most of the political power are classified as dictatorships. Countries that are engaged in civil war are classified as such, since their governments often face varying degrees of chaos.

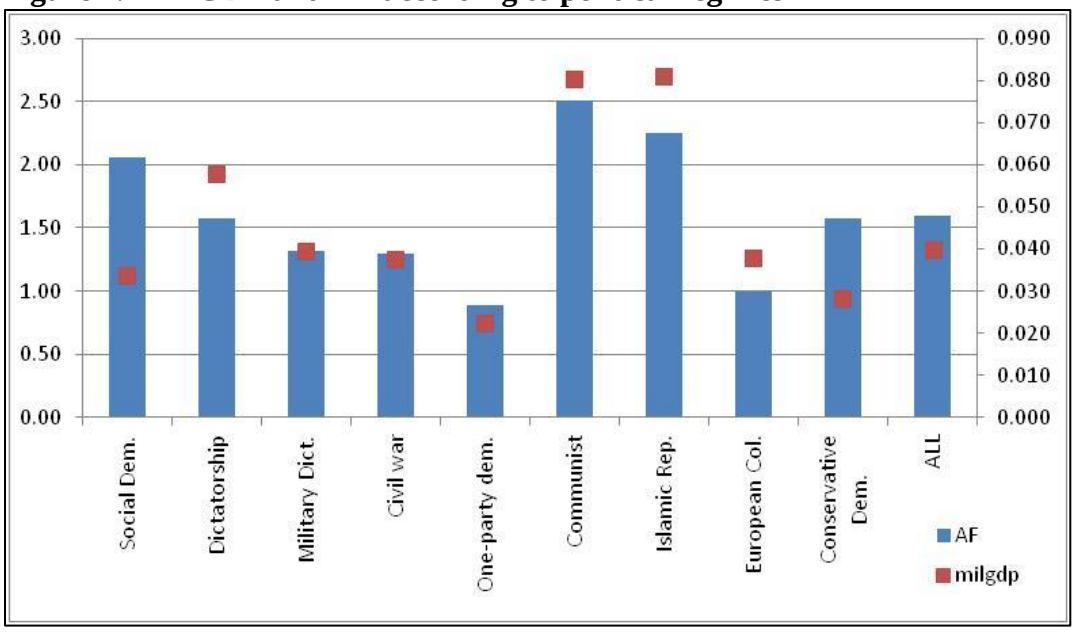
Table 1. Summary of Variables

Label	Variables	Source
MILGDP	Share of military expenditures as percentage of GDP	Nordhaus, Oneal & Russett (2012)
THEIL	UTIP-UNIDO industrial pay inequality index	University of Texas Inequality Project
EHII	Estimated Household Income Inequality	University of Texas Inequality Project
AF	(natural logarithm of) Armed forces per 1000 people	Correlates of War Project (COW)
T-EVENT	(natural logarithm of) Number of terrorist incidents	Global Terrorism Data Base
T-KILLWOUND	(natural logarithm of) Number of people wounded or killed	Global Terrorism Data Base
GROWTH	Real GDP growth rate	World Bank
FRIENDS	(natural logarithm of) Total military spending of allies and other friendly states	Nordhaus, Oneal & Russett (2012)
FOES	(natural logarithm of) Total spending by states with different security arrangements	Nordhaus, Oneal & Russett (2012)
WAR	dummy for each war year	Correlates of War Project (COW)
CONFLICT	dummy for each war year or each use of force year	Correlates of War Project (COW)
Type of Political Regimes (dummies)		Hsu (2010)

The sample used in our regressions includes 3,064 country-year observations. When we look at the distribution of the sample with respect to political regimes, out of all of them, 146 are social

democratic, comprising 4.8 percent of all observations. The numbers of observations and percentages for the remaining political regimes are as the followings[6]: 605 observations comprising 19.7 % dictatorships, 413 observations comprising 13.5 % military dictatorship, 84 observations comprising 2.7 % for civil-war, 112 observations comprising 3.7 % for one-party democracies, 191 observations comprising 6.2 % Communist regimes, 33 observations comprising 1.1 % Islamic Republics, 8 observations comprising 0.3 % European colonies, 1472 observations comprising 48% conservative democracies. The mean values of variables relating to political regimes can be seen in the following figures.

Figure 1. MILGDP and AF according to political regimes

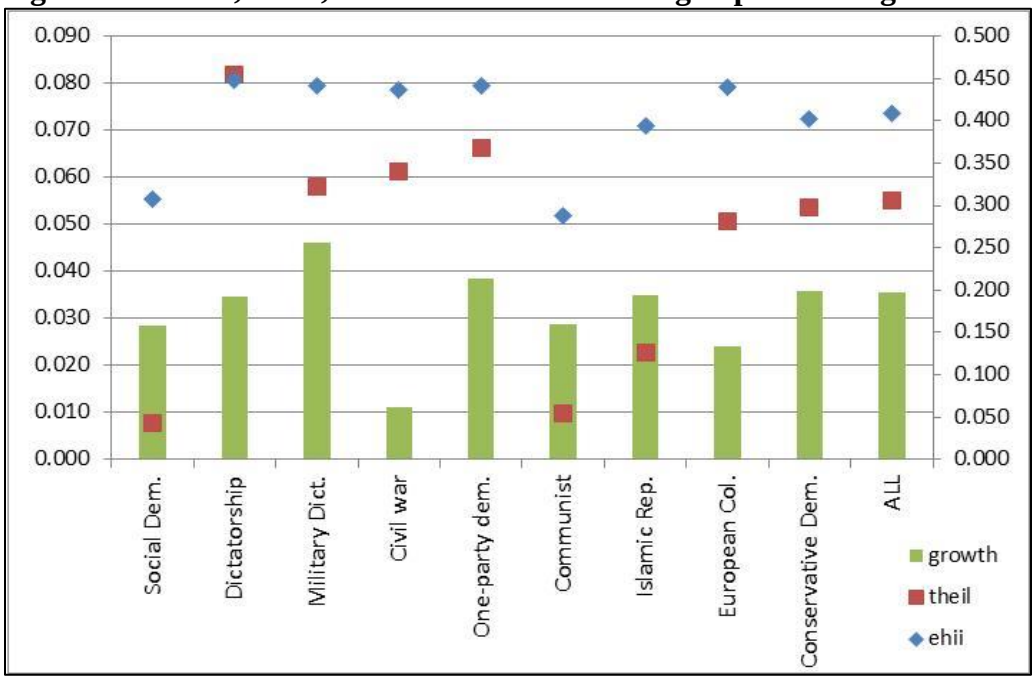


Note: Left-hand side axis shows AF; and right-hand side axis shows MILGDP.

[6] Since the political regimes of countries may change over time we provide descriptive statistics for political regimes rather than for countries.

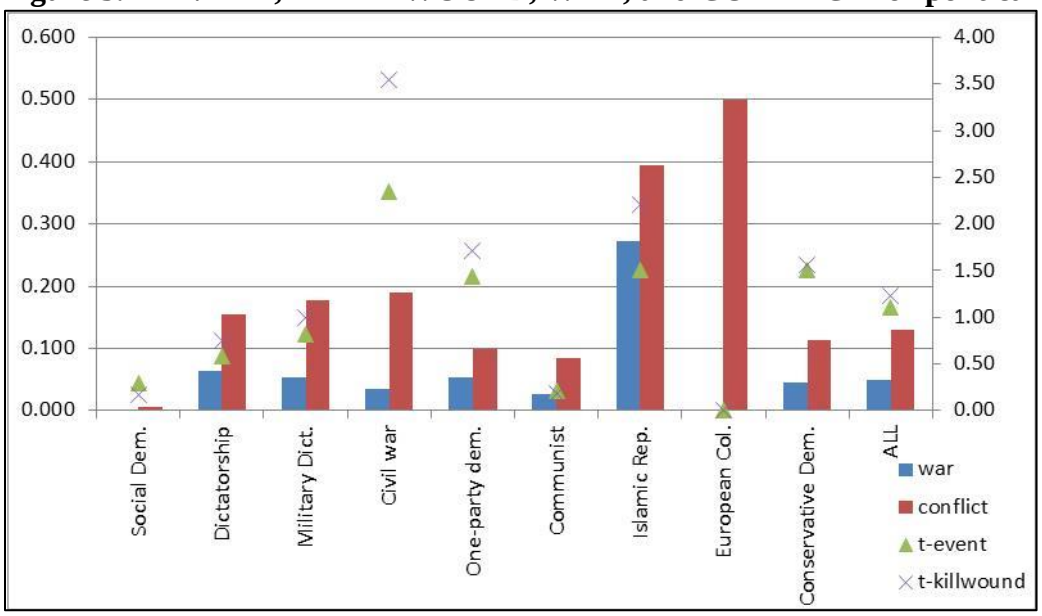
As demonstrated in Figure 1, while political regimes of one-party democracies, social democracies and conservative democracies have the smallest shares of military expenditures, Communist regimes, Islamic Republics and dictatorships have the highest shares. Also, considering the fact that social democracies (with Communist regimes) have the lowest income inequality (as shown in Figure 2), and experience the lowest conflict and war, we do not hesitate to take social democracy as a base regime category to compare and contrast with other regimes, to better capture the role of democracy, inequality, and threat.

Figure 2. THEIL, EHII, and GROWTH according to political regimes



Note: Left-hand side axis shows THEIL and GROWTH; right-hand side axis shows EHII.

Figure 3. T-EVENT, T-KILLWOUND, WAR, and CONFLICT for political regimes



Note: Left-hand side axis shows WAR and CONFLICT; right-hand side axis shows T-EVENT and T-KILLWOUND.

3.2 Methodology and Model Specification

We use a dynamic panel method in order to analyze the relationship between share of military expenditures in GDP and some covariates including political regimes.

Our empirical approach employs a dynamic specification in order to account for the occurrence of significant lagged effects of the dependent variable which determine serial correlation in the dependent variable. Regression specification for dynamic panel structure is as follows:

$$MILGDP_{it} = \alpha + \beta_1 MILGDP_{it-1} + \gamma X_{it} + \varepsilon_i + \eta_t + u_{it} \quad (1)$$

where the subscripts i and t denote countries and years, respectively.

The dependent variable is the share of military expenditures as a percentage of GDP ($MILGDP_{it}$). The right hand side also includes first lagged value of $MILGDP_{it}$. X_{it} is the set of explanatory variables including the spending by states with different security environments (FOES), the total military spending of allies and other friendly states (FRIENDS), armed forces per 1000 people (AF), real GDP growth (GROWTH), estimated household income inequality index (EHII), UTIP-UNIDO industrial pay inequality index (THEIL), number of terrorist incidents (T-EVENT), and number of people wounded or killed (T-KILLWOUND). X_{it} also includes several dummies the indicate whether it is a year in which war occur (WAR), whether it is a year in which war or use of force occurs (CONFLICT), and what type of political regime exists (social democracy, dictatorship, military dictatorship, civil war, one-party democracy, communist, Islamic republic, European colony, conservative democracy). ε_i are the unobserved country specific fixed-effects, η_t are year dummies, and finally u_{it} are the identically and independently distributed error terms. The model specification is constructed for two alternative inequality indices EHII and THEIL, separately. Also, there are some alternatives for internal threat (T-EVENT or T-KILLWOUND) and external threat (WAR or CONFLICT).

Estimating equation (1) with ordinary least square (OLS) method in a lack of a panel setting can be problematic. First of all, OLS ignores the individual fixed effects for countries; and then, the presence of individual fixed effects creates a correlation between the lagged dependent variable and the country-specific effect ε_i. Therefore, the dynamic specification implies a violation of the assumption of strict exogeneity of the estimators. Then, the use of OLS will lead to inconsistent and

upwardly biased estimates for the coefficient of the lagged dependent variable (Baltagi, 1995; Hsiao, 1986).

In order to control for individual fixed effects (ε_i), we can write equation (1) in differences. The first differencing specification is thus as follows:

$$\Delta MILGDP_{it} = \alpha + \beta_1 \Delta MILGDP_{it-1} + \gamma \Delta X_{it} + \eta_t + \Delta u_{it} \quad (2)$$

where Δ is the first difference operator.

First differencing removes any potential bias that could be sourced from fixed country-specific effects (unobserved heterogeneity). However, this leads to a downward bias of the estimated parameter of the lagged dependent variable (Nickell 1981). To control the endogeneity problem, Arellano and Bond (1991) proposed using a Generalized Method of Moment (GMM) estimation, in which they use lagged levels of the regressors as instruments for the first-differenced regressors (difference GMM). That is, the difference GMM uses historical (lagged) values of regressors for current changes in these variables.

However, the difference GMM estimator is weak or the regressors may be poor instruments if cross-section variability dominates time variability and if there is a strong persistence in the examined time series (Bond, Hoeffler & Temple 2001). On the other hand, some regressors may be endogeneous and may be affected by the dependent variable also. To solve those problems, Arellano & Bover (1995), and Blundell & Bond (1998) recommend an augmented version of difference GMM. The system GMM estimator takes into account both equations; a set of first-differenced

equations with equations in levels as a system. System GMM employs different instruments for each estimated equation simultaneously. Particularly, this method comprises the use of lagged levels of the regressors as instruments for the difference equation and the use of lagged first-differences of the regressors as instruments for the levels equation. Moreover, the system GMM method allows controlling for the dynamics of adjustment by including a lagged endogenous variable among the exogenous variables. Therefore, the system GMM method implies an efficiency gain by using additional instruments.

The system GMM method is widely used for the empirical models in the literature, which allows for few time periods and many individuals, i.e. small T, large N; some endogenous variables; and fixed effects. Also GMM considers heteroskedasticity and autocorrelation (Roodman, 2009).

4. Results and Discussion

We conduct System GMM analysis based on an unbalanced data set, in order to investigate the relationship between share of military expenditures in GDP and some covariates including political regimes.

Our dynamic panel approach uses the System-GMM approach based on Roodman[7] (2006) and Roodman (2009). We used an AR(1) model to capture the persistence in our data. In addition, the AR(1) model is desirable based on the Arellano-Bond tests for AR(1) and AR(2). Since there may be an endogeneity problem for most of our explanatory variables, we set country-specific variables as potentially endogenous (i.e. AF, GROWTH, EHII, THEIL, T-EVENT, T-

[7] Roodman (2006) develops 'the xtabond2' command for use with STATA.

KILLWOUND, WAR, and CONFLICT). In order to avoid an over-identification problem we used the collapse option, hence the GMM instrument is constructed by creating one instrument for each variable and lag distance (rather than one for each time period, variable, and lag distance). The other independent variables are instrumented as suggested by Roodman (2009). External environment variables for the country are FOES and FRIENDS. These variables are treated as typical instrumental variables instead of GMM because they are assumed to be exogenous. Political regimes are also set to be exogenous and treated as typical instrumental variables. To consider any cross sectional dependence we included time dummies as instruments in all regressions. All estimations were conducted with a two-step efficient GMM technique to fix any non-spherical errors, and finite sample corrections (Windmeijer-corrected standard errors) to the covariance matrix estimate (Windmeijer 2005).

Before looking into the estimation results, we check diagnostic tests for the regressions. All estimated models pass the specification tests. According to Arellano-Bond test statistics for AR(1) and AR(2), the consistency of the GMM estimators is verified, as there is no evidence of a second order serial correlation in the differenced residuals of the models. The Hansen test statistics approve the validity of the GMM instruments.

Table 2. System GMM Estimation Results

Variables	***1***	***2***	***3***	***4***	***5***	***6***
lag (MILGDP)	0.496***	0.493***	0.479***	0.488***	0.485***	0.480***
	[0.004]	[0.004]	[0.004]	[0.005]	[0.005]	[0.005]
FOES	0.005***	0.006***	0.004***	0.005***	0.005***	0.004***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
FRIENDS	-0.002***	-0.002***	-0.002***	-0.003***	-0.003***	-0.002***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
AF	0.009***	0.009***	0.006***	0.011***	0.012***	0.008***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
GROWTH	-0.088***	-0.089***	-0.089***	-0.123***	-0.125***	-0.122***
	[0.005]	[0.005]	[0.005]	[0.007]	[0.007]	[0.007]
EHII	-0.085***	-0.092***	-0.042***			
	[0.010]	[0.010]	[0.008]			
THEIL				-0.049***	-0.051***	-0.031***
				[0.010]	[0.010]	[0.008]
T-EVENT	0.000	0.000	0.001***	0.000	0.000	0.001***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
WAR	0.028***	0.028***	0.030***	0.032***	0.031***	0.032***
	[0.002]	[0.002]	[0.002]	[0.003]	[0.003]	[0.002]
Political Regimes						
Social Dem.		-0.017***			-0.011***	
		[0.002]			[0.002]	
Dictatorship			0.017***			0.013***
			[0.002]			[0.002]
Military Dict.			0.011***			0.008***
			[0.003]			[0.002]
Civil war			0.008***			0.006**
			[0.002]			[0.002]
One-party dem.			0.007**			0.006**
			[0.003]			[0.003]
Communist			0.016***			0.018***
			[0.003]			[0.003]
Islamic Rep.			0.014***			0.011***
			[0.004]			[0.004]
European Col.			0.018***			0.015***
			[0.002]			[0.002]

Conservative Dem.				0.003			0.002
				[0.002]			[0.002]
Constant		0.001	0.000	-0.006	-0.031***	-0.035***	-0.017
		[0.011]	[0.012]	[0.012]	[0.011]	[0.011]	[0.012]
Countries		131	131	131	134	134	134
Observations		2983	2983	2983	3023	3023	3023
F statistic		3109	2878	2194	2694	2544	1681
	p-value	0.000	0.000	0.000	0.000	0.000	0.000
m1		-1.319	-1.321	-1.31	-1.378	-1.384	-1.373
	p-value	0.187	0.187	0.19	0.168	0.166	0.17
m2		1.318	1.32	1.297	1.252	1.253	1.247
	p-value	0.188	0.187	0.195	0.211	0.21	0.212
Hansen Test		91.57	91.53	86.27	92.58	92.56	83.05
	p-value	0.14	0.14	0.244	0.124	0.124	0.327

Note: All models include year dummies as instruments. All estimations were conducted with two-step efficient GMM and finite-sample corrections to the covariance matrix estimate. m1 and m2 denotes Arellano-Bond tests for AR(1) and AR(2). Hansen Test is for over-identification. Standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.10.

We analyze the determinants of military burden with six different model specifications. While the first three models involve the EHII variable, the robustness check has been done according to the Theil variable in the last three models. As a matter of fact, all models have been also estimated with the alternative internal threat variable (T-KILLWOUND) and external threat variable (CONFLICT), which are defined as the data section. However, since the results do not change remarkably, both in terms of sign and magnitude, we do not report them in order to save space[8].

[8] All these regression results can be provided upon request from the authors.

One straightforward finding, as expected by the incrementalist argument, is that the lagged value of MILGDP is positive for each model, indicating that military expenditures in previous years leads to higher military expenditures in the current year.

Regarding FOES and FRIENDS, the arms race has been modeled as a type of action-reaction game in game theory, and results in a type of informal coordination of military spending. Allies are assumed to be countries with similar or complementary foreign policies and security interests, while foes have different policies and interests. These variables capture transmission of military conflict. Nordhaus, Oneal & Russett (2012) state that military expenditures of potential enemies can be used as evidence of a greater threat that requires an increased amount of resources for the military, resulting in an arms race. Our finding, a positive sign, is consistent with this argument. Regarding the effect of military expenditures of allies on home country's military expenditures, while an increased military spending by allies may result in increased military spending in the home nation because allies require support from the home nation, it may reduce the home country's spending since higher military power of its allies may cause the home country to act as a free-rider. In this sense, our findings show that an increase in military spending of allies leads to decline in the home country's spending. Our results are highly significant and consistent for each model.

However, the key determinant of military spending has changed from the arms race explanation to the internal threat explanation over the last two decades (Harbom & Wallensteen 2007; Albalate, Bel & Elias 2012). Most studies showed a significant and positive effect of external and civil war variables on military spending (inter alia Dunne & Perlo-Freeman 2003a,b,2008;

Collier & Hoeffler 2007). Considering this fact, we also controlled for internal and external threats. For each case we took two alternative measures into account (number of terrorist events vs. number of people killed and wounded; and war vs conflict) for sensitivity checks. Regarding internal threats, the sensitivity tests yield an expected sign but are only significant for the cases in which we use social democracy as a base category. On the other hand, as expected from the literature the results show that for each model external threat has a positive effect on military spending, supporting the previous findings in the literature.

Turning back to the size of military, AF, we found positive and statistically significant results for each model. This is an expected result and consistent with the previous findings of Ali (2007) and Tongur & Elveren (forthcoming).

The relationship between GDP and military expenditures is one of the hottest topics in the defence literature. Although there is an immense literature on the impact of GDP on military expenditures (see inter alia Dunne & Uye 2010 and Dunne & Tian 2013) we limit our discussion with the converse relationship. However, it is of importance to note that this endogeneity problem has been taken into account in the regressions. The absolute level of military spending increases as GDP rises, since the state has more wealth to protect, and better means which to protect it (Sandler & Hartley 1995); however, because military spending is a public good, this tends to create a negative relationship between GDP and share of resources allocated for defense spending (Fordham & Walker 2005). Economic expansion does not require an increase in military expenditure per se, since the benefits of national defense are non-rivalrous. What is more, larger states do not need to allocate a larger share of resources to compete with smaller states (Fordham & Walker 2005). Another

linkage is that decline in economic growth induces Keynesian spending by the government to jump-start consumption, leading to higher military spending (Russett 1990 cited in Goldsmith 2003). While some studies found that national income (i.e. GNP) has no significant impact of military expenditures (such as Dunne & Perlo-Freeman 2003a,b), Dunne, Perlo-Freeman & Smith (2008) found a significant and negative effect. Our results supports the findings of Dunne, Perlo-Freeman & Smith (2008), indicating that higher growth comes with a decline in the military burden of the country. Also, when one considers the fact that economic growth leads to higher democracy, which in turn includes less military expenditures, our results become more consistent with and supportive to the early literature.

Our results on income inequality deserve a little bit more discussion. We found that regardless of model specification and variables used, higher inequality is associated with less military expenditures as a share of GDP. At first sight, this finding might seem conflicting when one recalls the early finding of Tongur & Elveren (forthcoming) indicating that higher income inequality is associated with higher military expenditures. Beside the fact that the time period and set of countries that we cover in this study is substantially different than one of Tongur & Elveren (forthcoming), there is a basic factor that might lead to this outcome. Our dependent variable is the military expenditure-to-GDP ratio while Tongur & Elveren (forthcoming) considered the military expenditure-to-central government budget ratio. In fact, the results of these two studies are not necessarily inconsistent with one other[9]. It is plausible to argue that higher income inequality might

[9] It is important to recall the fundamental differences between Tongur & Elveren (forthcoming) and the present study. First, the former is primarily interested in welfare regimes; second, it covers only 37 countries for a shorter time period (1988-2003).

be a result of a trade off in the budget, indicating higher military expenditures at the cost of lower social expenditures on as health, education etc., all of which have some income improving effect as discussed in Tongur & Elveren (forthcoming). However, here in this paper, we argue that even though the same trade off effect is valid, higher inequality may not lead to a higher military burden (as a share of GDP, rather than central government budget). This is because higher income inequality might be associated with higher military expenditures, but this increases GDP more than an increase in military expenditure via the multiplier effect. Therefore, since income inequality increases GDP more than it increases military expenditures, the military expenditures-to-GDP ratio may fall. The possible positive impact of inequality on growth does strengthen the mechanism that we raised here. On the other hand, if one considers the possible negative impact of inequality on growth, then our results imply that the positive impact of military expenditures on economic growth is larger than the negative impact of income inequality on economic growth. This might be an indirect support for those early findings of the positive impact of military expenditures on economic growth.

One of the key issues in this analysis was incorporating inequality into the military expenditures-political regimes nexus. Considering the critical role of inequality in the growth-military expenditures context we emphasize that a more robust examination which should include a measure for inequality as well. This makes our analyses sensitive to the used inequality measure. There is no such comprehensive income inequality data set on the economy as a whole. That is why we prefer to use UTIP data sets, which makes use of manufacturing wage data. Reexamining the same issue with different inequality measures (such as Deininger & Squire, but of course for fewer

countries and shorter time period), would be a topic for further studies, but it is out of the scope of this study. Rather, we check the robustness of our results by utilizing the Theil inequality data set. The results of models 4, 5 and 6 are highly consistent, not just in terms of signs but also in terms of magnitudes of coefficients.

Now, we can turn our attention to the relationship between different political regimes and military burden (i.e. military expenditure-to-GDP ratio). We investigate this relationship within four different model specifications (i.e. 2, 3, 5, and 6). While 2 and 5 present the cases where we analyze the impact of being social democracy or not on the military burden, the rest of the models (i.e. 3 and 6) are dedicated to the cases where we compare the political regimes with our base political regimes, namely 'social democracy'.

First of all, comparing the results of these models with base cases (i.e. 1 and 4) one observes that the results are highly consistent, not just in terms of the signs of the variables but also in terms of their coefficients, showing very slight changes between models. Models 2 and 5 are to examine the effect of being in a social democracy political regime, our base regime type. Our findings of these models show that being in a social democracy political regime decreases the share of the military expenditures. That is, countries that have social democracy have a tendency to spend less on armaments as a share of their national income.

Models 3 and 6 are attempts to compare other political regime types with the social democracy one. These exercises suggest that compared to the social democracy political regime, all other types have a tendency to spend more on armaments. Except for conservative democracy regime types, these models present statistically significant results for other political regimes,

confirming a general remark of higher democracy is associated with lower military expenditures in the literature.

Acknowledging the fact that determining the base regime type is a key issue in such estimations, we extended the analysis for each political regime. That is, we reiterate Models 2 and 3 for each political regime. Table 3 summarizes of the results of these sets of estimations. In an extension of Model 2, in which the status of being a social democratic political regime is compared to being a non-social democratic regime type, the estimation results (as presented in Table A2 in the Appendix) show that only being Civil War or Islamic Republic are not statistically significant from being a Social Democratic regime in their impact on military spending. Similarly, while being social democracy or conservative democracy has negative sign (that is having less military burden), other regimes have positive signs. In an extension of Model 3, where all regime types are compared to a base regime type, the estimation results are presented in Table A3 in the Appendix. Below, Table 3 provides the summary of these results. Each column shows the signs of regime dummies in the same regression with respect to the base regime. For example, when Dictatorship (DI) is taken as a base category, except for European Colony all other regimes have lower military expenditures. Or, looking at Conservative Democracies, with the exception of Social Democracy, all other political regimes have the tendency to spend more on the military. An important result from Table 3 is that one can compare and contrast regimes with each other directly and easily, rather than only according to a base category. For example, according to the first row, social democratic regimes have lower military expenditures according to the all other regimes, and according to the last row conservative democratic regimes have lower military expenditures according to all other regimes except for social

democratic ones (i.e. a positive sign). Taking all of this information into account allows one to rank regime types, from European colonies with the highest military burden to social democracies with the lowest one.

Table 3. Summary of the results of estimations for each base category

	B A S E C A T E G O R Y								
Signs of dummies	SD	DI	MD	W	OD	C	IR	EC	CO
Social Dem. (SD)	base	- (***)	- (***)	- (***)	- (**)	- (***)	- (***)	- (***)	-
Dictatorship (DI)	+ (***)	base	+ (***)	+ (***)	+ (***)	+	+	-	+ (***)
Military Dict. (MD)	+ (***)	- (***)	base	+ (***)	+ (**)	-	-	- (***)	+ (***)
Civil war (W)	+ (***)	- (***)	- (***)	base	+	- (**)	- (*)	- (***)	+ (***)
One-party dem. (OD)	+ (**)	- (***)	- (**)	-	base	- (***)	- (**)	- (***)	+ (**)
Communist (C)	+ (***)	-	+	+ (**)	+ (***)	base	+	-	+ (***)
Islamic Rep. (IR)	+ (***)	-	+	+ (*)	+ (**)	-	base	-	+ (***)
European Col. (EC)	+ (***)	+	+ (***)	+ (***)	+ (***)	+	+	base	+ (***)
Conservative Dem. (CO)	+	- (***)	- (***)	- (***)	- (**)	- (***)	- (***)	- (***)	base

*** p<0.01, ** p<0.05, * p<0.10.

These results, at first hand, support our initial expectation that social democratic regimes have the least military burden (followed by conservative democracy regimes). They also show that regimes that result in statistically significant, higher military expenditures include European colonies, dictatorships, Communist regimes, military dictatorships, Islamic Republics, and one party democracies. This reflects the more general theorized relationship between authoritarianism and military spending as we laid out above but clearly distinguishes among types of regimes. What could not have been gleaned from the existing literature is that even one party democracies clearly invest in the military as do full fledged authoritarian regimes, albeit less than the latter. The order of magnitude of the coefficient for all positive and significant regimes is as follows for the first run

with these variables (second run is similar): one party democracies, followed by civil war, military dictatorship, Islamic Republic, Communist regimes, full fledged dictatorships, and finally, European colonies.[10] All in all, the relationship between political regime and military expenditures is quite what we expected.

Conclusion

We examined the military expenditures as a share of GDP with respect to political regimes. There is an immense empirical literature that supports the theoretical view that "reduced military spending would promote peace and prosperity as countries avoid conflict spirals and devote resources to social spending." While the most of this literature focuses on the relationship between military expenditures and the level of democracy -rather than different type of political regimes-, this study provides further evidence on the military expenditures-political regime nexus by considering a recent political regimes data set, Hsu (2010), and income inequality indices provided by University of Texas Inequality Project. This is a follow up study to Tongur & Elveren (forthcoming), in the which authors analyze the relationship between welfare regimes and military expenditures for 37 countries during the 1988-2003 period. In this study, we focus on political regimes for over 130 countries for a longer time period (1963-2001). Employing a system-GMM method, our analysis confirms and strengthens the previous results, and provides further evidence on the military expenditures characteristics of the political regimes.

[10] The fact that European colonies spend (or spent) the most on their militaries may come as a surprise, but we must bear in mind that colonies were often of strategic economic or political importance, and therefore important to defend, and also often had to be militarily occupied to remain in full control of the imperial power. However, we note that only one country is classified as a European colony, while two countries are classified as Islamic Republics. Therefore, readers should be cautious when interpreting results or these two types of political regimes. Results for all other regimes can be interpreted more broadly.

Our data set suggests that while there is a positive relationship between military expenditures as a share of GDP and arm size, military expenditures of foes, and internal and external threats, there is negative relationship between military expenditures of allies and growth. Further, the analysis provides some more evidence on the relationship between income inequality and military burden. The results show that higher income inequality is associated with a smaller military expenditure share in GDP. This might be possible with different linkages between inequality and military expenditure and economic growth and does not state a direct relationship between income inequality and military expenditure (as a share). For instance, if one considers a budgetary trade-off between social spending and military spending --and therefore a positive relationship between income inequality and military expenditures--, our results suggest that an increase in income inequality increases GDP more than it increases military expenditures, leading to lower military expenditure to GDP ratios.

Our results also show that a country that has a social democratic political regime is likely to spend less on the military, followed by conservative democractic political regimes; and all other political regimes, namely European colonies, dictatorships, military dictatorships, civil war regimes, one-party democracies, Communist regimes, and Islamic Republic have higher military burdens compared to social democratic political regimes. This strongly supports the general findings of an immense literature that higher democracy (authoritarianism) is associated with less (higher) military burden. The study clearly distinguishes this general finding among types of regimes.

This study was a modest attempt to contribute to the large literature on military expenditures and political regimes by considering a recent political regimes data set and income inequality, an important factor that has not been received much attention in this context. An examination for an extended time period might be a topic for further studies.

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Table A1. Countries included in the estimations

Afghanistan	Eritrea	Libya	Saudi Arabia
Albania	Ethiopia	Lithuania	Senegal
Algeria	Fiji	Luxembourg	Sierra Leone
Argentina	Finland	Macedonia	Singapore
Armenia	France	Madagascar	Slovakia
Australia	Gabon	Malawi	Slovenia
Austria	Gambia	Malaysia	Somalia
Azerbaijan	German Democratic Republic (*)	Mauritania	South Africa
Bahrain	West Germany/Germany	Mauritius	Spain
Bangladesh	Ghana	Mexico	Sri Lanka
Belgium	Greece	Moldova	Sudan
Benin	Guatemala	Mongolia	Swaziland
Bolivia	Guinea (*)	Morocco	Sweden
Botswana	Haiti	Mozambique	Syria
Brazil	Honduras	Myanmar	Taiwan
Bulgaria	Hungary	Namibia	Tanzania
Burkina Faso	India	Nepal	Thailand
Burundi	Indonesia	Netherlands	Togo
Cameroon	Iran	New Zealand	Trinidad and Tobago
Canada	Iraq	Nicaragua	Tunisia
Central African Republic	Ireland	Nigeria	Turkey
Chile	Israel	Norway	Uganda
China	Italy	Oman	Ukraine
Colombia	Jamaica	Pakistan	United Arab Emirates
Costa Rica	Japan	Panama	United Kingdom
Cote d'Ivoire	Jordan	Papua New Guinea	United States
Croatia	Kazakhstan (*)	Paraguay	Uruguay
Cuba	Kenya	Peru	USSR/Russian Federation
Cyprus	Korea	Philippines	Venezuela
Denmark	Kuwait	Poland	Yugoslavia
Dominican Republic	Kyrgyzstan	Portugal	Zambia
Ecuador	Latvia	Qatar	Zimbabwe
Egypt	Lesotho	Romania	
El Salvador	Liberia	Rwanda	

All countries (134) in the table are included for the regressions which involve Theil index. 131 countries in the table are included for the regressions which involve EHII index (except three countries (*)).

Table A2. Political Regime Dummy Variable Specification-1

	A1	A2	A3	A4	A5	A6	A7	A8	A9
lag (MILGDP)	0.493***	0.481***	0.496***	0.497***	0.496***	0.496***	0.497***	0.495***	0.487***
	[0.004]	[0.005]	[0.005]	[0.005]	[0.005]	[0.004]	[0.004]	[0.004]	[0.004]
FOES	0.006***	0.004***	0.004***	0.005***	0.005***	0.006***	0.005***	0.005***	0.003***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
FRIENDS	-0.002***	-0.002***	-0.002***	-0.002***	-0.003***	-0.002***	-0.002***	-0.003***	-0.002***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
AF	0.009***	0.009***	0.009***	0.009***	0.009***	0.006***	0.008***	0.009***	0.008***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
GROWTH	-0.089***	-0.089***	-0.091***	-0.088***	-0.089***	-0.082***	-0.087***	-0.087***	-0.089***
	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]	[0.004]	[0.005]	[0.005]	[0.005]
EHII	-0.092***	-0.076***	-0.081***	-0.084***	-0.088***	-0.056***	-0.085***	-0.086***	-0.057***
	[0.010]	[0.011]	[0.009]	[0.010]	[0.011]	[0.009]	[0.010]	[0.010]	[0.009]
T-EVENT	0.000	0.001***	0.000**	0.000*	0.000*	0.000*	0.000	0.000*	0.001***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
WAR	0.028***	0.027***	0.030***	0.028***	0.028***	0.030***	0.028***	0.028***	0.030***
	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]
SD	-0.017***								
	[0.002]								
DI		0.013***							
		[0.001]							
MD			0.006***						
			[0.001]						
W				0.000					
				[0.001]					
OD					0.003**				
					[0.001]				
C						0.007**			
						[0.003]			
IR							0.003		
							[0.003]		
EC								0.011***	
								[0.001]	

CO									-0.009***
									[0.001]
Constant	0.000	0.001	0.006	0.001	0.004	-0.015	0.002	0.003	0.018
	[0.012]	[0.014]	[0.012]	[0.011]	[0.012]	[0.011]	[0.011]	[0.012]	[0.012]
Countries	131	131	131	131	131	131	131	131	131
Observations	2983	2983	2983	2983	2983	2983	2983	2983	2983
F statistic	2878	2875	2867	2826	2811	2649	3034	2831	3086
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
m1	-1.321	-1.312	-1.322	-1.319	-1.32	-1.309	-1.319	-1.319	-1.316
p-value	0.187	0.19	0.186	0.187	0.187	0.19	0.187	0.187	0.188
m2	1.32	1.32	1.312	1.317	1.318	1.307	1.319	1.318	1.307
p-value	0.187	0.187	0.189	0.188	0.188	0.191	0.187	0.188	0.191
Hansen Test	91.53	87.5	87.63	91.93	91.7	91.78	91.49	91.48	86.77
p-value	0.14	0.216	0.213	0.134	0.138	0.136	0.141	0.141	0.233

Note: All models include year dummies as instruments. All estimations were conducted with two-step efficient GMM and finite-sample corrections to the covariance matrix estimate. m1 and m2 denotes Arellano-Bond tests for AR(1) and AR(2). Hansen Test is for over-identification. Standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.10.

Table A3. Political Regime Dummy Variable Specification-2

	A10	A11	A12	A13	A14	A15	A16	A17	A18
lag (MILGDP)	0.479***	0.479***	0.479***	0.479***	0.479***	0.479***	0.479***	0.479***	0.479***
	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]
FOES	0.004***	0.004***	0.004***	0.004***	0.004***	0.004***	0.004***	0.004***	0.004***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
FRIENDS	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
AF	0.006***	0.006***	0.006***	0.006***	0.006***	0.006***	0.006***	0.006***	0.006***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
GROWTH	-0.089***	-0.089***	-0.089***	-0.089***	-0.089***	-0.089***	-0.089***	-0.089***	-0.089***
	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]
EHII	-0.042***	-0.042***	-0.042***	-0.042***	-0.042***	-0.042***	-0.042***	-0.042***	-0.042***
	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]
T-EVENT	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
WAR	0.030***	0.030***	0.030***	0.030***	0.030***	0.030***	0.030***	0.030***	0.030***
	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]

SD		-0.017***	-0.011***	-0.008***	-0.007**	-0.016***	-0.014***	-0.018***	-0.003
		[0.002]	[0.003]	[0.002]	[0.003]	[0.003]	[0.004]	[0.002]	[0.002]
DI	0.017***		0.006***	0.009***	0.010***	0.001	0.003	-0.001	0.014***
	[0.002]		[0.001]	[0.001]	[0.002]	[0.003]	[0.003]	[0.001]	[0.001]
MD	0.011***	-0.006***		0.003***	0.004**	-0.005	-0.003	-0.007***	0.008***
	[0.003]	[0.001]		[0.001]	[0.002]	[0.003]	[0.003]	[0.001]	[0.001]
W	0.008***	-0.009***	-0.003***		0.001	-0.009**	-0.006*	-0.010***	0.005***
	[0.002]	[0.001]	[0.001]		[0.002]	[0.003]	[0.003]	[0.001]	[0.001]
OD	0.007**	-0.010***	-0.004**	-0.001		-0.010***	-0.007**	-0.011***	0.004**
	[0.003]	[0.002]	[0.002]	[0.002]		[0.004]	[0.003]	[0.002]	[0.002]
C	0.016***	-0.001	0.005	0.009**	0.010***		0.003	-0.002	0.013***
	[0.003]	[0.003]	[0.003]	[0.003]	[0.004]		[0.005]	[0.003]	[0.003]
IR	0.014***	-0.003	0.003	0.006*	0.007**	-0.003		-0.004	0.011***
	[0.004]	[0.003]	[0.003]	[0.003]	[0.003]	[0.005]		[0.003]	[0.003]
EC	0.018***	0.001	0.007***	0.010***	0.011***	0.002	0.004		0.015***
	[0.002]	[0.001]	[0.001]	[0.001]	[0.002]	[0.003]	[0.003]		[0.001]
CO	0.003	-0.014***	-0.008***	-0.005***	-0.004**	-0.013***	-0.011***	-0.015***	
	[0.002]	[0.001]	[0.001]	[0.001]	[0.002]	[0.003]	[0.003]	[0.001]	
Constant	-0.006	0.011	0.005	0.001	0.000	0.01	0.007	0.012	-0.003
	[0.012]	[0.012]	[0.012]	[0.012]	[0.012]	[0.012]	[0.012]	[0.012]	[0.012]
Countries	131	131	131	131	131	131	131	131	131
Observations	2983	2983	2983	2983	2983	2983	2983	2983	2983
F statistic	2194	2194	2194	2194	2194	2194	2194	2194	2194
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
m1	-1.31	-1.31	-1.31	-1.31	-1.31	-1.31	-1.31	-1.31	-1.31
p-value	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
m2	1.297	1.297	1.297	1.297	1.297	1.297	1.297	1.297	1.297
p-value	0.195	0.195	0.195	0.195	0.195	0.195	0.195	0.195	0.195
Hansen Test	86.27	86.27	86.27	86.27	86.27	86.27	86.27	86.27	86.27
p-value	0.244	0.244	0.244	0.244	0.244	0.244	0.244	0.244	0.244

Note: All models include year dummies as instruments. All estimations were conducted with two-step efficient GMM and finite-sample corrections to the covariance matrix estimate. m1 and m2 denotes Arellano-Bond tests for AR(1) and AR(2). Hansen Test is for over-identification. Standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.10.