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Military expenditures and political regimes: Evidence from global data, 1963–2000☆

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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 1963–2000 by employing a dynamic panel data analysis. The paper aims at contributing to the literature by utilizing a recently constructed political regime data set and controlling for income inequality, a key variable that has not received substantial attention in the context of political regimes, economic 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 a higher income inequality is associated with a higher military burden.

1. 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 1963–2000 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; representative governments would perpetuate peace. 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, conservative democracy, one-party democracy, dictatorship, military dictatorship, civil war, and communist. These are qualitatively different regimes, and 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 external threats, and income inequality), our findings show the negative relationship between military burden and the military expenditures of allies, and economic growth. Also, regardless of the model specifications, we find 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.

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2. Military expenditures and political regimes

There are several ways in which scholars have theorized a relationship between military expenditures and political regime. Fordham and 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. Kant's idea was that representative ("republican") governments were a crucial prerequisite to creating peace, since these, he stated, tend to be more peaceful in general.[3] Kant's idea was that well-functioning, representative governments emphasize the freedom and rights of individuals who will not be eager to sacrifice their own well-being for war.

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) states that the relationship between democracy and military spending, with regard to the "peace dividend," is complex, and references Alesina and 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 and 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 and Wolf (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 the state's ability to raise public finance in the case of war. Bove and Brauner (2011) reference Nordlinger (1977) and other political scientists (such as Sprout and 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.

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 (see Yildirim and Sezgin, 2005). Mulligan, Gil and 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 and Andreev (2006) find a moderately negative relationship between democracy and military expenditures looking at the period between 1870 and 1938. Fordham and 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 the 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 and Smith (2009), Collier and Hoffler (2004, 2007a,b), Nordhaus, Oneal and Russett (2012), and Garfinkel (1994). In studies analyzing mainly developing nations, several scholars, including Nordlinger (1977), Schmitter (1971) and O'Leary and 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 were positively correlated before World War I and negatively correlated after World War I. Baliga, Lucca and Sjöström (2011) find that limited democracies are more war-oriented than autocracies. Dudley and 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.

A part of literature has extended the research by incorporating other measures of regime type in the analysis of military spending. McKinlay and 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. Russett and Oneal (2001) find that the transition from authoritarian to democratic regimes in Latin America results in reduced military spending. Bove and 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. Albalate, Bel and Elias (2012) separate democracies themselves into two types, presidential and parliamentary democracies, and find that military spending in the former is higher than in the latter. And most recently, a study on welfare regimes, Tongur and Elveren (2013) 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.

We augment the above literature on political regimes and military expenditures with a consideration of the effect of inequality on military expenditures as well. In this context, the contribution of the paper is twofold. First, we consider the criticism of the studies on political regime and military spending where political regime uses only one classification, including either a binomial or a 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. Considering this issue, we adopt a recent and detailed political regime data set to clarify the impact of political regimes on military expenditures. The data set distinguishes between a wider range of qualitatively different political regimes rather than categorizing regimes as "democratic" or "autocratic." Further, we argue that social democracies, as being more inclusive systems than conservative democracies, are more likely to have generous welfare systems, which means less of a military burden due to an implicit budgetary trade off. In addition, social democracies specifically incorporate the goal of maintaining peace, which reinforces the result of fewer military expenditures.

Second, we consider income inequality in order to better understand the determinants of military expenditures. Separate from the impact of political regime/ideology on military spending, the status of income inequality within the state also impacts military regime. Like political inequality arising from a particular type of political regime, economic income inequality can in theory destabilize society, leading to social unrest and potentially to war. These two factors—political regime and economic inequality—then influence military expenditure[4].

There is a dearth of literature on the military impact of these two factors together, however. Although there is a bidirectional linkage between military spending and income inequality, the literature[5] has mostly investigated the impact of military expenditures on income inequality since the seminal work of Abell (1994). There are four distinct approaches that account for the effect of military spending on income

[3] Kant set forth Three Definitive Articles that would build peace: representative government, freedom of emigration, and a league of nations.

[4] We acknowledge that there might be some relationship between income inequality and political regimes. However, our political regime data set, Hsu (2010), is constructed in a way that it does not characterize political regimes based on inequality.

[5] Several studies found that higher military expenditures exacerbate income inequality (Abell, 1994; Ali, 2007; Kentor, Jorgenson and Kick, 2012; Seiglie, 1997; Vadlamannati, 2008).

inequality (Lin and Ali, 2009). First, the Keynesian view finds that military expenditures expand 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 and Ali, 2009). Finally, for governments, higher military spending results in lower levels of funds for education, health, and social transfers, which would otherwise improve income distribution.

By contrast, in this study, we consider the effect of income inequality on military expenditures, a rarely investigated relationship. There is no specified model to examine the effect of income inequality on military expenditures. Therefore, it is fair enough to investigate this possible relationship in our extended model, since the literature suggests that it is not only military expenditures that affect income inequality but also vice versa, in line with Ali (2007, 2012), Lin and Ali (2009) and Tongur and Elveren (2013). For example, from a viewpoint of political economy, an increased economic inequality creates social instability and social tension, generating demands for social and political change (Ali, 2004). Those in power seek to preserve their status by increasing military expenditures and continuing to suppress forces for equality, reinforcing inequality. Caverley (2007) also relates economic inequality to military spending using a median voter argument; the median voter may choose to reduce costs of war. Caverly's results suggest that military spending increases as economic inequality rises.

In this context, while Lin and Ali (2009), in a panel Granger analysis, find no causality between military expenditures and income inequality, Ali (2007), treating both military spending and income inequality as endogenous variables, finds that there is a positive effect of military expenditure on pay inequality, and vice versa. Tongur and Elveren (2013), in a GMM structure, also find a positive relationship.

There are three fundamental differences between Tongur and Elveren (2013) and this current study. First of all, the former is primarily interested in welfare regimes rather than political regimes per se. The authors analyze the relationship between welfare regimes and military expenditures for 37 countries during the 1988–2003 period. Political regimes are included just to test the validity of the results. Second, the current paper deals with the demand function for military expenditures with special attention to political regimes, by adopting a totally different model. Finally, in this study, our estimations cover more than 130 countries for a longer time period (1963–2000).

3. Data and methodology

3.1. Data

In line with the latter studies[6] that incorporate economic, political and strategic factors in order to examine the institutional determinants of military expenditures, we consider the main variables that are used and discussed in major studies like Goldsmith (2003), Ali (2007) and Dunne, Perlo-Freeman and Smith (2009).

In parallel to these major studies, we use the military expenditure-to-GDP ratio, *MILGDP*, as our dependent variable, indicating the defense burden[7]. We derive this variable based on a data set, the military spending in constant dollars measured with purchasing power parity (PPP), provided by Nordhaus, Oneal and Russett (2012), and real GDP.

Nordhaus, Oneal and Russett (2012) incorporate the commonly-used Stockholm International Peace Research Institute's (SIPRI) data from 1989 onward, and the Correlates of War (COW) database for the rest of the period. Since SIPRI has been criticized for underestimating Communist country spending, the authors use COW numbers for those countries and years; on the other hand, since COW shows a precipitous decline in China's military spending from 1985 to 1988, the authors use SIPRI's estimates for 1988.

Following Ali (2007) and Tongur and Elveren (2013), we take the size of army into account by (i.e. number of military person per 1000 people), *AF*, provided by the COW.

The arms race, a possible explanation for military expenditures, is introduced by Richardson (1960). However, empirical works have shown 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 and Perlo-Freeman, 2003a,b) and that of neighbors (Collier and Hoffler, 2004). In this context, we do not hesitate to borrow two more variables from Nordhaus, Oneal and Russett (2012), specifically, the weighted military expenditures of foes and that of friends. These are noted as military spending of potential enemies (*FOES*), and military spending of allies (*FRIENDS*), respectively. Nordhaus, Oneal and Russett (2012) rank states from high to low in terms of similarity of alliance portfolios to the country under consideration, and assumed that countries with similar allies have similar or complementary foreign policies. States above the median are classified as friends, while states below are classified as potential foes[8].

To capture the external threat, besides the 'civil war' designation within political regimes, we incorporate *WAR* and *CONFLICT* dummies based on the Militarized Interstate Dispute Data of the COW[9]. Here, while we take *WAR* as defined in the original data set, we on the other hand define *CONFLICT* as either war or the use of force in disputes[10].

Since economic growth has an effect on military spending, as discussed by a vast array of literature, and as it also may reflect some effects of economic crises on the defense burden, we use the real GDP growth rate (*GROWTH*) as a control variable[11].

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), calculated by the Theil T Statistic (Theil, 1972). The UTIP group also calculated the Estimated Household Income Inequality (*EHII*) by incorporating the UTIP-UNIDO and Deininger and Squire (1996) data sets into a Gini format[12]. We use these measures rather than Deininger and Squire's (1996) data set because of two main reasons in line with the extensive discussions in Galbraith and Conceição (2001) and Galbraith and Kum (2005). First, Deininger and Squire's data set is plagued by sparse data coverage. Second, the set is based on surveys that utilize heterogeneous methods and definitions, creating a comparability problem. *EHII* and *THEIL* on the other hand cover more than 150 countries for the 1963–2002 period based on a uniform

[6] The early studies primarily focuses on the military spending of enemies or allies, adopting the arms race model suggested by Richardson (1960).

[7] 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.

[8] We use these measures in order to control the coordinated expenditures with friends and arms races with potential foes. In this way we assess the transmission of military conflict through these channels (see Nordhaus, Oneal and Russett, 2012 for details).

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

[10] One might think of a possible relationship between war/conflict dummies and foes. However, foes by definition does not necessarily depend on war/conflict. Moreover, using war/conflict dummies can control only external threats and it may isolate the effects on the military burden resulting from war/conflict that the country participated in.

[11] We checked our models by using real GDP, real GDP per capita, and economic crisis dummies as alternative control variables.

[12] See UTIP and Galbraith and Kum (2005) for further information about calculation.

definition, providing approximately 3000 observations for our analysis[13].

We use a more recent database for political 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 and 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 and 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 and 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.[14,15]

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 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 seven regime types to categorize our data[16]: social democracies (*SD*), conservative democracies (*CD*), one-party democracies (*OD*), dictatorships (*DI*), military dictatorships (*MD*), civil war (*W*), and communist regimes (*C*). 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 to win elections. 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. Communist regimes are classified by their own governments as such, and we simply follow their classification.

The sample used in our regressions includes 4224 country-year observations. When we look at the distribution of the sample with respect to political regimes, out of all of them, 148 are social democratic, comprising 3.5% of all observations. The numbers of observations and percentages for the remaining political regimes are as follows[17]: 1765 observations comprising 41.8% for conservative democracies, 178 observations comprising 4.2% for one-party democracies, 993 observations comprising 23.5% for dictatorships, 622 observations comprising 14.7% for military dictatorships, 192 observations comprising 4.5% for civil-war, and 326 observations comprising 7.7% for communist regimes. The descriptive statistics of the raw data according to political regimes can be seen in Table A2 in Appendix A.

We take the natural logarithm of the variables to use in the regressions. A summary of the variables used in the regressions is provided in Table 1, and the dynamics of defense burden and inequality variables according to political regimes can be seen in Fig. 1.

As demonstrated in Table A2 in Appendix A, while democratic regimes (OD, CO, and SD) have the smallest shares of military expenditures, social democracies and communist regimes have the lowest income inequality in EHII. None of the social democratic countries experienced a war.

On the other hand, when we look at the dynamics of defense burden and inequality variables used in regressions according to regimes (Fig. 1), there is a sharp decrease in defense burden for social democratic regimes and communist regimes over time. Moreover, although there has been a high military burden for social democratic regimes in earlier periods with respect to other democratic regimes, all democratic regimes have similar shares of military expenditures to GDP in recent years.

3.2. Methodology and model specification

We use a dynamic panel method in order to analyze the relationship between share of military expenditures to 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:

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

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 ($lnMILGDP_{it}$). The right hand side also includes the first lagged value of $lnMILGDP_{it}$. X_{it} is the set of explanatory variables including armed forces per 1000 people (*lnAF*), total military spending by states with different security environments (*lnFOES*), total military spending of allies and other friendly states (*lnFRIENDS*), real GDP growth (*GROWTH*), estimated household income inequality index (*lnEHII*), and UTIP-UNIDO industrial pay inequality index (*lnTHEIL*) as an alternative to *lnEHII*. X_{it} also includes several dummies to indicate whether it is a year in which war occurs (*WAR*), whether it is a year in which war or use of force occurs (*CONFLICT*), and what type of political regime exists (social democracy, conservative democracy, one-party democracy, dictatorship, military dictatorship, civil war, communist). 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 specifications are constructed in six different ways. While the first three sets do not include political regimes, the last three are reiterations of first three specifications with political regimes.

[13] Although the UNU-WIDER World Income Inequality Database (WIID), an updated version of Deininger and Squire data set, has better coverage than before it still suffers from the use of heterogenous surveys. Considering the highest quality observations, on the other hand, reduces the coverage and makes our data set EHII still the most favorable one in terms of consistency of the data set and coverage together. Another reason to utilize EHII (and Theil) is that the core point of the study is not just to analyze the effect of inequality but also of political regimes. Using other data sets would result in very few observations to compare political regimes, yielding misleading outcomes. Finally, focusing on inequality per se would allow one to compare and contrast the effects of all available data sets, perhaps for a much smaller number of countries and shorter time period. However, that is outside the scope of this study, it could be a research topic for future studies within a different framework.

[14] The World Bank Database (Beck et al., 2001) measures many aspects of party types and electoral competitiveness without creating a regime classification per se.

[15] 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.

[16] Although our data has nine regime types in total, including Islamic republics and European colonies, we do not cover those two regimes as they have very few observations and countries.

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

Table 1
Summary of variables used in regressions.

Variable	Definition	Source
lnMILGDP	(Natural logarithm of) share of military expenditures as percentage of GDP	Nordhaus, Oneal and Russett (2012)
lnAF	(Natural logarithm of) armed forces per 1000 people	Correlates of War Project (COW)
lnFOES	(Natural logarithm of) total spending by states with different security arrangements	Nordhaus, Oneal and Russett (2012)
lnFRIENDS	(Natural logarithm of) total military spending of allies and other friendly states	Nordhaus, Oneal and Russett (2012)
WAR/CONFLICT	Dummy for each war year/dummy for each war year or each use of force year	Correlates of War Project (COW)
GROWTH	Real GDP log growth rate	World Bank
lnEHII	(Natural logarithm of) estimated household income inequality	University of Texas Inequality Project
lnTHEIL	(Natural logarithm of) UTIP-UNIDO industrial pay inequality index	University of Texas Inequality Project
Political regimes (*SD*, *CO*, *OD*, *DI*, *MD*, *W*, *C*)	Dummy for each political regime	Hsu (2010)

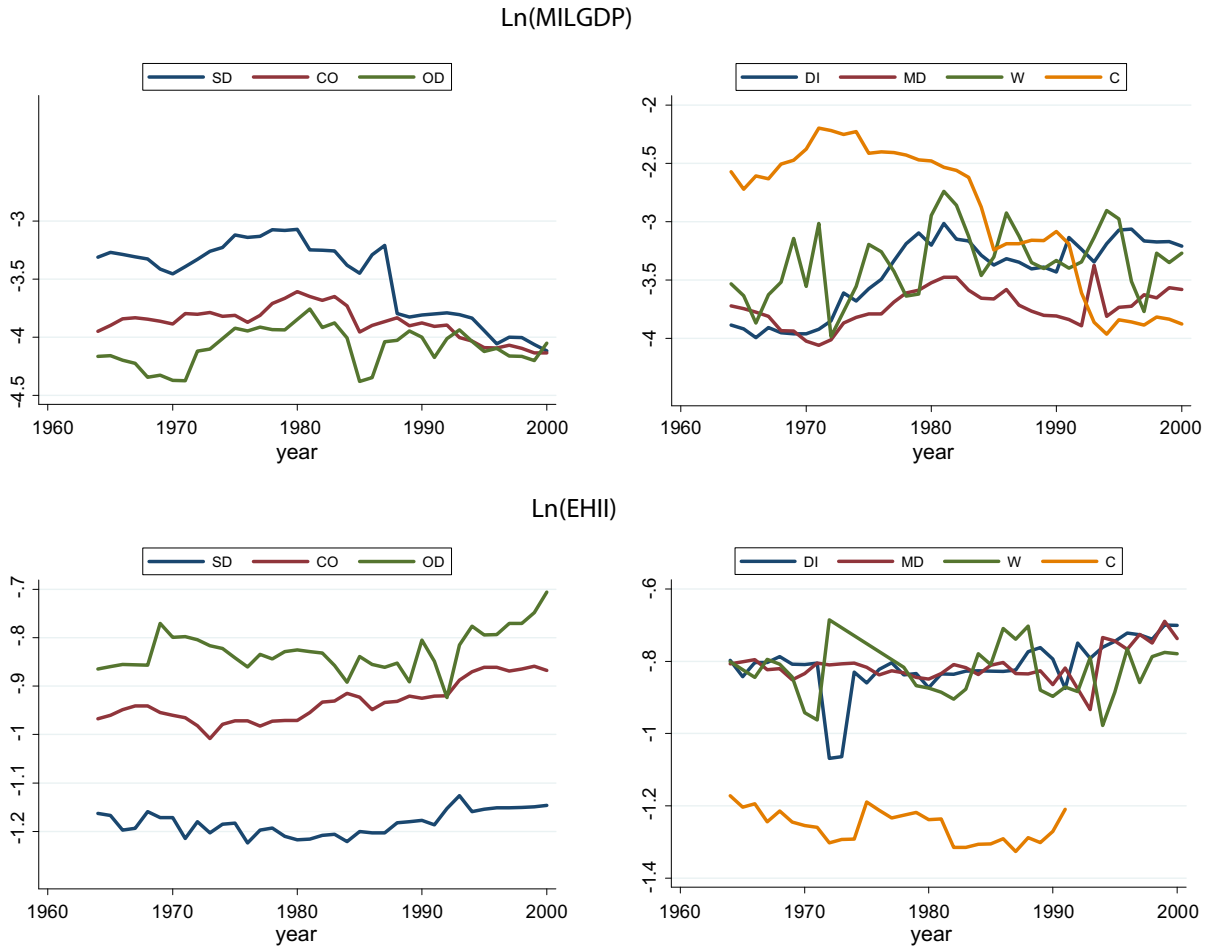
Estimating Eq. (1) with the ordinary least squares (OLS) method without a panel setting can be problematic. First of all, OLS ignores the individual fixed effects for countries; then, the presence of individual fixed effects creates a correlation between the lagged dependent variable and the country-specific effect ε_i. Therefore, the dynamic specification implies a violation of the assumption of strict exogeneity of the estimators. In addition, the use of OLS leads 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 Eq. (1) in differences. The first differencing specification is thus as follows:

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

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,



Note: Inequality data in the 1990s is missing for China and Cuba, two communist (C) countries in our sample.

Fig. 1. Dynamics of defense burden and inequality variables used in regressions according to regimes.

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) propose 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 and Temple, 2001). On the other hand, some regressors may be endogenous and may be affected by the dependent variable also. To solve those problems, Arellano and Bover (1995) and Blundell and 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 and large N; some endogenous variables; and fixed effects. Also GMM considers heteroskedasticity and autocorrelation (Roodman, 2009).

4. Results and discussion

We investigate the relationship between share of military expenditures in GDP and covariates, including political regimes. Our dynamic panel approach uses the system-GMM approach based on Roodman (2006)[18] 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[19], we set country-specific variables as potentially endogenous[20] (i.e. *lnAF*, *WAR/CONFLICT*, *GROWTH*, *lnEHII*, and *lnTHEIL*). 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 *lnFOES* and *lnFRIENDS*. 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 using a two-step efficient GMM technique to correct 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 examine diagnostic tests for the regressions. All estimated models pass the specification tests. AR(1) tests show strong and highly significant time persistence, encouraging the use of a system GMM estimator. According to Arellano–Bond test statistics for 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 non-significant Hansen test statistics underscore the validity of the GMM instruments.

The results are provided in Table 2. One straightforward finding, as expected by the incrementalist argument, is that the lagged value of *lnMILGDP* is positive for each model, indicating that military expenditures in previous years lead to higher military expenditures in the current year. The positive and highly significant values of the lagged coefficients for the military burden confirm the persistence of the military burden's time series.

Another straightforward finding is the effect of the size of military, *lnAF*. We found positive and statistically significant results for each model. This is not an unexpected result and is consistent with the previous findings of Ali (2007) and Tongur and Elveren (2013).

Regarding *lnFOES* and *lnFRIENDS*, 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 and 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 of *lnFOES*, 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. Therefore, our results are highly significant and consistent for each model.

Most studies showed a significant and positive effect of external and civil war variables on military spending (*inter alia* Dunne and Perlo-Freeman, 2003a,b; Dunne, Perlo-Freeman and Smith, 2008; Collier and Hoeffler, 2007a,b). Considering this fact, we also controlled for civil war. For the war case, we took two alternative measures into account—war vs. conflict—for sensitivity checks. As expected from the literature the results show that for each model, the external threat has a positive effect on military spending, supporting the previous findings in the literature.[21]

We also examined the long-run effects (see Table 3). Except for foes and friends in only one case out of six specifications, the results are highly significant. The main findings of this exercise are that all variables have a stronger effect in the long-run, in line with theory and enhancing the short-run results.

The relationship between GDP and military expenditures is one of the hottest topics in the defense literature. Although there is an immense literature on the impact of GDP on military expenditures (see *inter alia* Dunne and Uye, 2010 and Dunne and Tian, 2012) we

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

[19] Moreover, potential multicollinearity among all explanatory variables is detected with the variance inflation factors (VIF) for each set of estimations (see Table A3). For all models, computed values of VIF for variables vary from 1.00 to 1.41, and of mean VIF vary from 1.15 to 1.19. Hence these low VIF values suggest no empirical evidence of multicollinearity.

[20] It is of importance to recall that the GMM method takes care of the endogeneity problem resulting from this bidirectional linkage between the dependent variable, military expenditures, and the independent variable, income inequality.

[21] Since using the conflict variable rather than war does not change the results both in terms of sign and magnitude, we do not report them in order to save space. All these regression results can be provided upon request from the authors.

Table 2
Estimation results.

	1	2	3	4	5	6
Lag(*lnMILGDP*)	0.811***	0.785***	0.869***	0.784***	0.869***	0.858***
	[0.002]	[0.002]	[0.003]	[0.005]	[0.006]	[0.006]
lnAF	0.229***	0.119***	0.068***	0.208***	0.094***	0.093***
	[0.003]	[0.003]	[0.004]	[0.012]	[0.016]	[0.012]
lnFOES	0.041***	0.053***	0.035***	0.040***	0.017***	0.012*
	[0.002]	[0.002]	[0.003]	[0.004]	[0.003]	[0.007]
lnFRIENDS	−0.027***	−0.026***	−0.014***	−0.018***	−0.014***	−0.015***
	[0.001]	[0.001]	[0.002]	[0.002]	[0.001]	[0.002]
WAR	0.128***	0.130***	0.118***	0.134***	0.102***	0.125***
	[0.003]	[0.007]	[0.010]	[0.008]	[0.026]	[0.022]
GROWTH	−0.783***	−0.767***	−0.762***	−0.784***	−0.593***	−0.668***
	[0.011]	[0.014]	[0.020]	[0.033]	[0.048]	[0.063]
lnEHII		0.012***			0.001	
		[0.002]			[0.026]	
lnTHEIL			0.013***			0.000
			[0.004]			[0.011]
Political regimes				Included	Included	Included
Constant	−1.224***	−1.326***	−0.816***	−1.496***	−0.714***	−0.787***
	[0.026]	[0.028]	[0.046]	[0.080]	[0.081]	[0.097]
Observations	4224	2942	2982	4224	2942	2982
Countries	137	131	134	137	131	134
F statistic	155,124***	183,061***	144,776***	15,373***	795,452***	485,086***
Goodness of fit	0.874	0.908	0.913	0.881	0.914	0.913
m1	−3.926***	−6.825***	−6.829***	−3.926***	−6.908***	−6.876***
m2	0.669	−0.519	−0.629	0.678	−0.405	−0.542
Hansen test	132.5	124	129.9	128.3	122.9	126.2

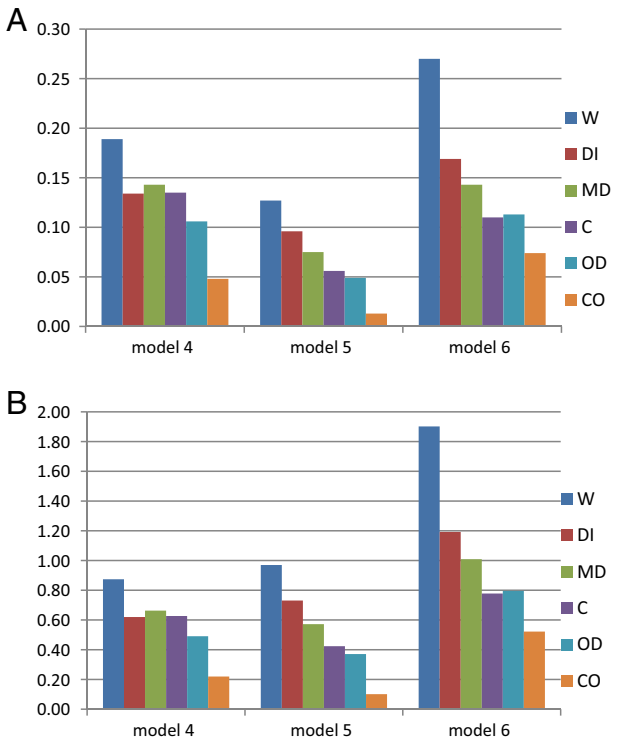
Note: All models include year dummies as instruments. All estimations were conducted with two-step efficient GMM and finite-sample corrections to the covariance matrix estimate. m1 and m2 denotes Arellano–Bond tests for AR(1) and AR(2). Hansen test is for over-identification. The goodness of fit measure is the squared correlation coefficient between actual and predicted levels of the dependent variable. Base category is SD for political regimes. Standard errors in brackets.
*** $p < 0.01$.
* $p < 0.10$.

limit our discussion of 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 with which to protect it (Sandler and 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 and 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 and Walker, 2005). Another linkage is that a 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 and Perlo-Freeman, 2003a,b), Dunne, Perlo-Freeman and Smith (2008) found a significant and negative effect. Our results support the findings of Dunne, Perlo-Freeman and Smith (2008), indicating that higher growth comes with a decline in the military burden of the

Table 3
Long-run effects.

	1	2	3	4	5	6
lnAF	1.210***	0.553***	0.519***	0.964***	0.721***	0.654***
	[0.213]	[0.15]	[0.042]	[0.050]	[0.121]	[0.090]
lnFOES	0.215***	0.245***	0.265***	0.187***	0.130	0.085*
	[0.008]	[0.010]	[0.029]	[0.018]	[0.024]	[0.049]
lnFRIENDS	−0.143***	−0.121***	−0.105***	−0.082***	−0.107	−0.105***
	[0.004]	[0.005]	[0.011]	[0.009]	[0.011]	[0.014]
WAR	0.675***	0.605***	0.896***	0.620***	0.778***	0.882***
	[0.019]	[0.033]	[0.056]	[0.040]	[0.206]	[0.175]
GROWTH	−4.135***	−3.567***	−5.808***	−3.631***	−4.527***	−4.714***
	[0.061]	[0.067]	[0.184]	[0.152]	[0.397]	[0.459]
lnEHII		0.057***			0.006	
		[0.010]			[0.199]	
lnTHEIL			0.101***			0.001
			[0.035]			[0.738]
Political regimes				Included	Included	Included

Note: The long run coefficients were calculated for system GMM results in Table 2 by considering rate of convergence. Standard errors in brackets.
*** $p < 0.01$.
* $p < 0.10$.



Note: Panel A represents short-run coefficients, whereas Panel B is for long-run coefficients.

Fig. 2. Effects of political regimes on defense burden. Note: Panel A represents short-run coefficients, whereas panel B is for long-run coefficients.

country. Also, when one considers the fact that economic growth leads to higher democracy, which in turn includes fewer military expenditures, our results become more consistent with and supportive to the early literature[22].

One of the key issues in this analysis is that of incorporating inequality into the military expenditures–political regimes nexus. Considering the critical role of inequality in the context of growth and military expenditures, we attempt to make a more comprehensive examination by incorporating a measure for inequality as well. There is no such comprehensive income inequality data set on the economy as a whole. That is why we prefer to use the EHII data set and check the robustness of our results by utilizing the Theil inequality (manufacturing pay inequality) data set.

We find that higher inequality is associated with high military expenditures as a share of GDP (models 2 and 3). This result is consistent with the findings of Ali (2007) and Tongur and Elveren (2013) even though the time period and set of countries that we cover in this study are substantially greater than those used in Tongur and Elveren (2013)[23]. Hence, our results confirm the positive relationships between military burden and inequality measures with the extension of models, time periods and the number of countries. On the other hand, when we control for the effects of income inequality and political regimes together, the effect of income inequality become insignificant whereas the effects of political regime remain significant. Although our political regime data set, Hsu (2010), is constructed in such a way that it does not characterize political regimes based on inequality, the existence of political regime dummies in models 4 and 5 may lead to strong effects of regimes, and this may mitigate the effect of income inequality.

Now we can turn our attention to the relationship between different political regimes and military burden. When the regression includes only one political regime dummy separately, the coefficients of SD and CO are negative and significant. This means that being a social democratic regime leads to a lower defense burden with respect to all other regime types, and being a conservative democratic regime leads to a lower defense burden with respect to all other regime types as well. The coefficients of all other regime types are positive. Therefore, being any political regime except SD or CO, leads to a higher defense burden with respect to all other regime types (see Table A4 in Appendix A).

Moreover, we investigate the relationship between political regime and military burden by comparing each regime to one another. As can be seen in Table A4 in Appendix A, the coefficient of social democracy is negative, and is the smallest among all political regimes. Therefore, 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. Hence, the last three model specifications (4, 5, and 6) are dedicated to the cases in which we compare all other political regimes with our base political regime, namely 'social democracy'. All other political regimes have positive coefficients, and they have higher military burdens than does social democracy (see Table A5 in Appendix A for specific coefficients for political regimes). Fig. 2 provides a clear summary of the political regime comparison both for the short- and long-run periods. It compares all political regimes using the base regime of social democracy in terms of the effects of political regimes on the defense burden. As the figure shows, being a civil war regime leads to the highest military burden. Dictatorship, military dictatorship, and communist regimes also have significantly higher military burdens. Also focusing on the three democratic regime types with the lowest military expenditures, one can see that one-party democracies and conservative democracies have higher military burdens than do social democracies. That is, regimes are ranked from highest military burden to lowest as follows: civil war, dictatorship, military dictatorship, communist, one-party democracy, conservative democracy and social democracy.

5. Conclusion

We examined the military expenditures as a share of GDP with respect to political regimes. There is an immense empirical literature that supports Immanuel Kant's wisdom 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 the 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 and Elveren (2013), in which the 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 (1963–2000). Employing a system-GMM method,

[22] The results are significantly similar when the analyses are repeated with real GDP, real GDP per capita, and crisis dummies as alternatives to growth. The coefficients of real GDP and real GDP per capita are negative as expected. The coefficient of the crises dummy is positive, confirming the effect of growth. This finding suggests that countries have a tendency to keep their military expenditures at some certain levels even in crisis years. The results are not reported to save space, but are available upon request from the authors.

[23] Since Tongur and Elveren (2013) is primarily interested in welfare regimes rather than political regimes per se, it covers only 37 countries for a shorter time period 1988–2003.

our analysis confirms and strengthens the previous results, and provides further evidence on the military expenditure characteristics of various political regimes.

Our data set suggests that while there is a positive relationship between military expenditures as a share of GDP and army size, military expenditures of foes, and internal and external threats, there is a negative relationship between military expenditures of allies and growth. Further, the analysis provides some additional evidence on the relationship between income inequality and military burden. The results show that higher income inequality is associated with a higher military expenditure share of GDP. However, when inequality is analyzed along with political regimes, the effect disappeared.

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 democratic political regimes; and all other political regimes, namely, dictatorships, military dictatorships, civil war regimes, one-party democracies, and communist regimes have higher military burdens compared to social democratic political regimes. This strongly supports the general findings of an immense literature that higher levels of democracy (authoritarianism) are associated with lower (higher) military burdens. The study clearly distinguishes this general finding among types of regimes.

In general, our results suggest that Kant's wisdom that reduced military spending results in increased social spending and therefore peace, applies in a peaceful world, which the Western security umbrella provided for social democracies after World War II. Kantian theory is not however easily applicable to the egalitarian military states that existed outside of these Western alliances.

This study is a modest attempt to contribute to the large literature on military expenditure 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. However, we acknowledge that there are some other issues that may be taken into account in the context of determinants of military expenditures. First of all, as we noted, inequality is an important topic that has not received enough attention in the literature on military expenditures. Further analysis with different inequality data sets to allow some comparison might be helpful. Secondly, it is a fact that spatial issues are key factors in influencing the pattern of military expenditures. That is, reexamining the relationship in question within a spatial regression model would be a topic for further studies.

Appendix A

Table A1
Countries included in the estimations.

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

All countries (137) in the table are included for the regressions 1 and 4. (*) denotes the countries are not included in regressions 3 and 6 which involve Theil index as well as (**) denotes the countries are not included in regressions 2 and 5 which involve EHII due to missing data.

Table A2
Descriptive statistics for the raw data according to political regimes.

	SD	*CO*	*OD*	*DI*	*MD*	*W*	*C*	All
MILGDP	*148*	*1765*	*178*	*993*	*622*	*192*	*326*	*4224*
	0.033	**0.026**	**0.022**	**0.055**	**0.036**	**0.052**	**0.087**	**0.040**
	[0.014]	[0.026]	[0.019]	[0.080]	[0.051]	[0.608]	[0.062]	[0.055]
AF	*148*	*1765*	*178*	*993*	*622*	*192*	*326*	*4224*
	7.943	**6.583**	**2.900**	**8.600**	**5.590**	**4.940**	**13.070**	**7.230**
	[1.473]	[7.100]	[2.000]	[9.980]	[6.720]	[3.740]	[7.020]	[7.774]
FOES	*148*	*1765*	*178*	*993*	*622*	*192*	*326*	*4224*
	694,988	**633,455**	**682,395**	**739,359**	**722,135**	**768,508**	**645,519**	**682,698**
	[171,891]	[200,432]	[204,966]	[206,012]	[224,784]	[183,494]	[215,309]	[210,961]
FRIENDS	*148*	*1765*	*178*	*993*	*622*	*192*	*326*	*4224*
	252,913	**292,117**	**260,005**	**211,962**	**250,984**	**217,230**	**308,234**	**262,330**
	[109,991]	[140,319]	[133,402]	[139,890]	[148,322]	[83,199]	[182,190]	[146,068]
WAR	*148*	*1765*	*178*	*993*	*622*	*192*	*326*	*4224*
	0.000	**0.041**	**0.034**	**0.050**	**0.039**	**0.031**	**0.015**	**0.039**
	[0.000]	[0.198]	[0.181]	[0.219]	[0.193]	[0.174]	[0.123]	[0.193]
GROWTH	*148*	*1765*	*178*	*993*	*622*	*192*	*326*	*4224*
	0.029	**0.036**	**0.042**	**0.040**	**0.042**	**−0.002**	**0.035**	**0.036**
	[0.027]	[0.048]	[0.062]	[0.105]	[0.069]	[0.128]	[0.080]	[0.076]
EHII	*146*	*1457*	*112*	*580*	*413*	*67*	*167*	*2942*
	0.307	**0.402**	**0.442**	**0.448**	**0.441**	**0.435**	**0.287**	**0.408**
	[0.021]	[0.059]	[0.034]	[0.059]	[0.042]	[0.052]	[0.047]	[0.069]
THEIL	*146*	*1458*	*101*	*591*	*413*	*83*	*190*	*2982*
	0.008	**0.053**	**0.066**	**0.079**	**0.058**	**0.061**	**0.010**	**0.055**
	[0.003]	[0.082]	[0.046]	[0.071]	[0.037]	[0.057]	[0.014]	[0.071]

For each regime and variable, the first, second and third rows show the number of observations, means, and standard errors, respectively.

Table A3
Variance inflation factors (VIF) for the regressions.

Variables/models	1–4	2–5	3–6
lnAF	1.03	1.16	1.16
lnFOES	1.32	1.36	1.36
lnFRIENDS	1.34	1.40	1.41
lnWAR	1.02	1.05	1.05
GROWTH	1.01	1.01	1.00
lnEHII		1.14	
lnTHEIL			1.15
Mean VIF	1.15	1.19	1.19

Table A4
Estimation results for political regime dummy variables separately.

Lag(*lnMILGDP*)	0.807***	0.784***	0.813***	0.805***	0.803***	0.818***	0.804***
	[0.003]	[0.005]	[0.004]	[0.004]	[0.005]	[0.004]	[0.003]
lnAF	0.238***	0.216***	0.234***	0.232***	0.254***	0.221***	0.222***
	[0.006]	[0.008]	[0.010]	[0.007]	[0.006]	[0.006]	[0.008]
lnFOES	0.046***	0.042***	0.044***	0.040***	0.038***	0.035***	0.046***
	[0.004]	[0.005]	[0.005]	[0.004]	[0.005]	[0.003]	[0.002]
lnFRIENDS	−0.024***	−0.019***	−0.025***	−0.022***	−0.025***	−0.025***	−0.024***
	[0.001]	[0.002]	[0.002]	[0.002]	[0.002]	[0.001]	[0.002]
WAR	0.136***	0.138***	0.131***	0.129***	0.134***	0.132***	0.135***
	[0.005]	[0.007]	[0.005]	[0.005]	[0.006]	[0.006]	[0.006]
GROWTH	−0.619***	−0.735***	−0.626***	−0.664***	−0.698***	−0.642***	−0.603***
	[0.025]	[0.024]	[0.026]	[0.023]	[0.031]	[0.024]	[0.024]
SD	−0.120***						
	[0.011]						
CO		−0.079***					
		[0.005]					
OD			0.037***				
			[0.013]				
DI				0.044***			
				[0.003]			
MD					0.064***		
					[0.006]		
W						0.087***	
						[0.004]	

(continued on next page)

Table A4 (*continued*)

C							0.010
							[0.009]
Constant	−1.363***	−1.389***	−1.304***	−1.323***	−1.296***	−1.144***	−1.348***
	[0.066]	[0.091]	[0.083]	[0.072]	[0.091]	[0.059]	[0.034]
Observations	4224	4224	4224	4224	4224	4224	4224
Countries	137	137	137	137	137	137	137
F statistic	70,304**	52,686***	84,147***	65,760***	45,688***	34,290***	98,964***
Goodness of fit	0.872	0.878	0.873	0.874	0.869	0.876	0.875
m1	−3.912***	−3.914***	−3.92***	−3.911***	−3.929***	−3.92***	−3.91***
m2	0.719	0.688	0.709	0.724	0.697	0.713	0.716
Hansen test	131.5	129.9	129.6	132.3	130.9	133.6	133.5

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. The goodness of fit measure is the squared correlation coefficient between actual and predicted levels of the dependent variable. Standard errors in brackets. ***p < 0.01, **p < 0.05, *p < 0.10.

Table A5
Coefficients of political regime dummies.

	4	5	6	4-LR	5-LR	6-LR
CO	0.048***	0.013	0.074*	0.220**	0.101	0.522*
	[0.018]	[0.015]	[0.038]	[0.085]	[0.113]	[0.267]
OD	0.106***	0.049**	0.113**	0.491***	0.371**	0.796**
	[0.023]	[0.023]	[0.044]	[0.107]	[0.177]	[0.310]
DI	0.134***	0.096***	0.169***	0.620***	0.731***	1.192***
	[0.017]	[0.019]	[0.040]	[0.086]	[0.134]	[0.278]
MD	0.143***	0.075***	0.143***	0.663***	0.572	1.009***
	[0.018]	[0.020]	[0.043]	[0.085]	[0.151]	[0.301]
W	0.189***	0.127***	0.270***	0.874***	0.970***	1.902***
	[0.018]	[0.018]	[0.091]	[0.089]	[0.135]	[0.641]
C	0.135***	0.056***	0.110***	0.627***	0.424***	0.778***
	[0.015]	[0.012]	[0.036]	[0.075]	[0.081]	[0.246]

Standard errors in brackets. ***p < 0.01, **p < 0.05, *p < 0.10.

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