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War and the Fiscal Capacity of the State

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Abstract.

We examine the role of war in retarding state fiscal capacity in developing countries, measured by tax revenue ratios to GDP. This in contrast to the European experience from the Renaissance to the 20th century, where it is believed that war and state-building were inseparable, enhancing the fiscal capacity of the state; in turn enlarging the scope and magnitude of government expenditure. We build a simple theoretical model of a factionalized state, where patronage substitutes for common interest public goods, along with the possibility of violent contestation over a rent or prize, typically in the form of natural resource revenues. Our dynamic panel empirical analysis on the determinants of fiscal capacity is applied to 79 developing countries, during 1980-2010. Results indicate that war, especially in its current dominant form of civil war, retards fiscal capacity, along with imperfect democracy, political repression, the quality of governance, dependence on oil and macroeconomic mismanagement. High intensity conflict is particularly destructive of state capacity. Countries experiencing low intensity wars, other institutional factors may matter more for fiscal capacity formation compared to war. The diminution of state capacity due to war appears less pronounced after the end of the cold war.

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1. Introduction

One characteristic of developing countries is low fiscal capacity and smaller government relative to the size of the economy, compared to that of richer developed countries and emerging economies (Brazil); see Table 1. Low fiscal capabilities constrain state capacity: the manifold functions of the state in terms of guaranteeing security, social protection, economic management and the provision of a host of other public goods. It has been argued by Tilly (1992) that for Europe, historically, state building and war making were inseparable, leading ultimately to enhanced state capacity amidst widening spheres of government activity. The purpose of this paper is to empirically analyze the relationship between war, particularly in its dominant form civil war, and the fiscal capacity of the state for contemporary developing countries.

Table 1: State Capacity in Selected Developed and Developing Countries in 2010

Country	Government Expenditure as a per cent share of GDP	Taxes as a per cent share of GDP
UK	45.8	35.0
Germany	48.8	36.3
Brazil	40.6	34.4
India	22.4	17.7
Congo, Democratic Rep. of	22.9	13.2
Ethiopia	21.8	11.6

Source: OECD Tax Statistics 2011; Planning Commission of India; World Bank

The functions of the state are important in maintaining the cohesiveness of society, and sustaining the social contract between rulers and the ruled, and different factions within society. Besides a *legitimate* Weberian monopoly over violence, a functioning state must be able to enforce laws, property rights and contracts, as well as have the fiscal capacity to raise revenues and provide public goods (Mill, 1848). A modern state must also be able to provide a wider range of public goods (health, education for example), in addition to a capacity to regulate and manage markets. More affluent nations have bigger governments (as measured by the share of government consumption in national income). Economic decline in 'failing' states severely undermines the state's fiscal capacity, something which can make it heavily aid dependent (Ghani and Lockhart, 2008). Aid dependence, in turn, can further diminish state capacity. Furthermore, a 'failing' state's ability to guarantee personal security, property rights and laws is often compromised, leading to the gradual privatisation of violence between predatory and defensive elements within society. Individuals rely on kinship based groups and local warlords for security and public good provision; this in turn heightens the risk of civil war as society descends towards an anarchical, Hobbesian, state of nature. In the contemporary developing world the lack of

fiscal/state capacity enhances civil war risk; civil war in turn further attenuates fiscal capacity by destroying pre-existing fiscal institutions that used to garner revenues for the state. Thus, the lack of state capacity increases the risk of civil war.

State capacity is essential for sustained growth with equity, which is the major challenge for developing countries. The size of government and growth may sometimes be negatively correlated, but the state has minimum functions associated with security, law enforcement, securing property rights and the enforcement of contracts. Human capital formation is also central to newer growth theories, and much of this education is usually publicly provided. All of this requires that the state is able to command resources for its activities, and public goods provision; richer countries tend to have bigger government measured by the share of government consumption in national income.

Curiously, war may have facilitated the development of state capacity in Europe since the 15th century (Tilly, 1992). The development of the modern European state was closely linked to external war: war made the state and the state made war. A prominent feudal oligarch might establish a monopoly of violence within a society previously characterized by competition amongst competing warlords. The coercive activity of state-making (removing rivals and challengers to the sovereign's power) was complemented by other wars against external enemies, as well as protecting the interests of his support group. These activities require resources, initially funded by the means directly at the ruler's disposal or tributes exacted from the population, particularly in conquered regions.

Gradually, as war became more and more complex, requiring larger forces which had to be maintained for longer periods, other sources of finance (newer taxes or borrowing from merchant capitalists) had to be explored and invented. The path chosen could be more coercive in countries more dependent on agriculture (Tsarist Russia), or more capital intensive in states engaged in more merchant capital based activities (the Dutch Republic), or a mixture of the two. It should be noted that a reliance on land and agricultural taxes require a more elaborate bureaucratic machinery such as in Prussia, compared to the dependence on trade and other indirect taxes (the 17th century Dutch republic). Be that as it may, it compelled the successful ruler to enter in to bargains with wider sections of the population (landlords and/or merchants). A wider administrative structure unfolded, leading to the gradual development of laws, fiscal institutions, accounting systems, academies and schools to train state functionaries. The sovereign had to invest in state, especially fiscal, capacity so as to be able to levy taxes and oversee their smooth collection. Some wars advance the economic interests of the sovereign's richer subjects, such as during mercantilist wars of the 17th to 19th century. This will prompt the political support of the merchant and nascent capitalist classes, and they will not object to

the sovereign's gathering revenues for further and more efficient war making against their common (economic) foes, provided he respects their property rights and develops legal frameworks facilitating contractual capital formation.

Further down history, as the scale of war increased requiring more specialized equipment and larger standing armies, more revenues and administrative capacity became necessary. Tilly (1992), for example, points out fiscal innovations like the income tax in Britain during the Napoleonic wars in 1799, and the rise in share of government revenues to GDP from 15-24% in the same country during that period did much to lay the foundations of future British state capacity. Increased taxation and conscription compelled rulers to make concessions to wider sections of the population. This meant more representative government, and augmentation of state activities towards regulating production, manipulating distribution, providing social protection; in short more and more public goods, until we arrive at a point where military expenditure, even if increasing in absolute terms, becomes a smaller segment of total government expenditure. Monopolized trade related rents lead to the accumulation of capital, followed by economic growth, even industrialization in some cases. Industrialization and modern economic growth, however, require technical progress, which reduces the dependence on a war making state, as it is competitiveness and not exclusive trading rights that drives profit, a process, which is aided by free trade and domestic public goods that enhance factor productivity.

In a nutshell, war leads to the development of state capacity, primitive accumulation and in some cases metamorphoses into modern manufactures based economic growth led by technical progress. A history of making war against a nation's common external enemies may lay the foundations for future state capacity, and assist nation building, as it lays the basis for fiscal and legal institutions. This process, however, may not apply to internal conflict, which often undermines institutions, and interest in the provision of public goods.

Does this narrative, if valid, have any relevance for developing countries at present? Most developing countries commenced their post-colonial existence with reasonable institutions and state capacity. The last quarter of the 20th century, however, witnessed growth and development failure in many parts of the developing world (especially in Africa). This phenomenon is also referred to as state failure, particularly in the discourse of strategic and international studies. Associated with these developments, state capacity has declined in many countries, and several of these nations have also experienced civil war, which is widely believed to attenuate state capacity even further. Other developing countries (including those not experiencing civil war) are characterized by factional politics, with governments, even democratically elected ones, serving particular group interests. These states have little interest in providing common interest public goods to its

entire citizenry, but instead will concentrate on using the state's resources to reward their own faction via political patronage. Patronage substitutes for wide ranging public goods. Thus, state capacity as measured by government expenditure as a proportion of national income may be low, but tax revenues as a share of national income will certainly be smaller in factionalized states where patronage is widespread; the state may rely on overseas aid and its ability to directly command resources, royalties and rents.

In a series of papers Besley and Persson (2008, 2010) have developed models of the endogenous investment by present-day rulers in state and legal capacity for future use by society. Legal capacity is similar to the good economic institutions essential for economic growth in long-run in the spirit of the currently fashionable arguments disseminated by Acemoglu, Johnson and Robinson (2005). The development of legal capacity enhances growth, which in turn increases the revenue base of the state. Fiscal capacity formation in particular, is a costly investment and the returns are in the future. In a factionalized society state capacity to finance a public good in the future depends on whether the revenues are put to uses (public goods) that enhance the utility of all members of society, not just the incumbent group in power. The purest form of a common interest public good is national security expenditure directed against external threats, and Besley and Persson (2008, 2010) do not consider other public goods such as education, health and infrastructure. In a society where there are no national (common) interest public goods a factionalized society emerges; the state taxes everyone but uses the revenues to make transfers only to its own followers (who in effect pay negative taxes). The state's incentives to invest in state capacity are further attenuated by political instability, possible violent challenges to the state via civil war (which eliminates the need for common interest public goods provision), and an economy where a large share of national income emanates from natural resource rents (that do not require the production relations of manufacturing or agriculture). Besley and Persson (2010) conduct some preliminary empirical investigation of their propositions and find support for their assertions, but much more systematic analysis is required using time series econometric techniques to address the reverse causality between war, especially civil war and fiscal institutions, and to account for unobserved heterogeneity between countries. This is what we do in our paper.

The next section presents a simple theoretical model explaining the absence of common interest public goods in factionalised societies that may lead to outright civil war. Section 3 discusses our econometric modeling strategy for analyzing the effect of war on state fiscal capacity, including dynamic panel data and country fixed effects techniques. Section 4 presents our results, and Section 5 discusses sensitivity tests. The long run multipliers are presented in Section 6 while additional robustness tests are reported in Section 7. The final section concludes the paper.

2 Theory

Our theoretical model is meant to motivate the empirical work that follows on the determinants of the state's fiscal capacity. In this section, however, we will refer to state capacity more generally. Following Besley and Persson (2008, 2010) we have two groups in society (S): a politically incumbent group another faction in opposition, denoted by a subscripts I and O respectively. We will examine three degrees of political factionalism indicated by common interest public goods, another situation where each group benefits from a specific club good provided by the state, and a scenario of outright civil war (or equivalently a repressive state) when both groups fight over a prize or rent, and there are no common interest public goods across political factions. We reduce our theoretical analysis into a one period decision making process that has implications, both for the present and future, as present investment in state capacity enhances both current and future income, unless there is internal war.

To begin with the first (common interest scenario), the utility (U_I) of the group in power is¹:

$$U_I = G_S + [1-t_I](G_S)Y_I(G_S) + \varphi R \quad (1)$$

For the opposition:

$$U_O = G_S + [1-t_O](G_S)Y_O(G_S) + [1 - \varphi]R \quad (2)$$

G_S refers to the provision of common national interest public goods across both factions of society. It *directly* enhances the utility of both social groups equally, and is non-excludable and non-rivalled, also enhancing the productivity of national output. In other words, it is not solely military expenditure directed for defense against a common external enemy as in Besley and Persson (2008, 2010), but includes social sector expenditures such as on infrastructure, health and education which enhance productivity in the economy and promote growth.²

The parameter t , refers to the tax rate imposed on income, Y to finance the public good to group I in equation (1) and for group O in equation (2). Hence, $[1 - t]Y$ represents disposable income. The ability to raise revenues rises with the provision of the common

¹ We assume that each group has resolved the collective action problem, and participation and incentive compatibility constraints of group members have been met.

² G_S can be composed of social sector spending, S_S and military (security) spending M_S . An increase in military spending can therefore crowd out social sector spending out of a given budget.

interest public good, which in turn enhances the state's fiscal capacity. A high value of G_s may also be indicative of better quality institutions, as state (fiscal) capacity is greater.

The last term R refers to a rent, which is shared according to some partisan rule. Rents can be composed of natural resource revenues, fungible foreign aid or a purely political rent extractable when in office.³ A fraction φ accrues to the incumbent group in equation (1), and a proportion $1 - \varphi$ is the share of the opposition in (2). Alternatively, φ can be viewed as the probability of remaining in power in the next period for the incumbent, and $1 - \varphi$ the probability that the opposition gets into power in the next period; enlightened self-interest (a rule that does not produce latent or open conflict) dictates that these correspond to the group's population share. Sometimes, an enlightened dictator can choose shares (φ and $1 - \varphi$) according to some rule that reflects population size and political weight, effectively employing inclusiveness to avoid having to either fight or repress the opposition.

Observe that we are stating that the rent (whether natural resource, patronage or foreign aid based) does not enhance state capacity even if it is used for public good provision rather than private distribution. This is in line with the arguments of Ghani and Lockhart (2008) that foreign aid does not add to state capacity, but can be an alternative (foreign) source of public good provision, as well as Ross' (2001) assertion that when resource rents finance public goods, obviating from the need to tax, this retards the accountability of the state and democratic development (no taxation, no representation). In equations (1) and (2) the rent, R enters into utility in an additive, separable fashion, so that increases in both Y and R enhance utility. However, to maintain constant utility in the face of a decline in R , there has to be an increase in Y , which requires state capacity. By the same token, countries experiencing resource booms may have less incentive to enhance state capacity, if their reliance on produced income, Y , diminishes, thus experiencing classic 'Dutch' disease effects both in their macroeconomy and in the political economy sphere.

Maximising utilities in (1) and (2) with respect to G_s and setting we obtain:

$$1 + [1-t_i]Y_{IG} = t_{iG}Y_i \tag{3}$$

And

$$1 + [1-t_o]Y_{OG} = t_{oG}Y_o \tag{4}$$

³ In the case of natural resource royalties we are referring to rent: that is the revenue available after extraction costs.

In (3) and (4) the marginal benefits of the common interest public good are on the left hand side, and the right-hand sides correspond to marginal costs. An additional subscript, such as G , refers to a partial derivative with respect to that variable. In this common national interest equilibrium the state will equalize tax rates for both groups ($t_1 = t_0$), and both groups will accept this voluntarily as it enhances individual, group and national income. This is also the utilitarian (greatest good of the greatest number) outcome.

What if there is a degree of polarization and factionalism between the two groups? In this case we may choose to rewrite the utility functions (1) and (2) as:

$$U_1 = \alpha G_1 + [1-t_1](G_1)Y_1(G_1) + R \quad (5)$$

$$U_0 = [1-\alpha]G_0 + [1-t_0](G_0)Y_0(G_0) \quad (6)$$

$$\text{Where } G_S = \alpha G_1 + [1-\alpha]G_0$$

In this case, the common interest public good becomes akin to a group specific club good (Cornes and Sandler, 1996). These are non-rivalled, and each member of the club (or group) can enjoy the good, but somehow it is excludable for the outside group. This happens in states that are multi-ethnic with different languages, religions, histories of division and vastly competing economic endowments. Here the state collects the revenues for the public good and apportions a fraction α to its own group and a proportion $1 - \alpha$ to the opposition. One may assume that the more factional the state, α increases, and in the limit as $\alpha \rightarrow 1$, we have a completely partisan state that taxes the opposition but gives it no benefit, instead appropriating all the revenues for its own group. Only the politically incumbent group enjoys the rent, R , and no thought is given to the future consequences of excluding the opposition. Maximisation of (5) and (6) with respect to G_1 and G_0 yields:

$$\alpha + [1-t_1]Y_{1G} = t_1 Y_1 \quad (7)$$

And

$$1-\alpha + [1-t_0]Y_{0G} = t_0 Y_0 \quad (8)$$

When we compare (7) and (8) with (3) and (4) this situation may not produce less provision of the public goods, but may engender demands for greater autonomy (if α is more than proportional to population share of the incumbent), and calls for fiscal

federalism in terms of setting tax rates and deciding on public expenditure priorities. Here, t_i, G_i and t_0, G_0 are not necessarily equal.

Finally, we have the possibility of outright repression by the incumbent of the opposition, and civil war. In this case, $\varphi = 1$, with no national provision of public goods to the opposition. Also, there is no direct utility from public goods, although indirectly it enhances utility for the governing faction by increasing the productivity of private goods.

The utilities of the two groups become:

$$U_I = [1-t_i(G_i, F_i)]Y_i(G_i, F_i) + \psi(F_i)R \quad (9)$$

$$U_0 = [1-t_0]Y_0(F_0) + [1-\psi](F_0)R \quad (10)$$

Here both sides violently contest the rent R , utilizing a fighting effort F ; ψ and $1-\psi$ are the probabilities of success in this civil war for the government and rebels (opposition) corresponding to a Tullock (1967) type contest success function.⁴ We also, postulate that civil war has a negative influence on income for both sides, because of the negative effect on existing institutions, damage to infrastructure and the endowments of each group. For the government (or incumbent) side there is still a group specific public good (besides its fighting expenditure against the rebels) that enhances income of the group, but its total taxes now have to finance fighting the opposition also:

$$G_i = t_i Y_i - F_i \quad (11)$$

There are fewer resources available to enhance growth and productivity. The opposition group has an endowment, Y_0 from which a proportion t_0 is taxed to finance their war effort, and there are no group specific public goods that enhance productivity for the opposition.

Maximizing (9) and (10) with respect to F_i and F_0 :

$$\Psi_{F_i} R + [1-t_i]Y_{iF_i} = t_{F_i} Y_i \quad (12)$$

$$[1-\psi]_{F_0} R + [1-t_0]Y_{0F_0} = t_{F_0} Y_0 \quad (13)$$

⁴ The probability of success depends on own military effort compared to total military effort by both sides scaled upwards or downwards by a military decisiveness parameter.

Where the left hand sides represent the marginal benefit of fighting (gaining the rent or prize) and the right hand side its marginal cost. Observe, that the second term on the left-hand side is negative, civil war adversely impacts on income by undermining institutions, and because of collateral damage to endowments. Clearly, the incentive to fight the other faction rises with the value of the resource rents (R) available for capture by either group relative to the income loss due to civil war. Hence, civil war will be less likely the greater the share of produced income (Y).

Maximizing (11) with respect to G_I yields:

$$[1-t_I]Y_{IG} = t_{IG}Y_I \tag{14}$$

The marginal benefit of the public good (Y_{IG}) will be smaller than before (utilizing (11)), and the marginal cost (t_{IG}) will be greater again from (11). Some revenues have to be diverted to fighting internal rivals, something that does not increase state capacity or the productivity of produced income. Thus, in the state of civil war there is diminished investment in state capacity, even when compared to the non-violent factional outcomes in (7) and (8), and none for the opposition; a large share of revenues are used to fight a domestic foe. Furthermore, during civil war *existing* state capacity and institutions may also be undermined. Thus, there is a two-way (reverse) causality that may be operational during civil war; it creates lesser incentives for investment in state capacity; the state capacity that does exist may atrophy and decay.

In a purely repressive equilibrium, where the opposition is unable to mount a challenge against the ruling faction, $\psi = 1$, and the government uses part of its resources (F_I) to suppress an opposition group that is unable to fight back; R is not contestable between the two parties, and of course the incumbent power (state) does not share rents or public goods with rival groups.

3. Methodology and Variables

Given the theoretical underpinnings discussed in the previous section for the lack of common interest public goods, our objective is to empirically analyze the effect of war, especially civil war, on the fiscal capacity of the state in the contemporary developing world (between 1980 and 2010), specifically the effect of war (our data sources for conflict are described in detail in the appendix) on the tax-GDP ratio. We do not look at government expenditure, because total state spending may be financed not only by taxation and borrowing, but also direct access to rents, royalties, state trading monopolies and foreign aid (as indicated for Ethiopia and the Congo in Table 1). The state may also rely on inflation taxes, and manipulate the exchange rate to capture more resources for itself (we proxy this

via a dual exchange rate variable). We will proxy the nature of the state through governance and political variables. A poorly governed state, with weak institutions will have less fiscal capacity. It is particularly difficult to find data on the quality of governance prior to the late 1990s, with the exception of the economic freedom index described in the appendix. As far as the political nature of the state is concerned we use the Polity scale, which ranges from -10 for a perfect autocracy to 10 for a mature well functioning democracy. There are possibilities in between, most developing countries fall into a category called anocracy (with Polity scores between -4 to 6—which means it has characteristics of both democracy (elections) and autocracy (unconstrained executives). More democratic states are more accountable and have more common interest public goods, meaning that their fiscal base is likely to be larger. We also use the political repression index (see appendix), more repressive states may have narrower tax bases for the theoretical reasons outlined above. We also postulate that Presidential (as opposed to Prime Ministerial) systems are more authoritarian, as challenges (impeachment) is more difficult in these instances; most developing countries are Presidential. We also include an oil exporter effect, the impact of ethnic fractionalisation and aid as independent variables. These are likely to reduce domestic resource mobilization. We utilize the size of the economy (GDP), and per-capita GDP as control variables.

An important complication in empirically studying the impact of conflict on state capacity is the potential for endogeneity biases as a result of measurement error, reverse causation, and omitted variables. Reverse causality is a concern when examining the link between state capacity and conflict, since greater fiscal capacity might lead to lower conflicts either because higher tax revenue reduces some of the causes of internal conflicts, or because it leads to more income inequality which fuels more discontent and conflict. Moreover, omitted factors can explain both the evolution of conflict and of fiscal capacity, also leading to biases in the estimated impact of conflict on fiscal capacity.

We try to address these concerns by using several different estimators. First, we conduct estimations including country and time fixed effects to account for unobserved country characteristics and for common shocks and trends across countries. In order to address biases due to reverse causality, we run regressions lagging all regressors one period and we conduct dynamic system Generalized Method of Moments (GMM) estimations à la Arellano and Bover (1995), using lagged regressors as instruments. Finally, we perform instrumental variables (IV) estimations to try to address, in a more direct manner, the potential endogeneity of conflicts arising from measurement error, omitted factors, and/or reverse causation. We use two sets of instruments based on characteristics of the sample countries: (a) measures of economic conditions in sample countries and (b)

variables that capture the views held, and the policies pursued by policy-makers with respect to conflicts.

We empirically examine the link between state capacity and conflict by estimating a number of variants of Eq. (15)

$$\text{TAX}_{it} = \alpha_0 + \alpha_1 C_{it} + \beta' X_{it} + \delta' D_t + \mu_{it} \quad (15)$$

where i refers to the country and t refers to the time period included in the study. TAX is the ratio of tax revenue to GDP and measures state capacity. A complete list of countries and years is given in the Appendix Table 1. Appendix Table 2 provides definitions and sources for each of the variables in our estimations.

The matrix X in Eq. (15) refers to a set of variables that the literature has found to be related to fiscal capacity. In all estimations we control for the size of the economy, defined as the log of GDP in constant US dollars, and the level of economic development, as measured by per capita GDP. These variables are included on the grounds that fiscal sector development entails fixed costs that become less important the larger the size of the economy and the richer the country. Also, GDP per capita can proxy for the quality of legal institutions in the country, which have been shown to have a positive impact on revenue collection. In all models, we also control for inflation, measured as the annual percentage change in the GDP deflator.

Current and capital account openness have also been found to have a positive effect on government revenue. Following Gupta *et al* (2009), we include two variables to control for the degree of capital and current account openness. First, we include a dummy for the presence of dual exchange rate regimes — a measure of capital account restrictions. Second, the ratio of imports and exports to GDP proxies for current account openness. Finally, the EFI variable represents the economic freedom index.

We first examine the link between state capacity and conflict by running estimations with country and time fixed effects to control for unobserved country characteristics and for common shocks and trends across countries. These estimations should help lessen concerns about endogeneity due to relevant omitted factors. Also, to reduce concerns about reverse causality we lag all regressors in our estimations.

To address the potential bias due to reverse causality, we conduct estimations using two lagged values of the regressors as instruments in a GMM dynamic framework à la

Arellano and Bover (1995). In particular, Eqs. (16) and (17) , are estimated as part of the dynamic system GMM estimates

$$TAX_{it} = \alpha_0 + \sigma TAX_{i,t-1} + \alpha_1 C_{it} + \beta' X_{it} + \delta' Dt + \mu_{it} \quad (16)$$

$$TAX_{it} - TAX_{i,t-1} = \alpha_0 + \sigma(TAX_{i,t-1} - TAX_{i,t-2}) + \alpha_1 C_{it} + \beta'(X_{it} - X_{i,t-1}) + \delta' Dt + (\mu_{it} - \mu_{i,t-1}) \quad (17)$$

In Eqs. (16) and (17), the use of instruments is required to deal with the likely endogeneity of the explanatory variables and with the fact that in both equations the error term is correlated with the lagged dependent variable.

While using lagged values of the regressors as instruments can help deal with the problem of reverse causality, it does not address biases arising due to measurement error, since lagged values of the regressors are likely to suffer from this problem as well. Therefore, we also estimate Instrumental Variables (IV) estimations where we use external as opposed to internal instruments. In particular, we use two-period lagged economic conditions such as GDP per capita and inflation. Given space constraints, these results are not presented here but are available from the authors upon request.

4. Estimation Results

We now proceed to test our model on a sample of 79 countries. The choice of countries is strictly determined by the availability of consistent data on all the variables. We consider five types of variables in the estimation process: the fiscal variable, conflict variable, control variables, governance indicators, and other explanatory variables. The analysis uses a panel data set with data averaged over 5-year periods from 1980 to 2010. The averaging of the data helps to reduce the possibility of short-run cyclical movements affecting the results.

The CONFLICT variable refers to the use of armed force between two parties, of which at least one is the government of a state, resulting in at least 25 battle-related deaths. Fifty-one countries in the sample are categorized as conflict countries. Depending on the intensity of the conflict, we allow for three conflict categories: Low, Medium, and High corresponding to the alpha-numeric ranking 1, 2, and 3, respectively. From our sample, 29 per cent of countries are high conflict nations, 22 per cent medium conflict, and 14 per cent low conflict countries. The remaining 35 per cent of the sample include countries with no conflict. These countries are assigned a rank of zero.

A number of control variables are used in the models. The rationale for using per capita GDP as one of the control variables is straightforward: richer nations tend to have better scores in governance indicators, and to have more solid and mature fiscal institutions.

The indicators of economic freedom capture the likely impact of governance in the context of risk and prudential regulation prevailing in that country. They not only show how governments are elected, monitored and replaced, but also their capacity to formulate and implement public policies effectively as well as the attitude of the electorate and their representatives toward the institutions that govern economic, political, and social interactions.

Thirty three countries in the sample are from Africa. An African dummy variable is therefore used to capture adverse geographical, neighborhood, and conflict effects. First, to set the stage, the 51 conflict-prone countries in the sample are ranked by the intensity of the CONFLICT variable. State capacity, TAX, is inversely related to CONFLICT across the three groups shown in Table 2. The asterisk next to the average TAX variable in the countries with low intensity conflict, 0.257, indicates that this ratio is significantly larger than in the countries with medium conflict intensity (at the 0.05 level in a one-tailed, homoskedastic t-test, i.e., assuming equal variance), as indicated by the t-statistic within parentheses below. The critical t-value is 1.66. Likewise, the average TAX variable for the middle conflict intensity group, 0.142, is significantly larger than in the high conflict intensity countries. The F-value in the bottom line, 10.58, also exceeds the critical value, 2.89, indicating significant differences among the three average values of TAX reported (at the 0.05 level). Thus countries with high conflict intensity tend to be associated with lower average values for state capacity, TAX. In fact, the figure for high conflict economies is nearly a quarter of that for low conflict countries, indicating a significantly lower tax receipts as a proportion of GDP in high conflict countries.

The regression results are presented in Table 3. Each regression equation uses a balanced data set using various years from the sample 1980, 1985, 1990, 1995, 2000, 2005 and 2010. The point estimate and the absolute values of the corresponding t-statistics are reported. The results reported in Column (1) in Table 3 is for a baseline specification, over an extended sample period, that does not control for fixed effects and does not take persistence into account. The estimates show a negative relationship between conflict and tax revenue but it is significant only at the 10 percent level. The signs of the coefficients of the other control variables, except per capita GDP, are statistically significant and have the expected signs.

However, these results should be treated with caution as they may be driven by the omission of initial conditions. These conditions are potential determinants of both contemporaneous fiscal capacity and the probability that a country initially entered a conflict. To address the limitations of OLS regressions, we estimate the effect of conflicts on fiscal capacity in a specification that takes into account country fixed effects and the potential of persistence over time. In particular, we use a dynamic panel data model, which allows us to capture the effect of past fiscal capacity and country fixed effects on current fiscal capacity, while addressing endogeneity problems. This approach also implies that we focus on relatively short run effects of conflicts on a country's fiscal capacity, as only within-country variability is taken advantage of.

Column 2 reports results for the fixed effects specification. To lessen concerns about endogeneity, we have lagged all appropriate regressors by one period. Turning first to variables other than those related to conflict, the pattern of coefficients is broadly as expected. The results are much better than those reported for OLS regressions in Column (1). All the coefficients are statistically significant at least at the 5 percent level. The results confirm that fiscal capacity is positively correlated with a country's size and level of income, but negatively associated with inflation and the adoption of multiple exchange rate regimes.

By introducing country fixed effects and the lag of the dependent variable in the model, Column (2) takes into account the possible effects of initial conditions, a country's level of development, other sources of unobserved time-invariant heterogeneity, and persistence in state capacity. At the same time, the specification is subject to the problems of endogeneity for the lagged dependent variable that are standard in dynamic panel data models (e.g. Arellano and Bond, 1991; Blundell and Bond, 1998). Also, both fiscal capacity and the probability of facing conflicts may be affected by third shocks that are unobserved by us (e.g. political reform). This would introduce additional endogeneity problems, directly related to our variables of interest. Reverse causality is also possible, since current fiscal capacity may affect the probability that a conflict involving the state occurs.

We address these problems by implementing a one-step – dynamic System GMM estimation (Arellano and Bover, 1995; Blundell and Bond, 1998). We consider fiscal variables as a predetermined regressor in our model, and the conflict measure as an endogenous variables, given the possibility of both reverse causality and simultaneity bias. Our instrument for the lagged dependent variable is its own first lag, while we instrument all other endogenous variables with their own second lags in the differenced equation. The results we report correspond to a specification where, say, GDP is considered exogenous, but the effect of conflict on fiscal capacity is not changed if inflation is considered as an

endogenous variable; however, in the latter case instrument proliferation impedes an appropriate evaluation of the joint exogeneity of instruments. It should be noted, in any case, that the causality from fiscal capacity to GDP should materialize mainly in the long run; given that we control for country fixed effects, and thus focus on within country variability, declaring GDP as exogenous in the present setting is not implausible (Cardenas *et al* 2010).

It is worth mentioning that the System GMM estimator requires that the first differenced instruments used for the variables in levels be uncorrelated with the unobserved country effects. We make this assumption in all our estimations. That is, we assume that the first differences of both our lagged values of fiscal capacity and contemporaneous values of conflict are uncorrelated with any country-specific characteristics. While the levels of conflict and fiscal capacity must be correlated with country fixed effects, it seems plausible to assume that changes in these dimensions do not reflect fixed characteristics of countries.

The estimates of the system GMM are, in principle, fully consistent. The diagnostics are satisfactory: the Arelano and Bond (1991) tests for first and second order serial correlation in the differenced equation suggest that, consistent with the underlying assumptions, the former is present but the latter is not; and the Hansen statistics seems tolerable. Strikingly, conflict now emerges as both substantially larger and more significant.

For the GMM estimates, the Table reports serial correlation tests, a Sargan test, and a Difference Sargan test. The serial correlation tests are used to examine the null hypothesis of no first-order serial correlation and no second-order serial correlation, respectively, in residuals in first-differences. Given the errors in level being serially uncorrelated, we would expect to find significant first-order serial correlation, but no significant second-order correlation in the first-differenced residuals. The Sargan test of over-identifying restrictions is used to examine the overall validity of the instruments by comparing the sample moment conditions with their population analog. The Difference Sargan Test, proposed by Blundell and Bond (1998) , is used to test the null hypothesis that the lagged differences of the explanatory variables are uncorrelated with the errors in the levels equations.

The GMM estimate provides strong evidence that the reduction in conflict is associated with increased tax receipts of the government, and the diagnostic tests, including the first-order and second-order serial correlation tests, Sargan test, and the Difference Sargan test, are supportive. In general, the coefficients on the GDP growth, per-capita GDP, and EFI are positively signed, while the coefficients on inflation, multiple

exchange rate regime, trade are negatively signed. The interaction term of Africa and conflict is also negative.

5. Sensitivity and Robustness

The robustness tests include the following dimensions: the use of spline regressions, and the reduction of the instruments set.

Spline regression: By using spline regressions, the paper further analyzes nonlinearities with respect to the tax revenue and conflict. A spline specification with two breaks allows for the effect of tax revenue to be different at low, medium, and high levels of tax revenue and for low, medium, and high levels of economic freedom (see Cordella et al., 2009). The results confirm the absence of nonlinearities with respect to the tax revenue.

Instruments set: The robustness of the initial results are also checked using different lags of the instruments for the lagged dependent variable as well as other endogenous variables in the differenced equation. There are no qualitative changes in the result thus confirming the robustness of the findings.

6. Long run impact multipliers

In order to analyze the effect of a change in each explanatory variable on TAX, the comparative statics method described in Chowdhury (2001) is utilized to calculate long run impact multipliers. These multipliers measure the change in endogenous variables in the long run given a unit change in the explanatory variable and are reported in Table 4. Table 5 summarizes the ranking of the variables considered so far. The values suggest that in our sample countries conflict, economic freedom indicator, and GDP have a significant adverse effect on fiscal depth.

The presence of CONFLICT is found to be extremely costly in terms of a long-run reduction in fiscal capacity. The presence of high intensity conflict is, for example, responsible for a long-run reduction in state capacity, as measured by the tax/GDP ratio of 1.12 per cent. The corresponding reduction in countries with medium and low intensity conflict are 1.04 and 0.91 per cent, respectively. More interestingly, a reduction in the intensity of conflict from high to medium would lead to a 7.7 per cent drop in the reduction in tax receipts due to conflict. A similar shift from a medium to low intensity conflict would lead to a 14.3 per cent drop in the reduction in tax receipts caused by conflict. Hence any policy measures that would reduce the intensity of conflict would go a long way to enhancing the revenue capability in the developing countries.

Among the variables considered, the presence of conflict, in the countries with high intensity conflict, has the highest long-run adverse effect on state capacity. In high intensity

conflict countries, economic freedom indicators and inflation follow conflict in their adverse effect on state capacity. A worsening of the economic freedom indicators reduces state capacity by 1.04 per cent while a similar worsening in the inflation rate leads to a 0.88 per cent reduction.

Interesting results are found in the medium and low conflict intensity countries. The CONFLICT variable is no longer the largest contributor to the long-run adverse impact on state capacity. In both groups of countries, the CONFLICT variable follows EFI and GDP in its effect on the state capacity. The net impact on tax receipts of each of these variables are smaller in magnitude than the results for the high conflict intensity countries. This confirms our previous findings that the more intense the conflict, the higher will be the magnitude of the adverse effect that other variables have on state capacity.

Overall, the value of the multipliers from the countries with no conflict (last column in Table 4) are smaller in magnitude than those from the conflict-prone countries. EFI, GDP and Inflation have the highest long-run adverse effects on depth. The EFI variable leads the list with a value of 21.84 per cent and is followed by the GDP at 1.25 per cent.

7. Additional Estimation

We have also run a number of GMM systems with various permutation of the variables. In Tables 6 and 7, we report some of the results. The other regressions (not reported) support the general conclusions shown in Tables 6 and 7.

POLITY variable - Alternative Measures of Democracy: To test the robustness of our results to different measures of political democracy across different estimation techniques, we replaced the Fraser Institute's EFI variable in regressions from Table 3 with two different alternatives, and reran these specifications using several different panel-data estimation methods. The first is the Polity index, which ranges from -10 (full autocracy) to +10 (full democracy). The second is a measure of democracy taken from Isham *et al* (1997) using a composite of indicators of the effectiveness of the legislature vis-a-vis the executive, the competitiveness of the political nominating process, and freedom of group opposition (each of which are scored from one to three). The Polity and Banks measures are both rescaled to yield indicators that range from zero to one. We reran regressions in Table 3 using a generalized method of moments (GMM) estimator. All results are consistent with our previous findings.

Table 6 starts with the base system GMM equation in column 1. This is the same equation from Table 3 from the paper and used for comparison purposes only. In Column 2, we have

re-estimated the GMM equation replacing the EFI variable with the POLITY variable. The Polity variable is positive and statistically significant showing that democracy leads to higher tax capacity. All other variables retain their signs and statistical significance. Conflict has a statistically significant and negative impact on tax capacity (Tax revenue/GDP ratio).

Political Repression variable - This represents the political terror scale. We replaced the conflict variable with the Political Repression variable (1-5 scale with higher numbers reflecting more terror/repression). The results are very promising. We have run a number of GMM estimations using the political repression variable and its impact on state capacity. The results consistently show that higher political repression reduces tax revenue and state capacity. In column 3 of Table 6, the results are given. Political repression has a negative and statistically significant impact on state capacity as measured by Tax revenue/GDP ratio. Other variables are significant and have the expected signs. When we replaced the EFI with Polity and ran the same estimation (results not reported here), the results didn't change qualitatively.

President Dummy - In Table 7, we re-estimated the GMM system with President dummy. Countries with presidential system set to 1 and countries with parliamentary system set to 0. However, the results showed that the president dummy variable was negative but statistically insignificant. We tried a number of different permutations of the model but the presidential dummy variable was never significant.

Cold War: The end of the Cold War, marked by the collapse of the Soviet Union in 1991, had a dramatic effect on the general level of armed conflict in the global system. The levels of both interstate and societal warfare declined dramatically through the 1990s and this trend continues in the early 2000s, falling over 60% from their peak levels. In order to statistically test this impact, we have re-run the GMM estimates for two sample periods – Cold War 1980-1990 (reported in Table 8) and post-Cold War 1995-2010 (Table 9). We have used EFI or POLITY; and CONFLICT or Political Repression as independent variables. Different combinations of variables were tried. The GMM results didn't change much.

However, interesting results occurs when we calculate the long run multipliers – the various intensity of conflict are more significant and have greater impact on tax revenue/GDP during the Cold War period than in post-Cold War period. Conflict has lost some of its adverse impact on state capacity after the cold war ended. The introduction of the Presidential Dummy variable still doesn't make the variable statistically significant in either the Cold War or post-Cold War period.

Inter versus intra-state conflict: Next we divide the conflict variable into inter and intra-state (civil war) conflict. The results (reported in Table 10) are much stronger for the intra-state conflict variable. Conflict has a greater negative impact on state's fiscal capacity under civil war than with inter-state conflict as measured by the tax/GDP ratio. The introduction of the Polity and Political Repression variables in Table 10 (not reported here) do not qualitatively change the overall results. War may no longer contribute to state building, but ultimately Charles Tilly may have rightly discerned that state building remains a quasi-criminal activity; a process which may not require the development of fiscal capacity as long as other avenues of coercing resources remain open to those who govern.

Ethnicity: We now see the impact of ethnicity on the state's fiscal capacity by including an index of ethno-linguistic fragmentation. Ethnic fragmentation may have an independent negative impact on tax capacity besides being a cause of civil war. Therefore, we look at its independent effect, as well as interacting the variable with Conflict. This is because we have civil war as an independent variable, and the information contained in civil war already contains information on ethnic division as a cause of war.

The Fractionalization dataset was compiled by Alberto Alesina and associates, and measures the degree of ethnic, linguistic and religious heterogeneity in various countries. In other words, it measures the probability that two randomly selected individuals from a country are from different ethno-linguistic groups. The dataset was used in Alesina et al. (2003) to test the effects of fractionalization on the quality of institutions and economic growth. This measure of ethnic fragmentation takes into account not only language but also racial characteristics (ethnicity) and religion. The indices are computed as one minus the Herfindahl index of group shares. Data on the ethnicity indices are taken from the *Macro Data Guide* website.

The results are shown in Table 11. The base GMM equation from Tables 3 and 7 is reproduced in column 1. The impact of ethnicity as well as the interaction of ethnicity and conflict variable are shown in column 2 in Table 11. The results show that the Ethnicity variable is statistically insignificant. The interaction term, though positive, is also statistically insignificant. In column 3, the ethnicity equation is re-estimated after dropping both the conflict and the ethnicity/conflict interaction variable. Now the ethnicity variable turns out to be negative and statistically significant.

Oil and Gas Exporter Dummy: We now add an oil and gas exporter dummy to the base model. This dummy is also taken independently as well as interacted with the Conflict variable. The conflict variable is dropped from the two estimated equations reported in

column 4 and 5 in Table 11. The Oil/Gas Dummy has a statistically significant negative impact. The interaction terms is also negative and statistically significant. Oil exporting countries appear to depend less on domestic resource mobilization. When the equation is re-estimated by dropping both the Conflict and the interaction of the Dummy and Conflict variable, the Oil/Gas Dummy variable gains in both magnitude and significance.

Foreign Aid: Finally, the base equation is re-estimated by adding a Foreign Aid variable. Data on Foreign Aid is taken from the OECD/DAC database. The resulting estimates are given in Table 12. The Foreign Aid variable is negative and statistically significant. This supports the view that inflow of Foreign Aid tends to replace the fiscal capacity of the state.

8. Conclusions

In this paper we examine the role of war in retarding state fiscal capacity in developing countries, measured by tax revenue ratios to GDP. We build a simple theoretical model of a factionalized state, where patronage substitutes for common interest public goods, along with the possibility of violent contestation over a rent or prize, typically in the form of natural resource revenues. Our dynamic panel empirical analysis on the determinants of fiscal capacity is applied to 79 developing countries, during 1980-2010. Results indicate that war, especially in its current dominant form of civil war, retards fiscal capacity, along with imperfect democracy, political repression, the quality of governance and macroeconomic mismanagement. High intensity conflict is particularly destructive of state capacity. Countries experiencing low intensity wars, other institutional factors may matter more for fiscal capacity formation compared to war. The diminution of state capacity due to war appears less pronounced after the end of the cold war.

Nations receiving more external development assistance and those countries who rely more on oil and gas exports have less incentives to develop fiscal (tax) capacity. This finding has similarities to Ross (2003), who finds a negative impact of oil and gas abundance on democratic development. Oil and gas endowments can also be a major cause of outright conflict as our theoretical model suggests. Greater ethnic fractionalization also retards fiscal capacity, perhaps because of a diminished interest in common interest public goods as also suggested by our theoretical model.

The findings have important policy implications for a large number of countries that have faced various forms of civil unrest and armed rebellion. First, measures to reduce conflict are not only desirable from a humanitarian perspective, they also have positive effects on economic development. Therefore the prevention and resolution of conflict—

through democratization, better peace-keeping, and broad-based reconstruction—need more support from the international community. Second, it follows that revenue-enhancing reform will have more positive effects when complemented by conflict-reducing measures. The benefits of reform to the countries themselves will be higher, and the effectiveness of aid in support of such reform will also be greater. Third, while it is highly desirable to eliminate conflict entirely—from both humanitarian and economic-development perspectives—we have shown that there are still substantial gains from the more modest objective of lowering the level of conflict (from either high intensity to medium intensity, or from medium intensity to low intensity). This is encouraging given the longstanding and complex nature of many conflicts in poor countries, and the time and effort which is often required to achieve complete peace.

We find that civil war does not promote the fiscal capacity of the state in contemporary developing countries unlike the findings of Charles Tilly for inter-state war in European history. This may be attributable to the destructive influence of civil war on political and economic institutions, as well as the possibility that civil war further retards the development of common interest public goods. Ultimately, however, Charles Tilly may have got it right---state building remains a quasi-criminal activity; a process which may not require the development of fiscal capacity as long as alternative avenues of coercive resources remain open to those who govern.

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Appendix

The sample includes the following 79 countries. The letter 'c' within parentheses besides a country denotes the countries with conflict.

African countries

Algeria (c)	Ghana	Rwanda (c)
Angola (c)	Guinea-Bissau (c)	Senegal (c)
Burkina Faso	Kenya	Sierra Leone (c)
Burundi (c)	Lesotho (c)	Somalia (c)
Cameroon (c)	Liberia (c)	South Africa (c)
Chad (c)	Malawi	Sudan (c)
Congo, Dem. Rep. (c)	Mali (c)	Tanzania
Congo, Rep. of (c)	Morocco	Togo
Côte d'Ivoire	Mozambique (c)	Tunisia (c)
Eritrea (c)	Niger (c)	Uganda (c)
Ethiopia (c)	Nigeria	Zambia

Non-African countries

Argentina	Guatemala (c)	Mexico
Azerbaijan (c)	Haiti (c)	Myanmar (c)
Bangladesh	Honduras	Nepal (c)
Bolivia	India (c)	Nicaragua (c)
Bosnia and Herzegovina (c)	Indonesia (c)	Pakistan (c)
Brazil	Iran (c)	Paraguay
Cambodia (c)	Iraq (c)	Peru (c)
Chile	Israel (c)	Philippines (c)
Colombia (c)	Jamaica	Singapore
Costa Rica	Laos (c)	Sri Lanka (c)
Croatia (c)	Lebanon (c)	Thailand
Dominican Republic	Libya (c)	Uruguay
Ecuador	Macedonia (c)	Venezuela (c)
Egypt (c)	Madagascar	Yemen (c)
El Salvador (c)	Malaysia	
Georgia (c)	Maldives	

Variables and Data Source:

Observations in the panel dataset used in the study are collected for all 79 countries for which data were available for the 1980-2010 period. The data is averaged over 5-year periods in order to generate balanced regression equations. The periods are 1981-1985, 1986-1990, 1991-1995, 1996-2000, 2001-2005, and 2006-2010.

Data Source:

Per capita GDP (constant US dollar, 2000): World Development Indicators

GDP constant US dollar, 2000: World Development Indicators

Trade openness ((import+export)/GDP): World Development Indicators

Dual Exchange market dummy: Annual report on exchange/arrangements, and exchange restrictions, IMF

Economic Freedom Indicator: Gwartney, Lawson, and Block (1996) were among the first to systematically quantify in each country those tangible characteristics reflecting various aspects of these basic categories of economic freedoms and aggregate them into a single index of economic freedom, herein referred to as the EFI. Appendix A contains a list from Gwartney and Lawson (2011) of the specific measures of institutional characteristics that comprise the EFI. This index has been created for over 120 countries and has been updated every five years starting in 1975, and then annually starting in 2000. The EFI value for each country ranges from 1.0 (the least economic freedoms) to 10.0 (the greatest economic freedoms). Many studies using this index have found empirical support for the argument that societies adopting institutions that retain higher levels of economic freedoms have achieved higher levels of economic growth (for a thorough survey, see Berggren, 2003).

The Economic Freedom of the World Index (EFI) was designed by James Gwartney and Robert Lawson and is published periodically (annually since the year 2000) by the Fraser Institute. The index ranges from 1 (the least amount of economic freedom) to 10 (the highest amount of economic freedom). The latest index was published in 2003 and can be found at: www.freetheworld.com/. Gwartney and Lawson use empirically observed values from within these seven categories to derive an index representing a relative measure of economic freedom. The following is an abbreviated description of the five major components and their respective subcomponents that are used to derive the EFI.

1. Size of a country's government (relative to the whole economy):
 - a. Expenditures as a percentage of total consumption
 - b. Transfers and subsidies as a percentage of GDP
 - c. Government enterprises and investment as a percent of total investment
 - d. Top marginal income tax rate

2. The country's legal structure (rule of law) and security of property rights:
 - a. Evidence of judicial independence
 - b. Evidence of impartial courts
 - c. Protection of intellectual property
 - d. Military interference in the rule of law
 - e. Integrity of the legal system

3. Access to sound money:
 - a. Average annual growth rate of money supply less average growth rate of GDP
 - b. Inflation rate
 - c. Inflation rate variability
 - d. Freedom to own foreign currency

4. Freedom to trade internationally:

- a. Taxes on international trade
- b. Regulatory trade barriers
- c. Actual versus expected size of the of trade sector of the economy
- d. Difference between official and actual currency exchange rates
- e. Extent of international capital market controls

5. Regulation of credit, labor, and business:

- a. Credit market regulations: interest rate controls, privatization of banks, etc.
- b. Labor market regulations: wage restrictions, hiring/firing restrictions, military conscription, etc.
- c. Business regulations: price controls, licensing restrictions, etc.

The Uppsala Conflict Data Program (UCDP) has recorded ongoing violent conflicts since the 1970s. The data provided is one of the most accurate and well-used data-sources on global armed conflicts and its definition of armed conflict is becoming a standard in how conflicts are systematically defined and studied. Data source: Themnér, Lotta & Peter Wallensteen, (2011), and updated using data from *The Uppsala Conflict Data Program (UCDP)* http://www.pcr.uu.se/research/ucdp/datasets/ucdp_prio_armed_conflict_dataset/

Conflict

Low intensity armed conflict: at least 25 battle-related deaths per year and fewer than 1000 battle-related deaths during the course of the conflict.

Medium intensity armed conflict: at least 25 battle related deaths per year and an accumulated total of at least 1000 deaths, but fewer than 1000 deaths per year.

High intensity armed conflict: at least 1000 battle-related deaths per year.

Political Repression: The Political Terror Scale (PTS) measures levels of political violence and terror that a country experiences in a particular year based on a 5-level “terror scale” originally developed by Freedom House. The data used in compiling this index comes from two different sources: the yearly country reports of Amnesty International and the U.S. State Department Country Reports on Human Rights Practices.

Political Terror Scale

Level 5: Terror has expanded to the whole population. The leaders of these societies place no limits on the means or thoroughness with which they pursue personal or ideological goals.

Level 4: Civil and political rights violations have expanded to large numbers of the population. Murders, disappearances, and torture are a common part of life. In spite of its generality, on this level terror affects those who interest themselves in politics or ideas.

Level 3: There is extensive political imprisonment, or a recent history of such imprisonment. Execution or other political murders and brutality may be common. Unlimited detention, with or without a trial, for political views is accepted.

Level 2: There is limited amount of imprisonment for nonviolent political activity. However, few persons are affected, torture and beatings are exceptional. Political murder is rare.

Level 1: Countries under a secure rule of law, people are not imprisoned for their views, and torture is rare or exceptional. Political murders are extremely rare.

Source: www.politicalterroryscale.org

Fractionalization:

The Fractionalization dataset was compiled by Alberto Alesina and associates (see Alesina et al (2003)), and measures the degree of ethnic, linguistic and religious heterogeneity in various countries. This measure of ethnic fragmentation is a broad classification of groups taking into account not only language but also racial characteristics (ethnicity) and religion. The indices are computed as one minus the Herfindahl index of group shares.

<http://www.nsd.uib.no/macrodatabguide/set.html?id=16&sub=1>

Foreign Aid:

Data on the flow of foreign aid is taken from the OECD/DAC database

<http://www.oecd.org/dac/stats/statisticsonresourceflowstodevelopingcountries.htm>

The Development Assistance Committee (DAC) publishes statistics and reports on aid and other resource flows to developing countries, based principally on reporting by DAC Members, multilateral organisations and other donors. The data are collected via two reporting systems:

- The **DAC aggregates** on aid, other official flows and private flows, including a breakdown on type of aid extended, geographical distribution, sectoral breakdown and tying status of aid.

- The **Creditor Reporting System** (CRS) aid activity database, which contains detailed quantitative and descriptive data on individual aid projects and programmes. CRS data are used to analyse the sectoral and geographical breakdown of aid for selected years and donors, to examine aid that promotes specific policy objectives (gender equality, environmental sustainability, untying, aid for trade) and to monitor donors' compliance with various international recommendations in the field of development co-operation.

Oil/Gas Exporting countries:

The list of oil and gas exporting countries is taken from the database of the International Energy Agency (IEA)

<http://www.iea.org/>

Table 2

The Tax Revenue (TAX) variable and countries with different conflict intensity (n=51)

<u>Level of Conflict Intensity</u>	<u>Tax Revenue (TAX)</u>	<u>No. of Countries</u>
Low [1]	0.257* (2.66)	11
Medium [2]	0.142* (2.35)	17
High [3]	0.065* (2.02)	23
F-value	10.58*	

Note: An asterisk * next to the TAX variable indicates that the average value is significantly different from the average value shown next below, at the 5 percent level. The figures in parentheses () show the t-statistics which are all significant at least at the 5 percent level. An asterisk next to the F-value shows that it exceeds the critical value, which is 3.1 in this case. Figures in [] next to each level of conflict intensity show the number used to measure that particular level of intensity in the data set.

Table 3
Estimation Results

<u>Variable</u>	<u>Cross Section</u>	<u>Fixed Effects</u>	<u>System GMM</u>
Constant	3.66 (2.90)	8.54 (5.33)	12.24 (6.20)
Conflict	-0.08 (0.98)	-1.54 (4.90)	-1.84 (5.63)
Log(GDP PC)	0.11 (1.65)	0.85 (3.26)	0.54 (3.74)
Log(GDP)	0.10 (0.88)	0.46 (2.19)	0.78 (2.94)
Inflation	-1.13 (4.24)	-1.69 (3.77)	-1.20 (4.12)
Dual Ex Rate	3.62 (1.21)	-1.64 (4.20)	-1.33 (4.59)
Trade	0.088 (2.06)	-0.67 (2.69)	-0.49 (3.23)
EFI	1.48 (5.62)	3.72 (6.80)	3.90 (7.42)]
Africa*Conflict		-0.18 (2.45)	-0.08 (2.00)
1 st order Serial Corr. (p-value)		0.412	0.06
2 nd order Serial Corr. (p-value)			0.43
Years Indicator		Yes	Yes
Country Fixed Effect		Yes	Yes
AR(1) p-value			0.014
AR(2) p-value			0.336
Hansen test for Overidentifying restrictions (p-value)			14.68 (0.18)
Sargan Test (p-value)			0.26
Difference Sargan Test (p-value)			0.24
Number of countries	79	79	79
Number of observations	528	514	510

- *Figures in parentheses after the coefficient estimates are the absolute values of the t-statistics.*

Table 4

Effect of Long-run Impact Multipliers on Tax Revenue (TAX)

<u>Variables</u>	<u>Intensity of Conflict</u>			<u>No Conflict</u>
	<u>High</u>	<u>Medium</u>	<u>Low</u>	
Conflict	1.12	1.19	0.91	-----
GDP	0.68	1.40	1.05	1.25
Inflation	0.88	0.90	0.86	0.77
EFI	1.04	1.65	1.20	1.84

Note: The figures represent the percentage change in financial development due to a unit change in each of the explanatory variables

Table 5

Ranking of Variables in order of long run impact on financial development

	<u>Intensity of Conflict</u>			<u>No Conflict</u>
	<u>High</u>	<u>Medium</u>	<u>Low</u>	
Conflict	EFI	EFI	EFI	EFI
EFI	GDP	GDP	GDP	GDP
Inflation	Conflict	Conflict	Conflict	Inflation
GDP	Inflation	Inflation	Inflation	

Table 6
System GMM Estimation Results

<u>Variable</u>	<u>Base Equation</u>	<u>Column 2</u>	<u>Column 3</u>
Constant	12.24 (6.20)	11.16 (5.10)	8.70 (3.62)
Conflict	-1.84 (5.63)	-1.24 (4.12)	----
Log(GDP PC)	0.54 (3.74)	0.19 (2.66)	0.60 (8.32)
Log(GDP)	0.78 (2.94)	1.14 (3.17)	1.32 (6.14)
Inflation	-1.20 (4.12)	-0.66 (2.11)	-0.15 (1.60)
Dual Ex Rate	-1.33 (4.59)	-1.08 (1.99)	-0.78 (3.76)
Trade	-0.49 (3.23)	-1.25 (3.16)	-0.88 (2.94)
EFI	3.90 (7.42))	-----	2.78 (6.44)
Africa*Conflict	-0.08 (2.00)	-0.06 (2.44)	-0.63 (4.99)
POLITY		1.60 (3.74)	----
Political Repression			-2.15 (5.97)
1 st order Serial Corr. (p-value)	0.06	0.10	0.18
2 nd order Serial Corr. (p-value)	0.43	0.76	0.84
Years Indicator	Yes	Yes	Yes
Country Fixed Effect	Yes	Yes	Yes
AR(1) p-value	0.014	0.023	0.114
AR(2) p-value	0.336	0.166	0.186
Hansen test for	14.68 (0.18)	24.10 (0.34)	22.18 (0.30)
Overidentifying restrictions (p-value)			
Sargan Test (p-value)	0.26	0.34	0.38
Difference Sargan Test (p-value)	0.24	0.36	0.24
Number of countries	79	79	76
Number of observations	510	510	484

- *Figures in parentheses after the coefficient estimates are the absolute values of the t-statistics.*

Table 7
System GMM Estimation Results

<u>Variable</u>	<u>Base Equation</u>	<u>Column 2</u>	<u>Column 3</u>
Constant	12.24 (6.20)	8.23 (5.11)	9.60 (6.12)
Conflict	-1.84 (5.63)	-1.24 (4.66)	-----
Log(GDP PC)	0.54 (3.74)	0.22 (3.88)	0.66 (3.90)
log(GDP)	0.78 (2.94)	1.30 (3.26)	2.11 (5.12)
Inflation	-1.20 (4.12)	-0.88 (3.55)	-1.16 (4.20)
Dual Ex Rate	-1.33 (4.59)	-1.70 (5.90)	-0.86 (4.10)
Trade	-0.49 (3.23)	-1.65 (4.58)	-0.68 (3.24)
EFI	3.90 (7.42)	4.77 (8.44)	-----
Africa*Conflict	-0.08 (2.00)	-0.74 (3.22)	-1.19 (4.16)
POLITY	-----	-----	3.12 (6.80)
Political Repression	-----	-----	
President dummy	-----	-0.39 (1.23)	-0.09 (1.06)
1 st order Serial Corr. (p-value)	0.06	0.12	0.09
2 nd order Serial Corr. (p-value)	0.43	0.16	0.17
Years Indicator	Yes	Yes	Yes
Country Fixed Effect	Yes	Yes	Yes
AR(1) p-value	0.014	0.022	0.018
AR(2) p-value	0.336	0.241	0.187
Hansen test for Overidentifying restrictions (p-value)	14.68 (0.18)	12.20 (0.16)	10.65 (0.14)
Sargan Test (p-value)	0.26	0.18	0.18
Difference Sargan Test (p-value)	0.24	0.14	0.13
Number of countries	79	79	76
Number of observations	510	510	484

- *Figures in parentheses after the coefficient estimates are the absolute values of the t-statistics.*

Table 8: System GMM Estimation: Cold War Period 1980-1990

<u>Variable</u>	<u>Column 1</u>	<u>Column 2</u>	<u>Column 3</u>	<u>Column 4</u>
Constant	3.24 (4.14)	4.92 (5.10)	3.22 (2.90)	4.10 (3.88)
Conflict	-3.68 (4.55)	-4.34 (4.80)	-----	-----
Log (GDP PC)	0.84 (2.40)	1.26 (3.13)	1.07 (3.20)	0.98 (2.34)
Log (GDP)	0.36 (2.10)	0.47 (2.48)	0.65 (2.98)	0.32 (2.33)
Inflation	-0.88 (1.98)	-1.18 (2.44)	-1.13 (2.10)	-0.68 (3.00)
Dual Ex Rate	-3.80 (4.49)	-3.57 (6.10)	-3.28 (4.87)	-2.10 (4.29)
Trade	-1.15 (3.77)	-0.74 (3.99)	-0.88 (3.20)	-0.98 (3.11)
EFI	2.48 (7.10)	-----	1.55 (4.40)	-----
Africa*Conflict	-0.26 (3.77)	-0.58 (4.57)	-----	-----
POLITY	-----	1.76 (7.44)	-----	1.30 (3.48)
Political Repression	----	-----	-2.46 (5.55)	-3.87 (7.43)
# of Countries	79	79	76	76
# of observation	235	235	225	225

Table 9: System GMM Estimation: Post-Cold War Period 1990-2010

<u>Variable</u>	<u>Column 1</u>	<u>Column 2</u>	<u>Column 3</u>	<u>Column 4</u>
Constant	2.15 (2.88)	4.14 (3.10)	4.33 (4.16)	3.77 (4.72)
Conflict	-1.57 (2.87)	-1.76 (2.63)	-----	-----
Log (GDP PC)	1.18 (4.33)	2.84 (4.19)	1.86 (3.20)	2.28 (4.27)
Log (GDP)	2.65 (4.88)	4.17 (7.54)	3.10 (5.28)	365 (4.82)
Inflation	-1.77 (3.86)	-0.76 (2.90)	-1.05 (4.66)	-1.00 (3.76)
Dual Ex Rate	-3.24 (5.88)	-2.85 (5.77)	-3.19 (5.50)	-2.65 (4.38)
Trade	-1.23 (3.10)	-1.65 (3.38)	-1.09 (4.34)	-1.88 (4.98)
EFI	1.38 (2.55)	-----	1.09 (2.07)	-----
Africa*Conflict	-1.15 (3.99)	-2.09 (4.38)	-----	-----
POLITY	-----	2.86 (6.83)	-----	3.22 (7.40)
Political Repression	----	-----	-1.55 (3.88)	-1.38 (2.39)
# of Countries	79	79	76	76
# of observation	314	314	304	304

Table 10: System GMM Estimation: Intra versus Inter-state conflict

<u>Variable</u>	<u>Intra-state</u>	<u>Inter-state</u>
Constant	1.84 (3.15)	2.20 (3.44)
Conflict	-2.45 (4.18)	-0.36 (2.15)
Log (GDP PC)	0.96 (5.14)	1.14 (5.36)
Log (GDP)	1.11 (3.02)	0.68 (1.98)
Inflation	-0.48 (1.94)	-0.04 (1.47)
Dual Exch Rate	-1.20 (2.36)	-2.44 (2.90)
Trade	-0.15 (1.77)	-0.97 (1.53)
EFI	2.46 (5.80)	1.90 (3.77)
Africa*Conflict	-1.49 (3.60)	-1.74 (2.48)
# of Countries	25	42
# of observation		

Table 11
System GMM Estimation Results: Ethnicity & Oil and Gas Exporter Dummy

<u>Variable</u>	<u>Base Equation</u>	<u>Ethnicity</u>	<u>Ethnicity</u>	<u>Oil/Gas</u>	<u>Oil/Gas</u>
Constant	12.24 (6.20)	6.22 (3.45)	7.15 (3.91)	4.70 (2.56)	3.66 (2.90)
Conflict	-1.84 (5.63)	---	---	---	---
Log(GDP PC)	0.54 (3.74)	0.45 (2.68)	0.64 (3.14)	0.31 (2.96)	0.70 (3.03)
log(GDP)	0.78 (2.94)	2.44 (5.34)	1.80 (3.96)	1.98 (5.76)	1.04 (3.80)
Inflation	-1.20 (4.12)	-0.65 (2.65)	-1.02 (4.40)	-1.50 (3.70)	-1.94 (3.70)
Dual Ex Rate	-1.33 (4.59)	-0.87 (3.90)	-1.15 (4.16)	-1.12 (4.39)	-1.35 (3.66)
Trade	-0.49 (3.23)	-1.54 (4.10)	-0.63 (3.80)	-0.76 (3.87)	-0.85 (2.38)
EFI	3.90 (7.42)	2.35 (5.54)	2.40 (6.60)	2.75 (6.10)	1.80 (4.33)
Ethnicity	---	-0.74 (1.11)	-0.82 (2.04)	---	---
Oil/Gas Dummy	---	---	---	-1.12 (3.46)	-2.64 (4.15)
Africa*Conflict	-0.08 (2.00)	-0.43 (3.72)	-0.36 (2.14)	-0.64 (3.65)	-0.49 (3.04)
Ethnicity*Conflict	---	0.65 (1.45)	---	---	---
Oil/Gas*Conflict	---	---	---	-0.18 (2.35)	---
1 st order Serial Corr.(p-value)	0.06	0.10	0.04	0.10	0.07
2 nd order Serial Corr. (p-value)	0.43	0.22	0.18	0.27	0.34
Years Indicator	Yes	Yes	Yes	Yes	Yes
Country Fixed Effect	Yes	Yes	Yes	Yes	Yes
AR(1) p-value	0.014	0.009	0.008	0.011	0.017
AR(2) p-value	0.336	0.190	0.236	0.202	0.226
Hansen test for	14.68 (0.18)	13.11 (0.17)	12.84 (.12)	9.35 (0.11)	11.14 (0.13)
Overidentifying restrictions (p-value)					
Sargan Test (p-value)	0.26	0.12	0.17	0.12	0.17
Difference Sargan Test (p-value)	0.24	0.19	0.20	0.22	0.22
Number of countries	79	79	79	76	76
Number of observations	510	510	510	480	480

- *Figures in parentheses after the coefficient estimates are the absolute values of the t-statistics.*

Table 12
System GMM Estimation Results: Foreign Aid

<u>Variable</u>	<u>Base Equation</u>	<u>Foreign Aid</u>
Constant	12.24 (6.20)	7.88 (4.14)
Conflict	-1.84 (5.63)	-1.16 (3.84)
Log(GDP PC)	0.54 (3.74)	0.71 (3.18)
log(GDP)	0.78 (2.94)	1.53 (3.17)
Inflation	-1.20 (4.12)	-0.92 (3.36)
Dual Ex Rate	-1.33 (4.59)	-1.94 (5.22)
Trade	-0.49 (3.23)	-0.46 (3.14)
EFI	3.90 (7.42)	2.14 (6.36)
Africa*Conflict	-0.08 (2.00)	-0.36 (2.37)
Foreign Aid	---	-1.99 (4.15)
1 st order Serial Corr. (p-value)	0.06	0.09
2 nd order Serial Corr. (p-value)	0.43	0.36
Years Indicator	Yes	Yes
Country Fixed Effect	Yes	Yes
AR(1) p-value	0.014	0.011
AR(2) p-value	0.336	0.288
Hansen test for Overidentifying restrictions (p-value)	14.68 (0.18)	12.18 (0.17)
Sargan Test (p-value)	0.26	0.19
Difference Sargan Test (p-value)	0.24	0.21
Number of countries	79	79
Number of observations	510	510

- *Figures in parentheses after the coefficient estimates are the absolute values of the t-statistics.*

