# Wars and State Capacity<sup>\*</sup>

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## 1 Introduction

At the heart of state capacity lies the ability to levy taxes to finance public goods and make transfers. A common theme among political and economic historians is the central role of external war in promoting the development of state capacity. Governments who have more power to tax are more likely to win such wars and may also face less opposition from tax payers.<sup>1</sup>

Internal conflicts leading to civil war mainly take the form of insurgencies by rebel groups (see, e.g., Fearon 2007), which again requires the state to devote resources to fighting. How civil conflicts affect investments in state capacity has not received much attention, however, even though such conflicts are in the low income countries of the world.<sup>2</sup>

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<sup>&</sup>lt;sup>1</sup>See, e.g., Brewer (1989), Hoffman and Rosenthal (1997), O'Brien (2005) and Tilly (1990). There is also a large political science literature showing that democracies fight fewer external wars than autocracies (see e.g., Maoz and Russett, 1993), although some authors claim that this "democratic peace" largely reflects that democracies have higher incomes and are more economically intergrated (see e.g., Gartzke, 2007).

<sup>&</sup>lt;sup>2</sup>See Elbadawi and Sambanis (2002) for a review of the empirical work on the incidence of civil wars. A robust finding of this literature is that poor countries are disproportionately involved in civil war, even though the direction of causation is difficult to establish. In a debate over the interpretation of this finding, Fearon and Laitin (2003) see it as reflecting limited state capacity to put down rebellions, while Collier and Hoeffler (2004) see it as reflecting the lower opportunity cost of fighting in low-income economies.

While external war induces a common interest across different groups in society, civil war inherently reflects conflicting interests among groups. This crucial difference is the starting point for our paper. We build on Besley and Persson (2007), who develop a formal model of the state's investment in (legal) capacity to promote markets and (fiscal) capacity to levy taxes. We use a stripped down version of that model to analyze the difference between internal and external conflict.

The next section lays out our model, where a government investing in the fiscal system can levy more taxes in the future. Section 3 studies optimal tax and spending decisions, and derives predictions about the two types of conflict and investments in fiscal capacity. Section 4 takes a preliminary look at the data, and Section 5 offers a few concluding comments.

## 2 Model

**Basics** There are two periods s = 1, 2. Private consumption takes place in both periods, but consumers cannot save. The preferences of all agents are linear in private consumption, as well as in government spending.

In each period, the government makes taxing and spending decisions. In addition, the period-1 government invests in fiscal capacity, assuming that the world ends in period 2. This simple dynamic framework captures the essentials of a representative time period within a fully specified dynamic model.

There are two groups, J = A, B, which make up shares  $\beta^A, \beta^B$  of the population. Group membership is determined by some attribute observable by everybody, including the government. All agents within groups have identical income levels denoted by  $Y^J$ . We also define aggregate income and the income shares of each group as  $Y = \sum_J \beta^J Y^J$ , and  $\omega^J = \beta^J Y^J/Y$ .

Spending, taxes, state capacity, and external conflict Because the government observes income, tax rates in period s can be made group specific,  $t_s^J$ . To allow for redistribution in the simplest possible way, we allow tax rates to be negative. Taxation is constrained, as any individual can earn a fraction  $(1 - \tau_s)$  of her market income in an informal sector where taxation is avoided. Therefore, tax rates in period s must satisfy  $t_s^J \leq \tau_s$ . Let  $\tau_1$  be the initial period-1 stock of "fiscal capacity" (a higher  $\tau$  raises the feasible tax rate). Fiscal capacity does not depreciate but can be augmented by

nonnegative investment in period 1, which costs  $F(\tau_2 - \tau_1)$ . We assume costs are increasing and convex, with F(0) = 0 and  $F_{\tau}(0) > 0$ .

A public good with stochastic benefits is provided in quantity  $G_s$ . With probability  $\varepsilon$ , the value is "high"  $\alpha_s = \alpha$ . To diminish the number of cases below, we assume that  $\alpha > \text{Max}\left[\frac{\omega^J}{\omega^K}, \frac{\omega^K}{\omega^J}\right] > 1$ , which means that both groups will provide the public good when it has high value. With probability  $(1 - \varepsilon)$ , the valuation is "low"  $\alpha_s = 0$ . Realizations of  $\alpha_s$  are *iid* over time. We interpret  $\varepsilon$  as the probability of external conflict,  $\alpha_s$  as the level of external threat, and  $G_s$  as the level of defense against such threat.

By linearity, indirect utility of a member of group J is:

$$v_s^J(t_s^J, G_s) = \alpha_s G_s + (1 - t_s^J) Y^J.$$
(1)

The government budget constraints are

$$\sum_{J} t_{1}^{J} \beta^{J} Y^{J} = G_{1} + F(\tau_{2} - \tau_{1}) \text{ and } \sum_{J} t_{2}^{J} \beta^{J} Y^{J} = G_{2} .$$
 (2)

Their different form in periods 1 and 2 reflects the assumption of no investments in period 2.

Government preferences, turnover, and internal conflict In each period, power is held by a government, which represents either group A or group B and seeks to maximize the utility of group members in (1) Turnover is stochastic and *iid* over time. To simplify the algebra, we make the "neutral" assumption that group J holds power in period s with probability equal to its population share,  $\beta^{J3}$ :

Once the government (group) in power is known, the losing group may trigger a violent insurgency (civil war). Such internal conflicts occur only when there is no external conflict. The conditional (on no external conflict) probability of an insurgency is  $\delta$ , and the unconditional probability is  $(1-\varepsilon)\delta$ . We assume that all existing fiscal resources are absorbed in internal conflicts.

**Timing** Society starts out each time period with some fiscal capacity,  $\tau_s$ . The subsequent timing is as follows:

<sup>&</sup>lt;sup>3</sup>Besely and Persson (2007) study a richer model, where they separately investigate the effects on state capacity of political turnover, political stability, and political polarization.

- 1. Nature determines the value of public goods (external threat),  $\alpha_s$  which group J holds political control, and whether there is internal conflict.
- 2. Absent internal conflict, the government freely picks its policy vector of taxes and government spending,  $\{t_s^A, t_s^B, G_s\}$  and invests in fiscal capacity (only in period 1),  $\tau_2 \tau_1$ .
- 3. Agents consume.

# 3 Results

Given the specific structure of our model, the choice of taxes and spending in each period can be studied separately from the period-1 investment decision

**Optimal policy** Let group J be in power and group K be out of power. Absent internal conflict, the policy vector  $\{t_s^J, t_s^K, G\}$  chosen at stage 2. maximizes the indirect utility of a group J member in (1), for given  $\alpha_s$  subject to the appropriate part of (2) and the institutional constraints:

$$t_s^J \leq \tau_s \text{ and } t_s^K \leq \tau_s$$
.

If  $\alpha_s = \alpha$ , this maximization yields  $t_s^J = t_s^K = \tau_s$  for  $s \in \{0, 1\}$  and

$$G_1 = \sum_J \tau_1 \beta^J Y^J - F(\tau_2 - \tau_1)$$
 and  $G_2 = \sum_J \tau_2 \beta^J Y^J$ .

If  $\alpha_s = 0$ , then instead  $G_s = 0$ ,  $t_s^K = \tau_s$  for  $s \in \{0, 1\}$  and

$$t_1^J = \frac{F(\tau_2 - \tau_1) - \tau_1 \beta^K Y^K}{\beta^J Y^J}$$
 and  $t_2^J = \frac{-\tau_2 \beta^K Y^K}{\beta^J Y^J}$ .

Depending on the realized threat of external conflict, the ruling government uses existing fiscal capacity to finance either spending on external defense (public goods) or transfers to its own group. The group out of power is always taxed as much as possible.

Finally, by assumption, all tax resources are used up to put down any internal conflict, i.e.,

$$t_s^J = t_s^K = \tau_s \ \text{ and } \ G_s = 0 \ \text{ for } s \in \{1,2\} \ ,$$

and there is no investment in state capacity, i.e.,  $\tau_2 = \tau_1$ , if internal conflict breaks out in period 1.

**Optimal investments in state capacity** In period 1, group J decides on investment in fiscal capacity under uncertainty over the future realizations of  $\alpha_2$  and the period-2 group in power. Drawing on the results in Section 3, the expected net payoff to group J can be written:

$$Y^{J}\left(1+\tau_{2}\left[\beta^{J}\left(1+\frac{\omega^{K}}{\omega^{J}}\right)\left[\varepsilon\alpha+\left(1-\varepsilon\right)\left(1-\delta\right)\right]-1\right]\right)-\lambda(\alpha_{1})F(\tau_{2}-\tau_{1}),$$

where

$$\lambda(\alpha_1) = \begin{cases} \alpha & \text{if } \alpha_1 = \alpha \\ 1 & \text{if } \alpha_1 = 0 \text{ and there is no civil conflict} \\ \infty & \text{if } \alpha_1 = 0 \text{ and there is civil conflict} \end{cases}$$
(3)

is the (income-normalized) cost of investment in period 1 for government J. This depends on the opportunity cost of funds, which is higher when the realized external threat is high. The first-order condition for state capacity is

$$Y^{J} \left[ \beta^{J} \left( 1 + \frac{\omega^{K}}{\omega^{J}} \right) \left[ \varepsilon \alpha + (1 - \varepsilon) \left( 1 - \delta \right) \right] - 1 \right]$$
  

$$\leqslant \quad \lambda(\alpha_{1}) F_{\tau} \left( \tau_{2} - \tau_{1} \right) \qquad \text{c.s. } \tau_{2} - \tau_{1} \geqslant 0 .$$
(4)

The right-hand side of (4) is the marginal cost of investment in fiscal capacity, while the left-hand side is the marginal benefit. Fiscal capacity is useful in two cases – when the external threat is high, an event that occurs with probability  $\varepsilon$ , and when the external threat is low, no insurgency occurs, and group J holds on to power, a joint event that occurs with probability  $(1 - \varepsilon)(1 - \delta)\beta^J$ . But since taxes also lower private income, these marginal benefits are compared to the marginal cost of foregone income.

As mentioned above, there is no investment in state capacity in the wake of period-1 internal conflict. We assume that  $\varepsilon$  and  $\alpha$  are high enough that (4) holds with equality and positive investments in fiscal capacity are made (except during internal conflict) in period 1. We denote the equilibrium level of investment by  $T(\alpha_1, \varepsilon, \delta)$ .

**Empirical predictions** How do investments depend on the probabilities for external and internal conflict? To answer this question we first state two provisional results that speak to the effect of future anticipated conflicts, and the effect of current realized conflicts.

#### **Lemma 1** Absent internal conflict in period 1, investment in fiscal capacity is reduced by a greater risk of future internal conflict, $T_{\delta}(\cdot) < 0$ but raised by a greater risk of future external conflict, $T_{\varepsilon}(\cdot) > 0$ .

To prove Lemma 1, observe that neither  $\delta$  nor  $\varepsilon$  enter the right-hand side of (4), and the left-hand side is decreasing in  $\delta$  but increasing in  $\varepsilon$ . As the right-hand side is increasing in  $\tau_2$ , the result follows.

**Lemma 2** Absent internal conflict in period 1, a high current threat of external conflict reduces investment in fiscal capacity,  $T(\alpha, \cdot) < T(0, \cdot)$ .

This lemma follows because  $\alpha_1$  does not enter the left hand side of (4) while the opportunity cost of funds,  $\lambda(\alpha_1)$ , is increasing in  $\alpha_1$ . The result implies that a period 1 conflict of an internal or external variety reduces investment in fiscal capacity.<sup>4</sup>

Since the data at any given point of time will reflect both past anticipations and past realizations of conflicts, we define (unconditionally) expected investment as

$$E(T) = \varepsilon T(\alpha, \varepsilon, \delta) + (1 - \varepsilon)(1 - \delta)T(0, \varepsilon, \delta) .$$
(5)

In this expression, the  $\varepsilon$  and  $\delta$  parameters outside (inside) the investment function capture their effect on the expected frequency of period 1 (period 2) states. Differentiating (5) and drawing on Lemmas 1 and 2, we have:

#### **Prediction** Expected fiscal capacity is decreasing in the probability of internal conflict. The probability of external conflict has an ambiguous effect, but raises fiscal capacity if $\delta$ is high enough.

The last result follows because a higher value of  $\delta$  cuts the negative effect of the  $\varepsilon$  multiplying the second term in (5) and raises the positive effect of  $\varepsilon$ on both terms by a higher value of  $T_{\varepsilon}(\cdot)$ .<sup>5</sup>

<sup>&</sup>lt;sup>4</sup>Besley and Persson (2007) shows that there is a complementarity between investing in fiscal capacity and legal capacity creating a positive feedback to the level of income per capita. Amending the model with this mechanism would thus imply a lower future income per capita.

<sup>&</sup>lt;sup>5</sup>The model also predicts that the risks of external and internal conflict exert larger effects on state capacity if the ruling group internalizes a smaller share of income, because it commands a smaller share of income ( $\omega^J$ ) than the other group. The comparative statics of parameter  $\beta^J$  are harder to interpret, since they mix up aspects of relative group size and political stability.

### 4 Data

We now briefly ask how the theoretical results relate to international data on the incidence of internal and external wars in the period from 1945 to 1997. We follow the literature in using the (annual) Correlates of War data to gauge whether a country is involved in any external or internal war during these five decades.<sup>6</sup> In an average year, 5,5% of the 180 countries in the sample were engaged in a civil war, while 3.2% were engaged in an external war.<sup>7</sup> In our sample period, 24% of the countries had an internal conflict and 31% an external conflict in some year.

We want to correlate incidence of conflicts with measures of fiscal capacity. Our primary measure of the latter emanates from data on taxation collected by Baunsgaard and Keen (2005), which is available for 125 countries. We study the relation between average tax revenue, the share of taxes collected as income taxes, and seigniorage (the average inflation rate) with incidence of internal and external conflicts over the sample period.<sup>8</sup> What matters to us are past investments in fiscal capacity. Absent direct data on such investments, we assume that governments with little fiscal capacity tend to tax income less since this requires institutionalized compliance structures. Equally, the use of inflation taxes is more prevalent with fewer institutionalized sources of tax revenue.

The main correlations are given in Table 1 which runs regressions of our fiscal capacity measures on binary indicators for (eight) regions and (five) legal origins, and on binary indicators for each country which equal one if it has been involved in an external conflict or an internal conflict, respectively, between 1945 and 1997.<sup>9</sup> Because of the findings in the literatures on external and internal conflict noted in the introduction and the results in Besley and Persson (2007), we sometimes also include measures for the proportion of

<sup>&</sup>lt;sup>6</sup>http://www.correlatesofwar.org/. Specifically, we say that a country is involved in an external war in a specific year if either (or both) of the binary (0,1) variables *interstatewar* or *extrastatewar* is equal to one. A country is said to be involved in an internal war if *civilhomewar* is equal to one.

<sup>&</sup>lt;sup>7</sup>Over this period, 27 of the 180 countries are engaged in both an internal and an external conflict. In line with our theory, however, simultaneous external and internal conflicts are extremely rare.

<sup>&</sup>lt;sup>8</sup>In our sample of country years (1975-1997), the average tax revenue to GDP ratio is 21%, of which 35% is raised as income tax. The average inflation rate is about 15%.

<sup>&</sup>lt;sup>9</sup>The results are similar if we, instead of these binary indicators, use the share of years since 1945 that a country has been involved in each type of conflict.

years which a country has been democratic as well as the level of income. Given the likely simultaneity of the left and right hand side variables, nothing causal can be read into these regressions. But the correlations are interesting.

Column 1 shows that countries involved in internal conflict have a GDP share of taxes around 7% lower than countries without conflict, while countries involved in external conflicts have a tax share around 7% higher. The former result is qualitatively robust (column 2) to controlling for democracy and income, which are both positively correlated with rasing taxes. In column 3, income taxes as a share of total taxes are 0.8% lower in countries that experienced an internal conflict and 1.6% higher in countries that took part in an external conflict. The latter result is robust to controlling (column 4) for democracy and income. Finally, column 5 shows that countries that fought a civil war, on average, have an inflation rate 14% higher than others. This is a large effect indicating that such countries have poorly developed fiscal capacity and therefore resort to inflation for raising revenue in periods of conflict. This result, too, is robust (column 6) to democracy and income.

### 5 Conclusion

This paper has focused on determinants of long-run state development and the role of war in shaping investments in fiscal capacity. We have presented a simple theory, where the prospects of internal and external conflicts have very different effects on the incentives to build capacity to collect taxes, and some correlations consistent with the theory.

The work reported here is part of a broader research agenda that does not take the existence of effective government for granted. Our suggested approach aims to identify economic and political features that shape the incentives to invest in state institutions, which in turn affect policy outcomes. We believe that such an approach can help bring together ideas from economics, political science and history.

The existing literature on civil war has tended to take fiscal capacity as given along with the level of economic development. A more complete treatment of the causes and consequences of conflict will have to treat the incidence of conflict, the level of development and investments in state capacity as jointly determined. This presents a tall order for further theoretical and empirical research.

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# Table 1: Fiscal capacity and different types of war

	(1) Taxes as a share of GDP	(2) Taxes as a share of GDP	(3) Income taxes as a share of total taxes	(4) Income taxes as a share of total taxes	(5) Average inflation rate	(6) Average inflation rate
Any internal war during 1945-1997	- 6.993*** (1.843)	- 2.723** (1.310)	- 0.080** (0.040)	- 0.031 (0.036)	14.346*** (4.790)	12.551** (5.567)
Any external war during 1945-1997	6.911*** (2.267)	1.604 (1.569)	0.162*** (0.037)	0.067** (0.033)	3.586 (5.863)	6.676 (6.628)
Share of years in democracy during 1945-1997		5.028** (2.368)		0.019 (0.070)		– 3.979 (11.157)
Share of years in parliamentary democracy during 1945-1997		6.529*** (1.939)		0.076 (0.064)		- 5.403 (4.395)
Mean income during 1945-1997		3.302*** (1.067)		0.079*** (0.022)		0.974 (3.934)
Observations R-squared	125 0.489	105 0.739	125 0.390	105 0.598	116 0.307	100 0.370

Robust standard errors in parentheses (significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%) In addition to the variables shown, all specifications include a set of (eight) regional dummies and (five) legal origin dummies.