Fragile States and Development Policy*

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Abstract

It is widely recognized that fragile states are key symptoms of under-development in many parts of the world. Such states are incapable of delivering basic services to their citizens and political violence is commonplace. As of yet, mainstream development economics has not dealt in any systematic way with such concerns and the implications for development assistance. This paper puts forward a framework for analyzing fragile states and applies it to a variety development policies in different types of states.

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1 Introduction

The donor community has increasingly had to confront the issues raised by the prevalence of weak, fragile, and failing states in the world's poorest countries. This confrontation has changed the focus of development policy towards the particular problems that arise in fragile states. However, until recently, the mainstream development economics literature has paid little attention to these problems, in spite of a resurgent interest in the political economics of economic development.

This paper highlights two main pathologies of the state: *state ineffectiveness* in enforcing contracts, protecting property, providing public goods and raising revenues, and *political violence* either in the form of repression or civil conflict.

Our objective is to propose a theoretical framework, in which the roots of these pathologies can be explored.[1] In this framework, a government is endowed with a level of fiscal capacity (the ability to tax) and a level of legal capacity (the ability to support markets). Policy decisions include how much to spend on public goods and transfers. Political institutions may constrain the distribution of transfers; stronger, more cohesive, institutions prevent incumbents from using the state as a personal fiefdom, and make transfers solely to the ruling group. Governments can make three kinds of investments: (i) in fiscal capacity; (ii) in legal capacity, and (iii) in violence, as a means of hanging on to power. Opposition groups can also invest in violence if they choose to.

Seen through the lens of this framework, an ineffective state is one which has made few investments in fiscal and legal capacity, and a violent state is one where the government and opposition use violence to maintain or acquire power. Political institutions which foster common interests can eliminate both of these problems. However, when institutions are non-cohesive either pathology may emerge and the model allows us to explore the conditions for their emergence, thus uncovering the roots of state fragility. Having an explicit theory enables us to clarify what is exogenous and what is endogenous. It also enables us to clarify what is a symptom and what is a cause – a very murky distinction in the present policy debate.

Having built the framework, we explore its implications for development

[1] The paper builds on our earlier work especially Besley and Persson (2009) and (2010). A full exploration of the ideas developed here is in Besley and Persson (2011).

assistance. We consider different forms of assistance. We begin with cash aid – with or without conditionality – and go on to study military intervention, technical capacity building, and post-conflict assistance. In each case, we discuss the factors that shape the effectiveness of assistance, given the equilibrium responses of policy, state capacity, and political violence.

Even though our exploration is stylized and theoretical, the model gives a clear sense of the complexity of the issues. The exact impact of aid will likely vary with institutions as well as circumstances. Generalizations about the best course of action appear notoriously difficult, in view of the limited empirical knowledge about several of the channels uncovered by our analysis. This underlines the difficulties the donor community has to grapple with when facing the problems of fragile states.

The remainder of the paper is organized as follows. In the next section, we discuss some background on fragile states and the existing classifications of such states. Section 3 lays out a canonical two-period model with investments in state capacity and political violence. In Section 4, we use the model to investigate aspects of development policy – especially transfers of cash aid. Section 5 concludes.

2 What is a fragile state?

A growing literature deals with how to empirically define fragile or weak states and it is not our intention to survey this literature here.[2] Most contributors to that literature do not see it as their primary task to refine an inevitably fuzzy and imprecise classification, but instead to focus policy attention on the plight of specific countries and to seek means of improving the situation of the citizens who live there (see OECD, 2010). This is also the spirit in which we approach the issue. Indeed, it will become clear that, even in our stylized theoretical setting, no simple definition of a fragile state is likely to emerge.

Many lists of fragile states are now produced by national aid agencies, international organizations, and individual research teams.[3] The criteria underlying such lists are more or less transparent, as we might expect depending on the exact uses to which the lists are being put.

[2] See Di John (2008) for a review.

[3] Looking at different classifications of fragility (however termed) leads to rather similar rankings of states.

At one end, consider the Polity IV 2008 classification of fragile states, the outcome of which is summarized in Figure 1. This is admirably clear in explaining its eight underlying criteria, which include factors such as security effectiveness, political legitimacy, and economic effectiveness. These concepts are all based on specific empirical indicators that are aggregated in a transparent way. Such indicators certainly create a basis for debate about which factors shape state fragility. But the conceptual underpinning of the measurement is far from clear, and sometimes appears to confuse symptoms and causes. For example, low income is included as a component of state fragility. But is it a product of state fragility or a cause? The same can be said for the measures of violence or insecurity, which also figure prominently in the definition.

At the other end, development agencies are less clear about their definitions of fragile states and their basis of judgement. For example, USAID (2005) uses two criteria, each of which is sufficient to have a state classified as fragile: vulnerability and crisis. Vulnerability refers to those "states unable or unwilling to adequately assure the provision of security and basic services to significant portions of their populations and where the legitimacy of the government is in question. This includes states that are failing or recovering from crisis." Crisis refers to "states where the central government does not exert effective control over its own territory or is unable or unwilling to assure the provision of vital services to significant parts of its territory, where legitimacy of the government is weak or nonexistent, and where violent conflict is a reality or a great risk." As far as we can tell, these criteria are applied subjectively.

We do not wish to contend that more refined definitions of state fragility is an important goal in and of itself. One is reminded about debates about the measurement of poverty that have raged among specialists, and may have little or no bearing on whether social action is galvanized for dealing with its causes. However, it would be useful to have a definition to pinpoint issues for policy discussion. In this paper, we will propose a framework that does not presuppose state fragility. Our focus is on the economic and political forces which shape state ineffectiveness and the use of violence – two common pathologies debated in the literature. What emerges is a rather complex picture with different factors contributing to different problems.

But the focus on fragile states underlines a wider set of issues, which are crucial to discussions about development policy. It is well understood that the problem of underdevelopment reflects a complex array of interdependent fac-

tors which cluster together and where low income and living standards make up just one dimension. The notion of a fragile state is useful in highlighting this multi-dimensionality, and in getting away from excessive emphasis on income and insufficient emphasis on state ineffectiveness and political violence. The essence of fragility is then not so much that states are poor, poorly managed and prone to violence. The essence – and the only way to find solutions – is a better understanding of the causes underlying this unfortunate state of affairs.

3 Theoretical Framework

The modeling approach draws on our earlier work: Besley and Persson (2009, 2010, 2011). We develop a two-period approach to investments in state capacity and violence.

3.1 Basic set-up

There are two time periods $s = 1, 2$ with two groups of individuals, A and B, each of which has comprises half the population. Every individual has wage rate $\omega(\pi_s)$ where $\omega(\cdot)$ is an increasing, concave function, and where π_s is the government's legal capacity. There are no savings.

At the beginning of $s = 1$, one group holds power and we will refer to this group as the incumbent $I_1 \in \{A, B\}$. The other group is the opposition $O_1 \in \{A, B\}$. Between the two periods, there can be a transition of power. This affected by investments in political violence by the incumbent and opposition. In period 1, the opposition group O_1 can mount an insurgency with army $L^O \leq \overline{L}^O$, paid for within the group, at marginal cost of funds ν. We interpret ν as a reduced form representation of how well-organized and funded is the opposition. The incumbent group I_1 can invest in army $L^I \leq \overline{L}^I$, paid out of the public purse, at marginal cost λ_1. There is no conscription: each soldier just paid the period one wage, namely $\omega(\pi_1)$.

The probability that the opposition takes over depends on the conflict technology $\gamma(L^O, L^I, \xi)$ which is increasing in L^O, and decreasing in L^I. The winner becomes next period's incumbent, $I_2 \in \{A, B\}$ and the loser becomes the new opposition, $O_2 \in \{A, B\}$. If nobody takes up arms, then the transition probability is $\gamma(0, 0, \xi)$. We assume that parameter ξ raises (lowers) incumbent's (opposition's) marginal return to fighting $\gamma_I(0, 0, \xi)$ ($\gamma_O(0, 0, \xi)$).

It is thus a measure of the incumbent's relative technological advantage in fighting to hold on to power.

We assume that utility is linear and depends on the quantities of public and private goods:

$$u_s^J = c_s^J + \alpha_s g_s \ ,$$

where c_s^J denotes private consumption of a group-J member at s, and g_s is the consumption of public goods with α_s denoting their value. One archetypal example of g_s is "defense", in which case α_s is the "threat of external conflict".

Private consumption in period s is

$$c_s^J = \begin{cases} (1-\tau_1)\,\omega(\pi_1) + r_1^J - \delta^J \nu \omega(\pi_1)\, L^O & \text{at } s=1 \\ (1-\tau_2)\,\omega(\pi_2) + r_2^J & \text{at } s=2 \ . \end{cases}$$

where r_s^J is a transfer targeted towards group J and $\delta^J = 1$, if $J = O$, and 0 if $J = I$. The variable τ_s is fiscal capacity, a costly investment made one period ahead.[4]

The value of public goods stochastic. We assume a two-point distribution $\alpha_s \in \{\alpha_L, \alpha_H\}$, where $\alpha_H > 2 > \alpha_L > 1$, and $\text{Prob}[\alpha_s = \alpha_H] = \phi$. Shocks to α_s are iid over time and we assume that the realization of α_s is known when policy is set.

There can be investment in both legal and fiscal capacity in period 1. We take the initial stocks $\{\pi_1, \tau_1\}$ as given and, for simplicity, we assume that both kinds of investment are irreversible. Fiscal and legal capacity can be augmented by non-negative investments $\{\pi_2 - \pi_1, \tau_2 - \tau_1\}$. Investment in legal capacity takes the form of courts, judges, credit and property registries. Such investments are associated with a convex cost: $L(\pi_2 - \pi_1)$, where $L_\pi(0) = 0$. In the case of fiscal capacity, the investment can be thought of as developing a tax authority, its compliance structures and infrastructure to enforce an income tax (or impose a value added tax). We posit a convex cost $F(\tau_s - \tau_{s-1})$ of investing in fiscal capacity with $F_\tau(0) = 0$.

Government decisions at date s comprise $\left\{g_s, \{r_s^J\}_{J=I,O}, m_s\right\}$ where

$$m_s = \begin{cases} F(\tau_2 - \tau_1) + L(\pi_2 - \pi_1) + \omega(\pi_1)\, L^I & \text{if } s=1 \\ 0 & \text{if } \ s=2 \ . \end{cases}$$

[4] In our earlier work, we work with constraints on the government's tax and regulatory policies: $t_s \leq \tau_s$ and $p_s^J \leq \pi_s$. Under the same assumptions as in this paper, we show in Besley and Persson (2011) that it is always optimal for the incumbent to fully exploit both legal and fiscal capacity in every period. Thus, we skip that step here.

is the cost of investing in legal capacity, fiscal capacity and violence in period s. The government budget constraint is

$$R + \tau_s \omega = g_s + m_s + \frac{r_s^I + r_s^O}{2} \ , \tag{1}$$

where R is any additional revenue source accruing only to government in the form of natural resource ownership and foreign aid. We will suppose that the level of such resources is fixed and known ex ante.

Political institutions constrain the incumbent who must give a share $\sigma\,(\leq 1)$ to the opposition group for any unit of transfers that it gives to its own group. It is more convenient to work with the parameter $\theta = \frac{\sigma}{1+\sigma} \in [0, \frac{1}{2}]$ to represent more "cohesive" institutions. With θ close to $1/2$, there is equal sharing and θ close to zero represents a situation with weak constraints. A higher value of θ corresponds to greater checks and balances on executive or better representation of the opposition in government.

The timing of decisions in the model is as follows:

1. There is an initial level of state capacity $\{\tau_1, \pi_1\}$ and an incumbent group I_1.

2. Nature determines the period-1 value of public goods: α_1.

3. The incumbent chooses period-1 policies $\{r_1^I, r_1^O, g_1\}$ and investments in period-2 state capacities τ_2 and π_2. Simultaneously, the incumbent and opposition choose their investments in violence: $\left\{L^I, L^O\right\}$.

4. Period-1 consumption takes place.

5. The period-1 incumbent remains in power with probability $1-\gamma(L^O, L^I, \boldsymbol{\xi})$ and nature determines the period-2 value of public goods: α_2.

6. The period-2 incumbent chooses second-period policies $\{r_2^I, r_2^O, g_2\}$.

7. Period-2 consumption takes place.

We look for a sub-game perfect equilibrium in policy, violence and state capacity investments. Since the problem has a conveniently recursive structure, we are able to study these three parts separately beginning with policy choices in each period. For the violence and state capacity investment decisions, we work backwards with citizens forming rational expectations about the period-2 policy outcome.

3.2 Policy

The optimal public spending choices $\left\{g_s, r_s^I, r_s^O\right\}$ are made by the period s incumbent and maximize:

$$\alpha_s g_s + (1-\tau_s)\,\omega\,(\pi_s) + r_s^I \ ,$$

subject to $r_s^O \geq \sigma r_s^I$ and the government budget constraint, (1). We need to solve for two dimensions of policy: transfers and public-goods provision.

To derive the optimal levels of transfers, we use the government budget constraint to obtain:

$$r_s^J = \beta^J[R + \tau_s\omega\,(\pi_s) - g_s - m_s] \ ,$$

where $\beta^I = 2(1-\theta)$ and $\beta^O = 2\theta$. The revenue available for transfers is any part not spent on public goods, g_s or investments m_s. Transfers are divided between the two groups depending on the cohesiveness of institutions as measured by θ. Since $\beta^I \geq \beta^O$, the incumbent group will obtain a higher level of transfers.

The optimal level of public-good provision is given by:

$$G\,(\alpha_s, \tau_s) = \begin{cases} R_s + \tau_s\omega - m_s & \text{if } \ \alpha_s \geq 2\,(1-\theta) \\ 0 & \text{otherwise .} \end{cases}$$

All residual public revenues are spent on either transfers or public goods in period s, depending on the realization of the value of public goods: α_s. If institutions are consensual (θ is close to one half) then all spending is on public goods and none is on transfers.

Plugging in these optimal policies, we derive the following "indirect" payoff function for group J in period s:

$$\begin{aligned} W(\alpha_s, \tau_s, \pi_s, R_s, m_s, \beta^J) \ &= \ \alpha_s G\,(\alpha_s, \tau_s) + (1-\tau_s)\omega\,(\pi_s) + \\ &\qquad \beta^J[R + \tau_s\omega\,(\pi_s) - G\,(\alpha_s, \tau_s) - m_s] \ . \end{aligned}$$

For future reference, it is also useful to define "value functions"

$$U^I\,(\tau_2, \pi_2) = \left[\phi W\left(\alpha_H, \tau_2, \pi_2, R_2, 0, \beta^I\right) + (1-\phi)\,W\left(\alpha_L, \tau_2, \pi_2, R_2, 0, \beta^I\right)\right]$$

and

$$U^O\,(\tau_2, \pi_2) = \left[\phi W\left(\alpha_H, \tau_2, \pi_2, R_2, 0, \beta^O\right) + (1-\phi)\,W\left(\alpha_L, \tau_2, \pi_2, R_2, 0, \beta^O\right)\right]$$

for being the incumbent or opposition group in period 2 depending on the state variables $\{\tau_2, \pi_2\}$. These are the expected value of arriving in period 2 with state capacities $\{\tau_2, \pi_2\}$ either as a member of the incumbent or opposition group.

Putting these together, the expected period-2 utility of group J in period 1is:

$$\begin{aligned} &W(\alpha_1, \tau_1, m_1, \beta^J) \\ &+(1-\gamma(L^O, L^I, \xi))U^I(\tau_2, \pi_2) + \gamma(L^O, L^I, \xi)U^O(\tau_2, \pi_2) \end{aligned} \tag{2}$$

for the incumbent group and

$$\begin{aligned} &W(\alpha_1, \tau_1, m_1, \beta^J) - \nu\omega(\pi_1) L^O \\ &+\gamma(L^O, L^I, \xi)U^I(\tau_2, \pi_2) + \left[1-\gamma(L^O, L^I, \xi)\right] U^O(\tau_2, \pi_2) \end{aligned} \tag{3}$$

for the opposition group. For the opposition, we have deducted the cost of violence: $\nu\omega(\pi_1) L^O$, while, for the incumbent, violence is funded from the public purse.

These payoffs are key to understanding the determinants of investments in violence and state capacity. We begin by study the Nash equilibrium between the incumbent and opposition group in their violence decisions.

3.3 Investments in political violence

The prospective trade-off for the incumbent and opposition, as they contemplate investing in violence at stage 3, is to weigh a higher chance of period-2 political control against the cost of the investment. To study this as simply as possible, and put some structure on the problem, we impose the following restrictions on the conflict technology:

Assumption 1 *For all* $L^J \in \left[0, \overline{L}^J\right]$, *we have*:

a. if $\gamma \in (0,1)$, $\gamma_O > 0, \gamma_I < 0$, $\gamma_{OO} < 0$, $\gamma_{II} > 0$,

b. $\frac{-\gamma_I(0,0;\boldsymbol{\xi})}{\gamma_O(0,0;\boldsymbol{\xi})} \geq \frac{\alpha_H}{\nu}$, *and*

c. $\frac{\gamma_I \gamma_{OO}}{\gamma_O} \geq \gamma_{IO} \geq \frac{\gamma_O \gamma_{II}}{\gamma_I}$.

Condition **a** just says that fighting always has positive returns for both groups, albeit at a decreasing rate. The property in **b** ensures that the incumbent has a higher marginal return to fighting, when both parties do not invest in violence. It guarantees that the incumbent has a sufficient advantage in the returns to fighting relative to the rebels. Finally, **c** restricts the extent of any strategic complementarities or substitutabilities in the conflict technology. Assumption 1 is satisfied by a number of reasonable, and commonly used, contest functions.[5]

We now characterize the Nash equilibrium in violence levels denoted as $\left\{\hat{L}^O, \hat{L}^I\right\}$. These maximize (2) and (3). The first-order conditions are:

$$\gamma_I(\hat{L}^O, \hat{L}^I, \xi)\left[U^O(\tau_2, \pi_2) - U^I(\tau_2, \pi_2)\right] - \lambda_1 \omega(\pi_1) \leq 0 \ ,$$

where $\lambda_1 = \max\{\alpha_1, 2(1-\theta)\}$ and

$$\gamma_O(\hat{L}^O, \hat{L}^I, \xi)\left[U^I(\tau_2, \pi_2) - U^O(\tau_2, \pi_2)\right] - \nu\omega(\pi_1) \leq 0 \ .$$

This way of writing the first-order conditions makes transparent that the marginal benefit of investing in violence comes from the increased probability of being the incumbent in period 2, while the cost is the resources that are needed finance this violence whether from public or private funds. For both groups, the benefit is proportional to $\left[U^O(\tau_2, \pi_2) - U^I(\tau_2, \pi_2)\right]$, the value of being an incumbent in period 2. The parameter λ_1 is the opportunity cost of public funds to the incumbent. A key observation for the result to follows, is that:

$$\left[U^I(\tau_2, \pi_2) - U^O(\tau_2, \pi_2)\right] = \omega(\pi_1)\, 2(1-2\theta)\, Z \ ,$$

where

$$Z = (1-\phi)\left[\frac{R + \tau_2 \omega(\pi_2) - G(\alpha_L, \tau_2)}{\omega(\pi_1)}\right]$$

is the benefit from holding office in terms of residual tax revenues relative to the opportunity cost of fighting determined by the period-1 wage. This variable will determine the outcome in cases where common interests and political institutions are weak.

We now use the two first-order conditions to characterize the Nash equilibrium and its dependence on some key parameters. Our first result gives a guaranteed condition for peace:

[5] See Dixit (1987) for an overview of contest functions.

Proposition 1 *If $\alpha_L \geq 2(1-\theta)$ or if ϕ is close to 1, then neither group invests in political violence, i.e. $\hat{L}^I = \hat{L}^O = 0$.*

This proposition says that as long as institutions are sufficiently consensual, or there is a high enough demand for public goods, then there is never any political violence. In this case, the marginal benefit of being the incumbent goes to zero as there is agreement over policy. Since investing in violence is costly, neither group chooses to invest anything.

We now explore what happens when these conditions do not hold.

Proposition 2 *If Assumption 1 holds, $\alpha_L < 2(1-\theta)$ and ϕ is below 1, then there are two thresholds $Z^I(\theta, \phi; \xi)$ and $Z^O(\theta, \phi; \xi)$, where*

$$\begin{aligned} Z^I(\theta, \phi; \xi) &= -\frac{\lambda_1}{\gamma_I(0, 0; \xi)(1-\phi)2(1-2\theta)} \\ &< Z^O(\theta, \phi; \xi) = \frac{\nu}{\gamma_O(0, 0; \xi)(1-\phi)2(1-2\theta)} \end{aligned}$$

such that:

1. *if $Z \leq Z^I$, there is peace with $\widehat{L}^O = \widehat{L}^I = 0$*
2. *if $Z \in \left(Z^I, Z^O\right)$, there is repression with $\widehat{L}^I > \widehat{L}^O = 0$*
3. *if $Z \geq Z^O$, there is civil conflict with $\widehat{L}^I, \widehat{L}^O > 0$.*

Moreover, $\widehat{L}^O$ and $\widehat{L}^I$, whenever positive, increase in Z .

The proof is in the Appendix.

The proposition describes three states of violence. When Z is below Z^I, no conflict erupts, as both incumbent and opposition accept the (probabilistic) peaceful allocation of power, where the opposition takes over with probability $\gamma(0, 0; \xi)$. When $Z \in \left[Z^I, Z^O\right]$, the government invests in violence to increase its survival probability, but the opposition does not invest in conflict. It is natural to label this case government repression. Finally, when $Z > Z^O$, the opposition mounts an insurgency, which is met with force by the incumbent group, and we have civil war.

Our results have some striking empirical implications, when the logic of political violence is expressed as a function of latent variable Z. More precisely, our theory predicts an *ordering* in Z of the three violence states:

peace, repression, and civil war.[6] The existing literatures on political violence has studied repression and civil war as separate phenomena.[7] Our approach provides a means of thinking about their common roots.

Four empirical corollaries to Propositions 1 and 2 are worth bringing out. First, higher wages, $\omega(\pi_1)$, reduce the likelihood that an economy will experience political violence, i.e., be in repression or civil war, unless political institutions are consensual (θ close to $\frac{1}{2}$) or the demand for public goods is very high (ϕ close to 1). This is because the opportunity cost of fighting becomes higher. Second, higher natural resource rents, or other exogenous forms of income such as aid increase the likelihood that an economy will be in repression or civil war, unless political institutions are consensual or the demand for public goods is very high. This is because the redistributive prize becomes Z is higher. Third, higher expected spending on common interest public goods, induced by higher value of ϕ decreases the likelihood that an economy will be in repression or civil war, unless political institutions are consensual or the demand for public goods is very high. This is because Z is negatively related to ϕ. Fourth, political institutions with more checks and balances (more minority representation) leading to a higher value of θ, decrease the likelihood of observing repression or civil war (in the range of θ for which the equilibrium is not necessarily peaceful).

We can now define the equilibrium rate of political turnover. Plugging in the Nash equilibrium values, the political replacement rate for the period-one incumbent group is:

$$\Gamma\left(Z,\nu,\xi\right)=\begin{cases}\gamma\left(\hat{L}^{O},\hat{L}^{I},\xi\right) & Z>Z^{O}(\theta,\nu,\xi)\\ \gamma\left(0,\hat{L}^{I},\xi\right) & Z^{O}(\theta;\nu,\xi)\geq Z>Z^{I}(\theta,\lambda_{1},\xi)\\ \gamma\left(0,0,\xi\right) & Z^{I}(\theta,\lambda_{1},\xi)\geq Z\ .\end{cases}$$

The turnover rate depends on which of the three cases in Proposition 2 is relevant, since these determine the investments in political violence. While it is clear that the probability of political replacement is lower in repression than peace, the comparison of either peace or repression with civil war is ambiguous.

We now draw out some comparative statics, which prove useful in our discussion of development policy and which link the rate of political replacement

[6] These are explored empircally in Besley and Persson (2010).

[7] Davenport (2008) reviews the literature on the former and Blatman and Miguel (2010) the literature on the latter.

to Z, ν and ξ:

Proposition 3 *The the probability of political replacement varies with* $\{Z, \nu, \xi\}$ *as follows:*

1. *An increase in* Z *reduces the probability of political replacement when there is repression or civil war.*

2. *An increase in* ν *increases the probability of political replacement when there is a civil war.*

3. *An increase in* ξ *reduces the probability of political replacement when there is repression.*

The proof is in the Appendix.

Increasing the benefit of holding office (higher Z) makes the government to spend more on violence. Given our assumptions on $\gamma(\cdot)$, the incumbent uses violence at a faster rate than the opposition in a civil war. The proposition also states that circumstances which make insurgency more expensive raise the incumbent government's hold on power during civil war. They also make civil war less likely (by raising Z^O). As ξ goes up, the range of Z with repression becomes wider.

3.4 Investments in state capacity

To conclude the analysis of the equilibrium, we now consider investments in state capacities $\{\pi_2, \tau_2\}$. These are determined simultaneously with the violence decisions and maximize (2) taking L^O as given.

Choosing $\{\tau_2, \pi_2\}$ to maximize (2) yields the following Euler equations for legal and fiscal capacity:

$$\begin{aligned} \omega_\pi(\pi_2)[1 + (E(\lambda_2; Z, \nu, \xi, \theta) - 1)\tau_2] &\leqslant \lambda_1 L_\pi(\pi_2 - \pi_1) \\ \text{c.s.} \quad \pi_2 - \pi_1 &\geqslant 0 \end{aligned} \tag{4}$$

$$\begin{aligned} \omega(\pi_2)[E(\lambda_2; Z, \nu, \xi, \theta) - 1] &\leqslant \lambda_1 F_\tau(\tau_2 - \tau_1) \\ \text{c.s.} \quad \tau_2 - \tau_1 &\geqslant 0\ , \end{aligned} \tag{5}$$

where

$$E(\lambda_2; Z, \nu, \xi, \theta) = \phi\alpha_H + (1 - \phi)E(\lambda_2|\alpha_L; Z, \nu, \xi, \theta)$$

is the *expected* value of period-two public funds with

$$E(\lambda_2|\alpha_L; Z, \nu, \xi, \theta) = \begin{cases} \alpha_L & \text{if } \alpha_L \geq 2(1-\theta) \\ 2[(1-\theta)(1-\Gamma(Z,\nu,\xi)) + \theta\Gamma(Z,\nu,\xi)] & \text{otherwise .} \end{cases}$$

These conditions set the marginal benefit from investments in state capacity, which depend on the expected marginal value of public funds. To understand the latter, observe that if $\alpha_L \geq 2(1-\theta)$, all spending is on the public good regardless of the state. However, if $\alpha_L < 2(1-\theta)$, then when $\alpha_s = \alpha_L$, then the state spends on transfers. The expected value of those transfers is $2[(1-\theta)(1-\Gamma(Z,\nu,\xi)) + \theta\Gamma(Z,\nu,\xi)]$ which depends on the strength of institutions, θ, and the equilibrium rate of political survival $(1-\Gamma(Z,\nu,\xi))$. A lower probability of political replacement increases the value of public funds.

Equations (4) and (5) both illustrate the importance of the future value of public funds in determining investment incentives. For fiscal capacity, this is clear as it pays off in the form of an ability to raise more public funds in period 2. But the value of public funds matters also for legal capacity, as it carries an indirect benefit from investing through increased public revenues. If $E(\lambda_2; Z, \nu, \xi, \theta) > 1$, then fiscal and legal capacity are complements in the sense that an increase in the stock of one kind of state capacity raises the marginal return to investing in the other kind.

To pin down state capacities, we need two conditions. The first one is:

Cohesiveness: $\alpha_L \geq 2(1-\theta)$.

This requires that θ is close enough to $1/2$. Observe that this condition also guarantees (by Proposition 1) that the equilibrium is peaceful.

The second condition is:

Stability: $\phi\alpha_H + (1-\phi)\,2\left[(1-\Gamma(Z,\nu,\xi))(1-\theta) + \Gamma(Z,\nu,\xi)\,\theta\right] \geq 1$.

This is relevant only when the cohesiveness condition fails. Whether Stability holds depends on the equilibrium level of political turnover and is more likely if $\Gamma(Z,\nu,\xi)$ is low.

We now show that the model implies three types of states, when it comes to investing in state capacities.

The first possibility is a common interest state:

Proposition 4 *Suppose that the cohesiveness condition holds or ϕ is close to one, then there is a common-interest state.*

1. *There are investments in both kinds of state capacity*

2. *An increase in ϕ increases both fiscal and legal capacity investments, whereas changes in R, ν, or ξ have no effects on investments.*

For this result to hold, it is sufficient that θ is close enough to one half, or ϕ has approached 1, so that all future marginal public revenues are allocated to public goods. If so, the incumbent in period 1 is reassured that the state will use public resources for common-interests, i.e., public goods regardless of who is in power in period 2. Moreover, $E(\lambda_2; Z, \nu, \xi, \theta) = \phi\alpha_H + (1-\phi)\,\alpha_L > 1$ so future public funds are valuable enough to make a positive marginal return to investment in fiscal capacity. A higher value of ϕ raises investments in both aspects of that state by making future government revenue more valuable and, given that state capacities are complements raises investment in both fiscal and legal capacity. Finally, by Proposition 1, common-interest states are always peaceful, since there is no redistribution to fight about.

The second possibility is a redistributive state:

Proposition 5 *Suppose that Cohesiveness fails but Stability holds, then the state is redistributive with public revenues used to finance transfers when $\alpha_s = \alpha_L$.*

1. *There are investments in both kinds of state capacity.*

2. *An increase in ϕ raises both fiscal and legal capacity investments, as do (weakly) higher values of R, ν or ξ.*

In a redistributive state, the incumbent government uses available funds to make transfers when $\alpha_s = \alpha_L$. It now chooses to invest in state capacity, as it is sufficiently likely to stay in power and to have use of that capacity as an incumbent. The stability condition implies that $E(\lambda_2; Z, \nu, \xi, \theta) > 1$ so that investment in fiscal capacity and legal capacity are both worthwhile. Moreover, both types of state capacity are complements.[8] If the incumbent

[8]This complementarity is reinforced by the fact that higher state capacity of either kind increases Z and hence (by Proposition 3) reduces the probability of being replaced in office.

finds itself under the risk of repression or civil war – i.e., Z is above one or both of trigger points Z^I and Z^O – parameter changes that raise the intensity of repression or civil war, and hence raise the chances that the incumbent survives, promotes higher investments in both fiscal and legal capacity. A stronger redistributive state may thus go hand in hand with more repression.

Finally, we have the possibility of a weak state:

Proposition 6 *If both the cohesiveness and the stability conditions fail, then the state is weak. There is no incentive at all to invest in fiscal capacity and the level of legal capacity investment is lower than with a common interest or redistributive state, all else equal.*

The fact that the stability condition fails now implies that the marginal benefit of investing in fiscal capacity is negative, $E(\lambda_2; Z, \nu, \xi, \theta) < 1$. The non-cohesiveness of political institutions and the high rate of political turnover means that any fiscal capacity investments are likely to be used by the other group for redistributive purposes once it takes office. This deters investment in the state and we see a weak state together with high political instability associated with political violence. Legal capacity investment is lower, because there is longer a positive benefit from raising wages coming through the government budget constraint.

3.5 The State Space

Our simple model provides a framework for thinking about the causes and consequences of state fragility.

It shows clearly how the two main pathologies of states, political violence and low state capacity, have common roots. The model ties these together, particularly through the parameters ϕ and θ. High θ, reflecting consensual political institutions, and high ϕ, reflecting strong common interests, lead to high investments in fiscal and legal capacity, as well as low violence. This is the case of a peaceful and prosperous state. If θ and ϕ are low then the details of the state pathologies matter leaving open the possibility of low investments in fiscal and legal capacity, as well as repression or conflict. Parameters affecting conflict (R, ξ, ν) then become relevant to the outcome.

The results are summarized in the following table.

Table 1
The state space

	Weak	Redistributive	Common interest
Peace	low ϕ, θ, R	high ϕ low θ, R	high θ, ϕ
Repression	low θ, ϕ, ξ, R high ν	low θ, ϕ, R high ν, ξ	n/a
Civil war	low θ, ϕ, ξ high ν, R	low θ, ϕ, ν high ξ, R	n/a

Whether repression is associated with a weak or redistributive state depends on how much equilibrium political stability there is. When fighting is costly (high ν) and the advantage of the incumbent is large (high ξ) then we would expect a redistributive state and repression to go together. This is the case of an effective state in repression terms which holds an incumbent in power despite weak political institutions.

Civil war will generally be associated with weak or redistributive regimes. Weak states and civil war reflects circumstances when the insurgency is relative easy to organize (low ν), the government is not effective in fighting it (low ξ). An increase in military effectiveness reduces the prospect of turnover and increases incentives to invest as in a redistributive state. Another decisive factor for which particular pathology we will observe is the amount of resource rents or foreign aid. For example, a higher degree of resource dependence (high R) raises the likelihood that we see civil war rather than repression.

The approach taken here implies that the fundamental determinants of fragile states are the strength of common interests, the extent of consensual institutions, the amount of resource rents, and the technologies for organizing and conducting violence. Phenomena like civil war, repression, low income per capita, low spending on common-interest goods, low taxation and weak enforcement of property rights are all symptoms rather than determinants.

Most of the existing literature on fragile states is not derived from any underlying theory, which explains why it tends to mix up symptoms and determinants. For example, one criterion that is frequently used in fragile state indices is low income per capita. While it is true that this may increase

incentives for violence, all else equal, it is only an intermediate factor.[9]

Another advantage of putting together a specific dynamic theoretical structure – however simple it may be – is that we get a clear sense of the margins where there may be an equilibrium response, when an outside donor intervenes in fragile states. In the next section, we will thus use our framework to explore the consequences of state fragility for development policy. We will find that common-interest and peaceful states make the task of supporting development quite easy. However, once we exit this fortunate state of affairs, the details of the pathologies matter. We venture an *Anna Karenina Principle* (cf. the 1st line of Leo Tolstoy's 1870s novel): "All happy families resemble each other; every unhappy family is unhappy in its own way."

4 Development Assistance

Just what can be done to improve the well-being of citizens in poor nations has been a controversial topic throughout the post-war period.[10] Foreign aid flows from rich to poor countries have been the main vehicle for improving the situation of poor countries. But the efficacy of such development assistance remains contested. After a brief overview of the main arguments, we will apply our framework from the previous section and show how it addresses some of the issues in this debate.

A shining example which buoyed interest and enthusiasm for aid was the experience of the Marshall plan for rebuilding post World War II Germany, and other parts of Europe. Between 1948 and 1951, the U.S. transferred around $13 billion to the economies of Western Europe. This episode created a sense that large-scale resource transfers could make a significant difference to economic development, a sense that was further underpinned by the so-called *Truman Doctrine* which called for a global focus on the plight of the developing world.

The Marshall plan fuelled the belief that lack of resources is the key impediment to economic development and aid flows are necessary to build public institutions and stocks of capital. Countries may eventually achieve a successful development path if left to themselves, but the helping hand of

[9]This argument is reinforced further by introducing private capital formation as in Besley and Persson (2011, Chapter 5).

[10]See Riddell (2007) for a review. Temple (2010) provides an excellent review of many of the economic debates.

international resource transfers would hasten that progress. This was institutionalized in a network of development banks, such as International Bank for Reconstruction and Development (IBRD, known simply as the World Bank, the Asian Development Bank, the Inter-American Development Bank or the European Bank for Reconstruction and Development. Chenery and Strout (1966) is key exposition of the underlying ideas, and a modern statement of a similar view is Sachs (2005).

This "gap-oriented" traditional view of aid underpins huge aid flows from developed countries. Official Development Assistance (ODA) comes mainly form the 23 members of the Development Assistance Committee (DAC) and totalled around $100 billion in 2007, with a further $12 billion from the European Commission. While aid targets for rich countries have been set at 0.7% of Gross National Income, very few countries meet these targets. Cost-benefit analysis is the hand-maiden of the traditional view and the notion is that aid should be spent on the projects with the highest social returns. Whether such analysis is conducted in practice – whether by donors or recipients of aid – is questionable.

The real-world experience has not fulfilled the rather romantic vision of the aid traditionalists. Aid pessimists point to the fact that much of aid would not survive any reasonable cost-benefit test. Domestic political agendas of governments in poor countries have frequently not supported economic development, and these governments often lack the technical competence to spend resources wisely. The result, it is argued, is that much aid is wasted and does not contribute to developmental ends. Bauer (1972, 1975) was an early aid pessimist, while a modern critique of aid is strongly stated in Easterly (2006).[11]

Just what to make of this view of aid is moot. A drastic response would be to simply cut off aid entirely, in the belief that the long-run prospects for countries would be better in the absence of international transfers. This response is closely linked to the resource-curse view, which identifies natural resources with slow development, and possibly with decline rather than progress.

Another response to a failure of aid would be to argue in favor of greater conditionality, trying to condition the receipt of aid on specific policies, or institutional reforms. But the real aid pessimists are sceptical. Condition-

[11] Djankov et al (2008) argues that aid leads to a deterioration in the quality of institutions.

ality frequently creates soft conditions and there is overwhelming pressure from the development community to disperse funds allocated to development assistance. Far from an indication of problems in recipient countries, a failure to disperse ODA is thought of as a failure of the donor countries. So committing to aid conditionality is hard or infeasible.

More recently, some have attempted to reconcile the two views, by being more optimistic on conditionality and the ability of analysts to identify the underlying pathologies. Certainly, traditionalists have had a naive view of the workings of political institutions or the ability to navigate around political constraints. Without a more forthright analysis of the institutional environment, it is hard to make progress. Collier (2007) can be seen as an exponent of this revisionist view.

As Table 1 illustrates, a state away from the top right-hand corner, may have a variety of potential symptoms and these have a variety of causes. Moreover, the problems may change in response to shocks (such as resource prices and natural disasters). Effective development assistance has to tailor the right form of intervention to circumstances and institutional context. This opens up the menu of possibilities to include the right mix of budgetary, project, military and technical assistance, and to make the right amount of conditionality credible.

4.1 Applying the Framework

In our analysis, we assume that the primary objective of the international community is the ex ante welfare of the citizens of a country to which it is providing development assistance. This neglects the role of strategic objectives, which could explain the willingness of countries to donate.[12] We also assume away coordination problems, by analyzing a single intervention, rather the plethora of sometimes uncoordinated action that characterizes the aid industry. Our perspective thus supposes that a foreign government or multilateral organization makes a transfer of resources to a developing country. The question is how this affects the behavior of the receiving government and, ultimately, the welfare of the citizens.

Our model suggests a number of natural margins to focus on. First, the *policy-dimension*: $\left(g_s, r_s^I, r_s^O\right)$. Does development assistance increase or decrease spending on public goods or the amount of redistributive transfers?

[12] See the discussion in OECD (2010).

Second, the *state capacity dimension*: (π_s, τ_s). In which way do different forms of development assistance influence the incentive to build fiscal or legal capacity? Third, the *political violence dimensionn*: $\left(L^I, L^O\right)$. How does development assistance affects incentives of both the incumbent and opposition to use violence as a means of winning or securing power?

4.1.1 Cash Aid

We will proceed by applying a cost-benefit style analysis to the model. Suppose that an aid agency is considering spending some aid resources in a particular country at date s. Let the shadow price of this aid in the donor country be $\hat{\lambda}$. Depending on circumstances and institutions, the additional resources will raise public-goods spending, state-capacity investments, transfers (or, in a more general model, lower taxation). We will model cash aid as an increase in the recipient government's budget which we denote by ΔR. This acts like an increase in Z in the model above.

The timing of the model is exactly as in Section 3, except that in between stages 2 and 3 the aid agency commits resources ΔR for future aid that will augment the period-2 budget. In deciding whether to offer aid, we assume that the aid agency can see through the subsequent equilibrium choices by government and takes the policy responses into account. In effect, the aid agency is applying backwards induction to the subsequent moves in the policy and investment game.

We begin with the following benchmark result:

Proposition 7 *In a common-interest state, cash aid is worthwhile if and only* $\phi\alpha_H + (1-\phi)\,\alpha_L > \hat{\lambda}$.

The logic of this result is clear. If $2\,(1-\theta) \geq \alpha_L$, all future spending is devoted to public-goods regardless of the realization of α_2. There is also no conflict risk in this case (as showed in Proposition 1). In *ex ante* terms, therefore ΔR will be spent on public goods, with value $\phi\alpha_H + (1-\phi)\,\alpha_L$. This is compared to the cost of $\hat{\lambda}$.

In this case, observe that it would not make any difference whether development assistance comes as budgetary aid or as direct support of a specific project. There is a complete congruence of interest between the aid donor and the recipient government.

Suppose instead that the cohesiveness condition fails, but there is no propensity to political violence. When $\alpha_2 = \alpha_L$, the additional resources are

spent on transfers rather than public goods. In this case, Proposition 7 is modified to:

Proposition 8 *In a weak or redistributive, but peaceful, state, cash aid is worthwhile if and only* $\phi\alpha_H + (1-\phi) > \hat{\lambda}$.

In this case, the value of aid is lower than in the benchmark case of Proposition 7 and it is even possible that aid does not yield a gross return above unity, if ϕ is low enough.[13] This result chimes with the frequently made observation, discussed in Collier and Dollar (2004), that aid impact is better when institutions are stronger.

Propositions 7 and 8 allow us to reflect upon an observation made by Peter Bauer, which Temple (2010) has christened the *Bauer Paradox*. His view is succinctly stated in the following quote: "A government unable to identify ... projects or collect taxes is unable to be able to use aid productively" (Bauer (1975), page 400). Being able to identify projects is like having high α_H and/or high ϕ. Governments that are able to collect taxes (have high fiscal capacity) will likely have more consensual institutions (Proposition 4). Hence, these are the governments where Proposition 7 applies. But when θ is low and ϕ is low, then aid is less likely to be used productively and the government is less likely to build fiscal capacity.

We now consider what happens in the case where the cohesiveness condition does not hold and where ϕ is low enough or R high enough, so that the state is prone to political violence. This gives two additional considerations in the comparative statics assessing the effect of cash aid on welfare. First, there is an impact on the use of political violence, and second there is an effect, working through political stability, on investments in state capacities.

The effect of cash aid is like an increase in Z, which – as we know – raises the use of violence. This has two welfare effects. First, it leads to more resources being allocated to violence, an activity which is directly unproductive and has no direct welfare benefits. Second, when deciding on violence, each group does not internalize this effect on the welfare of the other group, leading to strategic inefficiency. We summarize this as:

[13] In the benchmark model, granting cash aid in a common interest state makes no difference to investments in state capacity. But this is due to the assumption that unilty is linear in public goods. In the case where $V(g)$ is increasing and concave, this property of the model is no longer truem, and the analysis captures some aspects of the more sceptical view on aid and its impact. This is explored in Besley and Persson (2011, Chapter 6).

Proposition 9 *In a weak or redistributive state, which is prone to political violence, a small increase in cash aid is welfare improving if* $\phi\alpha_H + (1-\phi) - \omega(\pi_1)\frac{dL}{dZ} > \hat{\lambda}$ *where*

$$\frac{dL}{dZ} = \begin{cases} \left[\lambda_1 \frac{dL^I}{dZ} + \nu \frac{dL^O}{dZ}\right] & \text{if } Z > Z^O(\theta;\nu,\xi) \\ \lambda_1 \frac{dL^I}{dZ} & \text{if } Z^O(\theta;\nu,\xi) \geq Z > Z^I(\theta,\lambda_1;\xi). \end{cases}$$

With $\alpha_2 = \alpha_H$, we have a common interest state and resources are spent on public goods. When $\alpha_2 = \alpha_L$, resources are spent on transfers. The key point is now that aid will have an impact on equilibrium violence reflected in the third term deducted from the value of any public goods that are being created. Compared to Proposition 8, therefore, it is less likely that cash aid will be welfare increasing due to the additional welfare cost of violence. Indeed, cash aid could actually lower ex ante welfare. This is more likely when ϕ is low.

The enhanced violence affects political stability in line with the results in Proposition 3.

Proposition 10 *In a weak or redistributive state, which is prone to political violence, cash aid can increase political stability and may increase investment in fiscal and legal capacity.*

This effect comes through the fact that foreign aid (by Proposition 3) allows incumbents to entrench themselves and cement their control on power, when institutions are weak. The most clear-cut example is the case of a repressive regime. Once aid is given, the incentive to hang on to power is enhanced. As we have seen, in Proposition 5, this will tend to result in more state capacity investment all else equal. But the benefits are allocated in part to increased military force and accrue disproportionately to the incumbent group.

4.1.2 Conditionality

The assumption in the previous subsection is that government cannot contract directly over the policy and investment decisions when it grants aid. Conditionality should be thought of as a contracting problem where the donor government specifies an array of observable and verifiable decisions by the recipient government in exchange for ΔR. As with any interesting contracting problem, the real issue is what can reasonably supposed to be observed

and enforced. The latter is a particular issue, given that there is nothing equivalent to an international court which can enforce agreements. Indeed, this is often thought of as a major obstacle to effective conditionality.[14]

It is interesting to see how the earlier results might be affected by (enforceable) conditionality. Propositions 8 and 9 highlight the possibility that conditionality to make sure that aid is spent on public goods could be valuable. In the case of Proposition 9, it would ensure that fewer resources are spent on violence. However, for this latter effect, it would have to be the case that conditionality is binding on both the incumbent and the opposition if the latter wins office in the struggle for power.

4.1.3 Non-Cash Development Assistance

In this section, we consider the possibility of development assistance in other forms than cash aid, as captured by influence on other parameters of the model.

Technical Assistance Technical assistance refers to the transfers of skills and knowledge that can be useful in improving the working of government. Some estimates suggest that around one quarter of official aid comes in this form.[15] Some people refer to technical assistance as *phantom aid,* since it is often dispersed via international consultants who reside in the donor country. Evaluating the returns to technical assistance is notorious difficult, and is likely to be specific to the context and the nature of the intervention in question. Technical assistance can come in many forms. Our model suggests a focus on two of these: (i) efforts to increase the benefits or reduce the costs of providing public goods, and (ii) efforts to lower the cost of investing in state capacity. We will discuss these two cases here and demonstrate how their impact can be thought of in our analytical framework.

Consider first technical assistance that helps to identify good projects. This can be represented in the model as an attempt to raise α or ϕ. An important line of development research in recent years has used randomized control trials (RCTs) to identify the value of public interventions.[16] These can be thought of as trying to find ways of better allocating resources to public

[14] See Svensson (2000, 2003) for early analyses of the credibility problems wih conditionality.

[15] http://www.actionaid.org.uk/doc_lib/real_aid2.pdf

[16] See Duflo et al (2007) for a discussion of these methods.

goods by identifying high benefit interventions. Such interventions also raise the investments in state capacity (by Propositions 4 and 5). For given θ, it also makes it less likely that there will be conflict (by Proposition 2) and increases the probability of creating a common-interest state. We record this as:

Proposition 11 *Technical assistance that raises α_H or ϕ, increases welfare and investment in state capacity. It also reduces the likelihood political violence.*

Technical assistance can also raise try to act on α_L. In our framework that can even lead to the creation of a common-interest state with its virtuous consequences. In the case describe here, the cost of the intervention should be weighed against the increased public goods that will be provided (since fiscal and legal capacity increase) and the value of the extra public goods that are generated by these investments.

Our model shows the same complementarity between the value of aid and consensual institutions that we saw in the case of cash aid. Technical assistance is more powerful in countries where public resources are more likely to be allocated for the common good. So, the return to RCTs will be lower in weak or redistributive states if they are intended to inform government about the value of good policy.

Another type of technical assistance would be to reduce investment costs – improving state capabilities. These interventions are common in development and can be represented in the model as shifts in the functions $F(\cdot)$ and $L(\cdot)$. In this case, we have:

Proposition 12 *Technical assistance that reduces the cost of investing in state capacity: $F(\cdot)$ and $L(\cdot)$ increases welfare and investment in state capacity. It will tend to increase the possibility of political violence all else equal.*

The result on state capacity follows from the Euler equations (4) and (5). Our framework makes sense of these type of interventions. Examples include giving advice on tax collection, or the creation of specialized courts to expedite the resolution of business disputes. It could even mean advice about fundamental changes in the nature of the legal code. The (perhaps surprising) effect on political violence comes from the fact that Z goes up when state-capacity investments increase which, all else equal, may lead to an increase in political violence

Military assistance We now consider the role of military assistance within the confines of our simple model. One aspect of such assistance may be to give advice on military technology/strategy, which can be modeled as changes in ξ. This could be training or provision of weapon systems and intelligence. In principle, this could be offered either to the government or the opposition. External governments could also directly intervene by providing manpower to either the government or rebels. We focus on the case, where support is offered to the incumbent government.

Our core result is:

Proposition 13 *Military assistance that increases ξ, augmenting the military capacity of the incumbent government, increases the parameter range in which there is repression. This increases political stability and investment in fiscal and legal capacity.*

If institutions are weak, the higher political stability due to higher repressions raise state capacity investments (by Propositions 3 and 5). But this comes at the price of increasing the entrenchment of the incumbent. In effect, this can create a rentier state, where the opposition group is frozen out of power. Military intervention to help any incumbent will therefore tend to increase the incentives for the incumbent to invest. But it is not a substitute for more consensual institutions (higher θ). This story seems relevant, perhaps especially for the cold war, but also for modern-day fragile states with ongoing or latent conflict.

Post-conflict assistance Finally, we consider attempts by external actors to assist in the process of promoting peace in post-conflict situations. Our model allows us to represent this in a very stylized fashion.

Peace-keeping or disarming the rebels can be thought of as raising ν. This reduces the parameter range in which there is conflict and increases political stability (by Proposition 3). Many post-conflict settlements can also be thought of as efforts to raise θ (diminishing the gain to the winner). This will reduce the risk of violence (by Propositions 1 and 2) . However, the latter effect requires that the interventions are expected and hence credible *ex ante*. A recent example of such a mechanism was attempted in Haiti after the recent earthquake, where the high influx of aid has been disbursed outside of the government structures with former U.S. President Bill Clinton playing a key role. We summarize this in:

Proposition 14 *Post-conflict assistance that raises ν or θ will lead to greater investments in state capacities and reduce the parameter range in which there is violence.*

Of course, post-conflict reconstruction may have a wider remit part of which could involve direct efforts to increase τ and π. It generally also comes with a good deal of cash aid, making reforms to raise θ and lower ν doubly important.

5 Concluding Remarks

We have presented a framework that makes sense of current policy debates about impediments to development in fragile states. While attempts to define fragility precisely are open to interpretation, they are crucial in reminding us that political violence and ineffective states are commonplace in many low-income countries. Our analysis shows how such an unfortunate situation can be understood and highlights some features of the economic environment which may perpetuate the problem. Table 1 summarizes our insights and underlines the common roots of state pathologies. In broad terms, the deepest root is the absence of common interests reinforced by non-cohesive institutions.

Throughout the paper, we have taken the cohesiveness of political institutions (parameter θ) as given, and our analysis begs the question why some states persist with non-consensual political institutions. In Besley and Persson (2011, Chapter 7), we explore the circumstances in which non-consensual institutions may stay unreformed. The basic finding is that repression and weak institutions can coexist, since the entrenchment in power creates poor incentives to reform institutions, unless the cost of that repression is very high. In the context of development assistance, it becomes particularly important whether aid adds to the incentives for political reform.[17]

In conclusion, we would like to acknowledge that this paper is a purely theoretical exercise. We know preciously little about how important the channels identified by our theory are in practice. That could only be assessed with appropriate empirical analysis on a case-by-case basis.

[17]See Djankov et al (2008) for an empirical analysis, which suggests that aid may deteriorate democracy and consensual institutions.

Indeed, our suggested Anna Karenina Principle underlines the importance of heterogeneity. This may to some degree reconcile the different positions in the debate on development policy. Our model suggests that there may always be some advantageous development policy. But identifying that policy requires a great deal of knowledge about circumstances and institutions. One could thus be an aid pessimist or an aid optimist, depending on the form of aid and the ability of aid agencies to understand its impact in specific contexts.

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6 Proof of Propositions

Proof of Proposition 2. The complementary slackness conditions for the problems faced by L^I and L^O assuming that $L^I > 0$ and $L^O > 0$ are:

$$\begin{aligned} -\gamma_I\left(L^O, L^I; \boldsymbol{\xi}\right) xZ - \lambda_1 &\leqslant 0 \\ \text{c.s. } \bar{L}^I &\geq L^I \geq 0. \end{aligned}$$

and

$$\begin{aligned} \gamma_O\left(L^O, L^I; \boldsymbol{\xi}\right) xZ - \nu &\leqslant 0 \\ \text{c.s. } \bar{L}^O &\geq L^O \geq 0. \end{aligned}$$

where $x = (1-2\theta)2\left(1-\phi\right) \in [0,2]$.

First, we show that, at any interior solution, resources devoted to fighting by both groups is increasing in Z. To see this, observe that differentiating and using the first-order conditions when they hold with equality yields:

$$\left[\begin{array}{cc} -\gamma_{II}xZ & -\gamma_{IO}xZ \\ \gamma_{IO}xZ & \gamma_{OO}xZ \end{array}\right]\left[\begin{array}{c} dL^I \\ dL^O \end{array}\right] = \begin{array}{c} \gamma_I x dZ \\ -\gamma_O x dZ \end{array} . \tag{6}$$

Define $\Omega = \left[-\gamma_{II}\gamma_{OO} + \left(\gamma_{IO}\right)^2\right] x^2 Z^2 > 0$. Solving (6) using Cramer's rule yields:

$$\frac{dL^I}{dZ} = \frac{x^2 Z\left[\gamma_I\gamma_{OO} - \gamma_O\gamma_{IO}\right]}{\Omega} > 0$$

and

$$\frac{dL^O}{dZ} = \frac{x^2 Z\left[\gamma_{II}\gamma_O - \gamma_I\gamma_{IO}\right]}{\Omega} > 0 .$$

where we have used both parts of Assumption 1**d**.

We now derive two trigger points for violence. Define $\hat{L}\left(Z\right)$ from

$$\begin{aligned} -\gamma_I\left(0, \hat{L}\left(Z\right); \boldsymbol{\xi}\right) xZ - \lambda_1 &\leqslant 0 \\ \text{c.s. } \bar{L}^I &\geq \hat{L}\left(Z\right) \geq 0 . \end{aligned}$$

It is simple to check that this is an increasing function of Z under Assumption 1**b**. Clearly with $L^O = 0$, $L^I = \hat{L}\left(Z\right)$. We can define $Z^I(\theta; \boldsymbol{\xi})$ from $\hat{L}\left(Z\right) = 0$, i.e.,

$$Z^I(\theta; \boldsymbol{\xi}) = \frac{-\lambda_1}{\gamma_I\left(0, 0; \boldsymbol{\xi}\right) x} .$$

Next, define $Z^O(\theta;\boldsymbol{\xi})$ implicitly from

$$\gamma_O\left(0,\hat{L}(Z^O(\theta;\boldsymbol{\xi})\right)xZ^O(\theta;\boldsymbol{\xi})=\nu\ .$$

The expression for $\frac{dL^O}{dZ}$ implies that for $Z\geq Z^O$, we must have $L^O>0$.

As the next step, we prove that $Z^O(\theta;\boldsymbol{\xi})>Z^I(\theta;\boldsymbol{\xi})$. Suppose not, then

$$\gamma_O\left(0,0;\boldsymbol{\xi}\right)xZ^O(\theta;\boldsymbol{\xi})=\nu\ .$$

If so,

$$Z^O(\theta;\boldsymbol{\xi})=\frac{\nu}{\gamma_O\left(0,0;\boldsymbol{\xi}\right)x}\leq Z^I\left(\theta;\boldsymbol{\xi}\right)=\frac{-\lambda_1}{\gamma_I\left(0,0;\boldsymbol{\xi}\right)x}\ ,$$

or

$$\frac{-\gamma_I\left(0,0;\boldsymbol{\xi}\right)}{\gamma_O\left(0,0;\boldsymbol{\xi}\right)}<\frac{\lambda_1}{\nu}\leq\frac{\alpha_H}{\nu}\ ,$$

which contradicts Assumption 1**c** for all values of θ.

Finally, it is easy to see from the explicit definition that $Z^I(\theta;\boldsymbol{\xi})$ is an increasing function. Using the implicit definition of $Z^O(\theta;\boldsymbol{\xi})$, and the fact that $\hat{L}\left(Z^O(\theta;\boldsymbol{\xi})\right)$ is (weakly) increasing, it follows that this function is increasing as well. This concludes the proof of the proposition. ■

Proof of Proposition 3. The result under repression obvious. As as Z increases, under civil war

$$\begin{aligned}\Gamma_Z\left(Z,\nu,\xi\right) &= \gamma_I\frac{dL^I}{dZ}+\gamma_O\frac{dL^O}{dZ}\\ &= \frac{\left[\left(\gamma_I\right)^2\gamma_{OO}+\left(\gamma_O\right)^2\gamma_{II}-2\gamma_I\gamma_O\gamma_{IO}\right]}{\left[-\gamma_{II}\gamma_{OO}+\left(\gamma_{IO}\right)^2\right]Z}<0\end{aligned}$$

since $\gamma\left(L^O,L^I;\xi\right)$ is quasi-concave under our assumptions. The incumbent fights relatively harder than the opposition when
more is at stake, because γ_I rises faster than γ_O.

Now observe that as ν increases, we have:

$$\begin{aligned}\Gamma_\nu(Z,\nu,\xi) &= \gamma_I\frac{dL^I}{d\nu}+\gamma_O\frac{dL^O}{d\nu}\\ &= \frac{\left[-\gamma_{II}\gamma_O+\gamma_I\gamma_{IO}\right]}{\left[-\gamma_{II}\gamma_{OO}+\left(\gamma_{IO}\right)^2\right]2\left(1-\phi\right)\left(1-2\theta\right)Z^2}<0.\end{aligned}$$

■

Figure 1 2008 Polity IV Index of Fragile States