State Capacity, Conflict and Development*

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Abstract

The absence of state capacities to raise revenue and to support markets is a key factor in explaining the persistence of weak states. This paper reports on an on-going project to investigate the incentive to invest in such capacities. The paper sets out a simple analytical structure in which state capacities are modeled as forward looking investments by government. The approach highlights some determinants of state building including the risk of external or internal conflict, the degree of political instability, and dependence on natural resources. Throughout, we link these state capacity investments to patterns of development and growth.

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A striking feature of economic development is an apparent symbiotic evolution of strong states and strong market economies. However, traditional analyses of economic development tend to focus on the expansion of the market economy with less attention paid to the expansion of the state. Just as private physical and human capital accumulation is a key engine of private sector growth, the buildup of public capital is also an engine of state expansion. It is arguable that a good part of investing in state effectiveness comes from improving the state's ability to implement a range of policies, something which we will refer to as *state capacity*. Nowadays, this concept is commonplace in other branches of social science. Coined by historical sociologists, such as Charles Tilly, state capacity originally referred to the power of the state to raise revenue. Here we broaden it to capture the wider range of competencies that the state acquires in the development process, which includes the power to enforce contracts and support markets through regulation or otherwise.

The issue of state capacity is also common currency in the applied development community, where it is intimately associated with the concept of *weak* or fragile states. Weak states tend to be hopelessly poor, unable to maintain basic economic functions and raise the revenue required to deliver basic services to their citizens. They are also often plagued by civil disorder or outright conflict. This propensity towards conflict and weak government institutions tends to be clustered with low income levels and stagnation.

This paper puts forward a simple model of investments in state capacity. It provides a unifying framework for thinking about a range of issues that have, so far, been discussed as disparate phenomena: the risk of external or internal conflict, the degree of political instability, and economic dependence on natural resources. It provides answers, albeit in a stylized way, to a range of questions: What are the main economic and political determinants of the state's capacity to raise revenue and support markets? How do risks of violent conflict affect the incentives to invest in state building? Does it matter whether conflicts are external or internal to the state? What may be the mechanisms whereby weak states are associated with lower income levels and growth rates than strong states? What relations should we expect between resource rents, civil wars and economic development? These questions are now occupying the attention of many scholars who try to understand patterns of development across time and place.

Section 1 of the paper presents a basic model, in which building state capacity to raise taxes (fiscal capacity) and support markets (legal capacity)

are modeled as investments under uncertainty. Our model yields a series of benchmark results, detailing how investments in state capacity depend on a number of structural factors. It shows why we might expect the two forms of state capacity to be complements and hence develop together, and illustrates why a lower risk of external conflict, a higher degree of resource dependence, as well as lower political stability, weaken the incentive for state building. This basic framework serves as a building block and is put to work in the subsequent two sections.

Section 2 models political stability endogenously, with the rate of turnover being affected by internal conflicts initiated by an opposition group of insurgents. Here, we model internal – as opposed to external – violent conflict, by allowing incumbent and opposition groups to invest in violence. Having characterized the circumstances when the economy ends up in peace, government repression, or civil war, we revisit the analysis of investments in state capacity. The results illustrate how high resource dependence may jointly trigger a high propensity towards conflict, low income, and low investments in legal and fiscal capacity.

In Section 3, we examine how building fiscal capacity can improve other aspects of policy making. Here, we extend the basic framework by allowing for quasi-rents in production. In this model version, political instability can keep the economy in an investment trap, where low investments in fiscal capacity perpetuate inefficient regulatory policies to redistribute income through rent creation/protection rather than through taxation. This in turn leads to factor market distortions, lower investments in market support, and low income/growth. The results suggest another channel that links together weak state capacity and low income, which again works through weak incentives to build the state.

The association of weak states (manifested in low state capacity) with poor economic performance is a theme that runs across all three sections. A unified model of the incentive to invest in state capacity is at the heart of each section and lays bare a common set of factors that shape low levels of state capacity, which have not been joined together in previous approaches. In each section, the theoretical results are summarized in a few key propositions. We discuss the implications of the theory, comment on its relationship to the existing literature, as well as mentioning some relevant empirical work. A short concluding section takes stock of the findings and suggests topics for further research.

1 The origins of state capacity

This section develops the core model for analyzing the incentive to invest in state capacity, based on Besley and Persson (2009a). As we mentioned in the introduction, economists have paid little attention to state capacity investments. For example, researchers in public finance, political economics, or development rarely assume that a government, which finds a certain tax rate for a certain tax base optimal and incentive-compatible, is constrained by fiscal infrastructure. Similarly, economic theory rarely assumes that the state is constrained by a lack of legal infrastructure when it comes to enforcing private contracts or, more generally, supporting private markets.

This contrasts with the approach taken by political and economic historians who view the state's capacity to raise revenue as an important phenomenon in itself. They link to a thirst for military success and regard it as a key factor behind the successful development of nation states (see e.g., Tilly, 1985, Levi, 1988, or Brewer, 1989). In line with the core thesis, the tax systems in countries such as the US, the UK, and Sweden, have indeed been reformed and expanded in connection with actual or latent external conflicts. Political scientists such as Migdal (1988) have emphasized that one of the major problems of developing countries is that their states are often too weak and lack the capacity to raise revenue and to govern effectively. State capacities and weak states are also major concepts in the development policy community.[1]

The starting point taken outside of economics has some attraction given the practical experience of economic development. Presupposing sufficient capacities to tax and support markets does not sit well with the experience of many states, either in history or in the developing world of today. Moreover, international data suggest that the ability to raise revenue from advanced tax systems is strongly positively related to the ability to support markets, as well as to the level of economic development.

Figure 1 illustrates these patterns in the data. It shows the positive correlations in contemporary data between the tax share of GDP (vertical axis), an index of property rights protections (horizontal axis), and income (blue dots above red dots below median income in 1980). There is no good reason to believe that these correlations can be interpreted causally. Indeed, our core model will emphasize the joint determination of these variables, where insti-

[1] See e.g., Rice and Patrick (2008) for a discussion and definition of weak states.

tutions, historical shocks and initial conditions are common omitted factors that jointly drive taxation, property-rights protection and income.

The model of Besley and Persson (2009a) separates decisions about investments that enhance the feasible set of policies from decisions about the policies themselves.[2] Thus, taxes and market-supporting policies are constrained by the state's fiscal and legal capacity. Expansion of these capacities are viewed as forward-looking investments under uncertainty. A central result that emerges from the framework, under specific assumptions, is an important complementarity between fiscal and legal capacity. This implies that the two forms of state capacity are likely to be positively correlated with each other and with income as Figure 1 suggests.

1.1 Basic model setup

The model is stripped down to give a simple and transparent account of the important factors. Total population size is normalized to one. There are two groups, each of which comprises half the population in every time period. For the purposes of this paper, two alternative timing structures give essentially the same results. In one, time is infinite and one generation is alive in each period, making investment decisions based on a warm-glow bequest motive. In the other, which we will adhere to here, there are just two time periods, $s = 1, 2$, and the world ends after period 2. Although artificial, this two-period approach allows us to make the main points of economic interest.

At the beginning of period 2, the group that held power at the end of period 1 is the incumbent government, denoted by I_1. The other group is the opposition denoted by O_1. Power can be peacefully transferred to the opposition, which happens with exogenous probability given by parameter γ. This can be thought of as the reduced form of some underlying political process, which we do not model. As a result, whoever wins becomes the new incumbent, I_2, and whoever loses becomes the new opposition, O_2. At the end of period s, the current incumbent, I_s, sets a tax on the income of each group member denoted by t^{J_s}, where $J_s \in \{I_s, O_s\}$. It also chooses a level of legal support for each group p^{J_s}, and spends on general public goods G_s. At the end of period 1, incumbent I_1 also makes investments in next period's

[2]Recent related papers include Acemoglu (2005), where governments can increase their future tax revenues by spending on public goods, and Acemoglu, Ticchi and Vindigni (2007) who study the build up of government bureaucracies. Earlier, fiscal capacity has been studied by Cukierman et al (1992) and legal capacity investment by Svensson (1998).

state capacity (see below). In addition to tax income, the government earns natural resource rents R_s. These are stochastic and drawn from a two-point distribution $\{R_L, R_H\}$ where $R_s = R_H$ with probability ρ in each period. None of the resource rents accrue directly to the private sector.[3]

The precise timing of these events is spelled out below.

Individual incomes and utility In period s, individuals consume and produce, with members of group J_s earning a market income:

$$w^{J_s} = w\left(p^{J_s}\right) \ ,$$

where $w(\cdot)$ is an increasing concave function. The policy variables p^{J_s} can be interpreted in a number of ways. In a broad sense, we view them as a reduced form for market-supporting policies that raise private incomes of group J. This might include the provision of productive physical infrastructure such as roads, ports and bridges. The distinctive feature of policy is that the way such capacity is deployed, reflected by p^{J_s}, is distinct from the *capacity* to use the policy, a feature that we introduce below. Following Besley and Persson (2009a), we will throughout refer to p^{J_s} as if they are policies that affect legal enforcement and raise incomes by facilitating gains from trade in capital markets.[4]

One feature of our formulation is worth emphasising as it is somewhat non-standard. Having created legal capacity π_s, we allow this level of market support to be enjoyed costlessly by *both* groups. However, whether these benefits are extended is a policy decision by government, i.e. $0 \leq p^{J_s} \leq \pi_s$. The government can therefore choose to protect the property rights of the two groups to different degrees, given its legal capacity (see below). Creating legal capacity can thus be (conceptually) distinct from regulating access to it.

Individual utility in period s is linear and given by:

$$\alpha_s G_s + c^{J_s} = \alpha_s G_s + (1 - t^{J_s}) w\left(p^{J_s}\right) \ , \tag{1}$$

[3]We could add private natural resources as accruing additively to private incomes without any affect on the incentives that we model in this paper. In this case, R_s can be thought of as the share of rents that accrue to the public sector.

[4]Besley and Persson (2009a) develop a microfounded model with less than perfect enforcement (by the state) of collateral in (private) credit-market contracts. The policy p^{J_s} in this context is interpreted as policies that allow greater use of collateral to support trade in credit markets.

where c^{J_s} is private consumption, and G_s is the level of public goods with parameter α_s reflecting the value of public goods. We assume that α_s has a two point distribution $\{\alpha_L, \alpha_H\}$, with $\alpha_H > 2 > \alpha_L$, and we use ϕ to denote the probability that $\alpha_s = \alpha_H$. A specific interpretation is that G_s denotes spending on external defense, while α_s and ϕ capture the severity and risk of external conflict. The equality in (1) arises since we assume that individuals do not save between periods 1 and 2.

Constraints on government Policies are constrained by state capacity. The levels of fiscal capacity τ_s, and legal capacity π_s are inherited from the previous period. The incumbent group in period 1 chooses these levels for period 2 given the political institutions in place.

In concrete terms, τ represents fiscal infrastructure such as a set of competent tax auditors, or the institutions necessary to tax income at source or to impose a value-added tax – we can think about τ as decreasing the share of her market income $(1-\tau)$ an individual can earn in the informal sector. Fiscal capacity does not depreciate, but can be augmented by I_1 through non-negative investments which cost $F(\tau_2 - \tau_1)$, where $F(\cdot)$ is an increasing convex function with $F(0) = F_\tau(0) = 0$. A higher τ_s allows the incumbent I_s to charge higher tax rates, such that $t^{J_s} \leq \tau_s$. To allow for redistribution in a simple way, we allow negative tax rates.

In concrete terms, π represents legal infrastructure investments such as building court systems, educating and employing judges and registering property or credit. Like fiscal capacity, legal capacity does not depreciate, but can be augmented with non-negative investments at cost $L(\pi_2 - \pi_1)$, where $L(\cdot)$ is an increasing convex function with $L(0) = L_\pi(0) = 0$. As we mentioned in the last section, a higher π_s allows government I_s to better support private markets with $0 \leq p^{J_s} \leq \pi_s$.

The government budget constraint in period s can be written as:

$$0 \leq \sum_{J_s \in \{I_s, O_s\}} \frac{t^{J_s} w^{J_s}}{2} - G_s + R_s - \begin{cases} L(\pi_2 - \pi_1) - F(\tau_2 - \tau_1) & \text{if } s = 1 \\ 0 & \text{if } s = 2 \end{cases} . \quad (2)$$

Given that the opposition takes over with probability γ, this parameter becomes a crude measure of political instability.[5]

[5]Besley and Persson (2009a) assumes that in its decisions the government internalizes the preferences of the opposition group, according to a weight $\theta \in [0, \frac{1}{2}]$ that captures, in

Timing Each period has the following timing:

1. The initial conditions are $\{\tau_s, \pi_s\}$ and the identity of last period's incumbent I_{s-1}.
2. The values of public goods α_s and natural resource rents R_s are realized.
3. Group I_{s-1} remains in office with probability $1-\gamma$.
4. The new incumbent I_s determines a vector of tax rates, legal support, and spending on public goods: $\left\{ \left\{ t^{J_s}, p^{J_s}, \right\}_{J_s \in \{I_s, O_s\}}, G_s \right\}$. The period-1 incumbent also chooses state capacities for the next period τ_2, π_2.
5. Payoffs for period s are realized and consumption takes place.

1.2 Equilibrium policy

We begin with the policy choices at stage 4 of period s. Linearity allows us to study these separately from the choices of state capacity for period 2. With the assumed policy weights, we can write the objective of incumbent I_s as:

$$V^{I_s} = w\left(p^{I_s}\right)\left(1 - t^{I_s}\right) + \alpha_s \left[\frac{t^{I_s} w\left(p^{I_s}\right) + t^{O_s} w\left(p^{O_s}\right)}{2} + z_s \right] , \qquad (3)$$

where we have replaced G_s via the government budget constraint (2), and where residual revenue z_s is defined by

$$z_s = R_s - \begin{cases} L(\pi_2 - \pi_1) - F(\tau_2 - \tau_1) & \text{if } s = 1 \\ 0 & \text{if } s = 2 \ . \end{cases}$$

This objective is maximized subject to $G_s \geq 0$, $t^{J_s} \leq \tau_s$ and $p^{J_s} \leq \pi_s$.

a simple and reduced-form way, the inclusiveness of political institutions through checks and balances or electoral systems. Here, we simplify the analysis by assuming that any government acts purely selfishly by maximizing the expected utility of its own group (i.e., we assume $\theta = 0$).

Taxation and spending on public goods The simple form of (3) makes it easy to derive equilibrium fiscal policy. Whenever $\alpha_s = \alpha_H > 2$, it is optimal for I_s to tax its own group maximally, $t^{I_s} = \tau_s$, and use the revenue to expand G_s. Because I_s puts zero weight on the opposition group, it also sets $t^{O_s} = \tau_s$. If $\alpha_s = \alpha_L < 2$, it becomes optimal to switch to a redistributive policy, where the opposition is still taxed fully, $t^{O_s} = \tau_s$, but no public goods are provided and

$$-t^{I_s} w\left(p^{I_s}\right) = \tau_s w\left(p^{O_s}\right) + 2z_s \ .$$

Thus, whether we have high or low demand for common-interest public goods is crucial. For high α, the incumbent taxes both groups at full capacity and spends all available revenue (less investment costs if $s = 1$) on public goods. When public goods are not very valuable, no public goods are provided and all available revenue is transferred to the incumbent group (through a negative tax rate).[6] We refer to $\alpha_s = \alpha_H$ as the *common-interest* state, and to $\alpha_s = \alpha_L$ as the *redistributive* state.

The *realized* value of government funds in period s, which is obtained by differentiating V^{I_s} with regard to z_s is state dependent and is given by:

$$\lambda_s = \ \text{Max}[\alpha_s, 2].$$

Legal protection It is straightforward to see that (3) is increasing in the legal protection afforded to each group. Thus, it becomes optimal to exploit any existing legal capacity fully and set

$$p^{O_s} = p^{I_s} = \pi_s \ .$$

Intuitively, the incumbent group can only gain from improving property rights to both groups, either directly via a higher wage, or indirectly via a higher tax base. Simple as it is, this production efficiency result is in the spirit of Diamond and Mirrlees (1971). The result does not mean that property rights are well protected everywhere, however, since this hinges on the value of π_s reflecting past investment decisions.

The key point – which can be broadly applied – is that whatever the state's capacity to improve productivity, it will be shared universally on an open access basis. But as we show in Section 3, when rents are present, the

[6] Besley and Persson (2009a) emphasize that public goods will generally be underprovided relative to a Utilitarian optimum. However, given the two potential values of α_s, this underprovision result is absent here.

state's capacity to tax those rents becomes important. In the present setting, however, the result holds regardless of the level of fiscal capacity.

Even though the setup is a bit different, the results on policy are similar to those in Besley and Persson (2009a). Collecting all results, we have:

Proposition 1 *In all states* $p^{J_s} = \pi_s$ *for* $J_s \in \{I_s, O_s\}$ *and* $t^{O_s} = \tau_s$. *In common interest states,* $G_s = \tau w(\pi_s) + z_s$ *and* $t^{I_s} = \tau_s$, *while in redistributive states,* $G_s = 0$ *and* $-t^{I_s} = \tau_s + 2\frac{z_s}{w(\pi_s)}$.

1.3 Equilibrium state capacity

Preliminaries Using the equilibrium policies in Proposition 1, we can write the expected future payoff to the incumbent at stage 4 of period 1, taking as given the state capacity for period 2:

$$E[V^{I_1}(\pi_2, \tau_2)] = w(\pi_2)(1 - \tau_2) + E(\lambda_2)[\tau_2 w(\pi_2) + E(z_2)] \ . \tag{4}$$

The expression $E(\lambda_2) = \phi\alpha_H + (1-\phi)(1-\gamma)2$ is the *expected* value of government funds in period 2 viewed from the perspective of period 1 and is a key magnitude determining investment incentives. It depends on three underlying parameters. With probability ϕ the value of public goods (risk of external conflict) is high, α_H, the future is a common-interest state and all revenue is used to supply private goods. With probability $(1-\phi)$ the future is a redistributive state, and the incumbent captures a marginal return of 2 with probability $(1-\gamma)$, namely when it stays in power.

State capacity choices The choice by incumbent group I_1 of state capacity for period 2 maximizes:

$$E[V^{I_1}(\pi_2, \tau_2)] - \lambda_1[L(\pi_2 - \pi_1) + F(\tau_2 - \tau_1)] \ , \tag{5}$$

subject to $\pi_2 \geq \pi_1$ and $\tau_2 \geq \tau_1$. Thus the choice of I_1 trades off the period-2 expected benefits against the period-1 costs of investment, given the realized value of public funds. When doing so, it takes into account the uncertainties about the future values of public goods and resource rents, as well as the prospects of government turnover.

Carrying out the maximization and using (4), we can write the first-order (complementary-slackness) conditions as:

$$w_p(\pi_2)\{1 + \tau_2[E(\lambda_2) - 1]\} \leq \lambda_1 L_\pi(\pi_2 - \pi_1) \tag{6}$$

and

$$w(\pi_2)[E(\lambda_2) - 1] \leq \lambda_1 F_\tau(\tau_2 - \tau_1) \ , \tag{7}$$

where (6) concerns legal capacity and (7) fiscal capacity.

Conditions (6) and (7) reproduce, in somewhat different notation, the gist of the results in Besley and Persson (2009a). Since $L_\pi(0) = F_\tau(0) = 0$, it is easy to see that, if $E(\lambda_2) > 1$, there is always positive investment in both kinds of state capacity. Moreover, in this case, fiscal and legal capacity are complements. To simplify the discussion, we focus on this case here.[7] It will prevail as the probability, ϕ, of the common interest state is large enough, or political instability, γ, is low enough – sufficient conditions are either $\phi > \frac{1}{2}$ or $\gamma < \frac{1}{2}$.

Determinants of state capacity When $E(\lambda_2) > 1$, the left-hand side of (6) is increasing in τ_2, while the left-hand side of (7) is increasing in π_2. The resulting complementarity is interesting in its own right. However, it also simplifies the analysis since it implies that the payoff function (5) is supermodular. This means that we can use standard results on monotone comparative statics (see, e.g., Milgrom and Shannon, 1994). Thus, any factor that increases (decreases) the expected value of government funds $E(\lambda_2)$, for given λ_1, will increase (decrease) investment in *both* legal and fiscal capacity. The same is true for any factor that weakly decreases (increases) the RHS of the two expressions for given $E(\lambda_2)$.

Using (6) and (7) together with the definition of $E(\lambda_2)$, we establish the following result:

Proposition 2 *Investments in both legal and fiscal capacity increase with:*

1. *wages* (*for given* π)
2. *the share of national income not generated by natural resources*
3. *the expected value of public goods* (*risk of external conflict*)
4. *the level of political stability*
5. *lower costs in either type of investment* (*for given* π *or* τ)

The proof of this and subsequent results is found in the Appendix.

[7] Besley and Persson (2009a) discuss some implications of this not being the case.

1.4 Implications

The first part of Proposition 2 is consistent with Figure 1, where we saw that taxation and property-rights protection are both positively correlated with income across countries. We return to the relation between legal capacity and income (growth) later on in this section.

Second, Proposition 2 suggests that investment in state capacity is declining in the share of resource rents in GDP – $R_s/Y_s = R_s/\left(w(\pi_s) + R_s\right)$ – for given Y_s. This is because we have assumed that only produced output is taxed and that legal capacity is only useful for produced output.

The third part of Proposition 2 is in line with Tilly's (1985) claim that war is important for building fiscal capacity, but extends it to legal capacity. While external defense is a natural example, the result applies to any national common-interest program, such as a universal welfare state or health program. If the demand for such public goods or services is expected to be high, any group that is in power has a greater incentive to invest in fiscal capacity to finance future common-interest spending. In the second half of the 18th century, continued state capacity building by the dominant British elite culminated in the launch of an income tax during the Napoleonic wars, when the British government could raise taxes equal to a remarkable 36% of GDP (Mathias and O'Brien, 1976).

Part four of the Proposition holds because the incumbent group faces a smaller risk of the opposition using a larger fiscal capacity to redistribute against the incumbent. Thus, we should observe higher political stability to induce more developed economic institutions.[8] We know of no systematic evidence on this prediction, but a historical case in point is England after the Glorious Revolution. During a parliament dominated by the Whigs for more than 40 years, tax income rose to 20% of GDP, and institutions for charging excise and indirect taxes were put in place (see e.g., Stasavage, 2007, and O'Brien 2005).

One interpretation of the fifth part of the proposition is a theoretical rationale for legal origins, the subject of many studies following La Porta et al (1998). If some form of legal origin, such as the common-law tradition, makes it cheaper to facilitate private contracting, then we would expect this to promote investments in the legal system. Less trivially, we would also expect

[8]In their richer model, Besley and Persson (2009a) find that this effect should be stronger in countries with less inclusive political institutions, They also find that more inclusive politcal institutions by themselves generally promote investments in state capacity.

the same legal origin to promote investments in the tax system, because of the complementarity of legal and fiscal capacity.

Correlations in international data Besley and Persson (2009a) explore the cross-sectional correlations in international data, motivated by results like Proposition 2, which identifies a number of *common* determinants of legal and fiscal capacity. First, they take the historical incidence of war as a proxy for the past demand for common public goods and use data from the Correlates of War data set to measure the share of all years between 1816 – or independence, if later – and 1975 that a country was involved in external military conflict. Second, they consider indicators of legal origin from La Porta et al (1998) as proxies for the cost of legal infrastructure. To gauge current legal and fiscal capacity, they consider four different indicators of each form of state capacity, including measures of contract enforcement, protection of property rights, and various aspects of tax structure.

Besley and Persson (2009a) show that a higher share of external conflict years in the past is always associated with higher measures of legal capacity as well as fiscal capacity in the present. Past incidence of democracy or parliamentary democracy (the two variables are closely related) correlate positively with both types of state capacity. While English legal origin is uncorrelated with legal capacity (except when it comes to contract enforcement), German and Scandinavian legal origins do display a robust positive correlation, not only with legal capacity but also with fiscal capacity. Key determinants identified by our theory thus appear to have stable correlations with the state's capacity to support markets as well as to raise revenue.[9]

Growth Beyond these direct implications, the model makes a prediction about economic growth between periods 1 and 2. Using Proposition 1, this is given by:

$$\frac{Y_2 - Y_1}{Y_1} = \frac{w(\pi_2) - w(\pi_1) + R_2 - R_1}{w(\pi_1) + R_1} \ . \tag{8}$$

If we ignore the exogenous resource rents, higher growth is generated solely by having higher legal capacity and hence better support for private markets.

[9]In line with their more extensive model, Besley and Persson (2009a) also measure inclusive political institutions in the past by the incidence of democracy and parliamentary democracy. They find that current state capacity of both types is generally correlated with these measures of politically inclusive institutions.

This would show up in the data as higher TFP.

Legal capacity may be closely related to financial development (in the microfounded model of Besley and Persson, 2009a, e.g., private credit to GDP is proportional to π). Financial development due to better institutions can thus cause growth. But the relationship can easily go the other way: according to the second part of Proposition 2, higher income generally raises incentives to invest in legal capacity leading to financial development.

The complementarity between fiscal and legal capacity has interesting implications for the relationship between taxation and growth. If greater legal capacity is driven by the determinants suggested by Proposition 2, we would expect it go hand-in-hand with greater fiscal capacity. Variation in these determinants would tend to induce a *positive* correlation between taxes and growth. Even in the case where $E(\lambda_2) < 1$ (when investment in fiscal capacity is zero), legal capacity and national income are still positively correlated even though taxation and growth are uncorrelated.[10]

These observations relate to recent empirical findings in the macroeconomics of development. Many researchers have found a positive correlation between measures of financial development, or property-rights protection, and economic growth (e.g., King and Levine, 1993, Hall and Jones, 1999 and many subsequent papers), although the first part of Proposition 2 warns us that such correlations may not reflect a causal effect of financial markets, but reverse causation. But many researchers who expected to find a negative relation between taxes and growth have found nothing (see e.g., the overview in Benabou, 1997). Simple though it is, our model suggests a possible reason for these findings.

Our approach focuses on state capacity and hence ignores the standard engine of growth through private capital accumulation. When one extends the model to include private investment, building fiscal capacity does have a more "standard" disincentive effect on growth because higher τ_2 raises expected taxes and lowers expected net private returns. However, building legal capacity has an additional positive effect on growth, because it can raise the gross return to investing, which stimulates private accumulation. With complementarity between fiscal and legal capacity, both kinds of state capacity may still expand with overall income.

[10] However, Besley and Persson (2009a) show that changes in income distribution drive fiscal and legal capacity in opposite directions, inducing a *negative* correlation between taxes and growth.

2 Conflict and state capacity

This section extends our approach to include the possibility of violent internal conflict. We modify the model by allowing for the possibility that public and private resources are used by incumbent and opposition to maintain or gain control of the state. As a by-product of this, we endogenize political instability. In our model, conflict might arise in the redistributive state (when $\alpha_s = \alpha_L$), since this entails a greater advantage of becoming a residual claimant on public resources, including natural resource rents.

Our analysis is motivated by the observation that political instability and/or high risk of conflict are clustered in the data with weak states and low levels of development. Our approach based on investments in state capacity will show how all of these have common underlying roots. Moreover, the factors identified as affecting investment in state capacity by Proposition 2 play a key role in this clustering.

There now exists a large literature on conflict in the third world (see e.g., Sambanis, 2002 and Blattman and Miguel, 2009 for broad reviews). Counting all countries and years since 1950, the incidence of civil war is about 6%, with a yearly peak of more than 12% (in 1991 and 1992), according to the Correlates of War data set. The cumulated death toll in civil conflicts since the Second World War exceeds 15 million (Lacina and Gledtisch, 2005). A robust empirical fact is that poor countries are disproportionately more likely to be involved in civil war. There are two leading interpretations of this correlation in the literature: Fearon and Laitin (2003) see conflict in poor countries as reflecting limited capacity to put down rebellions by weak states, while Collier and Hoeffler (2004) see it as reflecting lower opportunity costs of fighting.

The civil-war literature typically treats incomes and state capacity as exogenous.[11] But the dynamic implications of conflict are likely to be important. Although our approach is simple and stylized, it offers a first step towards a dynamic approach emphasizing the state capacity channel.[12] The analysis will also speak to the link between natural resources, conflict and

[11] Miguel, Satyanath and Sergenti (2004) take a step towards treating incomes as endogenous. They use weather shocks to instrument for growth in African countries from the 1980s and onwards, and find that lower growth raises the probability of civil conflict.

[12] In a previous paper, Besley and Persson (2008a), we argued that internal and external conflict may have opposite effects on the incentives to invest in fiscal capacity. But there we took the probability of civil war to be exogenous.

development.[13] In our model, large resource rents raise the risk of civil war, and diminish the incentive to invest in state capacity, thus creating a negative feedback loop to the level of development.

2.1 Conflict and takeover

The key change in the model is to modify the way in which political power is transferred. As in Section 1, this may happen peacefully. However, we add the possibility that power changes hand through violent conflict. Our approach is very simple. Suppose that the incumbent can raise an army, the size of which (in per-capita terms) is denoted by $\delta^{I_{s-1}} = \left\{0, A^I\right\}$, where $0 < A^I < 1$ (recall that total population size is unity). This discrete-choice formulation, which is relaxed in Besley and Persson (2008b), is somewhat artificial but makes the analysis simpler. There is no conscription, so soldiers must be compensated for their lost income. The army, which costs $w^{I_{s-1}}\delta^{I_{s-1}}$, is financed out of the public purse.

The opposition can also raise an army denoted by $\delta^{O_{s-1}} \in \left\{0, A^O\right\}$, with $0 < A^O < 1$, which it uses to mount an insurgency to take over the government. When in opposition, we assume that each group has the capacity to tax its own citizens in order to finance a private militia. The decision on $\delta^{O_{s-1}}$ is made by the opposition group, but the resources have to be raised within the group.

The probability that group O_{s-1} wins power and becomes the new incumbent I_s is

$$\gamma\left(\delta^{O_{s-1}}, \delta^{I_{s-1}}\right) \in [0,1] \ .$$

This probability of turnover depends on the resources devoted to fighting. We assume that his is increasing in the first argument and decreasing in the second so that there are returns to each side from fighting. We make the following assumption on the underlying conflict technology:

Assumption 1 *The contest function satisfies*:

$$\frac{1-\gamma\left(A^O,A^I\right)}{\gamma(A^O,0)-\gamma(A^O,A^I)} \leq \frac{1-\gamma\left(0,A^I\right)}{\gamma(0,0)-\gamma(0,A^I)} < \min\left\{1+\frac{\frac{A^O}{2A^I}}{\gamma(A^O,A^I)-\gamma(0,A^I)}, \frac{\frac{A^O}{2A^I}}{\gamma(A^O,0)-\gamma(0,0)}\right\}.$$

[13] See Ross (2004) for a survey of the research on natural resources ansd civil war.

This assumption rules out the possibility of an undefended insurgency. It will hold if the marginal return to fighting is low enough for the opposition and high enough for the incumbent.[14]

Given this technology for conflict, we make two substantive changes to the model described in Section 1.1. First, the government budget constraint has to be rewritten to reflect the financing of the state army. This is now[15]

$$0 \leq \sum_{J_s \in \{I_s, O_s\}} \frac{t^{J_s} w^{J_s}}{2} - G_s + z_s - w^{I_{s-1}} \delta^{I_{s-1}} \ . \tag{9}$$

Second, stage 3 in the timing is replaced by the sequence:

3a. Group O_{s-1} chooses the level of any insurgency $\delta^{O_{s-1}}$.

3b. The incumbent government I_{s-1} chooses the size of its army $\delta^{I_{s-1}}$.

3c. Group I_{s-1} remains in office with probability $1 - \gamma\left(\delta^{O_{s-1}}, \delta^{I_{s-1}}\right)$.

In this setting, we interpret civil war as $\delta^{O_{s-1}} = A^O$ and $\delta^{I_{s-1}} = A^I$, i.e., both groups are investing in violence, while $\delta^{O_{s-1}} = 0$ and $\delta^{I_{s-1}} = A^I$ is interpreted as repression by government to stay in power.

2.2 Incidence of civil war and repression

Preliminaries It is easy to show that the (new) incumbent's policy choices at stage 4 of each period in Proposition 1 still apply. Making use of this, we can derive the government's objective function after the resolution of uncertainty over α_s and R_s at stage 2, but prior to the choice of armies at stage 3. For the incumbent at stage 3b, the appropriate expression depends on the realized value of α_s and is given by

$$E[V^{I_{s-1}}(\pi_s, \tau_s) \mid \alpha_s = \alpha_H] = \alpha_H[\tau_s w(\pi_s) + z_s - w(\pi_s)\delta^{I_{s-1}}] + w(\pi_s)(1 - \tau_s) \tag{10}$$

[14] The assumption is consistent with a variety of assumptions about the functional form of the "contest function". In the case of a linear model where:

$$\gamma\left(\delta^{O_{s-1}}, \delta^{I_{s-1}}\right) = \gamma + \mu\left(A^O - A^I\right)$$

Assumption 1 is satisfied if:

$$1 - \gamma + \mu A^I < 1/2.$$

[15] This formulation assumes that resource revenues are large enough to finance the incumbent's army or, alternatively, that the new incumbent pays for the army ex post, honoring any outstanding "war debts".

and

$$E[V^{I_{s-1}}(\pi_s,\tau_s) \mid \alpha_s=\alpha_L] = w(\pi_s)(1-\tau_s) \tag{11}$$
$$+(1-\gamma\left(\delta^{O_{s-1}},\delta^{I_{s-1}}\right))2[\tau_s w(\pi_s)+z_s-w(\pi_s)\delta^{I_{s-1}}] \ .$$

The opposition chooses its army $\delta^{O_{s-1}}$, at stage 3a, to maximize the group's expected utility, which is given by

$$E[V^{O_{s-1}} \mid \alpha_s=\alpha_H] = \alpha_H[\tau_s w(\pi_s)+z_s-w(\pi_s)\delta^{I_{s-1}}]+w(\pi_s)(1-\tau_s-\delta^{O_{s-1}}) \tag{12}$$

and

$$E[V^{O_{s-1}} \mid \alpha_s=\alpha_L] = \gamma\left(\delta^{O_{s-1}},\delta^{I_{s-1}}\right)2[\tau_s w(\pi_s)+z_s-w(\pi_s)\delta^{I_{s-1}}]$$
$$+w(\pi_s)(1-\tau_s-\delta^{O_{s-1}}). \tag{13}$$

The main difference between these expressions reflects the fact that the incumbent uses the government budget to finance its army whereas the opposition uses its private resources.

We now in a position to characterize the unique sub-game perfect equilibrium of the game where the insurgents (opposition) move first. The equilibrium strategies are denoted by $\left\{\widehat{\delta}^{O_{s-1}},\widehat{\delta}^{I_{s-1}}\right\}$.

Common-interest states We begin by stating a useful (if perhaps obvious) result in the case when demand for public goods is high:

Proposition 3 *There is never conflict when* $\alpha_s=\alpha_H$: $\widehat{\delta}^{O_{s-1}}=\widehat{\delta}^{I_{s-1}}=0$.

Intuitively, all spending in the common-interest state will be on common-interest goods, independently of who holds power, so there is nothing to fight over. Given our interpretation of α_H as (a high risk of) external conflict, it is interesting to note that very few – less than half a percent – of the country-years in the Correlates of War data set entail simultaneous external and internal conflict.

This result implies that the probability of political turnover in common-interest states is $\gamma(0,0)$.

Redistributive states When $\alpha_s = \alpha_L$, the situation is different. The payoffs (11) and (13) reveal a trade-off: decision makers must weigh the opportunity cost of higher armed forces against a higher probability of takeover and control over state resources.

Given Assumption 1, we get a straightforward characterization of conflict regimes by the size of public revenues and other parameters in terms of three main regimes. Define

$$Z\left(z_s;\pi_s,\tau_s\right)=\frac{\tau_s w\left(\pi_s\right)+z_s}{w\left(\pi_s\right)}\ ,$$

the ratio of total government revenue per capita to the real wage (non-resource share of GDP), as well as a lower and an upper bound for this variable:

$$\underline{Z}=\left[\frac{1-\gamma\left(0,A^I\right)}{\gamma\left(0,0\right)-\gamma\left(0,A^I\right)}\right]A^I \text{ and } \overline{Z}=\frac{A^O}{\left[\gamma\left(A^O,A^I\right)-\gamma\left(0,A^I\right)\right]2}+A^I\ ,$$

where $\overline{Z}>\underline{Z}$, by the second inequality in Assumption 1. We now have:

Proposition 4 *Suppose that Assumption 1 holds and $\alpha_s=\alpha_L$ (a redistributive state). Then, there are three possibilities.*

1. *If $Z\left(z_s;\pi_s,\tau_s\right)>\overline{Z}$, then there is civil conflict with $\widehat{\delta}^{O_{s-1}}=A^O$ and $\widehat{\delta}^{I_{s-1}}=A^I$.*
2. *If $\underline{Z}\leq Z\left(z_s;\pi_s,\tau_s\right)\leq\overline{Z}$, then the state is repressive with $\widehat{\delta}^{O_{s-1}}=0$ and $\widehat{\delta}^{I_{s-1}}=A^I$.*
3. *If $Z\left(z_s;\pi_s,\tau_s\right)<\underline{Z}$, then there is peace with $\widehat{\delta}^{O_{s-1}}=0$ and $\widehat{\delta}^{I_{s-1}}=0$.*

If $Z\left(z_s;\pi_s,\tau_s\right)$ is very high, which corresponds to low wages (low π_s), high fiscal capacity or high natural resource rents, then the outcome is conflict because it is cheap to fight and there is a large cake to redistribute for the winner. If $Z\left(z_s;\pi_s,\tau_s\right)$ is in an intermediate range, then the government represses the opposition to increase the probability that it stays in power.

Finally, if $Z(z_s; \pi_s, \tau_s)$ is low enough, then there is peace.[16] The main role of Assumption 1 is to rule out an undefended insurgency. While this is a theoretical possibility, such cases do not seem common in practice.

Proposition 4 gives a link between natural resource rents, real wages, and the likelihood of conflict. For given state capacities (π_s, τ_s), variable Z_s varies stochastically with natural resource rents, R_s and real wages, w_s. By this route, we expect commodity prices to predict civil war. Besley and Persson (2008b) explore the empirical link between commodity prices and the incidence of civil conflict. Using trade volume data from the NBER-UN Trade data set, and international price data for about 45 commodities from UNCTAD, they construct country-specific commodity export and commodity import price indexes for about 125 countries since 1960.[17] According to the open-economy model in Besley and Persson (2008b), higher export price index can be interpreted as a positive shock to natural resource rents, and a higher import price index as a negative shock to (real) income. In line with Proposition 4, they find a robust empirical link between these price indexes and the incidence of civil war.

Proposition 4 also suggests that government repression and civil war may reflect the same underlying determinants, namely resource rents and real wages. Indeed, the proposition suggests that the regimes of peace, repression, and civil war can be looked upon as ordered states. Interpreting government repression as infringements on human rights, Besley and Persson (2009b) push this argument further and estimate the likelihood of observing these states as an ordered probit.

2.3 Investment in state capacity

The analysis in the previous subsection takes legal and fiscal capacity as given. We now explore the implications of conflict for the incentive to invest in state capacity.

[16] The parameter restriction in Assumption 1 is the reason that the ordering is straightforward. In Besley and Persson (2008b), we also obtain an ordering result of this form (under weaker assumptions) in a related model where the choice of armies is continuous and institutions constrain the behavior of the incumbent and opposition ex post. For some parameter restrictions, it is possible to have an outcome where the government does not defend against an insurgency (passive acceptance of terrorism).

[17] The price indexes for a given country have fixed weights, computed as the share of exports and imports of each commodity in the country's GDP in a given base year.

When there is no risk of future civil war, the analysis in Section 1.3 applies with $\gamma(0,0) = \gamma$. To highlight the new mechanisms added by the possibility of conflict, we assume that the period-1 incumbent knows for sure that the value of public goods in the future is low, i.e., that $\alpha_2 = \alpha_L$, Except for the issue of incumbency, the only remaining uncertainty – and the only determinant of the risk of conflict – then concerns the level of natural resource rents.

There are two new effects on state capacity investment beyond those found in the non-conflict model of section 1. The first of these comes from observing that conflict changes the probability that the incumbent group will stay in power and hence affects political instability. To see this formally, we can use the result in Proposition 4 to write the equilibrium probability of turnover as:

$$\Gamma\left(Z\left(R_2;\pi_2,\tau_2\right)\right) = \begin{cases} \gamma(A^O,A^I) & \text{if } Z\left(R_2;\pi_2,\tau_2\right) > \overline{Z} \\ \gamma(0,A^I) & \text{if } Z\left(R_2;\pi_2,\tau_2\right) \in \left[\underline{Z},\overline{Z}\right] \\ \gamma(0,0) & \text{if } Z\left(R_2;\pi_2,\tau_2\right) < \underline{Z}. \end{cases}$$

The constituent probabilities depend on the exogenous level of resource rents and the endogenous levels of state capacity. Note that the probability of turnover is not monotonic in natural resource rents: survival is largest in the middle range where the government represses the opposition. Whether outright conflict increases political instability is not clear a priori – this depends on whether the government is more or less likely to survive in the conflict regime compared to peace, i.e. $\gamma(A^O,A^I) \gtrless \gamma(0,0)$. Given our observation in Proposition 2 that political stability affects investments in state capacity, this makes it unlikely that there is any general proposition linking conflict and state development working through this channel. Thus, to wash this effect out, and home in other considerations, we will make:

Assumption 2: $\gamma(A^O,A^I) \approx \gamma(0,0)$.

One corollary of this assumption is that conflict is clearly Pareto inefficient with resources being spent without any material change (ex ante) in who holds power.

The second effect of adding conflict to the model comes from the fact that the incumbent government has to pay the real market wage to employ the soldiers in its army. Thus, incumbents may be more reluctant, all else

equal, to raise incomes by investing in legal capacity (or any other institution raising the wage).

We consider two cases. In *Case 1*, a country cycles between peace and civil war, whereas in *Case 2* it cycles between repression and civil war.

Case 1: $Z\left(R_H;\pi_2,\tau_2\right) > \overline{Z} > \underline{Z} > Z\left(R_L;\pi_2,\tau_2\right)$ Suppose the prize from winning a conflict is high enough for both incumbent and opposition to arm when resource rents are high, whereas neither of them arms when resource rents are low. Implicitly, we thus assume that variations in investment in fiscal capacity τ_2 are never large enough to induce changes in the conflict regime.

Under these assumptions, and following the same approach as in Section 1, we can write the payoff of the period-one incumbent controlling the state-capacity investment decisions as:

$$E[V^{I_s}(\pi_2,\tau_2) \mid \alpha_s = \alpha_L] = w\left(\pi_2\right)\left(1-\tau_2\right)$$
$$+E\left(\lambda_2\right)\left[\tau_2 w\left(\pi_2\right)+E\left(z_2\right)\right]-\rho[1-\gamma(A^O,A^I)]2w\left(\pi_2\right)A^I \ ,$$

where the expected value of future government funds is given by $E\left(\lambda_2\right) = \left[1-\left((1-\rho)\gamma(0,0)+\rho\gamma(A^O,A^I)\right)\right]2$. As in Section 1, we focus on the case where $E\left(\lambda_2\right) > 1$ so that investments in both kinds of state capacity remain complements.[18] Compared to our earlier expression (4) in the baseline (no-conflict) model in Section 1, the objective function has a new and third term, which captures the cost of conflict. That this term is multiplied by ρ reflects the fact that conflict occurs only when resource rents are high.

The first-order conditions for investments in legal and fiscal capacity are:

$$w_p(\pi_2)\left[\{1+\tau_2[E(\lambda_2)-1]\}-\rho\left[1-\gamma(A^O,A^I)\right]2A^I\right] \leq \lambda_1 L_\pi(\pi_2-\pi_1) \tag{14}$$

$$w(\pi_2)[E(\lambda_2)-1] \leq \lambda_1 F_\tau(\tau_2-\tau_1) \ . \tag{15}$$

When Assumption 2 holds, the probability of conflict, ρ, has a negligible effect on the expected value of public funds, $E\left(\lambda_2\right)$. Then, the only first-order effect on investments of a higher probability of conflict comes from the second

[18] Note, however, that an increase in ρ (now the probability of conflict since conflict occurs when natural resource rents are high) may increase or decrease the future expected value of public funds. Depending on the relative values of A^I and A^O, this can raise or cut the likelihood that state capacities are substitutes rather than complements.

term on the left-hand side of (14). Evidently, a higher ρ reduces the marginal return to investing in legal capacity, since a higher share of the economy's labor is expected to be devoted to conflict. Taking the complementarity between fiscal and legal capacity into account, we now have:

Proposition 5 *Suppose that the future state is always redistributive ($\alpha_2 = \alpha_L$), there is either conflict or peace depending on the level of natural resource rents, and that Assumption 2 holds. Then, an exogenous increase in the probability of conflict, via a higher value of ρ, reduces the incentive to invest in both fiscal and legal capacity.*

Proposition 5 illustrates a particular channel through which the static inefficiency of conflict is compounded by a dynamic inefficiency via a lower incentive to invest in state capacity: investing in economic development makes it more expensive for the government to finance its troops should a conflict arise. This highlights a specific mechanism through which conflict risk perpetuates a weak state.

Case 2: $Z\left(R_H;\pi_2,\tau_2\right) > \overline{Z} > Z\left(R_L;\pi_2,\tau_2\right) > \underline{Z}$ In this case, changes in resource rents cycle the economy between repression and civil war; the incumbent always finds it optimal to arm while the opposition only arms when resource rents are high. In this instance, the probability of high resource rents, ρ, has a direct effect on the expected probability of turnover for the period-one incumbent, even if Assumption 2 does not hold.

Now, the expected payoff to the incumbent is:

$$\begin{aligned} &E[V^{I_s}(\pi_2,\tau_2) \mid \alpha_s = \alpha_L] = w\left(\pi_2\right)\left(1-\tau_2\right) \\ &+E\left(\lambda_2\right)\left[\tau_2 w\left(\pi_2\right) + E\left(z_2\right) - w\left(\pi_2\right)A^I\right] \ , \end{aligned} \tag{16}$$

where $E\left(\lambda_2\right) = \{1-[(1-\rho)\gamma(0,A^I)+\rho\gamma(A^O,A^I)]\}2$. After some manipulation, the first-order conditions for investing in state capacity become:

$$w_p(\pi_2)\{(1-A^I)+(\tau_2-A^I)[E(\lambda_2)-1]\} \leq \lambda_1 L_\pi(\pi_2-\pi_1) \tag{17}$$

$$w(\pi_2)[E(\lambda_2)-1] \leq \lambda_1 F_\tau(\tau_2-\tau_1). \tag{18}$$

Note that the condition for positive investments in legal capacity – namely a positive left-hand side of (17) – may now be stronger than $E\left(\lambda_2\right) > 1$. Clearly, $E\left(\lambda_2\right) > 1$ together with $\tau_2 > A^I$ is a sufficient condition. In fact,

the term $(1 - A^I)w_p(\pi_2)$ always represents a drag on investment in state capacity similar to the effect identified in Case 1.

Assuming that this condition is met, we can contemplate the effect of a change in ρ on the incentive to invest. From the first-order conditions, we have:

Proposition 6 *Suppose that in the future state is always redistributive ($\alpha_2 = \alpha_L$) and there is either conflict or repression depending on the level of natural resource rents. Then, an increase in the exogenous probability of conflict, via a higher value of ρ, reduces the marginal incentive to invest in both fiscal and legal capacity.*

The result in Proposition 6 follows by complementarity, and by noting that a higher value of ρ decreases the left-hand side of both (18) and (17), the latter because $\frac{\partial LHS}{\partial \rho} = -2w_p(\pi_2)[\gamma(A^O, A^I) - \gamma(0, A^I)](\tau_2 - A^I) < 0$, where the sign follows from the sufficient condition for positive investment above. Intuitively, the direct effect through the probability of survival always outweighs the effect through the expected value of fighting.

This result is analogous to part four of Proposition 2, whereby higher political instability reduces investments in state capacity. However, the instability is now modeled as an equilibrium outcome, where conflict (relative to repression) makes it less likely that the incumbent survives. This result gives a further theoretical explanation as to why the prospect of conflict might perpetuate weak states both in raising taxes and supporting markets.

2.4 Implications

Propositions 5 and 6 highlight two key mechanisms through which the possibility of civil conflict may perpetuate weak states, with lower levels of income as a consequence. Our examples have focused on marginal incentives within a regime (corresponding to the maintained assumptions defining our two cases). Proposition 4 defines a threshold for wages relative to resource rents above which conflict ends. Because of this, a government may strive for a big enough investment in legal capacity to raise wages so as to generate peace. To the extent that this is important, we might expect incentives to go in the opposite direction of those driving the results in Propositions 5 and 6. There may then be scope for a "big push" to raise wages and to break out of the conflict trap.

The results also suggest a note of caution for researchers who pursue empirical studies of the determinants of civil war. Our model shows why it may be hazardous to interpret the correlation between poverty and civil war as a causal effect from poverty to the incidence of conflict. Indeed, the results in this section imply that both of the two leading explanations of this correlation – low opportunity cost of fighting due to low wages, and low state capacity in poor countries – may reflect common omitted factors rather than a causal mechanism. In particular, low state capacity in terms of raising tax revenue, as well as low wages (due to poor support of markets), may be simultaneously determined with a high probability of civil war by factors such as high resource rents.

Finally, the state-capacity channel developed here also provides a theoretical connection between conflict and low growth. This is apparent by returning to equation (8), which links low investment in π_2 to low growth.

3 State capacity, distortions and income

We now explore the link between state capacity investments – particularly investment in fiscal capacity – and policy distortions which lower the level of income. We show how investments in fiscal capacity can underpin efficiency-enhancing changes in the *form* of redistribution, diminishing the use of other "regulatory" distortions which make the economy less productive. We provide an example in which a government with insufficient fiscal capacity chooses legal protection in an inefficient way. While this general point has been made before, for example by Acemoglu (2006), this takes state capacity as given. We show that the production inefficiencies may persist over time when state capacity is chosen endogenously because the economy may be caught in an investment trap. The apparatus developed in Section 1 explains the factors that underpin this.

This analysis of the role of state capacity in encouraging efficient production provides a unique window on debates about the consequences of large government for the economy. As we noted in Section 1.4, it is hard to find evidence in macroeconomic studies of aggregate data that high taxes affects the growth rate. Most microeconomic studies of individual data also tend to find fairly modest behavioral effects of taxes on investment behavior. The mechanism that we identify here whereby fiscal capacity increase production efficiency may constitute an important offsetting effect of increasing the

power to tax. Our approach also provides an alternative to the standard macroeconomic view of government's role in enhancing growth, as exemplified by Barro (1990) and Barro and Sala-i-Martin (1992) who emphasize the role of tax-financed public capital accumulation, such as building ports and roads.

In order to make these points as simply as possible, we drop the extension to endogenous conflict in Section 2. Instead, we extend the basic framework of Section 1 in a different direction, adding an additional factor of production so that the model includes both labor and capital. Capital becomes a source of producer rents, and it is the seeking of these rents that can generate persistent production inefficiencies, when the economy is caught in an investment trap for state capacity. This way, we illustrate another mechanism that may generate a link between low income and low state capacity.

3.1 A simple two-factor economy

We modify the production side of the economy to have two factors of production. Suppose now that $w\left(p^{J_s}\right)$ is a form of capital, the productivity of which depends on property-rights protection for group J in period s. A share of each group, denoted by σ, are entrepreneurs and have access to a constant-returns Cobb-Douglas technology that combines capital and raw labor, l, to produce output. The capital share is denoted by η.[19] The remaining $1-\sigma$ share of the population supplies a single unit of raw labor to an economy-wide labor market. The production technology on intensive form is $l^{J_s}\left(k^{J_s}\right)^{\eta}$, where k^{J_s} is the capital-to-labor ratio $w\left(p^{J_s}\right)/l^{J_s}$. Since aggregate labor supply is $l=(1-\sigma)$, the aggregate capital-labor ratio

$$k(p^{I_s},p^{O_s})=\frac{\sigma[w\left(p^{I_s}\right)+w\left(p^{O_s}\right)]}{2(1-\sigma)}\ , \tag{19}$$

is increasing in the property-rights protection of *each* group. An individual capital owner in group J_s, sets optimal labor demand according to the condition $(1-\eta)\left(k^{J_s}\right)^{\eta}=\omega$, where ω is the economy-wide wage. As the technology is common across groups, the equilibrium wage is given by the

[19] Assuming a common share σ across groups simplifies the algebra. Relaxing this assumption makes it easier to prove the possibility of inefficient outcomes (see Propositions 3 and 4). An incumbent group, I, with a large share σ^I of capital owners is more willing to select inefficient policies to boost the group's rents than is a group with a small share.

same condition, evaluated at $k(p^{I_s}, p^{O_s})$:

$$(1-\eta)\left(k(p^{I_s}, p^{O_s})\right)^{\eta} = \omega(p^{I_s}, p^{O_s}) \ .$$

Thus, the wage depends on property-rights protection for the two groups and is increasing in both of these policy variables, since

$$\frac{\partial \omega}{\partial p^{J_s}} = (1-\eta)\,\eta(k(p^{I_s}, p^{O_s}))^{\eta-1}\frac{\sigma w_p\left(p^{J_s}\right)}{2(1-\sigma)} > 0 \ .$$

Intuitively, more productive capital in any sector drives up the demand for labor which raises the equilibrium wage.

Finally, we can define the income of a representative member of group J_s as

$$y^{J_s}(p^{I_s}, p^{O_s}) = (1-\sigma)\omega(p^{I_s}, p^{O_s}) + \sigma l^{J_s}[(k^{J_s})^{\eta} - \omega(p^{I_s}, p^{O_s})] \ , \qquad (20)$$

the sum of labor and rental income. Compared to the basic model, income of group J_s now depends on the legal protection of the other group as well, through the endogenous equilibrium wage. The latter has a positive effect on wage-earning group members (the first term on the right-hand side of (20)), but a negative effect on those earning quasi-rents on capital (the second term on the right hand side).

3.2 Policy and state capacity

The remainder of the model works exactly as in Section 1. To analyze the incumbent's optimal policy, we replace $w(p^{J_s})$ in (3) by the new income function $y^{J_s}(p^{I_s}, p^{O_s})$ in (20). The main consequence is that, if σ is high enough, then an incumbent group I_s may prefer to keep wages low. Moreover, the ruling group can engineer a lower wage by blocking the opposition group's access to legal capacity and hence driving down the demand for labor.

The role of taxation Going through similar steps as in Section 1.2, we can show:

Proposition 7 *If $\tau_s = 1$, then legal capacity is always fully utilized for both groups. Otherwise, there exists a threshold value $\hat{\tau}_K$ when the value of the public good is α_K with $K \in \{L, H\}$, such that the legal protection of the opposition group is minimal: $p^{O_s} = 0$ for all $\tau_s < \widehat{\tau}_K$. Moreover, $\hat{\tau}_L > \widehat{\tau}_H$.*

This result says that there is always production efficiency when fiscal capacity is high enough. However, when fiscal capacity is below a critical threshold, an incumbent may prefer an inefficient policy which lowers the level of national income. In this specific example, maximizing (gross) income and using the tax system for redistribution may be less useful to the incumbent than distorting production and raising quasi-rents by maintaining a supply of low-wage labor.[20] Proposition 7 also states that the critical threshold for fiscal capacity to generate an efficient use of legal capacity is lower in the common interest state than in the redistributive state.[21]

The observation that limited powers to use taxation for redistribution can lead to distorted factor markets is not new. In particular, this line of argument is developed by Acemoglu (2006). However, to provide a complete explanation we need to understand why the state lacks the power to tax. This can be addressed only if fiscal capacity is endogenous as it is in the approach taken here.

An investment trap for fiscal capacity? The results in Section 1, particularly Proposition 2, give us a stepping stone for the analysis. We now apply this logic to understand why fiscal capacity τ can remain low (below the threshold required for production efficiency). Our key result is

Proposition 8 *Suppose that $\tau_1 < \hat{\tau}_L$. Then, for ϕ close enough to zero, in a range of $\gamma > 1/2$, $\tau_2 = \tau_1$, and investment in legal capacity is lower than it would be if $\tau_1 > \hat{\tau}_L$.*

An immediate corollary of Propositions 7 and 8 is that, whenever initial fiscal capacity fulfills $\tau_1 < \widehat{\tau}_L$, the opposition group in each period is not fully protected by the legal system. When political instability is high, the incumbent in period 1 does not want to expand the ability to tax, because

[20] There is an analogy here with Diamond and Mirrlees (1971) who argue that production efficiency is desirable if a tax system is sufficiently rich. One of the assumptions required in their framework is that there be 100% taxation of pure profits. In our model all income is taxed at the same rate and hence $\tau_s = 1$ is effectively equivalent to full taxation of pure profits (the rents on capital).

[21] A previous version of this paper (Besley and Persson, 2008c), included the inclusiveness of political institutions, parametrized by θ as in Besley and Persson (2009a). In that richer setting, the critical threshold for fiscal capacity also depends on institutions, with a lower threshold for more inclusive institutions. Moreover a utilitarian planner would always choose full protection for both groups.

it fears that such ability will be used to redistribute against its own group. As a result of the weak state, any period-2 incumbent uses inefficient legal protection to generate rents to the capital owners of its own group.

Proposition 8 thus describes an "investment trap" in state capacity. Political instability makes an incumbent group expect that larger state capacity will be used against its interests. That expectation perpetuates an ineffective apparatus for raising taxes, which then causes inefficiencies in production. The situation persists because the probability of the common-interest state ($\alpha_s = \alpha_H$) is low.

3.3 Implications

These results have implications for growth rates and the level of income. To see this, define the non-resource part of GDP as

$$Y_s = Y(p^{I_s}, p^{O_s}) = \frac{y^{I_s}(p^{I_s}, p^{O_s}) + y^{O_s}(p^{I_s}, p^{O_s})}{2} \ .$$

With an inefficient regulatory policy in period s, income becomes $Y(\pi_s, 0)$, where by symmetry $Y(\pi_s, 0) = Y(0, \pi_s)$. This is clearly lower than the level with efficient legal protection $Y(\pi_s, \pi_s)$.

Consider two economies S and L, where Propositions 7 and 8 apply. Assume the same initial legal capacity $\pi_1^S = \pi_1^L = \pi_1$ prevails in both, but $\tau_1^S < \widehat{\tau}(\alpha_L)$ and $\tau_1^L > \widehat{\tau}(\alpha_L)$ so that the economies find themselves at opposite sides of the fiscal-capacity threshold, because of different initial fiscal capacities, $\tau_1^S < \tau_1^L$.

Let us compare income levels in periods 1 and 2. By Proposition 7

$$Y_1^L - Y_1^S = Y(\pi_1, \pi_1) - Y(\pi_1, 0) > 0 \ ,$$

i.e., in period 1, economy S has a lower income level due to the inefficient legal protection of the opposition group. As the conditions in Proposition 8 hold, we have

$$Y_2^L - Y_2^S = Y(\pi_2^L, \pi_2^L) - Y(\pi_2^S, 0) > Y(\pi_1, \pi_1) - Y(\pi_1, 0) \ ,$$

where the inequality follows from the fact that $\pi_2^L > \pi_2^S$. Due to its low fiscal capacity, economy S pursues a policy of less efficient legal protection than economy L in period 2, whichever group is in power. But Proposition 8 tells us that economy S has also invested less in legal capacity than economy L.

The larger state not only has the higher GDP level, but its income advantage to the smaller state is growing over time.

These implications of Proposition 7 and 8 suggest another possible interpretation of the correlations in Figure 1. Using the results in Section 1, we may observe a weak government together with low income because the two are jointly determined by other factors, or because low income causes weak government (recall Proposition 2). The results in this section suggest that a weak state can actually *cause* low income, to the extent it encourages policies that distort production.[22]

It is interesting to think about ways out of inefficient legal protection in an investment trap. Propositions 7 and 8 suggest that political reform as well as exogenous circumstance may play a role. Reform that diminished political instability (lower value of γ) may induce first-period investment.[23] Circumstance, such as a higher likelihood or expected severity of external conflict (higher ϕ or α_H), may make it too costly to pursue inefficient legal protection by raising the prospect of a future common-interest state.

Let us also relate the results to some recent work on the political origins of financial development, which argues that a desire to create or preserve rents can prevent a ruling elite from building the institutions needed for well-functioning financial markets (see e.g., Rajan and Zingales, 2003 or Pagano and Volpin, 2005). This work generally considers the financial sector without reference to the tax system. So, the political-origins argument may implicitly assume a lack of fiscal capacity, which makes it unattractive for the incumbents to invest in private markets, maximize income, and instead carry out its desired redistribution via taxes and transfers. As stressed by Acemoglu (2003, 2006), it is important to pose the political Coase-theorem question explicitly, and our analysis here suggests a new way of doing so. But the key innovation is to think of both aspects of state capacity as evolving endogenously together and influencing policy incentives.

We believe that the argument is much more general than the specific example in this section. Further research might consider the joint determination of weak states and other policy-induced production distortions leading to low income, such as tariffs or red-tape regulation.

[22] Of course, our caveat noted above about not considering tax distortions still applies.

[23] In the richer model of Besley and Persson (2009c), political reform that increased the inclusiveness of political institutions may achieve the same goal.

4 Final remarks

In politics, history and sociology, state capacity is viewed as an important object of study. We have illustrated some simple ways of bringing the study of state capacity and its determinants into mainstream economics.

In the development community, a lack of state capacity as manifested in weak states is often cited as a major obstacle to development. We have shown that low legal capacity can be conducive to lackluster economic growth (in Section 1) or might contribute (through wages) to the likelihood of civil war (in Section 2), and that lack of fiscal capacity can yield (through production distortions) low income (in Section 3). These observations make it essential to understand, therefore, where low state capacities comes from and all three sections discuss the factors that shape investment incentives.

Our analysis also suggests an important complementarity between these two forms of state capacity. Such complementarity is a natural way to think about the clustering of institutions that appears to be a common feature of weak and strong states at different levels of economic development.

A few common themes emerge from our analysis in Sections 1 through 3. First, the level of economic development at a point in time affects policy outcomes, but also feeds dynamic state development. Second, realized and prospective shocks to resource rents and public-good preferences have both static and dynamic effects on policies, as well as state development. Third, we have made a distinction between circumstances where the state is mainly used to pursue common-interest goals and where it is mainly used to redistribute income, and showed how this distinction between common-interest and redistributive states help us understand why (threats of) external and internal conflict have opposite effects on the incentives to invest in state institutions. These themes, together with the complementarity of state capacities, help us understand why some states stay weak while others grow strong, and why we find weak states mainly at low levels of income.

Although our theory has already helped us approach the data in novel ways, the model variations we have presented are very simple. To better understand the long-run forces of development, it would be valuable to add private capital accumulation and a full-fledged dynamic framework. Another natural extension would be to introduce and endogenize political institutions. Given the history of today's developed states, it is a reasonable conjecture – in line with some work in political science – that demand for more representative government increases with state capacity. This suggests another

complementarity, between political and economic institutions, a possibility which deserves further study.

Its simplicity notwithstanding, we view the research presented here as a first step towards disentangling some of the complex interactions between state capacity, conflict and development.

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5 Appendix

Proof of Proposition 2 Part 1 refers to a multiplicative upward shift of the wage function $w(\cdot)$, as this raises both $w(\pi_2)$ and $w_p(\pi_2)$ for any given π. Part 3 follows from $\frac{\partial E(\lambda_2)}{\partial \phi} = \alpha_H - 2(1-\gamma) > 0$, and part 4 from $\frac{\partial E(\lambda_2)}{\partial \gamma} = -(1-\phi)\,2$. Finally, part 5 refers to a multiplicative downward shift of either cost function $L(\cdot)$ or $F(\cdot)$. ■

Proof of Proposition 3 The relevant objective functions when $\alpha_s = \alpha_H > 2$, (10) and (12), are strictly decreasing in $\delta^{I_{s-1}}$ and $A^{O_{s-1}}$, respectively. ■

Proof of Proposition 4 First, observe that (by 11) the incumbent will set $\delta^{I_{s-1}} = A^I$ if:

$$\left(\gamma\left(\delta^{O_{s-1}}, 0\right) - \gamma\left(\delta^{O_{s-1}}, A^I\right)\right) Z\left(z_s; \pi_s, \tau_s\right) \geq A^I\left(1 - \gamma\left(\delta^{O_{s-1}}, A^I\right)\right) \ .$$

If $\delta^{O_{s-1}} = 0$, this condition holds by the definition of $\underline{Z}$. If $\delta^{O_{s-1}} = A^o$, the condition for $\delta^{I_{s-1}} = A^I$ can be written

$$Z \geq \frac{1 - \gamma\left(A^O, A^I\right)}{\gamma\left(A^O, 0\right) - \gamma\left(A^O, A^I\right)} A^I \ .$$

Since the expression on the right-hand side is smaller than $\underline{Z}$ by the first part of the inequality in Assumption 1, whenever $Z\left(z_s; \pi_s, \tau_s\right) \geq \underline{Z}$ it is optimal for I to set $\delta^{I_{s-1}} = A^I$ independently of what O does.

Next, we show that if $Z\left(z_s; \pi_s, \tau_s\right) \geq \underline{Z}$, so that $\delta^{I_{s-1}} = A^I$, then $\delta^{O_{s-1}} = A^O$. From (13), this requires:

$$\left[\gamma\left(A^O, A^I\right) - \gamma\left(0, A^I\right)\right]\left(Z - A^I\right) 2 \geq A^O \ ,$$

which is equivalent to $Z \geq \overline{Z}$. We also need to show that when $Z < \underline{Z}$, then indeed $\delta^{O_{s-1}} = 0$. By (13), the condition is

$$Z < \frac{A^O}{2(\gamma\left(A^O, 0\right) - \gamma\left(0, 0\right))} \ .$$

Evaluated at the left-hand side maximum $\underline{Z}$, the condition becomes

$$\frac{1 - \gamma\left(0, A^I\right)}{\gamma\left(0, 0\right) - \gamma\left(0, A^I\right)} A^I < \frac{A^O}{2(\gamma\left(A^O, 0\right) - \gamma\left(0, 0\right))} \ ,$$

which is fulfilled by second part of the inequality in Assumption 1. Moreover, second part of the inequality in Assumption 1 also implies $\overline{Z} > \underline{Z}$. Hence, the above argument rules out the possibility of an undefended insurgency and Proposition 4 follows. ■

Proof of Proposition 7 To prove Proposition 7, first observe that:

$$l^{J_s} = \frac{w\left(p^{I_s}\right) 2\left(1-\sigma\right)}{\left[w\left(p^{I_s}\right)+w\left(p^{O_s}\right)\right]\sigma} \ .$$

Hence, for all $p^{I_s} > p^{O_s}$

$$\begin{aligned}
\frac{\partial y^{I_s}(p^{I_s},p^{O_s})}{\partial p^{I_s}} &= \left\{\left[\frac{\left[(1-\sigma)-\sigma l^{I_s}\right]}{2\left(1-\sigma\right)}\eta+1\right]\left(1-\eta\right)\left(k(p^{I_s},p^{O_s})\right)^{\eta-1}\sigma w_p\left(p^{I_s}\right)\right\} \\
&= \left\{\left[\left[\frac{1}{2}-\frac{w\left(p^{I_s}\right)}{\left[w\left(p^{I_s}\right)+w\left(p^{O_s}\right)\right]}\right]\eta+1\right]\left(1-\eta\right)\left(k(p^{I_s},p^{O_s})\right)^{\eta-1}\sigma w_p\left(p^{I_s}\right)\right\} > 0
\end{aligned}$$

and

$$\begin{aligned}
\frac{\partial y^{I_s}(p^{I_s},p^{O_s})}{\partial p^{O_s}} &= \left\{\frac{\left[(1-\sigma)-\sigma l^{I_s}\right]}{2\left(1-\sigma\right)}\eta\left(1-\eta\right)k(p^{I_s},p^{O_s})\sigma w_p\left(p^{O_s}\right)\right\} \\
&= \left\{\left[\frac{1}{2}-\frac{w\left(p^{I_s}\right)}{\left[w\left(p^{I_s}\right)+w\left(p^{O_s}\right)\right]}\right]\eta\left(1-\eta\right)k(p^{I_s},p^{O_s})\sigma w_p\left(p^{O_s}\right)\right\} < 0 \ .
\end{aligned}$$

Thus, there is a conflict of interest between creating property rights for the ruling group and the non-ruling group.

In general, we can write the part of the government's objective function that depends upon (p^{I_s}, p^{O_s}) as:

$$V^{I_s}\left(p^{I_s},p^{O_s};\psi\right) = \psi y^{I_s}(p^{I_s},p^{O_s}) + y^{O_s}(p^{I_s},p^{O_s}) \ ,$$

where

$$\psi = \psi\left(\tau,\alpha\right) = \begin{cases} \frac{1+\tau\left(\frac{\alpha}{2}-1\right)}{\tau\left(\frac{\alpha}{2}\right)} & \text{if } \alpha \geq 2 \\ \frac{1}{\tau} & \text{otherwise} \ . \end{cases}$$

It is easy to check that $\psi\left(\alpha\right)$ is decreasing in τ, and also decreasing in α if $\alpha \geq 2$. Moreover, as $\tau \to 1$, $\psi \to 1$ and as $\tau \to 0$, $\psi \to \infty$ (independently of the value of α). In general, the condition for choosing p_s^J is:

$$\psi\frac{\partial y^{I_s}(p^{I_s},p^{O_s})}{\partial p_s^J} + \frac{\partial y^{O_s}(p^{I_s},p^{O_s})}{\partial p_s^J} \underset{>}{\leqq} 0 \ .$$

Observe that

$$\frac{\partial\left[y^{I_s}(p^{I_s},p^{O_s})+y^{O_s}(p^{I_s},p^{O_s})\right]}{\partial p^{J_s}}=(1-\eta)\left(k(p^{I_s},p^{O_s})\right)^{\eta}\sigma w_p\left(p^{J_s}\right)>0\ .$$

From this, we conclude that as $\tau\to 1$ and $\psi\to 1$, $p^{I_s}=p^{O_s}=\pi_s$, i.e., production efficiency obtains, since the incumbent maximizes total income $y^{I_s}(p^{I_s},p^{O_s})+y^{O_s}(p^{I_s},p^{O_s})$. Moreover, as $\tau\to 0$ and $\psi\to\infty$ the incumbent maximizes its own group's income $y^{I_s}(p^{I_s},p^{O_s})$, such that $p^{I_s}=\pi_s$ and $p^{O_s}=0$. The existence of the critical threshold now follows from the intermediate value theorem, given that $\psi(\alpha)$ is continuous in τ for any value of α. When $\alpha=\alpha_L$ the threshold value is given by $\frac{1}{\hat{\tau}_L}\in[1,\infty)$ with $\hat{\tau}_H$ defined by:

$$\hat{\tau}_H=\left[\left(\frac{1-\hat{\tau}_L}{\hat{\tau}_L}\right)\frac{\alpha_H}{2}+1\right]^{-1}<\hat{\tau}_L,$$

since $\alpha_H>2$, as claimed.■

Proof of Proposition 8 To prove the proposition, we note some useful preliminaries. It is straightforward to check that the income function is:

$$\hat{y}^{J_s}(\pi_s,\alpha)=\left[(1-\sigma)(1-\eta)+\sigma\frac{\omega_s^J\left(p_s^J(\pi_s,\alpha)\right)}{\hat{k}(\pi_s,\alpha)}\right]\left(\hat{k}(\pi_s,\alpha)\right)^{\eta}\ ,$$

where $\hat{k}(\pi_s,\alpha)=k(p_s^J(\pi_s,\alpha),p^{O_s}(\pi_s,\alpha))$. Observe that:

$$\frac{\hat{y}^{J_s}(\pi_s,\alpha)+\hat{y}^{O_s}(\pi_s,\alpha)}{2}=(1-\sigma)\left(\hat{k}(\pi_s,\alpha)\right)^{\eta}.$$

Now let $k_H=\hat{k}(\pi_s,\pi_s)>\hat{k}(\pi_s,0)=k_L=k_H/2$.
The incumbent maximizes the expected period 2 benefits

$$\begin{aligned}\Gamma(\pi_2,\tau_2) &= (1-\gamma)\left\{\begin{array}{c}\phi\left(\begin{array}{c}\left(1+\tau_2\left(\frac{\alpha_H}{2}-1\right)\right)\hat{y}^{I_2}(\pi_2,\alpha_H)+\\ \left(\tau_2\left(\frac{\alpha_H}{2}\right)\right)\hat{y}^{O_2}(\pi_2,\alpha_H)\end{array}\right)+\\ (1-\phi)\left[\hat{y}^{I_2}(\pi_2,\alpha_L)+\tau_2\hat{y}^{O_2}(\pi_2,\alpha_L)\right]\end{array}\right\}\\ &\quad+\gamma\left\{\begin{array}{c}\phi\left(\begin{array}{c}\left(1+\tau_2\left(\frac{\alpha_H}{2}-1\right)\right)\hat{y}^{O_2}(\pi_2,\alpha_H)\\ +\left(\tau_2\left(\frac{\alpha_H}{2}\right)\right)\hat{y}^{I_2}(\pi_2,\alpha_H)\end{array}\right)+\\ (1-\phi)\left[1-\tau_2\right]\hat{y}^{O_2}(\pi_2,\alpha_L)\end{array}\right\}\end{aligned}$$

less the investment costs in period 1. As $\phi \to 0$,the marginal benefits with regard to the two choice variables are :

$$\Gamma_\tau(\pi_2, \tau_2) = (1-2\gamma)\,\hat{y}^{O_2}(\pi_2, \alpha_L)$$

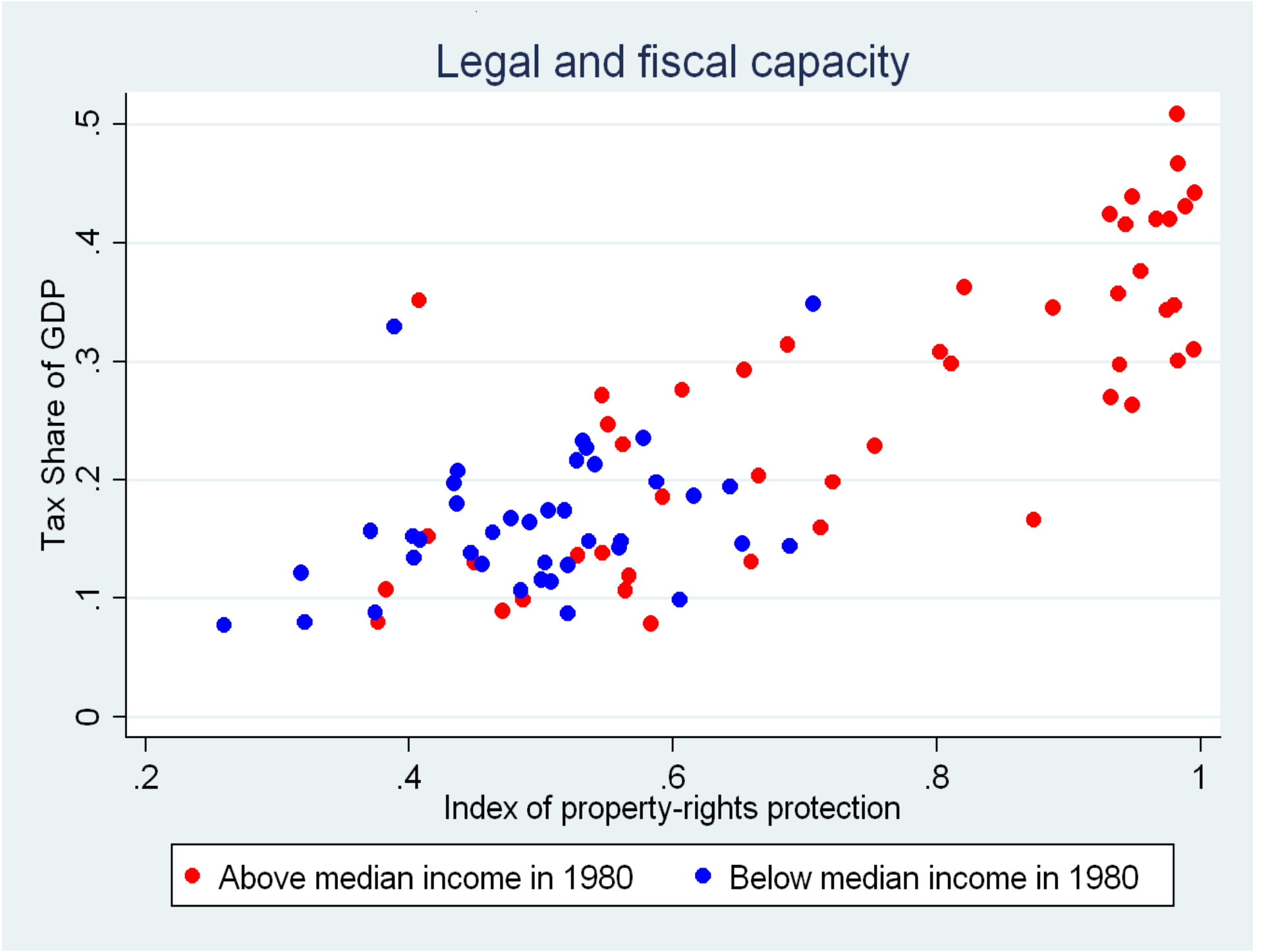
and

$$\Gamma_\pi(\pi_2, \tau_2) = (1-\gamma)\,\hat{y}_\pi^{I_2}(\pi_2, \alpha_L) + [\gamma + \tau_2(1-2\gamma)]\,\hat{y}_\pi^{O_2}(\pi_2, \alpha_L) \ .$$

For $\gamma \geq 1/2$, it is clear that $\Gamma_\tau(\pi_2, \tau_2) < 0$, so that $\tau_2 = \tau_1$. Moreover, since $\tau_1 < \hat{\tau}_L$ then as $\gamma \to 1/2$

$$\begin{aligned}
\Gamma_\pi(\pi_2, \tau_2) &= (1-\gamma)\,\hat{y}_\pi^{I_2}(\pi_2, \alpha_L) + [\gamma - \tau_2(1-2\gamma)]\,\hat{y}_\pi^{O_2}(\pi_2, \alpha_L) \\
&= \frac{1}{2}\left(\hat{y}_\pi^{I_2}(\pi_2, \alpha_L) + \hat{y}_\pi^{O_2}(\pi_2, \alpha_L)\right) \\
&= (1-\sigma)\,\eta\,[k_L]^{\eta-1}\,\frac{\sigma w_p(\pi_2)}{2(1-\sigma)} = \eta\left[\frac{\sigma}{2(1-\sigma)}\right]^\eta [w(\pi_2)]^{\eta-1}\,w_p(\pi_2) \\
&< \eta 2^\eta \left[\frac{\sigma}{2(1-\sigma)}\right]^\eta [w(\pi_2)]^{\eta-1}\,w_p(\pi_2) = (1-\sigma)\,\eta\,[k_H]^{\eta-1}\,\frac{w_p(\pi_2)}{(1-\sigma)}
\end{aligned}$$

where the last expression is equal to $\Gamma_\pi(\pi_2, \tau_2)$ when $\tau_2 > \hat{\tau}_L$. This, along with the fact that the state capacity investments are complements, proves the result. ■


Legal and fiscal capacity
Tax Share of GDP
0
.1
.2
.3
.4
.5
.2
.4
.6
.8
1
Index of property-rights protection
Above median income in 1980
Below median income in 1980