

Taxation and Development*

Timothy Besley
LSE and CIFAR

Torsten Persson
IIES and CIFAR

First Complete Draft (April 2012)

Contents

1	Introduction	2
2	Alternative Perspectives	4
3	Background Facts	8
4	Framework	16
4.1	Basic Set-Up	16
5	Drivers of Change	27
5.1	Economic Development	27
5.2	The Role of Politics	35
5.3	Social Structure and Politics	43
5.4	The Value of Public Spending	47
5.5	Non-Tax Revenues	53
5.6	Compliance Technologies	57
6	Conclusion	65

*Draft Chapter for the Handbook of Public Economics, edited by Alan Auerbach, Raj Chetty, Martin Feldstein, and Emmanuel Saez. We are grateful to Mohammad Vesal for superb research assistance. We also thank Alan Auerbach, Roger Gordon, Joel Slemrod and other participants at the Berkeley Conference in December 2011 for comments.

“It is shortage of resources, and not inadequate incentives, which limits the pace of economic development. Indeed the importance of public revenue from the point of view of accelerated economic development could hardly be exaggerated.” Nicholas Kaldor, ‘Taxation for Economic Development,’ *Journal of Modern African Studies*, 1963, p. 7

1 Introduction

Perhaps more than any other economist in the post-war generation, Nicolas Kaldor appreciated the centrality of public finance to development. As did Kaldor, we believe that the power to tax lies at the heart of state development. A moment’s reflection on the history of today’s developed countries and the current situation of today’s developing nations suggests that the acquisition of that power cannot be taken for granted. To be concrete, the central question in public finance and development is: “how does a government go from raising around 10% of GDP in taxes to raising around 40%”?

In the process of development, states not only increase the *levels* of taxation, but also undergo pronounced changes in *patterns* of taxation, with increasing emphasis on broader tax bases. Thus, some taxes – notably trade taxes – gradually diminish their importance. In the developed world, it is taxes on income and value added that do the heavy lifting in raising enough revenue to support the productive and redistributive functions of the state.

In spite of these facts, powers to tax are explicitly or implicitly taken for granted in most of mainstream public finance. What limits the ability to tax are incentive constraints tied to asymmetric information, or perhaps political motives, rather than the mere administrative capabilities of the state. Thus, public finance and development remains a relatively unexplored area in the field. As development scholars also do not pay too much attention to issues of taxation, public finance and development tends to fall in the cracks between the two fields.

We believe governments of the past or today’s developing world are about as rational and farsighted as those in today’s developed world. But they may face incentives and constraints shaped by weakly institutionalized political environments. The key challenge for the study of public finance and development is to understand how these incentives and constraints work, and how – if at all – the situation might be improved for the citizens in those na-

tions. Thus, we take the view that governments in poor countries reasonably do their best in raising taxes, *given* the administrative structures in place and the political incentives they face. The real question then becomes why these administrative structures remain so weak in many places. To answer it requires an analysis of endogenous *fiscal capacity* – the main topic of this chapter – sometimes just called state capacity. Crudely, this concept captures how much tax a government could potentially raise given the structure of the tax system and the powers of enforcement. But as a government need not always operate at or near the level of fiscal capacity, its capacity may not be directly observable.

We view the creation of fiscal capacity as a product of investments in state structures – including monitoring, administration and compliance through e.g., well-trained tax inspectors and an efficient revenue service. Our approach gets us away from the false juxtaposition of positive or normative analyses of optimal taxes versus studies of tax administration and political economy where administration reflect the same degree of rationality or irrationality as the choice of taxes.¹

Economists who study development and taxation tend to see the evolving economy as the driving force behind the government’s methods of taxation. However, we will argue that this traditional view needs to be augmented by an understanding of how political incentives shape the evolution of the tax system. We view this as a Schumpeterian perspective: an early study by Schumpeter (1918) saw the development of the tax system as intrinsically intertwined with the nature and history of the state. Moreover, our perspective reflects a modern approach to development, which puts political motives (and the role of institutions) at the heart of economic change.² Without invoking political motives as shaped by institutions, it is difficult to explain why some countries are rich and others are poor.

The remainder of the chapter is organized as follows. In section 2, we briefly discuss different perspectives on taxation and development, and outline our own perspective in more detail. Section 3 presents some background facts on levels and patterns of taxes in rich and poor countries and countries with strong and weak political institutions. Section 4 presents our analytical framework to study equilibrium choices of taxation and investments in fiscal capacity. In Section 5, we use this framework to identify different de-

¹See Slemrod (1990) for a related perspective which puts compliance at centre stage.

²See, for example, Hall and Jones (1999) and Acemoglu, Johnson and Robinson (2001).

terminants of taxation and fiscal capacity: economic development, political institutions, social structures, values of public spending, non-tax revenues like aid and resource rents, and the administration of taxation. Section 6 concludes.

2 Alternative Perspectives

There can be little doubt that changes in the economy influence the ability to tax and the form of taxes that can be raised. The traditional economic approach to taxation and development focuses exclusively on economic change as an influence on the tax system. In this approach, alterations of the tax system follow changes in the economy that are part and parcel of development, including the decline in the size of the informal sector, the growth of firms which can be used vehicles for compliance, and the increasing use of the financial sector. All of these changes make taxation easier and expand the revenues raised. This view is summarized in Figure 1.

But economic development does not automatically lead to increases in tax take. Tax shares of GDP have not gone up conceivably in some of today's most fast-growing economies, such as India and China. New tax bases, such as income and value added only become effective through extensive investments in tax compliance. Low levels of revenue and disproportionate reliance on narrow tax bases are an important constraint on tax compliance. This view is echoed in historical accounts of how tax systems have evolved, such as Brewer (1989) and Dincecco (2011). Looking at more the recent experience through the lens of effective administration, Bird (2004) observes that "the best tax policy in the world is worth little if it cannot be implemented effectively". Such observations underline the need to put conscious efforts to build fiscal capacity at centre stage when studying public finance and development.

A central part of our approach is to highlight mechanisms that improve the compliance with taxes and the possibility to raise taxes which they permit. The traditional economic view also identifies such mechanisms as important – see Slemrod and Yitzhaki (2002) for an overview. The greater reliance on trade taxes (and seigniorage) than income taxes in poor economies, which we discuss further below, has been noted and discussed by many authors



Figure 1: Traditional Approach

– see Hinrichs (1966), Tanzi (1992) and Burgess and Stern (1993) for early contributions. More recently, Gordon and Li (2009) describe the tilted tax structures as a puzzle to understand. However, the traditional explanation seeks such understanding exclusively in the interplay of economic phenomena, such as high levels of informality and undeveloped financial systems.

This chapter will argue that a purely economic view is at best an incomplete – and, arguably, even a misleading – way to study evolving tax systems in the process of development. We will argue that political as well as economic factors deserve a central role in explaining the joint interdependence of taxation and development. To anyone familiar with the modern literature on development, this will come as no surprise: political motives are nowadays seen as central to understand how development proceeds and to explain why some countries languish while others prosper. In keeping with this tradition, we highlight the structure of political institutions and the degree of political instability as key drivers of investment in fiscal capacity. Changes in the power to tax may also reflect circumstances – e.g., threats of foreign conflicts – that forge common political interests in building a strong state.

A second feature of our approach is to point to important feedback loops *from* taxation *to* development which also seem have to have been relatively neglected beyond the possible distortions imposed by taxation. When the government has a larger stake in the economy through a developed tax system, it has stronger motives to play a productive role in the economy, as a complement to its extractive role. Obvious examples include building high-return infrastructure projects and developing the legal system to reduce the extent of informality in the economy. Such complementarity can create a virtuous circle between taxation and development that goes beyond the traditional linear and uni-directional view.

Both of these features are incorporated in the approach of this chapter, as illustrated schematically in Figure 2.

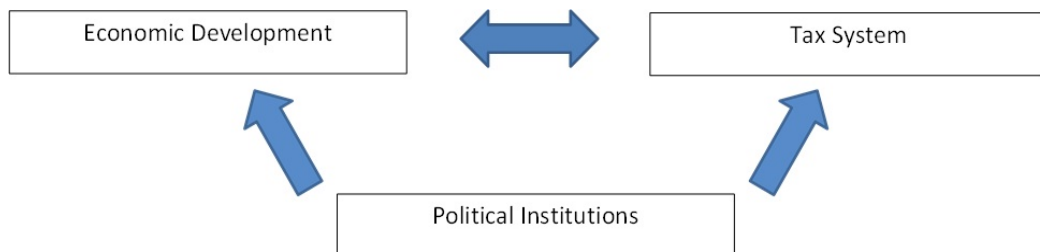


Figure 2: Our Approach

The approach we take emphasizes that tax compliance is not only a technical issue. It also reflects the incentives of policymakers to improve the tax system and ensure that taxes are paid. This also contrasts with the purely economic approach in thinking about compliance structures as a purposive, forward-looking activity by politically motivated incumbents. In this sense, our approach is related to the seminal theoretical and empirical work by Cukierman, Edwards, and Tabellini (1992) on how the use of seigniorage depends on the efficiency of the tax system, and how the strategic choice of the latter depends on factors like political stability and polarization. Changes in tax bases are seen as equilibrium outcomes of a dynamic process, which involves purposeful decisions shaped by political institutions.

An focus on political economics is also in tune with the extensive work by political and economic historians on the state's fiscal capacity. Scholars of history have indeed emphasized the key role of government motives to build fiscal capacity, and especially the centrality of warfare in stimulating demands for fiscal capacity. This research has yielded many interesting case studies, such as Brewer (1989). But there are also attempts at broader generalizations, as in the work by Schumpeter (1918), Tilly (1985) and Levi (1988). Tilly, in particular, aims at explaining European exceptionalism, although his work appears greatly inspired by the encyclopedic scholarship of German historian Hintze (1906). Still much debate remains about whether the fiscal state necessarily follows a pattern of war with Centeno (1997) arguing that Latin America may be an exception to the Tilly hypothesis of war as a major motive for building fiscal capacity.

The fact that many states remain unable to levy broad-based taxes is often seen as key to the persistence of weak states in many poor countries,

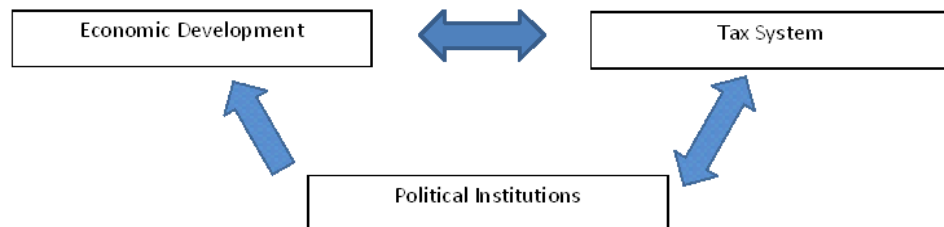


Figure 3: Extended Approach

as emphasized by development scholars like Migdal (1988). Others, such as Herbst (2000), have ventured the hypothesis that some countries in Africa might have been able to strengthen their weak states if external wars had been more frequent on the continent. Thus, our approach is arguably in tune with the approach taken by scholars in the social sciences and humanities.

Political scientists and sociologists sometimes push the role of taxation in development even further, by arguing that taxation is also a catalyst for political and economic change. This view is illustrated in Figure 3, where political institutions respond to an expanding domain of taxation. The old American adage of “no taxation without representation” is, of course, a vivid instance of such thinking, whereby demands for transparency and representation are built as part of the need to build a strong fiscal state in a “fiscal contract” between the citizens and the state.

As we gradually develop our approach, we begin by looking at economic factors alone, as in Figure 1. Next, we consider how political incentives affect the arguments and give a well-defined role for political institutions in determining how tax systems develop, as in Figure 2. Endogenous political institutions as in Figure 3, lies beyond the scope of this chapter, although we briefly return to this possibility in the concluding remarks. Before embarking on this trip, however, we present some facts on public finance and development.

3 Background Facts

The growth of the state and its capacity to extract significant revenues from citizens is a striking economic feature of the last two centuries. For example, Maddison (2001) documents that, on average, France, Germany, the Netherlands and the UK raised around 12% of GDP in tax revenue around 1910 and around 46% by the turn of the Millennium. The corresponding U.S. figures are 8% and 30%. Underpinning these hikes in revenue are a number of tax innovations, including the extension of the income tax to a wide population. For example, large-scale compliance with the income tax required states to build a tax administration and implement withholding at source. Such investments in fiscal capacity have enabled the kind of mass taxation now considered normal throughout the developed world.

Figure 4 gives a very partial picture of how fiscal capacity has evolved *over time*. It plots the distribution of two kinds of upgrading of tax systems for a sample of 73 countries since 1800.³ Red lines demarcate the introduction of the income tax and green lines whether a country has a VAT. Although the sample is limited, it illustrates clearly how investments in tax collection have evolved over time. Income taxes began appearing in the mid nineteenth century and are fully prevalent in the 73-country sample in the interwar period. VAT was lagging further behind, with adoption still incomplete by the end of the twentieth century.

The model developed in Section 3 below will be used to explain the forces that shape such changes in the tax system. The changes illustrated in Figure 4 are all associated with investments in administrative structures that support tax collection.⁴ Figure 5 looks at the historical picture over the last 100 years for a more limited sample of countries, using data from Mitchell (2007). This sample only includes a number of countries that existed already in 1900, where we are reasonably confident that the data are comparable across countries and time.⁵ The figure illustrates how the average tax take

³The sample is limited by the set of countries for which we have confirmed data on when the income tax was introduced.

⁴Aidt and Jensen (2009) study the factors, such as spending pressures and extensions of the franchise, behind the introduction of the income tax in panel data for 17 countries from 1815 to 1939.

⁵The countries in this sample are Argentina, Australia, Brazil, Canada, Chile, Colombia, Denmark, Finland, Ireland, Japan, Mexico, Netherlands, New Zealand, Norway, Sweden, Switzerland, United Kingdom, and the United States.

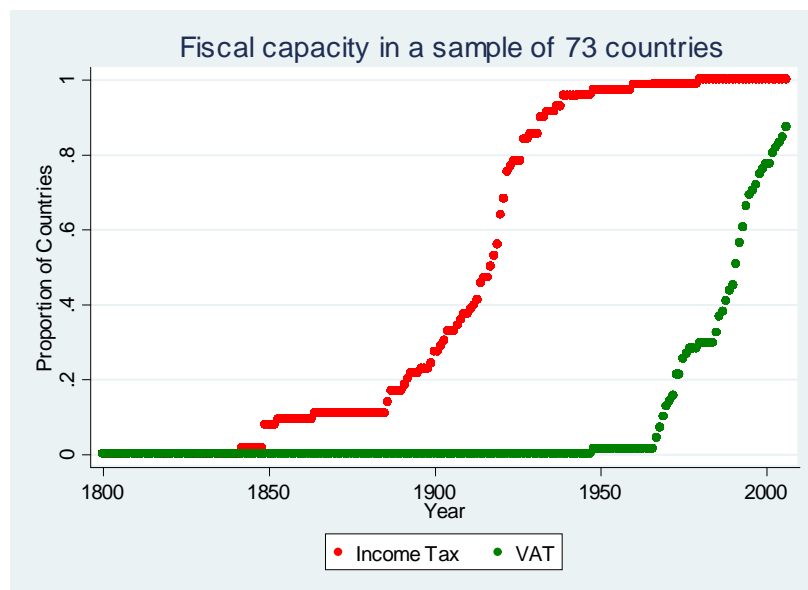


Figure 4: Historical evolution of fiscal capacity

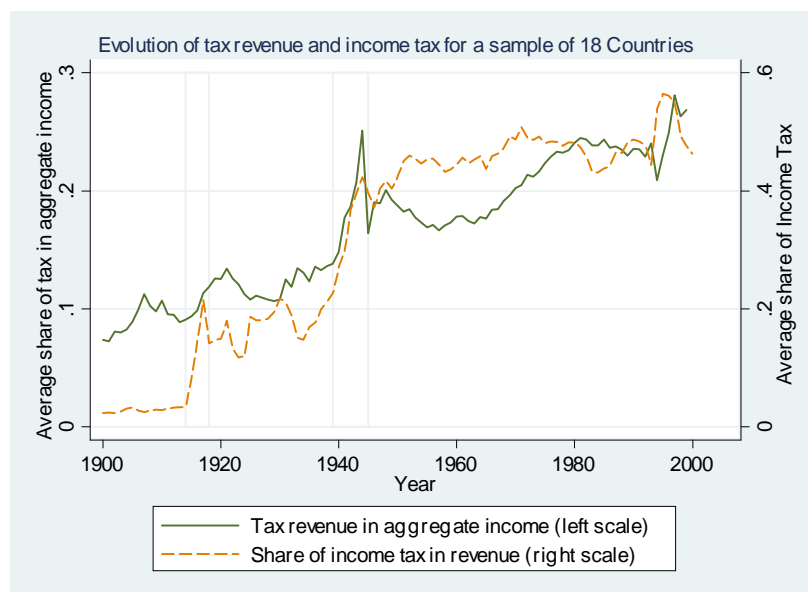


Figure 5: Taxes and share of income tax over time

has increased over time from around 10% in national income to around 25% in the sample as a whole. Equally striking is the increasing reliance on income taxation which only made up about 5% of revenues in 1900 but about 50% by the end of the last century. The hikes of the income tax share during the two world wars are also striking, and these hikes induce a clear ratchet effect.

However, the narrow sample selection in Figures 4 and 5 ignores many of the poorer countries in the world. We would also like to use the model in this chapter to understand how fiscal capacity varies *over countries* and *over time*. A first salient feature of the data is that richer countries tend to raise more tax revenue as a share of national income than poorer countries. This is illustrated in Figure 6. The left panel plots the overall tax take as a share of GDP from Baunsgaard and Keen (2005) against the log of GDP per capita from the Penn World Tables, both measured around the year 2000, and distinguishes observations by income. The right panel looks at the same relationship using the time-series data from Mitchell (2007) to plot five-year averages of the tax share over the twentieth century against national income, and distinguishes observations by time period. The cross-section and time-series patterns are strikingly similar. Higher-income countries today raise much higher taxes than poorer countries, indicating that they have made larger investments in fiscal capacity. Moreover, the tax share in GDP of today's developing countries does not look very different from the tax take 100 years ago in the now developed countries.

To probe further into tax differences across countries, it is interesting to look at the relative uses of different types of taxes, differentiated by the investments required for them to be collected. Arguably, trade taxes and income taxes are two opposite polar cases. To collect trade taxes just requires being able to observe trade flows at major shipping ports. Although trade taxes may encourage smuggling, this is a much easier proposition than collecting income taxes, which requires major investments in enforcement and compliance structures throughout the entire economy. We can thus obtain an interesting indication of fiscal-capacity investments by holding constant total tax revenue, and ask how large a share of it is collected from trade taxes and income taxes, respectively.

These shares are plotted against each other in Figure 7.⁶ Again, we re-

⁶Other taxes not included in either trade or income taxes include indirect taxes such as VAT, property and corporate taxes.

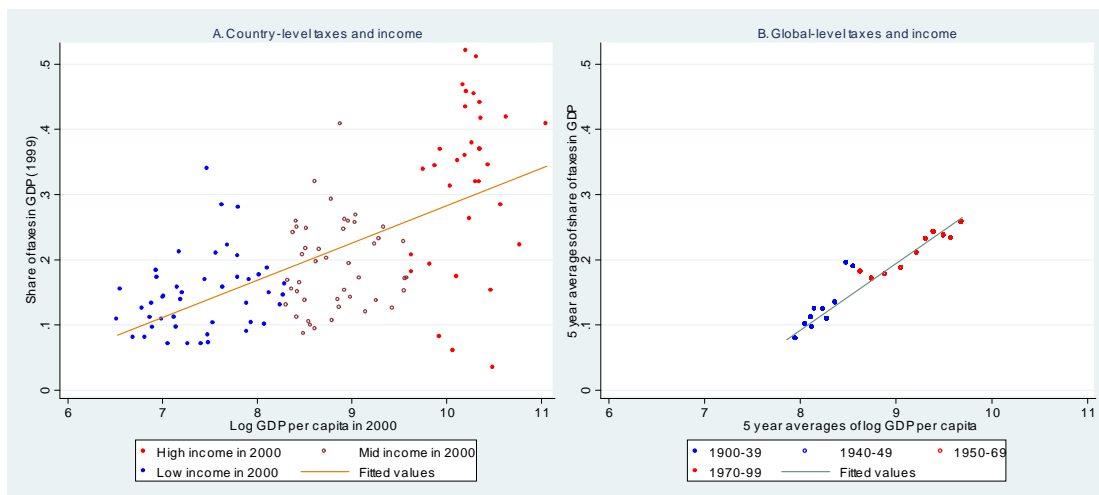


Figure 6: Tax revenue and GDP per capita

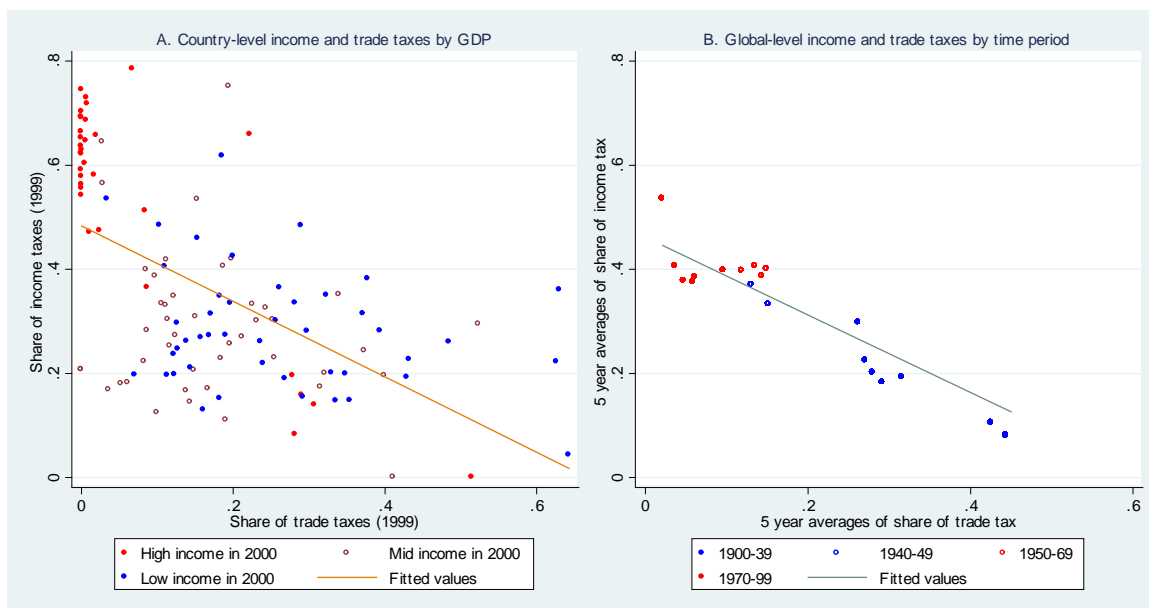


Figure 7: Income taxes and trade taxes

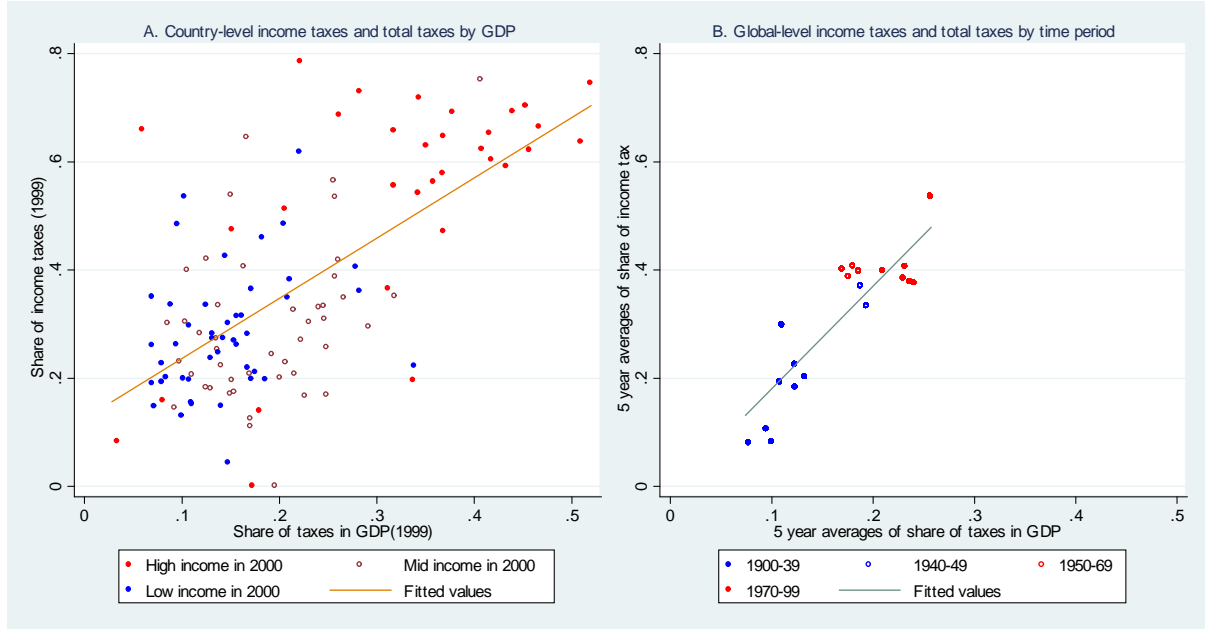


Figure 8: Income taxes and total taxes

port the cross-sectional pattern for the year 2000, based on contemporaneous data from Baunsgaard and Keen (2005), as well as the time-series pattern over the last 100 years based on historical data from Mitchell (2007). The income-tax share is displayed on the vertical axis, and the trade-tax share on the horizontal axis. We observe a clear negative correlation: countries that rely more on income taxes on average rely less on trade taxes. The left panel also shows a striking pattern by income: high-income countries depend more on income taxes, while middle-income and, especially, low-income countries depend more on trade taxes. The right panel of Figure 7 shows that the move from trade to income taxes has also been a feature of the historical development of tax systems. Again, the cross-sectional and time-series patterns look strikingly similar with a similar slope of the regression lines.

Figure ?? homes in on the income tax, plotting the relationship between the share of income taxes in total taxes and income per capita, in the current cross section as well as the historical time series. The left panel separates the observations into three groups by tax take: countries that raise more than 25% of taxes in GDP, countries that raise 15-25% of taxes in GDP, and countries that raise less than 15%. The countries in the high-tax group again

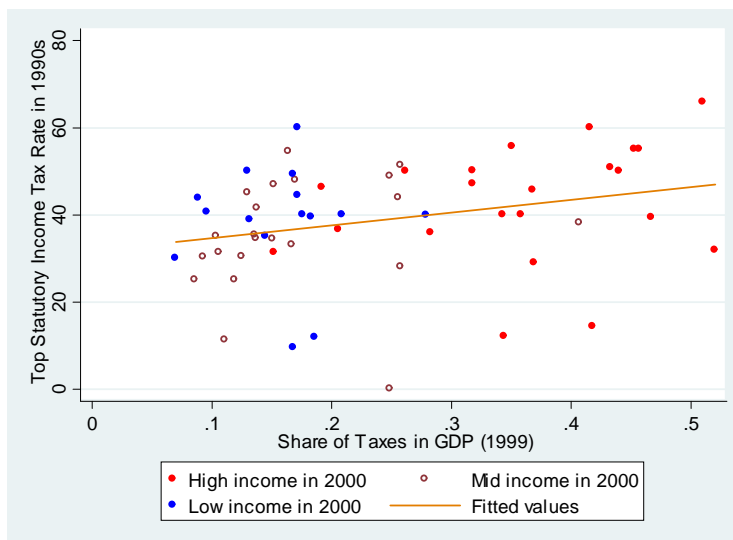


Figure 9: Top statutory income tax rate and total tax take

look markedly different, raising much more of their tax revenues in the form of income taxes. The right panel again colors observations by time period. The historical trend in this sample of older nations and the pattern in the world today is again very similar.

Another indicator of fiscal capacity is the relation between statutory tax rates and actual tax take. Figure 9 shows some plots the top statutory income tax rates in 1990s for the 67-country sample in Gordon and Lee (2005) against the share of total taxes in GDP from Baunsgaard and Keen (2005). The figure shows that the distribution of the top statutory rate is about the same amongst high-income and low-income countries. Obviously, the figure does not take aspects such as coverage and progressivity into account. With this qualification, the fact that high-income countries raise much more tax revenue than low-income countries suggests that a narrow tax base driven by compliance difficulties is a much bigger issue among low-income countries. This reinforces the earlier observation that fiscal capacity is considerably less developed in poor countries.

Finally, we turn to some facts relating tax structure and politics. As our core measure of political institutions, we use a measure executive constraints from the well-known Polity IV data base. We use the highest coding of such constraints (the variable `xconst` is equal to 7 on a 1-7 scale) to measure

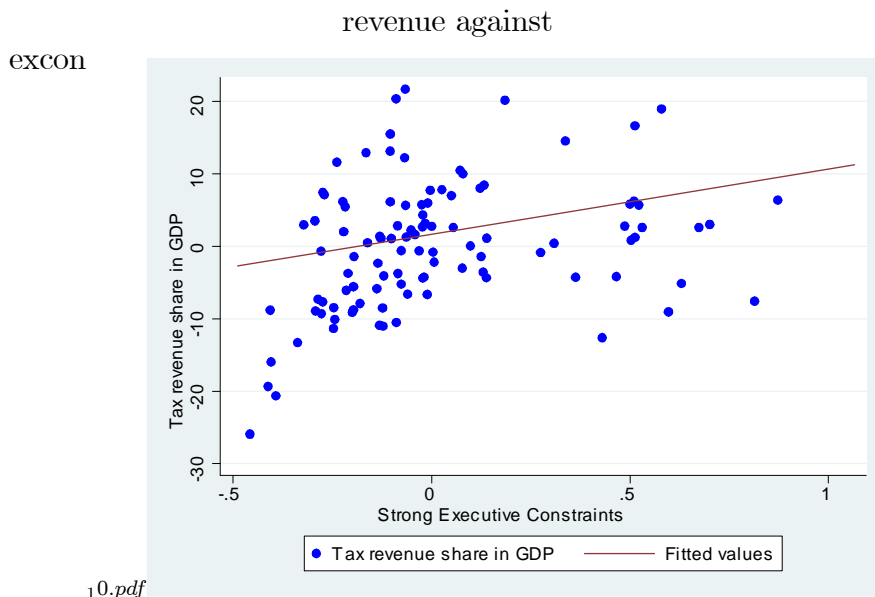


Figure 10: Tax Revenue and Executive Constraints

the proportion of years since independence (or since 1800 if independence is earlier) that a country had strong constraints on the executive. To highlight that this political dimension captures something different than country heterogeneity in income, we control for current income before plotting the *partial* correlation of high executive constraints and two of our fiscal-capacity measures: total tax share in GDP (Figure 10) and the income tax share in total income (Figure 11). In both cases, we see a clear positive correlation between this measure of political institutions and fiscal capacity, taking the level of economic development into consideration. The facts illustrated in these figures further underline the need to adopt an approach that studies allows political factors to help account for the level and evolution of fiscal capacity.

Taken together, the cross-sectional and time-series data suggest the following seven facts:

Stylized Fact 1: *Rich countries have made successive investments in their fiscal capacities over time.*

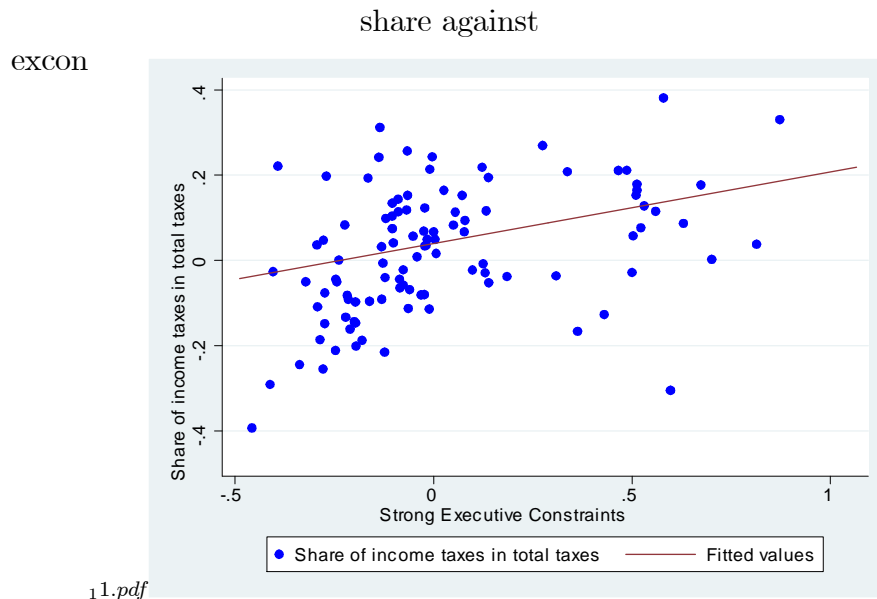


Figure 11: Income Tax Share and Executive Constraints

Stylized Fact 2: *Rich countries collect a much larger share of their income in taxes than do poor countries*

Stylized Fact 3: *Rich countries rely to a much larger extent on income taxes as opposed to trade taxes than do poor countries.*

Stylized Fact 4: *High-tax countries rely to a much larger extent on income taxes as opposed to trade taxes than do low-tax countries.*

Stylized Fact 5: *Rich countries collect much higher tax revenue than poor countries despite comparable statutory rates.*

Stylized Fact 6: *Countries with strong executive constraints collect higher tax revenues, when income per capita is held constant, than do countries with weak executive constraints.*

Stylized Fact 7: *Countries with strong executive constraints rely on a higher share of income taxes in total taxes, when income per capita is held constant, than do countries with weak executive constraints.*

Together, these seven facts strongly suggest that rich, high-tax, and executive-constrained states have made considerably larger investments in fis-

cal capacity than have their poorer, low-tax, and non-executive-constrained counterparts.

Despite such clear patterns in the data, economists have not devoted a great deal of attention to the economic and political analysis of fiscal capacity. Indeed, most normative and positive theories of taxation hardly ever touch upon lacking administrative infrastructure as important constraints on the taxes that governments can raise.

4 Framework

The framework we develop in this section is a generalization of the models studied by Besley and Persson (2009, 2011). Our approach also builds on the recent literature on how taxable income responds to taxes allowing for a wider range of responses than the traditional view based on labor supply elasticities – see Feldstein (1995, 1999) for the original contributions and Slemrod (2001) for a formulation close to the one we adopt.⁷ This makes particular sense in a developing country context, where non-compliance and decisions to earn or spend in the informal (untaxed) sector are such important issues. We build a framework to help us understand the forces behind the decisions to build a more effective tax system, where such decisions are made by a forward-looking government. In keeping with the stylized facts, we model greater effectiveness or fiscal capacity as increasing the yield on statutory taxes by reducing non-compliance.

The focus is on the taxation of labor income and of goods and services which fall directly on households. This neglects the important issue of taxation of firms. Neither does the framework deal with taxation of capital income. We also limit attention to a centralized tax system, ignoring the complications created by local taxation and federal structures.

4.1 Basic Set-Up

Consider a population with \mathcal{J} distinct groups, denoted by $J = 1, \dots, \mathcal{J}$, where group J is homogenous and comprises a fraction ξ^J of the population. There are two time periods $s = 1, 2$. The economy has $N + 1$ consumption goods, indexed by $n \in \{0, 1, \dots, N\}$. Consumption of these goods by group J in

⁷See Saez, Slemrod and Giertz (2009) for a review of the research on taxable income.

period s are denoted by $x_{n,s}^J$. There is also a traditional (non-rival and non-excludable) public good g_s . Individuals in group J supply labor, L_s^J , and choose how to allocate their income across consumption goods. This is a small open economy with given pre-tax prices of $p_{n,s}$. Wage rates ω_s^J are potentially group-specific and may vary over time.

Taxation and tax compliance The government may levy taxes on all goods except the non-taxed numeraire good 0, and on labor. The post-tax price of each good is:

$$p_{n,s} (1 + t_{n,s}), \quad n = 1, 2, \dots, N,$$

while the net wage is:

$$\omega_s^J (1 - t_{L,s}),$$

where $\{t_{1,s}, \dots, t_{N,s}, t_{L,s}\}$ is the vector of tax rates.

As in the standard model, statutory tax policy is a vector of tax rates for commodities and labor supply. However, to allow for non-compliance, we suppose that tax payments can be reduced by actions by those who are obliged to remit taxes to authorities. If the costs of non-compliance were large enough, this would not happen and we would be back in the standard model. But we suppose this may not be the case and allow the cost of non-compliance to depend on investments in fiscal capacity.

To capture these ideas simply, we assume that tax payments to the government from group J in period s , associated with the commodity tax imposed on good n , are

$$t_{n,s} [p_{n,s} x_{n,s}^J - e_{n,s}],$$

which we assume to be non-negative. Thus, $e_{n,s}$ (denominated in the units of the numeraire good) is the amount of the statutory tax owed but non-paid – think about $e_{n,s}$ as purchases from the informal sector. The cost function for such non-compliance is the same for all groups J , namely $c(e_{n,s}, \tau_{n,s})$ with c increasing and convex in $e_{n,s}$. The parallel expression for labor taxes is

$$t_{L,s} [\omega_s^J L_s - e_{L,s}]$$

with cost $c(e_{L,s}, \tau_{L,s})$. Analogously, one can interpret $e_{L,s}$ as the amount of work undertaken in the informal sector.

The vector $\tau_s = \{\tau_{1,s}, \dots, \tau_{N,s}, \tau_{L,s}\}$ represents investments in fiscal capacity. For each tax base, $k = 1, \dots, N, L$, we assume:

$$\frac{\partial c(e_{n,s}, \tau_{n,s})}{\partial \tau_{n,s}} > 0 \quad \text{and} \quad \frac{\partial^2 c(e_{n,s}, \tau_{n,s})}{\partial e_{n,s} \partial \tau_{n,s}} \geq 0 ,$$

such that greater fiscal capacity makes avoiding taxes more difficult.⁸ Moreover, we postulate that $c(e_{n,s}, 0) = 0$, i.e., for a tax base where the government has made no investments in fiscal capacity the cost of evading taxes are negligible. If citizens evade taxes fully when it is costless of doing so, there is no tax income from a base that the government has no fiscal capacity to tax.

For simplicity, we have assumed that fiscal capacity has a common effect on all individuals' abilities to avoid paying statutory taxes. As a consequence, every consumer in the model adjusts their tax-evading behavior on the intensive margin. An alternative way of modelling tax evasion would be to introduce heterogeneity in the cost of evasion (or in the stigma of being caught evading). This alternative formulation would introduce an extensive margin in tax evasion – to use the informal sector or not – but would otherwise lead to similar results. The most general approach would fashion both margins and allow for heterogeneous effects according to economic circumstance, e.g., greater difficulties in measuring the value of labor earnings by owner-cultivators, the values of own production, or the value of bartered exchange in some sectors of the economy.

Costs of fiscal-capacity investments There is an initial period-1 level of fiscal capacity relevant to sector k denoted by $\tau_{k,1}$ and a level for period 2 denoted by $\tau_{k,2}$ which is determined by costly investments. The costs of investing in fiscal capacity across the $N + 1$ tax bases $k = 1, \dots, N, L$ are:

$$\mathcal{F}^k(\tau_{k,2} - \tau_{k,1}) + f^k(\tau_{k,2}, \tau_{k,1}) \quad \text{for } k = 1, \dots, N, L .$$

We assume that the first part of the investment cost function \mathcal{F}^k is convex in $\tau_{k,2}$, with $\frac{\partial \mathcal{F}^k(0)}{\partial \tau_{k,2}} = 0$, i.e., the marginal cost at zero is negligible. Moreover, there may or may not be a fixed-cost component, depending on whether the

⁸See Kopczuk and Slemrod (2002) for a related model, where governments can affect the elasticity of taxable income through decisions about the extent of compliance.

period-1 government inherits a fiscal capacity of zero for tax base k

$$f^k(\tau_{k,2}, \tau_{k,1}) = \begin{cases} f^k \geq 0 & \text{if } \tau_{k,1} = 0 \text{ and } \tau_{k,2} > 0 \\ 0 & \text{if } \tau_{k,1} > 0 . \end{cases}$$

Let

$$\mathcal{F}(\boldsymbol{\tau}_2, \boldsymbol{\tau}_1) = \sum_{k=1}^L \mathcal{F}^k(\tau_{k,2} - \tau_{k,1}) + f^k(\tau_{k,2}, \tau_{k,1})$$

be the total costs of investing in fiscal capacity. The separability of the cost function across tax bases is made for analytical convenience. Another feature of the technology is that it does not depend on the wage rate, even though it could be that investing in fiscal capacity costs more in a more productive economy.

In practical terms, the costs of fiscal capacity investment is more obvious for some tax bases than others. For example, levying an effective income tax requires a collection system with trained inspectors, some kind of record keeping, and the ability to cross check. We would thus expect a relatively large fixed-cost component, i.e., $f^k > 0$ for $k = L$. Equally, a VAT system requires an ability to monitor and verify the use of inputs and the value of sales for *all* goods simultaneously (but the VAT does not directly fit the framework above). Levying border taxes usually takes place by monitoring ports and airports to measure trade flows. For such taxes, we would expect the fixed-cost component to be small or absent. Moreover, inspecting trade flows is easier for volumes than values, which might explain why so many border taxes are specific rather than ad valorem.

However, in all these cases, public resources need to be devoted to monitoring and compliance. Below, we will discuss in greater detail different options in introducing new technologies to improve compliance.

Household decisions Preferences are quasi-linear and given by:

$$x_{0,s}^J + u(x_{1,s}^J, \dots, x_{N,s}^J) - \phi(L_s^J) + \alpha_s^J H(g_s) .$$

where u is a concave utility function and ϕ the convex disutility of labor. The utility of public goods is partly described by concave function H . We use α_s^J to parametrize the value of public goods, which we allow to be group and time specific. The individual budget constraint is:

$$x_{0,s}^J + \sum_{n=1}^N p_{n,s} (1 + t_{n,s}) x_{n,s}^J \leq \omega_s^J (1 - t_{L,s}) L_s^J + r_s^J + \sum_{k=1}^L [t_{k,s} e_{k,s} - c(e_{k,s}, \tau_{k,s})] .$$

In this expression, r_s^J is a group-specific cash-transfer. The only non-standard feature is the last term, namely the total “profit” from reducing tax payments. What makes this formulation of the household problem simple is the fact that tax incidence and behavior are still governed by the statutory tax rates as long as $e_{k,s} < p_{k,s}x_{n,s}^J$.

Maximizing the consumers’ utility yields a vector of commodity demands and labor supply which is quite conventional. In particular, since there are no income effects on the potentially taxed commodities and each consumer faces the same prices and statutory tax rates, we have that the commodity demands are equal across groups $x_{n,s}^J = x_{n,s}$.

For the tax bases where the government has some fiscal capacity, $\tau_{k,s} > 0$, the decisions to reduce the tax burden, which we assume have an interior solution,⁹ are also equal across groups, and implicitly defined by

$$t_{k,s} = c_e(e_{k,s}^*, \tau_{k,s}) \text{ for } k = 1, \dots, N, L \text{ if } \tau_{k,s} > 0. \quad (1)$$

It is straightforward to see that the convexity of the cost function makes equilibrium evasion $e_{k,s}^*(t_{k,s}, \tau_{k,s})$ decreasing in the fiscal capacity investment, tax base by tax base. The household profits from such activities are:

$$q(t_{k,s}, \tau_{k,s}) = t_{k,s}e_{k,s} - c(e_{k,s}, \tau_{k,s}),$$

which are increasing in $t_{k,s}$ and decreasing in $\tau_{k,s}$.¹⁰

When there is no fiscal capacity, $\tau_{k,s} = 0$, any positive tax rate $t_{k,s}$ would give us a corner solution with $e_{k,s}^* = p_{k,s}x_{k,s}$ or $e_{L,s}^* = \omega_s^J L_{J,s}$. This is a case where all consumption could be sheltered from taxation in the informal sector

⁹One special case of the model is where

$$c(e, \tau) = ec(\tau).$$

In this case $t \leq c(\tau)$ otherwise evasion is complete and we essentially back to the formulation of fiscal capacity Besley and Persson (2009) as an upper bound on the feasible tax rate.

¹⁰While we have formulated the model in terms of household decisions not to comply with taxes, it should now be clear that we could have formulated this as a series of firm-level decisions, where consumers pay their taxes faithfully and firms decide whether to remit taxes to tax authorities. Profits of non-compliance would still appear as individual income for owners of firms. Our key assumption is that these non-compliance profits are distributed equally across the population with each individual getting his own per capita share. But it would be straightforward to generalize the model to allow for any sharing rule for these profits.

where the individual has no tax liability. Thus, no tax income is raised at whatever level the statutory rate is set. To break this tie, we assume that in such cases the government just sets the statutory tax rate at zero.

Indirect utility Let

$$Q(\mathbf{t}_s, \boldsymbol{\tau}_s) = \sum_{k=1}^L q(t_{k,s}, \tau_{k,s})$$

be the aggregate (equilibrium) per-capita profit from efforts devoted to tax-reducing activities where $\mathbf{t}_s = \{t_{1,s}, \dots, t_{N,s}, t_{L,s}\}$ is the vector of tax rates.

The indirect utility function for group J becomes:

$$\begin{aligned} V^J(\mathbf{t}_s, \boldsymbol{\tau}_s, g_s, \omega_s^J, r_s^J) &= v(p_1(1+t_{1,s}), \dots, p_{N,s}(1+t_{N,s})) + v^L(\omega_s^J(1-t_{L,s})) \\ &\quad + Q(\mathbf{t}_s, \boldsymbol{\tau}_s) + \alpha_s^J H(g_s) + r_s^J \end{aligned} \quad (2)$$

The first term on the right-hand side is the private surplus from the consumption of goods $n = 1, \dots, N$. The separable, quasi-linear preferences makes the private surplus additively separable in goods and labor – hence the second term. A convenient, but special, feature of the setup is that the gains from tax reduction are not group specific – hence the third, non-indexed term. These features help make the analysis much simpler but do not compromise the economic insights.

The policy problem Governments choose tax rates on all goods and labor and a spending policy, dividing the tax proceeds between public goods, transfers and investments in fiscal capacity.

Let

$$B(\mathbf{t}_s, \boldsymbol{\tau}_s) = \sum_{n=1}^N t_{n,s}(p_{n,s}x_{n,s} - e_{n,s}) + \sum_{J=1}^{\mathcal{J}} \xi^J t_{L,s}(\omega_s^J L_s^J - e_{L,s})$$

be the tax revenue from goods and labor, where the expression in the first sum relies on the fact that all groups choose the same consumption vector for non-numeraire goods. This is not true for labor supply, however, if different groups have different wage rates. The government budget constraint becomes

$$B(\mathbf{t}_s, \boldsymbol{\tau}_s) + R_s \geq g_s + \sum_{J=1}^{\mathcal{J}} \xi^J r_s^J + m_s, \quad (3)$$

where

$$m_s = \begin{cases} \mathcal{F}(\tau_2, \tau_1) & \text{if } s = 1 \\ 0 & \text{if } s = 2 \end{cases}$$

is the amount invested in fiscal capacity (relevant only in period 1) and R_s is any (net) revenue from borrowing, aid or natural resources.

We now go on to consider, first, how a government will set taxes and spending and, then, how it will choose to invest in fiscal capacity. Thus, we begin by studying the static (within-period) problem taking fiscal capacity as given.

The social objective of the government has fixed weights μ^J , one for each group, which are normalized so that $\sum_{J=1}^J \mu^J \xi^J = 1$. Then the government maximizes:

$$\sum_{J=1}^J \mu^J \xi^J V^J(\mathbf{t}_s, \boldsymbol{\tau}_s, g_s, \omega_s^J, r_s^J)$$

subject to (3). This is a more or less standard optimal-tax *cum* public-goods problem, along the lines first studied in Diamond and Mirrlees (1971). It is special only in that we have assumed quasi-linear utility and added the possibility of tax evasion.

Optimal taxation Taxes will follow a standard Ramsey-rule, except for the fact that taxes affect non-compliance decisions, as well as consumption and labor supply decisions. To state the tax rules, define the effective tax bases:

$$Z_{n,s}(\mathbf{t}_s, \boldsymbol{\tau}_s) = p_{n,s}x_{n,s} - e_{n,s} \quad \text{and} \quad Z_{L,s}(t_{L,s}, \tau_{L,s}) = \sum_{J=1}^J \xi^J \omega_s^J L_s^J - e_{L,s}, \quad (4)$$

where $x_{n,s}$ and L_s^J are per capita commodity demands and (group-specific) labor supplies. The additive separability of the utility function makes the effective income tax base a function of the the income tax alone. With this notation, the Ramsey-tax rule for commodities is

$$\begin{aligned} (\lambda_s - 1)Z_{n,s}(\mathbf{t}_s, \boldsymbol{\tau}_s) + \lambda_s \sum_{n=1}^N t_{n,s} \frac{\partial Z_{n,s}(\mathbf{t}_s, \boldsymbol{\tau}_s)}{\partial t_{n,s}} &= 0 \quad \text{for } n = 1, \dots, N \text{ if } \tau_{n,s} > 0 \\ t_{n,s} &= 0 \quad \text{if } \tau_{n,s} = 0, \end{aligned}$$

where λ_s is the value of public funds. Given the possibility of reducing the tax burden, it is the demands net of avoidance $p_{n,s}x_{n,s} - e_{n,s}$ and the behavioral response of these net demands that shape the tax rates.

For those goods where there is no fiscal capacity, the government (by assumption) sets optimal taxes at zero. Moreover, we focus on the natural case where $e_{k,s}^* < p_{k,s}x_{k,s}$ whenever $\tau_{k,s} > 0$. This says that, if the government has any fiscal capacity in some tax base, there is a non-trivial level of compliance. In this case, we also expect that the optimal tax rate will be positive for any tax base where $\tau_{k,s} > 0$.

The optimal income tax solves:

$$\begin{aligned} -\tilde{Z}_{L,s} + \lambda_s \left[Z_{L,s}(t_{L,s}, \tau_{L,s}) + t_{L,s} \frac{\partial Z_{L,s}(t_{L,s}, \tau_{L,s})}{\partial t_{L,s}} \right] &= 0 \quad \text{if } \tau_{L,s} > 0 \\ t_{L,s} &= 0 \quad \text{if } \tau_{L,s} = 0, \end{aligned}$$

where $\tilde{Z}_{L,s} = \sum_{J=1}^J \mu^J \xi^J \omega_s^J L_s^J - e_{L,s}$ is weighted net taxable labor income allowing for heterogenous wages. The optimal-tax expression is similar to the optimal commodity tax in that it involves the total behavioral response of the tax base $Z_{L,s}$. However, the income transferred from citizens to government (the first term) is weighted by the social objective. In general, this term depends on the correlation between the group weights μ^J and wages ω_s^J across groups.

To illustrate how the lack of fiscal capacity to enforce income taxes affects choices, let us assume that wages are the same for all groups, $\omega_s^J = \omega_s$. In this case, the optimal income tax rate solves:

$$\frac{t_{L,s}^*}{1 - t_{L,s}^*} = \frac{(\lambda_s - 1) - (\kappa - 1)\varepsilon}{\kappa\eta}, \quad (5)$$

where η is the elasticity of labor supply with regard to the after-tax wage, ε is the elasticity of evasion with respect to the income tax rate and $\kappa = \omega_s L_s / (\omega_s L_s - e_{L,s}) > 1$ reflects the extent of non-compliance. The standard optimal income tax formula has $\kappa = 1$ so only the inverse labor-supply elasticity η and the value of public funds λ_s , to be spent on public goods or transfers, determine the optimal tax. In that case, λ_s above one is sufficient for the optimal tax rate to be positive.

With non-compliance, however, the optimal tax rate is lower all else equal. To see this, observe that, using equation (5),

$$\frac{\partial t_{L,s}^*}{\partial \varepsilon} < 0 \quad \text{and} \quad \frac{\partial t_{L,s}^*}{\partial \kappa} < 0.$$

So any factor which makes it easier avoid paying taxes or increases the extent of avoidance depresses the incentive to use the income tax. Thus, we would expect lower rates of taxation, as well as lower collection of taxes for a given rate, in jurisdictions and times with little investment in fiscal capacity for tax collection (in so far as fiscal capacity increases ε and κ).

The optimal-tax formulas above reflect that when citizens can reduce their tax liability, taxes raise less revenue than otherwise. The total behavioral response to taxation can, in principle, be larger or smaller than in the absence of tax avoidance, depending on the sensitivity of such activity to a higher tax. And these responses will be influenced by investments in fiscal capacity.

There is a direct link here to the literature on taxable income elasticities. However, these considerations should be applied to all tax bases, not just to labor income. In many countries compliance with the VAT is big issue and the taxable demand elasticity would be relevant to understanding tax policy. As things stand, the evidence regarding the total response of tax revenues to tax rates, and the sources of these effects, is only in its infancy for developing countries. This is true even for income taxes, the area where most progress has been made in the developed country literature. For an exception to this, however, see Kleven and Mazhar (2011) who estimate taxable income elasticities for Pakistan using detailed administrative data. These elasticities turn out to be quite small, at least among those who are already registered to pay income taxes.

The analysis in this section suggests that to understand the fiscal facts about developing countries laid out in Section 3, we may be able to appeal to the fiscal-capacity investments that shape total behavioral responses to taxation through standard consumption and labor-supply distortions but also through compliance decisions. The structure of taxes is influenced by the fact that fiscal capacity is low or non-existent for some tax bases making it difficult to collect statutory taxes. This is particularly true when we compare income taxes and trade taxes, with the latter demanding much less in terms of fiscal-capacity investments. The low level of tax take may thus not reflect larger distortions in consumption and labor supply, for any given tax system, but larger opportunities for non-compliance. Hence, our emphasis on fiscal-capacity investments below.

Optimal public spending Before turning to fiscal capacity, we briefly deal with public spending. In this dimension, the government decides how

much revenue to allocate to transfers and public goods, respectively. With quasi-linear utility, an unconstrained government will direct all transfer spending, if any, to the group with the highest μ^J . This is, of course, a stark and unrealistic prediction (but in Section 4.2 we introduce political constraints that potentially bring about more equal sharing). In the special Utilitarian case, where $\mu^J = 1$ for all J , we can assume without loss of generality that any transfer spending is spent equally. Let $\mu^{\max} = \max_J \{\mu^J; J = 1, \dots, \mathcal{J}\}$.

To define the optimal level of public spending, let $B(\mathbf{t}_s^*(\lambda), \boldsymbol{\tau}_s)$ be total tax revenue when taxes are set optimally and the marginal value of public funds is λ . There are two cases. If

$$\sum_{J=1}^{\mathcal{J}} \mu^J \xi^J \alpha_s^J H_g(B(\mathbf{t}_s^*(\mu^{\max}), \boldsymbol{\tau}_s) + R_s - m_s) > \mu^{\max}$$

then all spending will be allocated to public goods, i.e.,

$$\lambda_s = \sum_{J=1}^{\mathcal{J}} \mu^J \xi^J \alpha_s^J H_g(B(\mathbf{t}_s^*(\lambda_s), \boldsymbol{\tau}_s) + R_s - m_s) .$$

This is a case where public goods are very valuable and/or tax revenue is scarce.

In the other case, the marginal value of public funds is $\lambda_s = \mu^{\max}$, tax revenues are $B(\mathbf{t}_s^*(\mu^{\max}), \boldsymbol{\tau}_s)$, public goods have an interior solution, and the remaining revenue is spent on transfers to the group defining μ^{\max} .

Investments in fiscal capacity The main novelty in our approach to public finance and development is to study purposeful and forward-looking decisions by government to invest in alternative forms of fiscal capacity, i.e., in vector $\boldsymbol{\tau}_2$. We study this investment decision when $\boldsymbol{\tau}_2$ is endogenous and chosen by the government in period 1. Having done so, we will use the resulting conditions to consider which forces drive the creation of fiscal capacity and how these relate to economic, political and social development.

Let

$$W(\boldsymbol{\tau}_s, R_s + m_s; \{\mu^J\}) = \max_{g_s, t_s, r_s^1, \dots, r_s^{\mathcal{J}}} \left\{ \sum_{J=1}^{\mathcal{J}} \mu^J \xi^J V^J(\mathbf{t}_s^*, \boldsymbol{\tau}_s, g_s, \omega_s^J, r_s^J) \quad \text{s.t. (3)} \right\} \quad (6)$$

be the maximized value of the government's payoff. Implicit in this payoff are the optimal tax and spending vectors for each level of the fiscal-capacity constraints.

Now we can formulate the fiscal-capacity investment decision, as choosing τ_2 to maximize:

$$W(\tau_1, R_1 - \mathcal{F}(\tau_2, \tau_1); \{\mu^J\}) + W(\tau_2, R_2; \{\mu^J\}) . \quad (7)$$

This yields a series of conditions for creating fiscal capacity, or investing in it once it has been created.

For fiscal capacity already in existence, i.e. $\tau_{k,1} > 0$, we have standard first-order conditions on a convenient and readily interpretable form. Using the envelope theorem to eliminate terms in optimal government (and private) choices, these first-order conditions can be written as:

$$\begin{aligned} \lambda_2 \frac{\partial B(\mathbf{t}_2^*, \tau_2)}{\partial \tau_{k,2}} + \frac{\partial Q(\mathbf{t}_2^*, \tau_2)}{\partial \tau_{k,2}} - \lambda_1 \frac{\partial \mathcal{F}(\tau_1, \tau_2)}{\partial \tau_{k,2}} &\leq 0 \text{ for } k = 1, 2, \dots, N, L(8) \\ \text{c.s. } \tau_{k,2} &\geq \tau_{k,1} > 0 . \end{aligned}$$

Three terms govern the investment decisions. The first is the added revenue from better fiscal capacity, weighted by the period-2 marginal value of public funds. The second term in (8) is the marginal cost imposed on citizens by higher fiscal capacity – essentially due to higher tax payments, as the profits from tax evasion fall when fiscal capacity is higher. The third term is the marginal cost of investing, weighted by the period-1 marginal cost of public funds.

The three terms in equation (8) nicely encapsulate the forces that shape fiscal capacity decisions. First, some factors make future revenue more valuable (cost of public funds λ_2 and the revenue function B) – these will have a disproportionate effect on investment in tax bases which are not very elastic. Second, some circumstances shape the utility cost of taxation, which depend on the lengths governments have to go to increase compliance (the profit function Q). Third, some features of the economy make it more less expensive to invest – including a high current marginal cost of public funds (the cost function \mathcal{F} and cost of public funds λ_1). The investment cost could be quite specific to some kinds of tax bases.

For the case where the government is thinking about introducing a new tax base, the reasoning is inherently non-marginal. Discrete gains or losses have to be weighed against the fixed cost of the investment. So consider a

decision by a government to add a tax base k where $\tau_{k,1} = 0$. This will give a non-marginal change in indirect utility, which comes from changes in the use of existing tax bases as well as increased spending on public goods. It will also imply non-marginal changes in the profits from non-compliance with new tax base as the optimal taxes change. Together, these yield a discrete change in $W(\tau_2, R_2; \{\mu^J\})$ – evaluated at the level $\tau_{k,2}$ which solves (8) – that must be weighed against the cost of the investment $\lambda_1 [\mathcal{F}^k(\tau_{k,2}) + f^k]$. In general, this kind of non-marginal analysis will be quite complicated. That said, the main economic forces identified in our discussion of (8) remain the salient forces to shape the decision to invest in genuinely new tax bases. In Section 5, we discuss in detail the specific case of the introduction of an income tax.

Next steps Having built a framework for studying investments in fiscal capacity, we will now develop some insights offered by the approach regarding differences between different societies at a point in time and the same society at different points in time.

More specifically, Section 5 brings up six sets of factors pinpointed by our modeling approach. First, we study the effect of purely economic factors on the incentive to build a tax system. Second, we turn to the role of politics, asking how political instability and the structure of political institutions affect the choice of fiscal capacity. Third, we look at social structure, including inequality, heterogeneity and polarization. Fourth, we study the demand side of state action and the factors that determine the value of public spending. Fifth, observing that many poor countries rely heavily on aid or natural resource rents to support state activities, we explore how these non-tax income flows affect the incentives to build other kinds of fiscal capacity. Finally, we go into more detail on the technology for increasing tax compliance.

In all cases, we take a starting point in our general model. However, in each case it will prove convenient to specialize some features to home in on a particular issue.

5 Drivers of Change

5.1 Economic Development

In this subsection, we discuss how changes in the economy might affect choices of fiscal capacity and the implications for observed taxation. Against

the background of the stark time-series and cross-sectional facts discussed in Section 3, we focus on the role of economic development for the introduction and expansion of the income tax. As discussed at the outset, this has also been the traditional focus of the taxation and development literature. We begin by discussing exogenous differences in the economy across countries or time, turning then to changes that are endogenous to the government's investment in state capacity.

Exogenous economic differences We noted in Section 3 (recall Figure 4) that today's rich economies all have taken the discrete steps of introducing the income tax and upgrading its efficiency via direct withholding during the last 150 years. In a contemporary cross section, we also saw (recall Figures 7 and 8) that rich and high-taxing countries rely much more on the income tax than their poor and low-taxing counterparts. Through which channels could our framework help explain such patterns in the data?

For that purpose, we specialize the model to include only one consumption good, in addition to the numeraire good and labor – i.e., we set $N = 1$. Moreover, there are no fixed costs associated with building fiscal capacity for the taxable consumption good, whereas there may exist such fixed costs for the income tax – i.e., we have $f^1 = 0$ and $f^L \geq 0$. Of course, this stark difference is for illustrative purposes only. To keep things simple and to pin down the value of public funds, we specialize the utility function of public goods to be linear, i.e., $H(g_s) = g_s$, and the value of public goods to be equal across groups exceeding the value of transfers, i.e., $\alpha_s^J = \alpha_s = \lambda_s > \mu^{\max}$. These specialized assumptions are relaxed in later subsections on politics and the value of public spending. However, they allow us to focus on the case where the government spends only on public goods with a constant marginal value of funds.

We start by assuming that wages are given by the simple expression

$$\omega_s^J = \Lambda_s \omega ,$$

i.e., every group J has the same wage. Different values of Λ_s could represent natural exogenous income differences between countries or over time due to, say, geography or total factor productivity.

In this specialized framework, the marginal first-order conditions (8) as-

sociated with the two tax bases are

$$\alpha_2 \frac{t_{k,2} \partial Z_{k,2}(t_{k,2}, \tau_{k,2})}{\partial \tau_{k,2}} + \frac{\partial q(t_{k,2}, \tau_{k,2})}{\partial \tau_{k,2}} - \alpha_1 \frac{\partial \mathcal{F}^k(\tau_{k,2} - \tau_{k,1})}{\partial \tau_{k,2}} \leq 0 \text{ for } k = 1, 2 \quad (9)$$

c.s. $\tau_{k,2} \geq \tau_{k,1}$.

If there were no fixed costs, this expression would tell us that the government invests more in the tax base that raises more revenue on the margin at the future value of public funds (the first term), induces a lower utility cost for consumers via the cost of tax evasion (the second term), or has a lower marginal cost of investing at the current value of public funds (the third term). Provided the positive first term outweighs the negative second term, for $k = 1, L$, we see positive investments in both types of fiscal capacity since $\frac{\partial \mathcal{F}^k(0)}{\partial \tau_{k,2}} = 0$.

We now revisit the questions when an income tax is worth levying at all and why economic growth might typically induce the introduction of an income tax, as we have seen historically. Suppose there is a fixed cost associated with fiscal-capacity building for the income tax and the period-1 level of this capacity is zero, $\tau_{L,1} = 0$. Recall that the government raises no revenue at zero fiscal capacity. In order for the income tax to be introduced, the perceived welfare gains from doing so, by bringing fiscal capacity up to locally optimal level $\tau_{L,2} > 0$ given by (9), have to be large enough to outweigh the effective fixed cost $\mathcal{F}^L(\tau_{L,2}) + f^L > 0$ associated with setting up a compliance and monitoring system. Using the definitions and additive separability of the government payoff (6), the net tax bases (4), and the indirect utility function (2), and recalling that when $\tau_{L,2} = 0$ we have $c(\cdot, \tau_{L,2}) = t_{L,2}^* = 0$ (private evasion cost and taxes are zero), we can write the formal condition as follows:

$$\begin{aligned} & \Lambda_s \omega \int_0^{t_{L,2}^*} [\alpha_2 L^*(\Lambda_2 \omega (1 - t_{L,2}^*)) - L^*(\Lambda_2 \omega (1 - t))] dt \\ & + [q(t_{L,2}^*, \tau_{L,2}^*) - (\alpha_2 - 1)t_{L,2}^* e^*(t_{L,2}^*, \tau_{L,2}^*)] \geq \alpha_1 [\mathcal{F}^L(\tau_{L,2}^*) + f^L], \end{aligned} \quad (10)$$

where $\tau_{L,2}^*$ solves (9).

There are basically three considerations. The term on the first line reflects the value of transferring funds from private incomes to public spending, recognizing a lower labor supply induces a deadweight loss. This expression

is positive only if α_2 is sufficiently high (above one).¹¹ Also, the first-line term is proportional to labor productivity, as this determines how lucrative a tax base income is. The second term on the left-hand side reflects the possibility of non-compliance. It has two parts, the first reflecting the gain from having a new source of profits from tax avoidance. However, this is offset by the fact that greater avoidance reduces valuable public spending. If, at $\tau_{L,2}^*$, there was full compliance then this expression would be zero. Finally, the term on the right-hand side reflects the costs that are incurred by introducing a new tax base – fixed costs and the cost of the investment in fiscal capacity of $\tau_{L,2}^*$.

Notice that the tax base in the first term of (10) is increasing in productivity factor Λ_2 . Moreover, the optimal income tax rate $t_{L,2}^*$ associated with a given level of fiscal capacity will generally be higher if income is higher – to see this, recall the Ramsey tax formula (5), where $t_{L,s}^*$ is decreasing in $\kappa = \omega_s L_s / (\omega_s L_s - e_{L,s})$ and hence increasing in ω_s (since κ is decreasing in ω_s).

Now, if Λ_2 captures how income grows over time, income growth can thus naturally explain the eventual introduction of an income tax, as in Figure 4, by reference to (10). If Λ_2 instead captures differences across countries at a given point in time, this can explain the higher reliance of the income tax in rich and high-tax countries, as in Figures 7 and 8. To explicitly link up with the data on income taxes vs. trade taxes discussed in Section 3, the argument would have to be recast in a setting where trade rather than consumption is the alternative tax base (see Besley and Persson (2011, ch. 2) for such a model).

Endogenous economic differences In this section, we make the level of fiscal capacity endogenous to other aspects of government state building.

¹¹To see this, observe that this expression can be written as:

$$\begin{aligned} & \Lambda_2 \omega [\alpha_2 - 1] t_{L,2}^* L^* (\Lambda_2 \omega (1 - t_{L,2}^*)) + \\ & \Lambda_2 \omega \int_0^{t_{L,2}^*} [L^* (\Lambda_2 \omega (1 - t_{L,2}^*)) - L^* (\Lambda_2 \omega (1 - t))] dt \end{aligned}$$

where the first term is positive and the second term is negative if there is any labor supply response to taxation. To a first order approximation this is

$$\Lambda_2 \omega \left[[\alpha_2 - 1] t_{L,2}^* L^* (\Lambda_2 \omega) - (t_{L,2}^*)^2 \alpha_2 L'^* (\Lambda_2 \omega) \right]$$

The general modeling follows the analysis in Besley and Persson (2011).

Let wages be given by $\omega_s^J = \Lambda_s \omega(\pi_s)$, where scalar π_s represents endogenous government investment in the productive side of the state and where $\omega(\pi_s)$ is an increasing function. Besley and Persson (2011, ch. 3) show that one can microfound such a formulation in settings where π_s represents the capacity to carry out legal support to the private sector in the form of contract enforcement or, alternatively, protection of property rights. In this interpretation, which we will maintain in this subsection, π_s thus captures the legal capacity of the government: its courts, its supply of educated judges, or its registers for credit or property. An alternative interpretation would be to think of π_s as government infrastructure that raised the productivity in the private sector. We could also let π_s be a vector of productive capacities, rather than a scalar.

In analogy with fiscal capacity, we assume that legal capacity in period 2 can be augmented by investment in period 1 at cost $\mathcal{L}(\pi_2, \pi_1) = \mathcal{L}(\pi_2 - \pi_1)$. We assume that legal-capacity investments have no fixed costs, for simplicity, and that \mathcal{L} is a convex function with $\frac{\partial \mathcal{L}(0)}{\partial \pi} = 0$. As a consequence, the total investment costs for the period-1 government are now given by

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

What happens to the investment in fiscal capacity in the specialized model that we just studied, when we replace exogenous wages $\omega_s^J = \Lambda_s \omega$ with endogenous wages $\omega_s^J = \Lambda_s \omega(\pi_s)$? The marginal investment conditions in (9) are not affected, because neither $\frac{\partial Z_{k,2}}{\partial \tau_{k,2}} = -\frac{\partial e_{k,2}}{\partial \tau_{k,2}} > 0$ nor $\frac{\partial q_{k,2}}{\partial \tau_{k,2}} = -\frac{\partial c}{\partial \tau_{k,2}} < 0$ depend on legal-capacity investments π_2 . However, the condition for incurring the fixed costs of the income tax now becomes:

$$\begin{aligned} \Lambda_s \omega(\pi_2) \int_0^{t_{L,2}^*} [\alpha_2 L^*(\Lambda_2 \omega(\pi_2)(1 - t_{L,2}^*)) - L^*(\Lambda_2 \omega(\pi_2)(1 - t))] dt \quad (11) \\ + q(t_{L,2}^*, \tau_{L,2}^*) - [\alpha_2 - 1] t_{L,2}^* e^*(t_{L,2}^*, \tau_{L,2}^*) \geq \alpha_1 [\mathcal{F}^L(\tau_{L,2}^*) + f^L] \end{aligned}$$

Only the first term from (10) is affected with higher legal capacity increasing wages. There are good reasons to expect that this key expression is increasing in Λ_2 and $\omega(\pi_2)$. For example, in the case of a constant elasticity of labor supply, η , the first expression in (11) becomes:

$$[\Lambda_s \omega(\pi_2)]^{1+\eta} \int_0^{t_{L,2}^*} [\alpha_2 (1 - t_{L,2}^*)^\eta - (1 - t)^\eta] dt$$

which is clearly increasing in π_2 . Thus, a country with higher legal capacity and endogenously higher income is more likely to have an income tax than one with low legal capacity.

Of course, this raises the question what drives investments in legal capacity. Maximizing the investment objective (7) with regard to π_2 , under the assumptions of the specialized model and using Roy's identity, we obtain the first-order condition

$$[1 + (\alpha_2 - 1)t_{L,2}^* L_2^* \Lambda_2] \frac{\partial \omega}{\partial \pi_2} - \alpha_1 \frac{\partial \mathcal{L}(\pi_2 - \pi_1)}{\partial \pi_2} = 0 . \quad (12)$$

Since the two terms in the first bracket, the net benefit of legal capacity, are both non-negative and since $\frac{\partial \mathcal{L}(0)}{\partial \pi_2} = 0$, there are always positive investments in legal capacity. Moreover, a higher level of fiscal capacity in the income tax $\tau_{L,2}$ raises the equilibrium tax rate $t_{L,2}^*$. This way, a higher value of $\tau_{L,2}$ raises the net benefit of investing in legal capacity, by raising the private marginal surplus from higher wages as well as boosting the fiscal benefits of the income tax through a higher tax base.

This result and the earlier result, that a higher π_2 makes (11) more likely to hold, make the investment in legal capacity and the investment necessary to introduce the income tax *complementary* decisions. This is a close relative to the complementarity discussed in Besley and Persson (2009, 2011). Thus, the endogenous growth of income triggered by investments in the productive side of the state makes it more likely that a country at some point in time will incur the fixed costs necessary to put an income tax in place.

As discussed at length in this earlier work, measures of fiscal capacity – like a high share of total tax income collected by the income tax – and measures of legal capacity are strongly positively correlated across countries in the data, and both of these capacities indeed have a strong positive correlation with income.

This point is illustrated in Figure 12 which plots the share of taxes in GDP in 2000 against the ICRG measure of property rights protection. Countries that raise more in taxes (have more fiscal capacity) also tend to enforce property rights in a better way (have more legal capacity).

Structural change Development is about a lot more than raising income per capita. The process of rising incomes is typically associated with deep structural change towards a more urban and non-agriculturally based economy. As a result more of economic activity operates in view of government –

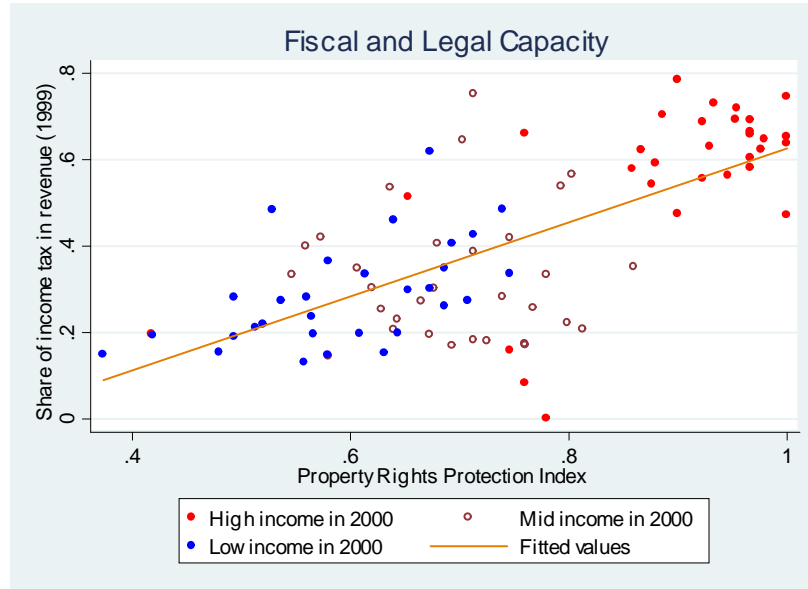


Figure 12: Share of income tax in revenue and protection of property rights

in the formal sector. Informality of production is, to some extent, just the flip side of tax avoidance. But it is much more than that. Firms choose not to become part of the formal sector in order to avoid an array of regulations too. But there is also a cost: such firms are not able to take advantage of formal legal protection and contract disputes have to be resolved informally. This limits the scope to do business, which often becomes restricted to personal social networks.

The move towards formality will facilitate tax compliance. More employment will take place in legally registered firms rather than self-employment, as stressed by Kleven, Kreiner and Saez (2009), and more financial transactions will take place in formal institutions (banks), as stressed by Gordon and Li (2009). Thus, transactions become more visible to tax authorities and enable them to obtain corroborating evidence from cross-reported transactions. Moreover, such changes result from transformations of economic activity, whereby larger firms take advantage of scale economies in production. To the extent that this is reflected in higher wages, the arguments above apply and we would expect fiscal capacity to increase.

The typical discussion of development and taxation couches structural change as an exogenous feature of economic development with causality run-

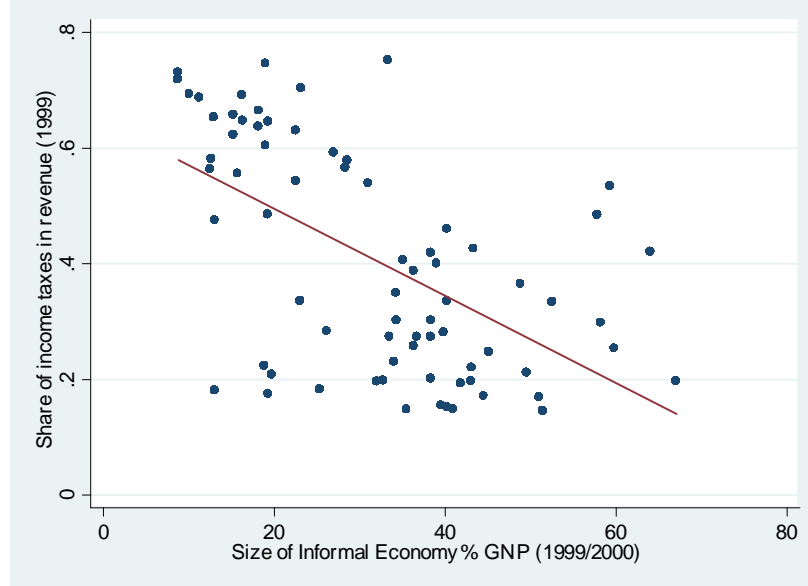


Figure 13: Share of income taxes and informal economy

ning from economic development to fiscal capacity. This can be captured in our model either by allowing the function $c(e_{k,s}, \tau_{k,s})$ to depend on the sector of the economy in which an individual is operating. Suppose we exogenously assign individuals to the formal and informal sectors denoted by $\delta \in \{f, n\}$ where f stands for “formal” and n for “informal” with evasion functions $c(e_{k,s}, \tau_{k,s}, \delta)$. We may then reasonably suppose that

$$-\frac{c_{\tau e}(e_{k,s}, \tau_{k,s}, f)}{c_{ee}(e_{k,s}, \tau_{k,s}, f)} > -\frac{c_{\tau e}(e_{k,s}, \tau_{k,s}, n)}{c_{ee}(e_{k,s}, \tau_{k,s}, n)}$$

so the marginal effect of an investment in fiscal capacity would be more effective in deterring evasion for those operating in the formal sector. In this event, more formality would boost the marginal revenues that can be generated from fiscal capacity investments, all else equal. This is consistent with the observation that countries with smaller informal sectors also raise more taxes. This is illustrated in Figure 13 which plots a measure of the size of the informal economy in 1999/2000 from the World Bank against the share of income taxes in total tax revenue in 1999 from Baunsgaard and Keen (2005). The downward sloping relationship is extremely clear.

The literature has paid less attention to the possibility that the size of

the informal sector and the structural development of the economy evolve endogenously with the development of fiscal capacity, as in the discussion of legal capacity above. However, we may also take a further step and think of legal capacity as affecting the returns to being formal. It is very hard for an individual to simultaneously be largely invisible to the tax system and take full advantage of the legal system. This creates a further complementarity between the legal and fiscal capacities of the state. A state which invests in the infrastructure to support formal financial intermediation will overcome some of the barriers to formality and enhance the ability to raise more taxes. A good example of this has been the efforts to build credit and land registries in the process of development, so as to increase property rights and contract enforcement. Such registries clearly bring the patterns of ownership and credit contracts into the daylight for tax authorities. To study these issues explicitly, we would have to extend the model with an endogenous decision to choose the sector δ based on costs and benefits. While a higher cost of tax evasion is a cost of choosing the formal sector, there may be benefits in the form of a better trading environment.¹²

5.2 The Role of Politics

No account of the development process can be complete without considering the political forces that shape policy selection. It is widely held that the failure of states to build strong institutions might reflect weak motives of doing so, given the nature of their political institutions. In this section, we explore the implications of bringing into the analysis a government which operates under institutional constraints and faces the possibility of political turnover. The framework we use is based on Besley and Persson (2010, 2011). As we shall see, this adds new issues to the analysis of fiscal-capacity building and allows us to uncover additional forces which can explain high or low investments.

Cohesive institutions Suppose that the government in power acts on behalf of a specific group in the spirit of the citizen-candidate approach to politics – see Besley and Coate (1997) and Osborne and Slivinski (1996).

¹²Also germane to this discussion are the increasing efforts by many governments to link certain transfer benefits, such as social security, to paying taxes and working in the formal sector.

There is no agency problem within groups: whoever in a group holds power, she cares about the average welfare of its members.

We model how political institutions constrain the incumbent's allocation of transfers in a very simple way. Specifically, the incumbent group in period s , called I_s , must give (at least) a fixed share θ to all non-incumbent groups J for any unit of transfers awarded to its own group. That is to say, we impose the restriction

$$r_s^J \geq \theta r_s^I, \text{ for } J \neq I .$$

We let $\theta \in [0, 1]$ represent the “cohesiveness” of institutions; the closer θ is to 1, the more cohesive are political institutions.

This is an extremely simple and tractable, but reduced-form, way of looking at politics. We will interpret a higher value of θ in one of two broad ways. One real-world counterpart might be minority protection by constitutional checks and balances on the executive, due to some separation of powers. In practice, we expect democracies to impose greater constraints on the executive than autocracies. An alternative real-world counterpart might be stronger political representation of the interests of losers in policy decisions through proportional representation elections or parliamentary democracy. The literature on the policy effects of constitutional rules suggests that both of these institutional arrangements make policymakers to internalize the preferences of a larger share of the population – see, e.g., Persson and Tabellini (2000), Persson, Roland and Tabellini (2000), or Aghion, Alesina, and Trebbi (2004).

In this representation of political institutions, we can solve for transfers allocated to the incumbent group and all the groups in opposition $J = O$. In the model of Section 4, these are

$$\begin{aligned} r_s^I &= \beta^I(\xi^I, \theta) [B(\mathbf{t}_s, \boldsymbol{\tau}_s) + R_s - g_s - m_s] \quad \text{and} \\ r_s^O &= \beta^O(\xi^I, \sigma) [B(\mathbf{t}_s, \boldsymbol{\tau}_s) + R_s - g_s - m_s] \end{aligned}$$

respectively, where

$$\beta^I(\xi^I, \theta) = \frac{1}{\theta + (1 - \theta)\xi^I} \quad \text{and} \quad \beta^O(\xi^I, \sigma) = \frac{\theta}{\theta + (1 - \theta)\xi^I} \quad (13)$$

For $\theta = 1$, any residual tax revenue is equally divided in transfers to all groups. Otherwise, the incumbent group receives a higher share of transfer spending.

We maintain the simplifying assumption that the utility function for public goods is linear, but allow the valuation of public goods to differ across groups. The shadow value of public revenue now compares the incumbent's value of transfers $\beta^I(\xi^I, \theta)$ to spending on public goods α_s^I . As in the general model, we have two cases. If $\alpha_s^I > \beta^I(\xi^I, \theta)$, all spending is allocated to public goods, i.e., $\lambda_s^I = \alpha_s^I$, else the marginal value of public funds is $\lambda_s^I = \beta^I(\xi^I, \theta)$.¹³

Suppose now that a single group is in power in period 1 as well as period 2, i.e. there is a natural elite and no political turnover for sure. In this case, the preferences of the elite determines policy and investment in fiscal capacity. For simplicity, we assume away any fixed costs in investment (or alternatively $\tau_{k,1} > 0$ for all k so that the fixed costs have already been incurred). Then, we get the following first-order conditions for investment in fiscal capacity:

$$\lambda_2^I \frac{\partial B(\mathbf{t}_2^*, \boldsymbol{\tau}_2)}{\partial \tau_{k,2}} + \frac{\partial Q(\mathbf{t}_2^*, \boldsymbol{\tau}_2)}{\partial \tau_{k,2}} - \lambda_1^I \frac{\partial \mathcal{F}(\boldsymbol{\tau}_1, \boldsymbol{\tau}_2)}{\partial \tau_{k,2}} \leq 0 \quad (14)$$

$$\text{c.s. } \tau_{k,2} \geq \tau_{k,1} .$$

The analysis requires only a modest modification of the benchmark model, where we recognize that the driving force behind the decision to build fiscal capacity is now the preference of the elite, rather than society as a whole, for tax revenue. Clearly, an elite that greatly values public goods is more likely to spend on public goods than one that does not. Spending on public goods rather than transfers is more likely as institutions become more cohesive, $\theta \rightarrow 1$ and the ability of incumbents to extract transfers diminishes. However, an elite can also be motivated to build capacity to collect tax revenue as a means of increasing transfers for itself when $\lambda_s^I = \beta^I(\xi^I, \theta)$, because the elite faces few checks and balances on its power to pursue group interests (i.e., θ is low which makes $\beta^I(\xi^I, \theta)$ high).

Political turnover The model becomes more interesting when there is political turnover, i.e., the identity of the incumbent group may shift over time. To zoom in on this issue, we specialize the model to the case of only two groups each comprising half the population, $\xi^J = 1/2$. Let $\gamma \in [0, 1]$ be the probability that the incumbent group is replaced between the two time periods. Clearly, γ is a natural measure of political instability. This new

¹³Here, we abstract away from corruption and within-group agency problems, which are introduced below.

feature adds new and important dimensions to the analysis of policy and fiscal capacity.

Let the period- s payoff of being either the incumbent or the opposition, $J = I_s, O_s$, be:

$$W^J(\tau_s, R_s - m_s) = V_s^J(\mathbf{t}_s^*(\lambda_s^{I_s}, \tau_s), \tau_s, g_s^*(\lambda_s^{I_s}, \tau_s), \omega_s^J, \beta^J(\theta) b_s(\lambda_s^{I_s}, \tau_s)) ,$$

where

$$b_s(\lambda_s^{I_s}, \tau_s) = [B(\mathbf{t}_s^*(\lambda_s^{I_s}, \tau_s), \tau_s) + R_s - m_s - g_s^*(\lambda_s^{I_s}, \tau_s)]$$

is the total budget available for transfers, and $\beta^I(\theta) = \beta^I(\frac{1}{2}, \theta)$ and $\beta^O(\theta) = \beta^O(\frac{1}{2}, \theta)$ are the shares of transfers going to the incumbent and opposition groups. Now the level of fiscal capacity will be chosen to maximize

$$W^I(\tau_1, R_1 - \mathcal{F}(\tau_1, \tau_2)) + (1 - \gamma) W^I(\tau_2, R_2) + \gamma W^O(\tau_2, R_2) . \quad (15)$$

The effect of political turnover follows from the fact that γ enters this expected payoff.

The optimization of the incumbent over the vector of fiscal capacity yields:

$$(1 - \gamma) \frac{\partial W^I(\tau_2, R_2)}{\partial \tau_{k,2}} + \gamma \frac{\partial W^O(\tau_2, R_2)}{\partial \tau_{k,2}} - \lambda_1^{I_1} \frac{\partial \mathcal{F}(\tau_1, \tau_2)}{\partial \tau_{k,2}} \leq 0 \quad (16)$$

$$\text{C.S.} \tau_{k,2} \geq \tau_{k,1} .$$

which, of course, just says that marginal costs and benefits are equated (at an interior solution). The third marginal cost term in (16) is by now familiar. However, some additional considerations go into computing the marginal benefit represented by the first and second term.

After some algebra, one can rewrite (16) as:

$$[\lambda_2^I - \gamma(\lambda_2^I - \lambda_2^O)] \frac{\partial B(\mathbf{t}_2^*, \tau_2)}{\partial \tau_{k,2}} + \Delta_2^O + \frac{\partial Q(\mathbf{t}_2^*, \tau_2)}{\partial \tau_{k,2}} - \lambda_1^I \frac{\partial \mathcal{F}(\tau_1, \tau_2)}{\partial \tau_{k,2}} \leq 0 \quad (17)$$

$$\text{C.S.} \tau_{k,2} \geq \tau_{k,1} ,$$

where

$$\Delta_2^O \equiv \gamma \frac{\partial V_2^O(\mathbf{t}_2^*(\lambda_2^{I_2}, \tau_2), \tau_2, g_2^*(\lambda_2^{I_2}, \tau_2), \omega_2^J, \beta^J(\theta) b_s(\lambda_s^{I_s}, \tau_s))}{\partial \mathbf{t}_2^*(\tau_2)} \cdot \frac{\partial \mathbf{t}_2^*(\lambda_2^{I_2}, \tau_2)}{\partial \tau_{k,2}} \quad (18)$$

and

$$\lambda_2^O = \begin{cases} \alpha_2^{I_1} & \text{if } \alpha_2^{I_1} \geq \beta^I(\theta) \\ \beta^O(\theta) & \text{otherwise .} \end{cases}$$

The third and fourth terms in (17) are the same as in earlier cases , capturing the utility costs of greater compliance and the marginal costs of investment in fiscal capacity. As before, the first term represents the value of extra revenue. However, the weight on this is now more complicated since the value of public revenue to the current incumbent is different when a marginal future dollar is spent by the incumbent than by herself, especially when the spending is on transfers rather than public goods. Unless there is agreement in the valuation of public goods $\alpha_2^{I_1} = \alpha_2^{O_1}$ and/or institutions are fully cohesive $\theta = 1$, we would expect $\lambda_2^O < \lambda_2^I$, so this effect will tend to diminish the incentive to invest in fiscal capacity, and more so the higher is the probability of turnover γ .

The second term Δ_2^O is entirely new. It represents an effect familiar from the work on strategic policy making in dynamic models, which began with Alesina and Tabellini (1990) and Persson and Svensson (1989). The fact that the current incumbent and opposition may differ in their views about optimal period-2 taxes, means that the period-1 incumbent should structure investments in fiscal capacity to influence those decisions. For example, she may overinvest (underinvest) in the income tax if she likes the income tax more (less) than the opposition, so as to encourage (discourage) the opposition in using the income tax in the future, and the more so the higher the likelihood that the opposition takes over.

The size of this effect and whether it is positive or negative cannot be determined without going into details. A specific example that may lead to underinvestments is the case of a period-1 high-wage incumbent, who might be unlikely to invest heavily in income-tax compliance if she anticipates being replaced by a period-2 low-wage incumbent (see Subsection 5.3 for more details).

On balance, we may therefore expect higher political turnover to diminish investments in fiscal capacity, especially if there are few checks and balances so that θ is low and transfers are shared quite unequally.

Three types of state Following Besley and Persson (2011), the political model of the previous section allows us to think about three types of fiscal state that can emerge, depending on the combination of political institutions

and political turnover. For simplicity, and to focus on a specific set of issues, we will work through the case where $\alpha_s^{I_1} = \alpha_s^{O_1} = \alpha_s$ and $\omega_s^I = \omega_s^O$, so the valuations of public goods as well as earnings opportunities are identical across the two groups.

A common-interest state As long as α_2 is high enough relative to the value of transfers, we have:

$$\lambda_2^I = \lambda_2^O = \lambda_2 = \alpha_2 > \beta^I(\theta) . \quad (19)$$

In this case, all incremental tax revenue is spent on public goods and there is agreement about the future value of public funds. We will refer to this as a case of common interests, as both groups agree that the state should be for a common purpose, either because public goods are valuable (so that α_2 is high), or political institutions are very cohesive (so that $\beta^I(\theta)$ is low). In this case, we have a common-interest state, where the level of investment is driven entirely by the motive to invest in tax revenue to provide public goods. Moreover, both groups agree on the level and structure of taxation. The Euler equations for investing in fiscal capacity become identical to the benchmark model in Section 3, namely:

$$\lambda_2 \frac{\partial B(\mathbf{t}_2^*, \boldsymbol{\tau}_2)}{\partial \tau_{k,2}} + \frac{\partial Q(\mathbf{t}_2^*, \boldsymbol{\tau}_2)}{\partial \tau_{k,2}} - \lambda_1 \frac{\partial \mathcal{F}(\boldsymbol{\tau}_1, \boldsymbol{\tau}_2)}{\partial \tau_{k,2}} \leq 0$$

c.s. $\tau_{k,2} \geq \tau_{k,1} .$

Political institutions do not affect these decisions since the two groups agree on policy, and the state is run with a common purpose, no matter who is in charge. Although somewhat fanciful, the nearest real-world example might be what happens in a state of war, or a common external threat where common interests are paramount. We return to this theme in Subsection 5.4 on the value of public spending.

A redistributive state Now consider what happens when

$$\alpha_2 > \beta^I(\theta) . \quad (20)$$

In this case, the marginal dollar is spent on transfers, i.e. $\lambda_2^I = \beta^I(\theta)$. Moreover, the value of public funds to the opposition is $\beta^O(\theta)$. Now each group values public revenues differently and the period one incumbent cares

about whether his group will remain in power to reap the rewards from investing in fiscal capacity which will accrue to the incumbent. The expected value of public revenues in period 2 to the period-1 incumbent is now:

$$\lambda_2^{I_1} = (1 - \gamma) \beta^I(\theta) + \gamma \beta^O(\theta)$$

which is decreasing in γ for all $\theta < 1$. Indeed, this value is maximized at 2, when $\theta = \gamma = 0$. This is the case, where an incumbent faces no threat of removal and no checks and balances. The desire to build a revenue base is then based on the desire to redistribute resources towards the incumbent group.

Besley and Persson (2011) refer to the case when a strong sectional motive to redistribute is the driving force for state building as a redistributive state. Such states thrive on low turnover and low cohesion. In the limiting case of $\lambda_2^I = 2$, the Euler equations are:

$$\begin{aligned} 2 \frac{\partial B(\mathbf{t}_2^*, \boldsymbol{\tau}_2)}{\partial \tau_{k,2}} + \frac{\partial Q(\mathbf{t}_2^*, \boldsymbol{\tau}_2)}{\partial \tau_{k,2}} - 2 \frac{\partial \mathcal{F}(\boldsymbol{\tau}_1, \boldsymbol{\tau}_2)}{\partial \tau_{k,2}} &\leq 0 \\ \text{c.s. } \tau_{k,2} &\geq \tau_{k,1} . \end{aligned}$$

Since the incumbent is guaranteed to remain in power, there is no strategic effect in this case.

A weak state A weak state combines non-cohesive institutions so that (20) holds with high political instability. To illustrate this, consider what happens if an incumbent expects to lose power for sure and his successor faces no meaningful executive constraints, i.e. $\gamma = 1$ and $\theta = 0$. Then, the expected value of public revenues created by investments in fiscal capacity is zero! The future incumbent, i.e., the current opposition is the residual claimant on all revenue created by fiscal-capacity investments. In this special case, the fiscal-capacity Euler equations are:

$$\begin{aligned} \Delta_2^O + \frac{\partial Q(\mathbf{t}_2^*, \boldsymbol{\tau}_2)}{\partial \tau_{k,2}} - \lambda_1 \frac{\partial \mathcal{F}(\boldsymbol{\tau}_1, \boldsymbol{\tau}_2)}{\partial \tau_{k,2}} &\leq 0 \\ \text{c.s. } \tau_{k,2} &\geq \tau_{k,1} . \end{aligned}$$

Since the second and the third terms are both negative, the only potential argument for building fiscal capacity would be to influence strategically the decisions over taxation of a future incumbent, according to the first term.

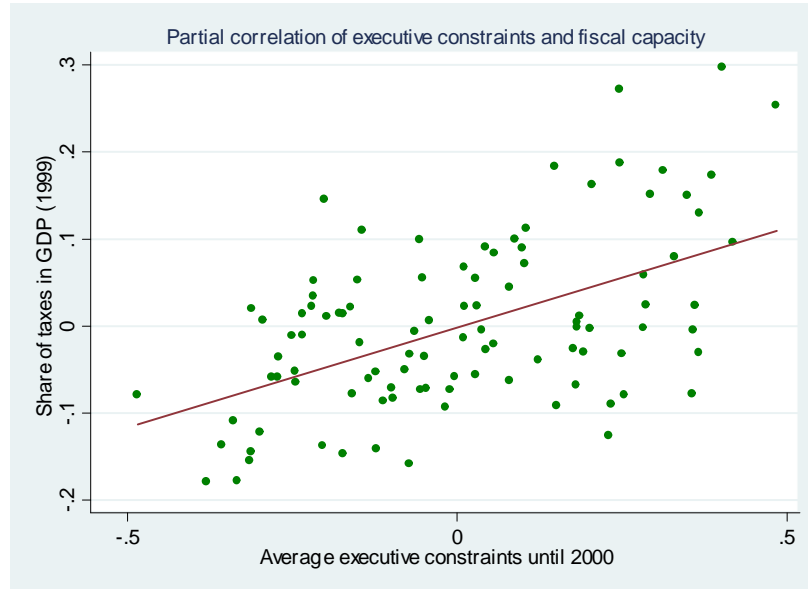


Figure 14: Share of tax revenue and executive constraints

However, this term is negative too: because $\lambda_2^I > \lambda_2^O = 0$, the future incumbent (the current opposition) wants (much) higher taxation than the current incumbent. Hence, the strategic motive makes the current incumbent not want to invest at all, perhaps even destroy fiscal capacity if that is feasible option.

While we have illustrated this mechanism for an extreme case, the logic is much more general. Political instability and little political cohesion (few checks and balances) generally mean that the incentives to invest in fiscal capacity are very slim, so we expect tax compliance and hence tax revenues to stay weak under these conditions.

One bottom line of the discussion in this section is that we should expect countries that have operated on more cohesive institutions in the past to have a higher stock of fiscal capacity today. Besley and Persson (2011, chs. 2 and 3) show that this is indeed the case, when fiscal capacity is measured in different ways and cohesive political institutions are measured by executive constraints in the Polity IV data set. Political instability is harder to measure in a convincing way, but there seems to be some evidence that more stability is correlated with higher fiscal capacity. Figure 14 illustrates the relationship

between current fiscal capacity and past cohesive political institutions using a partial correlation plot. As a measure of cohesiveness, we use the history of the strength of a country's executive constraints from 1800, or its year of creation, up to 2000. As in Section 3, the data come from the Polity IV data base, specifically the variable *executive constraints* measuring various checks and balances on the executive. Following the theory outlined above, the underlying regression controls for the value of public spending, through measures of ethnic homogeneity and (past) external wars, and the degree of political instability, through measures of openness and competition in the selection of the executive. We see a very clear upward slope in the regression line, consistent with the argument in this section – countries with a history of more cohesive institutions appear to have built more fiscal capacity.

5.3 Social Structure and Politics

The two-group model with common valuations of public goods and identical wages has served well to illustrate some key points. But clearly, it misses a lot in terms of social structure, which may affect the struggle for power. Often, the political struggle has different values or an unequal distribution of resources at its heart.

Group size heterogeneity and elite rule Consider now the possibility that the two groups in the specialized model have different size but face the same institutions, as represented by θ , when in office. Observe that $\beta^I(\xi^I, \theta)$, as defined in (13), is larger for the majority group than the minority group, meaning that transfer behavior becomes more cohesive when larger groups are in office, as their value of extracting a dollar in transfers is much lower than for a small group. A lower value of $\beta^I(\xi^I, \theta)$ means that the condition

$$\alpha_s^I > \beta^I(\xi^I, \theta)$$

for all spending to be on public goods is more easily to fulfil. Thus, there is a greater chance the state pursues a policy in the common interest when large groups hold power. On this account, majority rule is more likely to stimulate buildup of fiscal capacity than minority rule. Indeed, if a country is governed by a small elite, it seems rather unlikely that a common-interest state will emerge – instead the state will become redistributive or weak.

The same basic effect will emerge when a leader rules on behalf of a small elite rather than on behalf of her group as a whole. When such narrow elites

alternate in power, it will be difficult to create common interests in the use of public resources. Therefore, the value of political reform that raises θ towards 1 can be particularly strong in such countries. Similarly, measures which reduce the agency problem between elites and rank and file group members could also push a country towards a common-interest state.

Income inequality The discussion in Subsection 4.2, abstracted from heterogeneity in earnings. To home in on this, we now focus exclusively on income taxation and assume away all other forms of heterogeneity, e.g., in group size or the preferences for public spending. Using standard logic from Romer (1975), Roberts (1977), and Meltzer and Richards (1981), we would expect a low-income group to prefer a higher rate of income taxation than the high-income group, due to the redistributive effect of income taxation whether it is spent on public goods or transfers. We might also expect these policy preferences to translate into different incentives to invest in fiscal capacity to increase income taxation.¹⁴

These mechanisms are most simply illustrated in the case of a common-interest state where (19) holds. Suppose we specialize the model to two groups, $J = P, R$, where P stands for “poor” and R for “rich” with $\omega^R > \omega^P$. We have dropped the time subscripts, i.e., we assume that the rich and the poor each have the same wage rates periods 1 and 2. In the case with constant elasticity of labor supply, the income tax preferred by group J (assuming an interior solution) becomes:

$$\frac{t_{L,s}^{*J}}{1 - t_{L,s}^{*J}} = \frac{(\lambda_s - \nu^J) + (1 - \kappa) \varepsilon}{\kappa \eta}, \quad (21)$$

where $\nu^J = \omega^J L^J / \sum \xi_K \omega^K L^K$ is the ratio of group J ’s labor income to average labor income. For the rich to want a positive income tax, the value of public spending as represented by λ_s has to be great enough. Clearly, we have

$$t_{L,s}^{*P} > t_{L,s}^{*R}$$

¹⁴Cárdenas and Tuzemen (2010) use a similar model, allowing for income inequality between two groups, called Elites and Citizens. When the (richer) Elites are in power, in the presence of political instability, both income and political inequality lead to lower investment in state capacity. Conversely, if the (poorer) Citizens rule, high political and income inequality results in higher state capacity.

in general. We can now say something concrete about the strategic effect in equation (18) provided we assume, as the discussion following equation (5) suggest, that

$$\frac{dt_{L,s}^{*I_s}}{d\tau_{L,s}} > 0 \text{ for } I_s \in \{P, R\} .$$

This says that an incumbent of any type would wish to implement a higher rate of income taxation if there is greater investment in the fiscal capacity to charge an income tax. Recall that this effect arises because greater fiscal capacity in the form of income-tax enforcement raises the marginal yield from any given statutory income tax rate. The strategic effects become:

$$\Delta_2^P > 0 > \Delta_2^R .$$

To see why, take the case of a rich incumbent. If the poor group takes over in the future, then it will tax too much from the viewpoint of the rich, so a rich group contemplating being in future opposition would gain an strategic advantage from lowering fiscal capacity. In the same way, a poor incumbent contemplating being in future opposition would gain a strategic advantage by pushing investment in income tax capacity further. These incentives are larger the higher is income inequality and the larger is political instability. The logic is the same as the one that makes a right-wing group want to impose a larger debt on a left-wing successor, and a left-wing group to impose a smaller debt on a right-wing successor in Persson and Svensson (1989).

It is perhaps unsurprising that inequality creates a conflict of interest over investing in fiscal capacity, which mirrors the conflict of interest over the tax base itself. However, the patterns of political control also matter to whether income-tax capacity gets built. If the rich are securely in power, they will invest in fiscal capacity to support public spending. However, if they fear losing power, they will invest less as their investment would encourage the poor to use income taxation more intensively in future making the rich pay for an even larger share of public spending. If the poor are securely in power, this should lead to a strong investment in income tax capacity. To the extent that transitions to more democratic rule leads to lower-income citizens being in political ascendancy, we should observe a tendency to build income tax capacity. This would be spurred on even further if the poor are more fearful of a reversion to elite rule. Generally, the poor's strategic incentive is to overinvest.

While we have applied this argument to income-tax capacity, the same argument applies to any tax base which generates a strong conflict of interest between groups. We have made the argument in the case of a common-interest state, where there is agreement over the disbursement of public resources. But the basic logic could equally well be applied to a redistributive or weak state.

The bottom line from this discussion is that we may expect income inequality to play an important role in the development of fiscal capacity. Given that a high level of income inequality particularly curtails the investment incentives for a rich incumbent, this conclusion is strengthened if we are willing to assume that economic power and political power tend to go hand in hand. Cárdenas (2010) considers the question empirically, using cross-sectional data for 100+ countries, and finds that political and (especially) economic inequality appears to be associated with lower incentives to invest in state capacity. In fact, he uses income inequality to explain Latin America's generally underdeveloped fiscal capacity.

Polarization In the political models above, we have assumed that there is a *common* way of valuing of public goods across the two groups. However, this need not be the case. Alesina, Baqir and Easterly (1999), e.g., have forcefully argued that ethnic conflicts may lead to polarized preferences that diminish society's spending on public goods.¹⁵ Differences in valuation may reflect e.g., ethnic, linguistic, or religious cleavages in society. We now briefly consider the implications of such divergent views, which we think about in two different ways. First, we consider what happens when groups inherently differ in their value of public goods in a way unrelated to whether they are incumbents. Second, we consider the possibility that differences arise according to whether a group is an incumbent, since an important dimensions of policy choice may be the type of public goods that are chosen.

To illustrate the first case, we suppose that $\alpha_2^J \in \{\alpha_L, \alpha_H\}$ with $\alpha_H > \alpha_L$. For simplicity, we focus on the common-interest case where all public spending is allocated to public goods. Now it is clear that the marginal value of public spending depends on which group is in office. Any group for whom $\alpha_2^J = \alpha_H$ has a higher value of future public funds $\lambda_2^I = \alpha_H$ than the low-valuation group, and will therefore invest more in fiscal capacity of all types, everything else equal. For such groups, securely holding power will encourage

¹⁵See Esteban and Ray (1994) for a discussion of how to measure polarization.

investing. One interpretation of such heterogeneity in values may be that certain groups have stronger social capital and hence can provide public goods on its own, e.g. through ethnic or family networks. Then, arranging the public goods provision through the state will be of lesser interest. For example, authors such as Esping-Andersen (1999) and, more recently, Alesina and Giuliano (2010) have argued that countries with strong family ties invest less in welfare state.

To illustrate the second case, where the decision rights of being in power affects the mix of public goods when in office, we suppose that $\alpha_2^I = \alpha_H > \alpha_L = \alpha_2^O$.¹⁶ In this case, $\alpha_H - \alpha_L$ becomes a natural measure of the polarization in preferences. The expected value of future public revenues to an incumbent becomes

$$\lambda_2^I = [(1 - \gamma) \alpha_H + \gamma \alpha_L] .$$

It follows from the expressions above that more polarization and higher political instability both reduce the incentive to invest in fiscal capacity of all types to boost future revenues. As shown in Figure 15, the partial correlation (holding constant the same factor as those discussed under Figure 14) between ethnic heterogeneity and different measures of fiscal capacity is indeed negative.

5.4 The Value of Public Spending

Our approach gives the value of spending on collectively valuable goods a central place among the motives to build fiscal capacity. Formally, parameter α_s^J affects the value of public revenues in the eyes of group J . In this section, we discuss some factors that go into determining this value. Of course, in the standard interpretation, these are just fixed preference parameters. But there are strong reasons to think that they depend on factors which can be shaped by history as well as policy.

Common-interest spending and war finance As discussed in the introduction, war has played a central role in the history of public finance. In terms of the model, external threats can help determine the structure of preferences $\{\alpha_2^J\}_J$. The threat of war may also act like a common-interest shock

¹⁶ A more involved case would explicitly introduce different types of public goods, with different groups having a preference bias towards certain types, as in Alesina and Tabellini (1990).

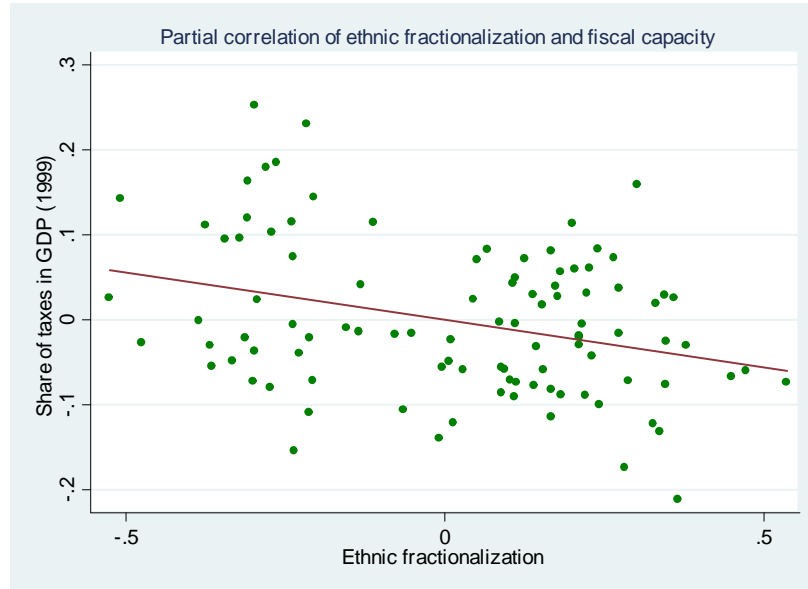


Figure 15: Share of taxes and ethnic fractionalization

that moves a society close to a common-interest state, or from the status of a weak to a redistributive state (at least during a period where the threat is felt). In our approach, the mechanism is to raise the value of public revenues and make it incentive compatible to spend these revenues on public goods rather than redistribution. This allows our framework to capture the arguments made by Hintze (1906), Tilly (1985, 1990) and others. Dincecco and Prado (2010) use pre-modern war causalities to explain fiscal capacity today (measured as direct taxes as a share of total taxes), and also relate GDP per capita to fiscal capacity. Gennaioli and Voth (2011) build a two-country model, where endogenous external conflict interacts with the fragmentation of political institutions and the cost of war to shape state-building motives. They then apply the insights of the model to explain the divergent paths of taxation of European states in the years between 1500 and 1800. Feldman and Slemrod (2009) link tax compliance to episodes of war.

War may have other effects which are more non-standard to the extent that war actually shapes social preferences. One interpretation may be that it diminishes polarization, as citizens forge a clearer sense of national identity – see Shayo (2009) on the endogenous formation of national identity. This might translate a transitory shock to a permanent effect. Thus, war may

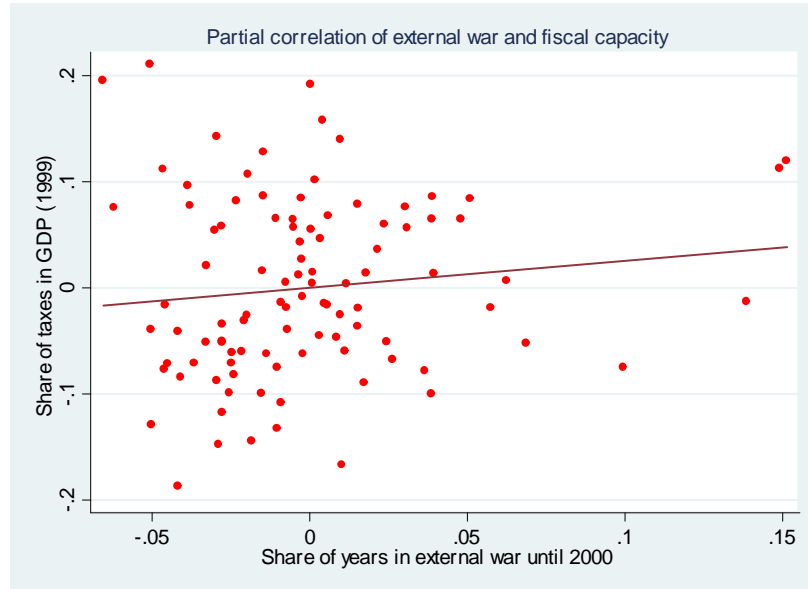


Figure 16: Share of taxes in GDP and external war

have lasting effects in a dynamic model where fiscal capacity investments are long-lived. The fact that a country built a strong tax system during a past war may raise its long-term tax take to the extent that such investments are permanent. This could be true, for example, in countries that introduced direct deduction of income taxes at source as a means to help finance their war expenditures.

One way to look at the link between wars and fiscal capacity is to look at the partial correlation (again holding constant the same factors as in the regression underlying Figure 14), between the years in external war from the Correlates of War data base and the share of taxes in GDP. This is done in Figure 16 which shows an upward-sloping relationship.

An important aspect of income tax compliance is direct withholding of taxes from wage packets. So its introduction is an interesting discrete investment in income tax capacity. Figure 17, illustrates the introduction of withhold over time, comparing countries who participated in the second world war with non-participants. The significant increase in the proportion of countries with direct withholding among the war participants is striking, especially when compared to the non-perceptible effect among the non-participants. Although this figure represents casual empiricism, it is consistent with the

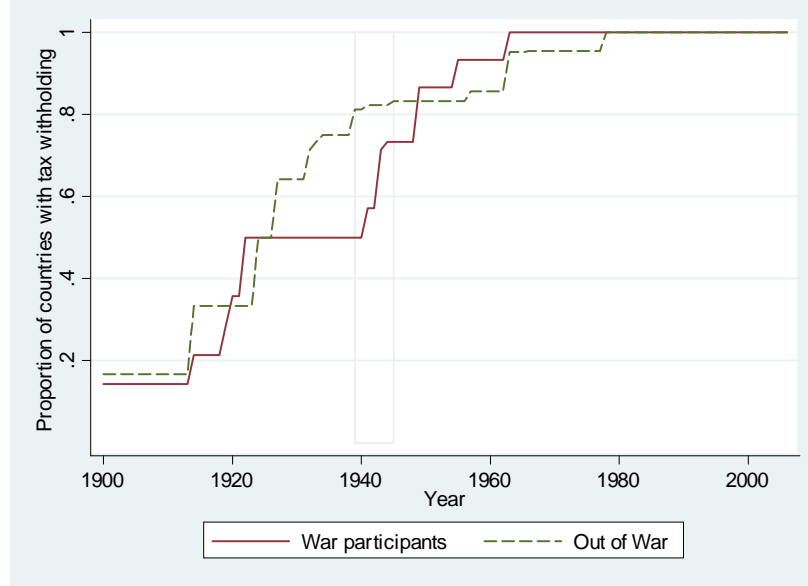


Figure 17: Introduction of tax withholding and war

arguments in this section.

Identifying public projects We could also see $\{\alpha_2^j\}_J$ as reflecting the ability of governments to identify good projects. An important line of development research in recent years has been instrumental in using Randomized Controlled Trials (RCTs) to identify the value of public interventions. These can be thought of as trying to find ways of better allocating resources to public goods by identifying high-benefit interventions. (See Duflo et al, 2007 for a discussion of the methodology.)

In our framework, we can represent an RCT as a particular form of experiment to evaluate project effectiveness. To model this, suppose there is a continuum of possible public projects indexed by $p \in [0, 1]$ where some have high returns and other low returns. Preferences for public goods are now:

$$\int_0^1 \alpha(p) h(g(p))$$

where $g(p)$ is spending on projects of type p . In the absence of discriminating information, we assume that the expected return on projects is the same, such that $\alpha(p) = \bar{\alpha}$. In this case, spending will be identical on all projects.

For the sake of illustration, let us suppose that utility of public goods is quadratic, i.e., $h(g) = g - \frac{1}{2}g^2$

Suppose now that RCTs have been conducted on a subset of projects, which we assign to the interval $[0, \iota]$, to establish which have high and low returns. For simplicity, suppose all projects are equally likely to be high return, α_H or low return α_L and that

$$\frac{\alpha_H + \alpha_L}{2} = \bar{\alpha} .$$

Given the outcomes of the trials and a given level of public spending, g_s , the government chooses three numbers – g_H, g_L , and \bar{g} – to maximize:

$$\iota \frac{[\alpha_H h(g_H) + \alpha_L h(g_L)]}{2} + (1 - \iota) \bar{\alpha} h(\bar{g})$$

subject to

$$\frac{\iota}{2} (g_H + g_L) + (1 - \iota) \bar{g} = g_s .$$

This will lead to governments spending more on projects that have value α_H and less on those with value α_L . Denote the solution by $H(g_s; \iota)$. Solving this for the quadratic case, the marginal value of public goods spending is

$$H_g(g_s; \iota) = \frac{1 - g_s}{\left(\frac{\iota}{2} \left(\frac{1}{\alpha_H} + \frac{1}{\alpha_L} \right) + \frac{1 - \iota}{\bar{\alpha}} \right)} ,$$

an expression which is increasing in ι , the fraction of spending in which the government is informed about returns. In words, better information about worthwhile projects raises the value of public spending. Moreover, this information effect is larger the greater is the difference between high and low returns, $\alpha_H - \alpha_L$.

This illustrates how public interventions found through randomized-control trials – provided they could be scaled up to achieve large aggregate returns – might assist the creation of common-interest states. Arguably, the argument may also illustrate why Western welfare states have gradually become the engine of state development during times of peace. Creating effective public health-care systems seems like an especially important example. Such systems persist essentially because the returns are perceived as common-interest spending with high returns.

One could develop a related argument regarding the improvement of cost efficiency in the delivery of public spending. In that case, there could be a

role for using knowledge about best practice to enhance the value of public spending. This could include innovations in the mode of delivery or lower cost forms of delivery, such as making better use of information and communication technologies. Our modeling approach would links such efficiency enhancement to the scale of demand for public goods at the expense of transfer payments.

Corruption Our model assumes that all resources that are spent on public projects finds their way into actual spending on public goods. But in many countries, this is a poor assumption due to high levels of corruption. Many studies, following the pioneering work by Reinikka and Svensson (2008), have shown the value of interventions which reduce corruption and increase the effective flow of spending benefiting the end users.

This argument is especially poignant when fiscal capacity is endogenous. Suppose that only a fraction ξ of the intended spending on public goods actually finds its way into actual spending on the ground. If so, the value of public goods is

$$\alpha_s^J H((1 - \xi_s) g_s) .$$

In terms of accounting, a share of the spending, $\xi_s g_s$, ends up in the hands of citizens who earn corruption rents. Indeed, if $\xi_s g_s$ is a pure transfer, then corruption is also pure transfer. In practice, corruption in this or other forms creates constituencies in favor of maintaining the status quo. In terms of our approach, if the corruption rents flow disproportionately to ruling groups, this can affect the decisions to build fiscal capacity.

To understand the implications for public finance, we ask how the parameter ξ_s affects incentives to build fiscal capacity. Two broad effects need to be understood. First, we have an effect on the marginal value of spending on public goods. This depends on how

$$(1 - \xi_s) H_g((1 - \xi_s) g_s)$$

depends on ξ_s . As long as the elasticity $-H_{gg}g(1 - \xi)/H_g$ falls short of unity, greater corruption reduces the marginal value of spending on public goods.

The second effect comes from the distribution of rents from corruption $g_s \xi_s$. If these accrue exclusively to the incumbent group, this will enhance the value of holding power – in effect, there is a blur between spending

on transfers and on public goods since:

$$r_s^I = \beta^I (\xi^I, \theta) [B(\mathbf{t}_s, \boldsymbol{\tau}_s) + R_s - g_s - m_s] + g_s \xi_s .$$

With low political turnover γ , corruption tends to enhance motives for building fiscal capacity, as in the case of a redistributive state above. But this effect is weakened by turnover, as in the case of the redistributive state. Moreover, even as $\theta \rightarrow 1$, a redistributive motive for building fiscal capacity remains due to extra-budget transfers accruing to incumbents through corruption. To the extent that corruption rents are widely held, i.e., are not distributed towards incumbent status, these motives will be weakened.

In summary, the first effect via the marginal value of public goods likely cuts the value of public funds and thus reduces the motives for investing in fiscal capacity. The second effect, via corruption rents, may go the other way – at least when incumbent groups capture a large share of the rents from corruption. .

Summary The discussion in this section ties together the taxation and spending sides of the state. A requirement for building a state run on common-interest grounds is that public revenues are spent on goods valued by a wide group of citizens. In history, war has arguably been an important source of such common interests and provides a key motive for creating fiscal capacity. Our framework suggests that states which lack common interests will have fiscally weak states, all else equal. One way to foster such interests might be to improve project evaluation and to identify which public interventions work in practice. This may not only improve the use of a given budget, but may also foster endogenous increases in fiscal capacity. As we have seen, combatting corruption in public spending is also linked to the motives for building an effective tax system.

5.5 Non-Tax Revenues

Our model framework permit states to have non-tax revenue, called R_s , in the form of aid or natural resources. These incentives are made plain in the first-order conditions for fiscal capacity (8). The conditions show that non-tax income matters for investments in the state through changing the marginal value of tax revenue, as represented by λ_1 and λ_2 .

Aid and development finance Anticipated period 2 aid, embodied in R_2 reduce the incentive to invest, whenever marginal spending is allocated to public goods. However, current non-tax income, R_1 reduces costs of investing in the short term, when marginal spending is on public goods, thus boosting the incentives to invest. When the transfer motive for investing in the state is dominant, we would expect aid and resources to go into transfers leading to no effect on the incentives to build indigenous fiscal capacity. As a result, political institutions matter – in the way we have already discussed – by governing the likelihood that common-interest, rather than special-interest, motives dominate politics.

This discussion justifies the standard focus of development finance on lending to government rather than handing out cash grants. Lending promotes the incentives to build an effective tax system. When public goods are valuable, a period-1 grant or loan should increase investment in fiscal capacity. Forcing repayment of the loan, thereby increasing λ_2 , further reinforces the investment effect. But the incentives would be reversed in a Samaritan’s dilemma, where a period-1 failure to invest in fiscal capacity elicits more aid to be paid in period 2. This dilemma seems relevant for some aid-dependent countries, where part of the gain from building indigenous fiscal capacity would be taxed away in the form of lower aid.

Figure 18 looks at the relationship between fiscal capacity, measured by the total tax take, and aid receipts as a share of gross national income. The graph shows that the partial correlation is negative, in line with what we would expect from the framework presented here. Of course, the direction of causality implied by a picture like this is far from clear. One justification of aid is often the difficulty that poor countries have in raising revenue domestically. Therefore, aid is unlikely to be exogenous to the process of fiscal capacity investment.

Resource revenues The model also gives insights into why natural resource discoveries can stifle the efforts to build fiscal capacity. A government that discovers oil in period 1 with anticipated revenues in period 2 will reduce their investment in fiscal capacity. Of course, such resource revenues may be beneficial but may necessitate a catch-up period of fiscal-capacity building and leave country vulnerable to negative commodity-price shocks.

Some data supports the prediction that fiscal-capacity building is related to resource dependence. Jensen (2011) presents econometric evidence, using

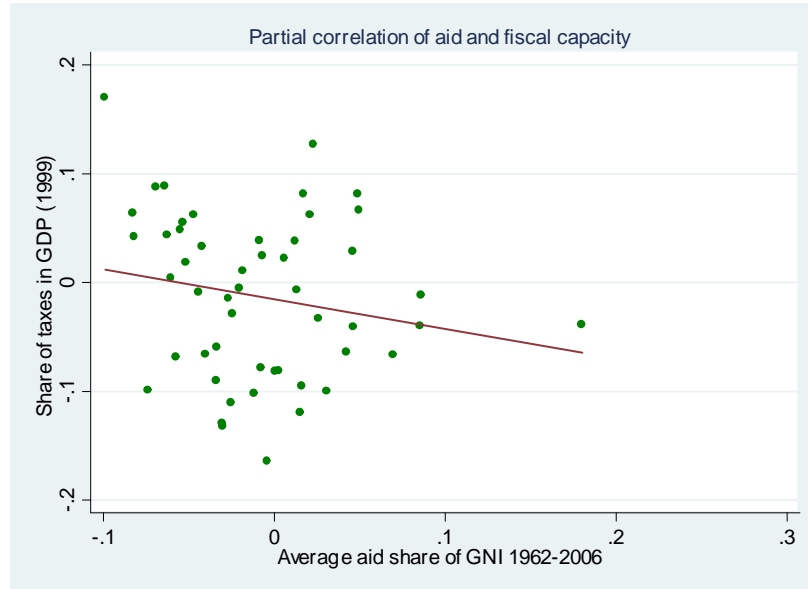


Figure 18: Share of taxes in GDP and aid

panel data with country-specific price indexes constructed for natural gas and oil and weighted by respective shares in total national energy production. He finds that a 1 percent increase in the share of natural resource rents in total government income is associated with a 1.4 percent decrease in the fiscal capacity of a country.

Informal taxation The previous subsection discussed the role of corruption on the spending side of the state and touched upon the revenues generated by corruption. But corruption may also work as a direct non-tax revenue-raising device for governments or government bureaucrats. Like explicit taxation, such informal taxation through corruption imposes static and dynamic distortions on the business of the private sector. Here, we briefly bring such considerations into the approach.

Suppose that there are now two kinds of taxation on activity k in period s , the formal tax rate $t_{k,s}$ studied above and informal taxation at rate $T_{k,s}$. Unlike formal taxation, we suppose that returns to corruption accrue directly as transfers to the ruling group, rather than being funneled through the public budget and subject to any checks and balances in place to constrain government spending. Moreover, we suppose that the governing group has

some "informal fiscal capacity" and that it is impossible to avoid corruption. This may be extreme, but will serve us well to make a few important points. It is clear that we could extend the treatment and make informal and formal fiscal capacity more alike.

The individual budget constraint is now:

$$x_{0,s}^J + \sum_{n=1}^N p_{n,s} (1 + t_{n,s} + T_{n,s}) x_{n,s}^J \leq \omega_s^J (1 - t_{L,s} - T_{L,s}) L_s^J + r_s^J + \sum_{k=1}^L [t_{k,s} e_{k,s} - c(e_{k,s}, \tau_{k,s})]$$

and the earnings from informal taxation are

$$B^I(\mathbf{T}) = \sum_{n=1}^N T_{n,s} p_{n,s} x_{n,s} + \sum_{J=1}^J \xi^J T_{L,s} \omega_s^J L_s^J .$$

The existence of such informal taxation affects optimal formal tax rates, as formal and informal tax rates interact on each tax base.

An increase in $T_{k,s}$ has a static effect in that it cuts available formal tax revenue by reducing goods demand or labor supply. This is a negative externality for formal taxation. If the motive for informal taxation is purely redistributive, as here, it also reduces the resources available to spend on public goods. There are no checks and balances on raising such revenues except any informal controls that may exist within a group. Incentives for informal taxation are particularly high when the revenues accrue to a small subset, an "elite", within the ruling group. In addition to this static effect, however, informal taxation through corruption can also have a dynamic effects. Specifically, it may undermine the incentives to invest in the formal tax base, since the latter shrinks in response to informal taxation. The lower tax base therefore diminishes investments in fiscal capacity, as did a lower level of development in Section 5.1.

Unlike corruption on the spending side, we would thus expect higher corruption on the revenue side to be associated with less tax collection, everything else equal. This is confirmed in Figure 19, which plots the partial correlation between fiscal capacity (measured by total tax take) and corruption, measured by a perceptions index from Transparency International (a higher score denotes less corruption). Countries with a higher share of taxes in GDP are also the least corrupt.

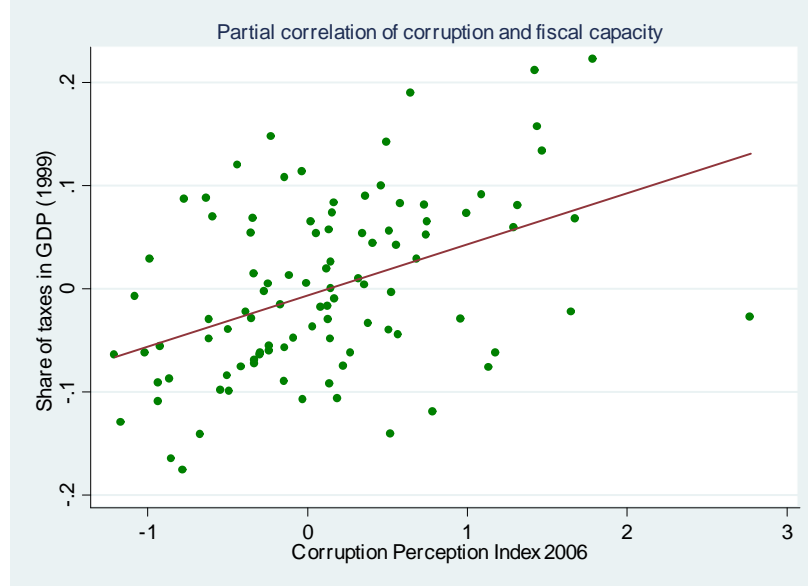


Figure 19: Share of taxes in GDP and corruption

5.6 Compliance Technologies

So far, we have basically left the technology for evading taxes and for increasing compliance as a black box. In this section, we will glean a little on the door of this black box and indicate how one may enrich the analysis. We begin with a simple model of the forces that may shape the costs of non-compliance, and then extend it in a few ways to motivate policy interventions to increase compliance.

A simple micro-foundation for the costs of non-compliance The simplest micro-foundation for the evasion cost function $c(\tau, e)$, which plays a crucial role for tax compliance, is a variant of the classic analysis of detection and punishment. Let $\zeta(e)$ be a non-pecuniary punishment for non-compliance with the tax code, increasing and convex in the amount of evasion e and let $v(\tau)$ be the probability of detection, increasing in τ .¹⁷ Then

$$c(e, \tau) = v(\tau) \zeta(e).$$

¹⁷It would be straightforward to allow $v(\tau)$ depends on e so larger transgressions are more likely to be detected.

This is the classic Allingham and Sandmo (1972) model of evasion, except that we have supposed that punishments are non-pecuniary. To the extent that $\zeta(e)$ is pecuniary, it adds directly to tax revenue and would have to be added to the government budget constraint. However, this would be a fairly minor difference with little effect on the main insights and we therefore stick with the non-pecuniary punishment case.

The other important part of the compliance technology is $v(\tau)$ – factors shaping the probability to be caught and face a sanction. A raft of measures based on technological improvements in record keeping and competence among tax authorities belong in here. It is questionable whether low-income countries generally use best-practice procedures, so there might be scope for technology transfer. At least, this seems to a presumption motivating extensive technical development assistance, in the form of capacity building in the area of taxation.

The function $v(\tau)$ also depends on the production structure, as we discussed in Section 5.1, with some kinds of economic activities intrinsically easier to monitor than others depending the degree of formality, the need for transparent record keeping, and the use of the formal financial system.

Social norms and tax morale The model can be used to crudely consider the role of social norms in affecting tax compliance. Suppose that shame or stigma from noncompliance in a particular tax base depends on the average amount of non-compliance in the population as a whole, which we denote by \bar{e} . Thus

$$c(e, \tau; \bar{e}) = v(\tau) \zeta(e; \bar{e}) ,$$

with $\zeta_{\bar{e}}(e; \bar{e}) < 0$ i.e., an increasing amount of evasion in the population as a whole lowers the stigma/shame from cheating. In this simple case, evasion decisions, corresponding to (1) in Section 4 will form a Nash equilibrium where:

$$t_{k,s} = v(\tau_{k,s}) \zeta_e(e_{k,s}^*; e_{k,s}^*) \text{ for } k = 1, \dots, N, L \text{ if } \tau_{k,s} > 0 .$$

With $\zeta_{e\bar{e}} < 0$, we get the possibility of multiple Pareto-ranked, tax-evasion equilibria, since the reaction functions for evasion slope upwards.

This opens the door for tax culture to affect compliance. Countries with a strong culture of compliance may find it much cheaper to achieve a similar level of fiscal capacity compared to one where the norm is unfavorable. Such

issues have been discussed by political scientists, e.g., Torgler (2007), Levi (1998) and Rothstein (2000).

Obviously, the simple model considered here could be modified in different directions. For instance, there could be spillover effects between different tax bases, so that common cheating on some tax base spreads by contagion and erodes compliance with other taxes. Also, the relevant reference group for the social norm espoused by some particular individual may be more local than the entire set of tax payers. Local reference groups of this sort might help explain local pockets with widespread tax evasion, like the favelas at the outskirts of large Brazilian cities in which whole communities function largely outside the formal sector.

If tax morale is important, then interventions that increase the stigma from non-compliance may be an important form of intervention to improve compliance. It may even make sense to increase the visibility of compliers and to associate compliance with social approval – see Chetty (2009) and Chetty et al (2009). But the real and fundamental question here, about which we know precious little, is how legal and administrative interventions interact with social norms – see, however, Benabou and Tirole (2011) for a recent and very interesting theoretical analysis.

Our discussion of tax morale has been speculative and sketchy. But the issue is certainly important and it is plausible that different tax cultures in, say, Sweden and Greece contribute to the large differences in their tax take. The idea of tax morale also goes to the heart of debates about state legitimacy, a concept we have not dealt with at all. However, the interactions between social norms of compliance, state legitimacy, fiscal capacity, and institutions is an interesting and important topic for further research.

Incentives for tax inspectors In many countries, a major problem in collecting tax revenues is the weak motives for tax inspectors. These could reflect either low incentives to detect tax evasion or a willingness to take bribes from non-compliers if caught. Our simple model allows us to think about both issues.

Suppose that detection of evasion requires that inspectors put in effort χ . Such effort increases the chances of being catching an evader, but is privately costly to the tax inspector. Denote the probability that an evader is caught by $v(\tau, \chi)$ with $v_\chi(\tau, \chi) > 0$. For any given tax base and level of fiscal

capacity, let equilibrium evasion be

$$e^*(t, \tau; \chi) = \arg \max_e \{et - v(\tau, \chi) \phi(e)\} .$$

It is easy to see that $e^*(t, \tau; \chi)$ is decreasing in χ . Let $q(t, \tau, \chi)$ now be the private profit per capita from non-compliance when tax inspectors put in effort χ .

An important question, on which much tax administration has tripped up, is what motivates inspectors to put in such costly monitoring. A traditional view is that this is taken care of by some kind of pro-social motivation, i.e., inspectors are intrinsically honest. But as governments have learned to their cost, this cannot be taken for granted.

Assuming that inspectors have to be compensated for their disutility of labor in a competitive labor market, the socially optimal level of tax-raising effort is:

$$\chi^*(t_{k,s}, \tau_{k,s}) = \arg \max_{\chi} \{q(t_{k,s}, \tau_{k,s}, \chi) + \lambda_s [t_{k,s} e^*(t_{k,s}, \tau_{k,s}; \chi) - \chi]\} . \quad (22)$$

where λ_s , as above is the marginal value of public revenues. The maximand includes two terms – the private non-compliance profits and the value of tax revenues net of effort cost. Higher effort χ will reduce the first term and increase the second term and the balance between the two will define the optimum.

The main question is how the government can implement such an optimal effort level. If χ is not observed, inspectors face a potential moral-hazard problem – see Mookherjee and Png (1995) and Besley and McLaren (1993) for studies along these lines. If the tax inspector were offered a fixed wage and is not strongly intrinsically motivated, he would set $\chi = 0$. In this case, there would be no point in employing inspectors at all. In this framework, we can think of changes in fiscal capacity as corresponding to alternative ways of organizing the tax-collection service to avoid this outcome.

One regime would be to focus on recruiting tax inspectors who set $\chi = \chi^*(t_{k,s}, \tau_{k,s})$ by establishing some kind of rigorous recruiting and training regime. Such merit-based professionalization of the bureaucracy is certainly a feature of fiscal history.

Another possibility would be to contemplate tax farming, a popular solution in historic times where tax inspectors are sold a franchise to collect taxes on a particular tax base, in exchange for becoming a residual claimants. In

this case, we would expect:

$$\hat{\chi}(t_{k,s}, \tau_{k,s}) = \arg \max \{t_{k,s} e^*(t_{k,s}, \tau_{k,s}; \chi) - \chi\} .$$

Comparing this to the expression in (22), we see that tax farming would never be optimal in our framework, for reasons that make sense given its history. Specifically, tax farming would vest too much effort in extracting taxes, as tax farmers would fail to internalize the utility costs they impose on the public. In practice, tax farmers would have tended to use brutal methods of collecting taxes, ignoring most of the costs to the populations from whom they were collecting.

Another option would be to pay tax inspectors efficiency wages, as discussed in Besley and McLaren (1993). To see how this might work, assume inspectors are themselves subject to inspection in a hierarchical structure. Suppose that inspectors are asked to put in effort χ and that the probability a tax inspector is monitored and caught is $\varrho(\tau)$. Finally, assume that if inspectors are caught, they are fired without being paid. Now, an inspector will put in effort at a wage of \tilde{w} if:

$$\tilde{w} - \chi \geq (1 - \varrho(\tau)) \tilde{w} .$$

Solving this inequality, says that the wage needed to elicit effort χ is an increasing function :

$$\tilde{w} = \frac{\chi}{\varrho(\tau)} > \chi .$$

Compared to a benchmark model with observable and contractible effort, getting effort is more expensive, meaning that the level of non-compliance will be higher for any $\varrho(\tau) < 1$. However, compared to a world which relies entirely on public spiritedness, or a world where $\chi = 0$, this could be a worthwhile proposition.

Corrupt tax inspectors Now consider how the possibility of corruption affects these arguments. Suppose for the moment that the level of effort put into detection is fixed. After detection, however, a bribe of b can be paid by an evader to the inspector, which exempts the evader from suffering the punishment $\zeta(e)$. Assume that the inspector and the evader engage in Nash bargaining, so that the bribe paid is:

$$b^* = \arg \max \{b(te - b + \zeta(e))\} = \frac{te + \zeta(e)}{2} .$$

In this case, higher penalties for non-compliance are partly transferred to tax inspectors, since they give the ability to tax inspectors to extort money from non-complying tax payers.

Somewhat paradoxically, bribery can motivate inspectors to put in greater detection effort since their payoff is:

$$v(\tau, \chi) \left[\frac{te + \zeta(e)}{2} \right] - \chi .$$

Moreover, this effort is sensitive to tax rates, with greater taxes actually motivating tax inspectors to put in greater effort. This suggests the possibility that efforts to reduce bribery in a world with a great deal of unobserved effort need not necessarily increase tax compliance. This is not to say that bribery should be condoned, but that we need to consider the full set of incentives in a second-best world. Note also that if some component of fiscal capacity is independent of the incentive scheme for the inspectors' own efforts (such as income tax withholding), then higher independent capacity raises equilibrium effort by complementing the inspector's own efforts.

Exploiting local information How far should local information be harnessed in improving tax compliance? Focusing on the formal inspection process underestimates the scope for schemes, which fall under the heading of "cross reporting". This has become very important in the development literature on peer monitoring in micro-finance but has received less attention in the taxation literature.

The main idea exploits something well-known in mechanism design, namely that once more than one person is informed about something then a variety of means can be used to illicit that information (see Maskin (1999) and Moore and Repullo (1988), among others). This has an obvious counterpart in taxation.

The following canonical model illustrates the idea. Suppose that evasion activity e is observed by two parties – whom we can call a purchaser (denoted by a subscript p) and a vendor (denoted by a subscript v). Suppose that the vendor is asked first to declare e_v and then the purchaser either agrees or disagrees. If there is disagreement, the government audits the transaction and the honest party is given a small reward and the dishonest party has to pay $\zeta(e)$.

In the unique sub-game perfect equilibrium of this game, there is full compliance as long as $\zeta(e) > te$. In other words, it is as if there is complete and

costless auditing of transactions – the gamble in the traditional Allingham and Sandmo (1972) model goes away. This simple “mechanism” is simply an illustration of the potential power of cross-reporting. However, it only works under two key assumptions. First, there is no scope for collusion between the vendor and purchaser. Second, both parties to a given transaction can be observed and verified. The latter is true when there exist formal contracts of employment or purchase, or where a receipt or record of the transaction is kept.

The evidence on informal taxation in Olken and Singhal (2011) suggest that traditional societies have developed ways of mutually raising revenues using local information and enforcement. In modern economies, firms have taken on this role as argued by Kleven, Kreiner and Saez (2009).

Tax remittance by firms Our model of compliance has focused exclusively on individual decisions. But in reality much of the onus for compliance is on firms and the gains from non-compliance accrue to firm owners.¹⁸ Substantively, this makes a difference when the size of the firm affects its non-compliance costs due to the visibility of its operations. It is straightforward to incorporate this feature into our model if we introduce some factor which affects the size distribution of firms. Consumers are assumed to face the same post-tax price but decisions not to comply are now only made at the firm level.

For simplicity, we focus only on commodity taxes and suppose that each industry comprises M firms indexed by m . At each date, we suppose that firms service demands (expressed in per-capita terms) of $\hat{x}_{n,s}^m$ from consumers for good n at date s , where $\sum_{m=1}^M \hat{x}_{n,s}^m = x_{n,s}$, i.e., the firms exhaust the market. We further suppose that all firms have identical costs of production denoted by u_n . Now let $c^m(E_{n,s}^m, \hat{x}_{n,s}^m, \tau_{n,s})$ be the firm’s cost of non-compliance which we denote by $E_{n,s}^m$. We allow this cost to depend on the firm’s sales because this makes evasion more visible.

Now, a firm’s profits are:

$$\begin{aligned} & [p_n (1 + t_{n,s}) - u_n] \hat{x}_{n,s}^m - t_{n,s} [p_n \hat{x}_{n,s}^m - E_{n,s}^m] - c^m(E_{n,s}^m, \hat{x}_{n,s}^m, \tau_{n,s}) \\ &= [p_n - u_n] \hat{x}_{n,s}^m + t_{n,s} E_{n,s}^m - c^m(E_{n,s}^m, \hat{x}_{n,s}^m, \tau_{n,s}) . \end{aligned}$$

This is the sum of profits from sales and profits from evasion. Such pure profits have to be distributed across citizens in proportion to their ownership

¹⁸See Kopczuk and Slemrod (2006) for discussion of these issues in general.

of firms. If we assume competitive pricing, i.e. $p_n = u_n$, then the only pure profits are from tax non-compliance. However notice that nothing essential is changed from the basic model if we define:

$$\hat{Q}(\mathbf{t}_s, \boldsymbol{\tau}_s) = \sum_{n=1}^N \sum_{m=1}^M \left[\arg \max_{E_{n,s}^m \leq p_n \hat{x}_{n,s}^m} \{t_{n,s} E_{n,s}^m - c^m(E_{n,s}^m, \hat{x}_{n,s}^m, \tau_{n,s})\} \right]$$

to be the total profits from evasion in firms. Note, however, that we have put the value of sales to be upper bound on evasion, so firms cannot evade more tax than they could in principle collect from final consumers. It is clear that the size distribution of firms can now make a difference to compliance.¹⁹ A firm with small sales could find it worthwhile not to comply at all if

$$t_{n,s} \geq \frac{\partial c^m(p_n \hat{x}_{n,s}^m, \hat{x}_{n,s}^m, \tau_{n,s})}{\partial E}.$$

This condition would endogenously create informal-sector firms in our framework. If there are some large firms, these would tend to comply more with taxes as they are more visible to tax authorities. And we might even have firms who deliberately reduce their sales to a point they benefit from reduced compliance, in the spirit of Dharmapala, Slemrod and Wilson (2012).

This extension shows why changes in the economy that make it optimal for firms to grow will also change the structure of compliance. For example, in an oligopoly model with m firms producing a good $u_n^1 < u_n^2 = u_n^3 = \dots u_n^m$, firm 1 would normally decide to price a shade below the others and take the entire market. However, with endogenous tax compliance, it may prefer to divide the market with other firms in order to remain less visible.

Firm-to-firm transactions provide a further interesting issue and are central to adoption of a VAT. This could be incorporated by supposing that some fraction of the cost u_n is based on purchased inputs that carry a tax but which are deductible against taxation of final goods. This gives the firm an incentive to comply in order to claim back input taxation. It also increases the scope for cross-reporting as we discussed above. We could, then suppose that the cost of evasion depends on the extent to which a firm is claiming a rebate on taxes on inputs which raises the marginal cost of non-compliance

¹⁹To give this a proper micro-foundation, we would have to underpin the reasons why some firms are larger or smaller than others for a homogeneous good. Very small elements of product differentiation such as location would be an example.

of taxation on final goods. The evidence from a clever field experiment in co-operation with the Chilean tax administration reported in Pomeranz (2011), suggests that cross-reporting in the value-added chain indeed helps enforce payments of the VAT except when the majority of transactions do not have firms but consumers (who cannot deduct) on the other side.

More generally, and as argued by Gordon and Li (2009), when firms start to use formal financial markets, their costs of evasion rises and this increases the feasible array of tax bases. In the simple model above, suppose firms have to publish accounts to inform outside investors. When these accounts declare profits, $[p_n - u_n] \hat{x}_{n,s}^m$, this is a useful piece of information to tax authorities who care about estimating $p_n \hat{x}_{n,s}^m$ for tax purposes. It is a short-step from this to having accountants be the agents of revenue authorities, and to report the data needed to have a VAT and help income-tax compliance. Of course, there would be difficulties in preventing collusion between firms and accountants. But it is clear that the need to raise external funds will put pressure to limit such collusion. This example further highlights how economic development may supports compliance. But it also illustrates the complementarity between legal and fiscal capacity. Building legal structures to protect outside investors and to demand transparent dealings in financial markets creates positive spillover effects on fiscal-capacity building.

6 Conclusion

A key question in public finance and development is to understand how a state moves from collecting a low level of public revenue of around 10% of national income towards collecting around 40%. In the process, tax bases are typically shifting from trade taxes and excises towards labor income and other broad bases such as value added.

To study this process is a challenge of appreciating incentives and constraints. Incentives are shaped by political institutions, existing power structures, and societal demands that the state perform certain functions. Constraints are imposed by a society's economic environment, social cleavages, and political interests. Over time, these constraints can be shifted and governments play a key role for such shifts. They may invest to improve the working of the economy and the efficiency of public goods provision. They may also try to create a sense of national identity and propose reforms to political institutions. Analyzing such issues requires a dynamic framework

and this chapter has sketched such a framework.

Throughout the chapter, we have taken political institutions as given. But it is questionable whether the forces that shape the development of the tax system can be separated from those that lead to institutional change. States that raise significant revenues will find themselves facing strong demands for accountability and representation, creating a two-way relationship between political development and the growth of the tax system. Little is yet known about this relationship. But it seems far from coincidental that states that are able to appropriate nearly half of national income in the form of taxation have also evolved strong political institutions, particularly those that constrain the use of such resources. This further underlines the centrality of taxation to understanding state development suggested long ago by Schumpeter, namely:

“The fiscal history of a people is above all an essential part of its general history. An enormous influence on the fate of nations emanates from the economic bleeding which the needs of the state necessitates, and from the use to which the results are put.” (Joseph Schumpeter, *The Crisis of the Tax State*, 1918)

Divorcing the study of the long-run development of the tax system from political factors is overly narrow. And the relation between the tax system and development is best studied using the modern tools of political economics to augment explanations based on economic factors alone. This lesson has been learned by development economists and should be learned by public-finance economists as well.

If developing states are to be able to support their citizens at a level now taken for granted by citizens in developed countries, this requires a series of investments, making the state more effective and responsive. Uncovering the preconditions for such investments is a central task for research on public finance and development.

References

- [1] Acemoglu, Daron [2003], "Why Not a Political Coase Theorem: Social Conflict, Commitment, and Politics", *Journal of Comparative Economics*, vol. 31, 620-652.
- [2] Acemoglu, Daron [2005], "Politics and Economics in Weak and Strong States", *Journal of Monetary Economics*, vol. 52, 1199-1226.
- [3] Acemoglu, Daron [2006], "Modeling Inefficient Institutions", in Blundell, Richard, Whitney Newey and Torsten Persson (eds.), *Advances in Economic Theory and Econometrics: Proceedings of the Ninth World Congress of the Econometric Society*, Cambridge UK: Cambridge University Press.
- [4] Acemoglu, Daron, Mikhail Golosov and Aleh Tsyvinski [2008], "Political Economy of Mechanisms", *Econometrica*, vol. 76, 619-641.
- [5] Acemoglu, Daron, Mikhail Golosov and Aleh Tsyvinski [2009], "Power Fluctuations and Political Economy", NBER Working Paper 15400.
- [6] Acemoglu, Daron and Simon Johnson [2005], "Unbundling Institutions", *Journal of Political Economy*, vol. 113, 949-995.
- [7] Acemoglu, Daron, Simon Johnson and James A. Robinson [2001], "The Colonial Origins of Comparative Development: An Empirical Investigation", *American Economic Review*, vol. 91, 1369-1401.
- [8] Aghion, Philippe, Alberto Alesina and Francesco Trebbi [2004], "Endogenous Political Institutions", *Quarterly Journal of Economics*, vol. 119, 565-612.
- [9] Aidt, Toke S. and Peter S. Jensen [2009a], "The Taxman Tools Up: An Event History Study of the Introduction of the Personal Income Tax", *Journal of Public Economics*, vol. 93, 160-175.
- [10] Aidt, Toke and Peter S. Jensen [2009b], "Tax Structure, Size of Government, and the Extension of the Voting Franchise in Western Europe, 1860-1938", *International Tax Public Finance*, vol. 16, 362-394.

- [11] Aizenman, Joshua and Yothin Jinjarak [2008], "The Collection Efficiency of the Value Added Tax: Theory and International Evidence", *Journal of International Trade and Economic Development*, vol. 17, 391-410.
- [12] Alesina, Alberto, Reza Baqir and William Easterly [1999], "Public Goods and Ethnic Divisions", *Quarterly Journal of Economics*, vol. 114, 1243-1284.
- [13] Alesina, Alberto and David Dollar [2000], "Who Gives Foreign Aid to Whom and Why?", *Journal of Economic Growth*, vol. 5, 33-63.
- [14] Alesina, Alberto and Paola Guiliano [2010], "The Power of the Family", *Journal of Economic Growth*, vol. 15, 93-125.
- [15] Alesina, Alberto and Guido Tabellini [1990], "A Positive Theory of Fiscal Deficits and Government Debt", *Review of Economic Studies*, vol. 57, 403-414.
- [16] Allingham, Michael G. and Agnar Sandmo [1972], "Income Tax Evasion: A Theoretical Analysis", *Journal of Public Economics*, vol. 1, 323-338.
- [17] Banerjee, Abhijit and Esther Duflo [2009], "The Experimental Approach to Development Economics", NBER Working Paper No. 14467.
- [18] Baunsgaard, Thomas and Michael Keen [2005], "Tax Revenue and (or?) Trade Liberalization", mimeo, IMF.
- [19] Benabou, Roland and Jean Tirole [2011], "Laws and Norms", NBER Working Paper No. 17579.
- [20] Berry, Francis Stokes and William D. Berry [1992], "Tax Innovation in the States: Capitalizing on Political Opportunity", *American Journal of Political Science*, vol. 36, 715-742.
- [21] Besley, Timothy and Stephen Coate [1997], "An Economic Model of Representative Democracy", *Quarterly Journal of Economics*, vol 112, 85-114.

- [22] Besley, Timothy, Ethan Ilzetzi and Torsten Persson [2010], "Weak States, Strong States and Steady States: The Dynamics of Fiscal Capacity", mimeo, LSE.
- [23] Besley and McLaren [1993], "Taxes and Bribery: The Role of Wage Incentives", *Economic Journal*, vol. 103, 119-141.
- [24] Besley, Timothy and Torsten Persson [2008], "Wars and State Capacity", *Journal of the European Economic Association*, vol. 6, 522-530.
- [25] Besley, Timothy and Torsten Persson [2009a], "Repression or Civil War?", *American Economic Review*, Papers and Proceedings, vol 99, 292-297.
- [26] Besley, Timothy and Torsten Persson [2009b], "The Origins of State Capacity: Property Rights, Taxation and Politics", *American Economic Review*, vol. 99, 1218-1244.
- [27] Besley, Timothy and Torsten Persson [2010a], "State Capacity, Conflict and Development", *Econometrica*, vol. 78, 1-34.
- [28] Besley, Timothy and Torsten Persson [2010b], "From Trade Taxes to Income Taxes: Theory and Evidence on Economic Development and State Capacity", mimeo, LSE.
- [29] Besley, Timothy and Torsten Persson [2011a], "Fragile States and Development Policy", *Journal of the European Economic Association*, vol. 9, 371-398.
- [30] Besley, Timothy and Torsten Persson [2011b], "The Logic of Political Violence", *Quarterly Journal of Economics*, vol. 126, 1411-1445.
- [31] Besley, Timothy and Torsten Persson [2011c], *Pillars of Prosperity: The Political Economics of Development Clusters*, Princeton: Princeton University Press.
- [32] Bird, Richard, [2004], "Administrative Dimensions of Tax Reform," *Asia-Pacific Tax Bulletin*, vol .10, 134-50.
- [33] Bird, Richard and Oliver Oldman (eds.) [1980], *Readings on Taxation in Developing Countries*, 3rd Edition, Baltimore: Johns Hopkins University Press.

- [34] Bonney, Richard (ed.) [1999], *The Rise of the Fiscal State in Europe c1200-1815*, Oxford: Oxford University Press.
- [35] Boone, Peter [1996], "Politics and the Effectiveness of Foreign Aid", *European Economic Review*, vol. 40, 289-329.
- [36] Brennan, Geoffrey and James M. Buchanan [1985], *The Reason of Rules: Constitutional Political Economy*, Cambridge: Cambridge University Press.
- [37] Brewer, John [1989], *The Sinews of Power: War, Money and the English State, 1688-1783*, New York: Knopf.
- [38] Bräutigam, Deborah, Odd-Helge Fjeldstad and Mick Moore [2008], *Taxation and State-Building in Developing Countries*, Cambridge: Cambridge University Press.
- [39] Buchanan, James M. [1967], *Public Finance in Democratic Process: Fiscal Institutions and Individual Choice*, Chapel Hill: University of North Carolina Press.
- [40] Buchanan, James M. [1987], "The Constitution of Economic Policy", Nobel Prize Lecture, *American Economic Review*, vol. 77, 243-250.
- [41] Buchanan, James M. and Gordon Tullock [1962], *The Calculus of Consent*, Ann Arbor: University of Michigan Press.
- [42] Burgess, Robin and Nicholas Stern [1993], "Taxation and Development", *Journal of Economic Literature*, vol. 31, 762-830.
- [43] Cárdenas, Mauricio [2010], "State Capacity in Latin America", *Economía*, vol. 10, 1-45.
- [44] Cárdenas, Mauricio and Didem Tuzemen [2010], "Under-Investment in State Capacity: The Role of Inequality and Political Instability", mimeo, The Brookings Institution.
- [45] Centeno, Miguel A [1997], "Blood and Debt: War and Taxation in Latin America", *American Journal of Sociology*, vol. 102, 1565-1605.
- [46] Chetty, Raj [2009], "The Simple Economics of Salience and Taxation", NBER Working Paper 15246.

- [47] Chetty, Raj, Adam Looney and Kory Kroft [2009], "Salience and Taxation: Theory and Evidence", *American Economic Review*, vol. 99, 1145-1177.
- [48] Cukierman, Alex, Sebastian Edwards and Guido Tabellini [1992], "Seignorage and Political Instability", *American Economic Review*, vol. 82, 537-555.
- [49] Dharmapala, Dhammika , Joel Slemrod and John D. Wilson, [2012], "Tax Policy and the Missing Middle: Optimal Tax Remittances with Firm-Level Administrative Costs" *Journal of Public Economics*, forthcoming.
- [50] Diamond, Peter and James Mirrlees [1971], "Optimal Taxation and Public Production: I Production Efficiency", *American Economic Review*, vol. 61, 8-27.
- [51] Dincecco, Mark [2011], *Political Transformations and Public Finances: Europe, 1650-1913*, Cambridge: Cambridge University Press.
- [52] Dincecco, Mark and José Mauricio Prado Jr. [2010], "Warfare, Fiscal Capacity, and Performance", mimeo, IMT Lucca Institute for Advanced Studies.
- [53] Doing Business 2007: How to Reform, [2006], World Bank, Washington DC: The World Bank Group.
- [54] Duflo, Esther, Rachel Glennerster and Michael Kremer [2007], "Using Randomization in Development Economics Research: A Toolkit", Chapter 61 in T. P. Schultz and A. S. John (eds), *Handbook of Development Economics Volume 4*, Amsterdam: Elsevier.
- [55] Engerman, Stanley L. and Kenneth L. Sokoloff [2002], "Factor Endowments, Inequality, and Paths of Development among New World Economies", *Economia*, vol. 3, 41-88.
- [56] Esping-Andersen, Gösta [1999], *Social Foundation of Post-Industrial Economies*, Oxford: Oxford University Press.
- [57] Fearon, James [2003], "Ethnic and Cultural Diversity by Country", *Journal of Economic Growth*, vol. 8, 195-222.

- [58] Feldman, Naomi and Joel Slemrod, [2009], "War and Taxation: When Does Patriotism Overcome the Free-Rider Impulse?" in Isaac William Martin, Ajay K. Mehrotra, and Monica Prasad (eds.) *The New Fiscal Sociology: Taxation in Comparative and Historical Perspective*, Cambridge: Cambridge University Press.
- [59] Feldstein, Martin [1995], "Behavioral Responses to Tax Rates: Evidence from the Tax Reform Act of 1986", *American Economic Review*, vol. 85, 170-174.
- [60] Feldstein, Martin [1999], "Tax Avoidance and the Deadweight Loss of the Income Tax", *The Review of Economics and Statistics*, vol. 81, 674-680.
- [61] Gennaioli, Nicola and Hans-Joachim Voth [2011], "State Capacity and Military Conflict", Working Paper, UPF.
- [62] Gordon, Roger (ed.) [2010], *Taxation in Developing Countries: Six Case Studies and Policy Implications*, New York: Columbia University Press.
- [63] Gordon, Roger and Young Lee [2005], "Tax Structure and Economic Growth", *Journal of Public Economics*, vol. 89, 1027–1043.
- [64] Gordon, Roger and Wei Li [2009], "Tax Structures in Developing Countries: Many Puzzles and a Possible Explanation", *Journal of Public Economics*, vol. 93, 855-866
- [65] Herbst, Jeffrey I. [2000], *States and Power in Africa: Comparative Lessons in Authority and Control*, Princeton, NJ: Princeton University Press.
- [66] Heston, Alan, Robert Summers and Bettina Aten [2009], *Penn World Table Version 6.3*, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania.
- [67] Hintze, Otto [1906], "Military Organization and the Organization of the State", reprinted in Gilbert, Felix (ed.) [1970], *The Historical Essays of Otto Hintze*, New York: Oxford University Press.

- [68] Hinrichs, Harley H. [1966], *A General Theory of Tax Structure Change During Economic Development*, Cambridge, MA: The Law School of Harvard University.
- [69] Hoffman, Philip and Jean-Laurent Rosenthal [1997], "Political Economy of Warfare and Taxation in Early Modern Europe: Historical Lessons for Economic Development", in Drobak, John and John Nye (eds.), *The Frontiers of the New Institutional Economics*, San Diego: Academic Press.
- [70] International Country Risk Guide, © The PRS Group, Inc., East Syracuse, NY, 1980-present.
- [71] Jensen, Anders [2011], "State-Building in Resource-Rich Economies", *Atlantic Journal of Economics*, vol. 39, 171-193.
- [72] Kaldor, Nicholas [1963], "Taxation for Economic Development", *Journal of Modern African Studies*, vol. 1, 7-23.
- [73] Keen, Michael [2010], "Taxation and Development Again", mimeo, IMF.
- [74] Keen, Michael and Ben Lockwood [2010], "The Value Added Tax: Its Causes and Consequences", *Journal of Development Economics*, vol. 92, 138-151.
- [75] Kenny, Lawrence and Stanley Winer [2006], "Tax Systems in the World: An Empirical Investigation into the Importance of Tax Bases, Administrative Costs, Scale and Political Regime", *International Tax and Public Finance*, vol. 13, 181-215.
- [76] Kleven, Henrik and Mazhar Waseem [2011], "Tax Notches in Pakistan: Tax Evasion, Real Responses, and Income Shifting", working paper, LSE.
- [77] Kleven, Henrik, Claus Thustrup Kreiner and Emmanuel Saez [2009], "Why Can Modern Governments Tax So Much? An Agency Model of Firms as Fiscal Intermediaries", NBER Working Paper 15218.
- [78] Kopczuk, Wojciech and Joel Slemrod [2002], "The Optimal Elasticity of Taxable Income", *Journal of Public Economics*, vol. 84(1), 91-112.

- [79] Kopczuk, Wojciech and Joel Slemrod [2006], "Putting Firms into Optimal Tax Theory," *American Economic Review* (Papers and Proceedings), 96(2), pp. 130-134.
- [80] Levi, Margaret [1988], "Of Rule and Revenue", Berkeley: University of California Press.
- [81] Levi, Margaret [1998], "A State of Trust", in Braithwaite, Valerie and Margaret Levi (eds.), *Trust & Governance*, New York: Russell Sage Foundation.
- [82] Madisson, Angus [2001], *The World Economy: A Millennial Perspective*, Paris: Organisation for Economic Co-operation and Development.
- [83] Marshall, Monty G. and Keith Jagers [2010], "Polity IV Project: Political Regime Characteristics and Transitions, 1800-2010", Version p4v2010 [Computer File]. College Park, MD: Center for Systemic Peace.
- [84] Maskin, Eric [1999], "Nash Equilibrium and Welfare Optimality", *Review of Economic Studies*, vol. 66, 23-38.
- [85] Meltzer, Alan and Scott Richards [1981], "A Rational Theory of the Size of Government", *Journal of Political Economy*, vol. 89, 914-927.
- [86] Mitchell, Brian R. [2007a], *International Historical Statistics: Africa, Asia and Oceania 1750-2005*, Palgrave Macmillan.
- [87] Mitchell, Brian R. [2007b], *International Historical Statistics: The Americas, 1750-2005*, Palgrave Macmillan.
- [88] Mitchell, Brian R. [2007c], *International Historical Statistics: Europe, 1750-2005*, Palgrave Macmillan.
- [89] Migdal, Joel S. [1988], *Strong Societies and Weak States: State-Society Relations and State Capabilities in the Third World*, Princeton NJ: Princeton University Press.
- [90] Mookherjee, Dilip, and Ivan Png, [1995], "Corruptible Law Enforcers: How Should They Be Compensated?" *Economic Journal*, vol. 105, 145-159.

- [91] Moore, Barrington, [1966], *Social Origins of Dictatorship and Democracy*, Boston: Beacon Press.
- [92] Moore, John and Rafael Repullo [1988], "Subgame Perfect Implementation", *Econometrica*, vol. 56, 1191-1220.
- [93] Moore, Mick [2004], "Revenues, State Formation and the Quality of Governance in Developing Countries", *International Political Science Review*, vol 25, 297-319.
- [94] Newbery, David and Nicholas Stern (eds.) [1987], *The Theory of Taxation for Developing Countries*, Oxford: Oxford University Press for the World Bank.
- [95] North, Douglass C. [1990], *Institutions, Institutional Change and Economic Performance*, Cambridge: Cambridge University Press.
- [96] O'Brien, Patrick [2001], "Fiscal Exceptionalism: Great Britain and its European Rivals From Civil War to Triumph at Trafalgar and Waterloo", mimeo, available at <http://www2.lse.ac.uk/economicHistory/pdf/WP6501.pdf>
- [97] O'Brien, Patrick [2005], "Fiscal and Financial Preconditions for the Rise of British Naval Hegemony: 1485-1815", mimeo, London School of Economics.
- [98] Olken, Benjamin A. and Monica Singhal [2011], "Informal Taxation", *American Economic Journal: Applied Economics*, vol. 3, 1-28.
- [99] Osborne, Martin J. and Al Slivinsky [1996], "A Model of Political Competition with Citizen-candidates", *Quarterly Journal of Economics*, vol. 111, 65-96.
- [100] Persson, Torsten and Lars E.O. Svensson [1989], "Why a Stubborn Conservative Would Run a Deficit: Policy with Time-Inconsistent Preferences", *Quarterly Journal of Economics*, vol. 104, 325-345.
- [101] Persson, Torsten, Gérard Roland and Guido Tabellini [2000], "Comparative Politics and Public Finance", *Journal of Political Economy*, vol 108, 1121-1161.

- [102] Persson, Torsten and Guido Tabellini [1994], "Is Inequality Harmful for Growth?", *American Economic Review*, vol. 84, 600-621.
- [103] Persson, Torsten and Guido Tabellini [2000], *Political Economics: Explaining Economic Policy*, Cambridge, MA: MIT Press.
- [104] Persson, Torsten and Guido Tabellini [2002], "Political Economics and Public Finance", Chapter 24 in Auerbach, Alan and Martin Feldstein (eds), *Handbook of Public Economics Volume 3*, Amsterdam: Elsevier.
- [105] Persson, Torsten and Guido Tabellini [2003], *The Economic Effects of Constitutions*, Cambridge MA: MIT Press.
- [106] Pomeranz, Dina [2011], "No Taxation without Information: Deterrence and Self-Enforcement in the Value Added Tax", mimeo, Department of Economics, Harvard University.
- [107] Reinikka, Ritva and Jakob Svensson [2008], "Working for God? Evaluating Service Delivery of Religious Not-for-profit Health Care Providers in Uganda", Policy Research Working Paper WPS3058, World Bank.
- [108] Roberts, Kevin [1977], "Voting over Income Tax Schedules", *Journal of Public Economics*, vol. 8, 329-340.
- [109] Romer, Thomas [1975], "Individual Welfare, Majority Voting, and the Properties of a Linear Income Tax", *Journal of Public Economics*, vol. 4, 163-185.
- [110] Rothstein, Bo [2000], "Trust, Social Dilemmas and Collective Memories", *Journal of Theoretical Politics*, vol. 12, 477-501.
- [111] Saez, Emmanuel, Joel Slemrod, Seth H. Giertz [2009], "The Elasticity of Taxable Income with Respect to Marginal Tax Rates: A Critical Review," NBER Working Paper No. 15012.
- [112] Sarkees, Meredith Reid and Frank Wayman [2010], *Resort to War: 1816 - 2007*, CQ Press.
- [113] Schneider, Friedrich [2002], "Size and Measurement of the Informal Economy in 110 Countries Around the World", mimeo.

- [114] Schumpeter, Joseph A. [1918], "The Crisis of the Tax State", *International Economic Papers*, vol. 4, 5-38.
- [115] Shayo, Moses [2009], "A Model of Social Identity with an Application to Political Economy: Nation, Class, and Redistribution", *American Political Science Review*, vol. 103, 147-174.
- [116] Slemrod, Joel [1990], "Optimal Taxation and Optimal Tax Systems," *Journal of Economic Perspectives*, vol. 4(1), 157-178.
- [117] Slemrod, Joel [2001], "A General Model of the Behavioral Response to Taxation", *International Tax and Public Finance*, vol. 8, 119-128.
- [118] Slemrod, Joel and Shlomo Yitzhaki [2002], "Tax Avoidance, Evasion, and Administration", in Auerbach, Alan and Martin Feldstein (eds.), *Handbook of Public Economics*, Vol 3, Amsterdam: Elsevier.
- [119] Stasavage, David [2003], *Public Debt and the Birth of the Democratic State: France and Great Britain, 1688-1789*, Cambridge: Cambridge University Press.
- [120] Stasavage, David [2007], "Partisan Politics and Public Debt: The Importance of the 'Whig Supremacy' for Britain's Financial Revolution", *European Review of Economic History*, vol. 11, 123-153.
- [121] Tanzi, Vito [1987], "Quantitative Characteristics of the Tax Systems of Developing Countries", in Newbery, David and Nicholas Stern (eds), *The Theory of Taxation for Developing Countries*, Oxford: Oxford University Press for the World Bank.
- [122] Tanzi, Vito [1992], "Structural Factors and Tax Revenue in Developing Countries: A Decade of Evidence", in Goldin, Ian and L. Alan Winters (eds.), *Open Economies: Structural Adjustment and Agriculture*, Cambridge: Cambridge University Press.
- [123] Temple, Jonathan [2010], "Aid and Conditionality", in Rodrik, Dani and Mark Rosenzweig (eds.), *Handbook of Development Economics*, vol 5.
- [124] Tilly, Charles (ed.) [1975], *The Formation of National States in Western Europe*, Princeton: Princeton University Press.

- [125] Tilly, Charles [1985], "Warmaking and State Making as Organized Crime", in Evans, Peter, Dietrich Rueschemeyer and Theda Skocpol (eds.), *Bringing the State Back In*, Cambridge: Cambridge University Press.
- [126] Tilly, Charles [1990], *Coercion, Capital and European States, AD 990-1992*, Oxford: Blackwells.
- [127] Torgler, Benno [2007], *Tax Morale and Tax Compliance: A Theoretical and Empirical Analysis*, Cheltenham U.K.: Edward Elgar.
- [128] Zolt, Eric M. and Richard M. Bird [2005], "Redistribution via Taxation: The Limited Role of the Personal Income Tax in Developing Countries", *UCLA Law Review*, vol. 52, 1627-1695.