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# Puzzling Tax Structures in Developing Countries: A Comparison of Two Alternative Explanations

Roger Gordon and Wei Li

Economic policies in developing countries often differ sharply from those commonly advocated by economists, generating advice to adopt policies more consistent with both the successful practices in richer countries and/or those that appear best based on existing economic theories.

For example, economists advocate a stable currency and low tariff rates. Yet inflation rates in developing countries are often high, as are tariff rates.

Economists advocate setting up procedures to protect property rights, and establishing a rule of law in particular to aid in the legal enforcement of contracts and in dispute resolution. Yet, complaints by firms in developing countries about costly and time-consuming procedures, under-the-table fees, and arbitrary outcomes are common.

Economists strongly discourage state ownership of firms.[1] Yet in developing countries state ownership of firms is common. State ownership of banks is even more common.

Taxes certainly require some interference with market transactions, so the advice would be to enact taxes with a broad base and low rates so as to lessen the efficiency costs resulting from the distortions created by the tax structure. Broad-based taxes, such as a value-added tax, certainly do play an important role in poorer as well as richer countries. However, a much larger share of revenue in developing than in developed countries comes

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1. Where monopoly power is present, exceptions might be made, though even here government regulatory oversight is typically preferred to government ownership.

from taxes with a narrow base. Even when broad-based taxes are used, the evidence suggests that in practice revenue is collected from only a fraction of the activity that by statute should be covered.

In each case, economists normally advocate a shift toward policies that reduce interference in the functioning of markets.

If existing policies in poorer countries are so costly, though, why are such policies adopted to begin with? The deviation from conventionally recommended policies is systematic among poorer countries, and has existed for many years, making it hard to dismiss this evidence as being a result of some officials misunderstanding the implications of the policies they choose. Why would developing countries choose to impose such costs on themselves?

A common explanation for such seemingly perverse policies in developing economies falls under the general category of *political economy* problems. Here, the presumption is that these policies are designed to benefit select groups within a country who have unusually strong political influence. In particular, a government can favor these groups by designing the tax system to transfer resources to them, and perhaps by interfering with market allocations so as to alter equilibrium market prices in ways that benefit particular favored industries. But these policies may still impose large costs on the rest of the population, justifying altruistic intervention from outside.

Gordon and Li (2005) develop an alternative hypothesis for such policies. Here, the key assumption is that poorer countries face much more severe enforcement problems with their tax systems. Enforcement depends heavily on the availability of information from outside a firm about the scale of any firm's economic activities. Such information, largely coming from the firm's recorded transactions through the financial sector, is essential to double-check the information reported by the firm. When firms use the financial sector, they leave a paper trail, facilitating tax enforcement. In contrast, cash transactions are virtually impossible to monitor and tax, to the point that the informal economy and the cash economy are often used as synonyms. When countries have both a financial sector that provides little value-added to firms, and firms that receive very heterogeneous benefits from using the financial sector, then the forecasted outcome is high tax rates in practice paid only by those firms strongly dependent on the financial sector, so a narrow tax base, with other firms avoiding tax through relying entirely on cash transactions. The result can be large intersectoral distortions favoring the informal economy.

Gordon and Li (2005) then argue that the government can lessen these intersectoral distortions through tariff protection of firms facing high effective tax rates, through inflation as a tax on firms that rely on cash to avoid tax, through controls on lending so as to redirect credit to heavily taxed sectors, and through red tape and fees that impose nontax costs on businesses that in practice pay little or no taxes.

Section 1.1 provides a derivation of the forecasted tax policy coming from a Grossman-Helpman (1994) style political economy model, and a comparison of these forecasts with those derived in Gordon-Li (2005). The forecasts from the two models differ in many respects. The political economy model certainly forecasts favorable tax treatment of sectors that can lobby the government effectively. However, while the model forecasts lower or even negative tax rates on income earned in the favored sector, as long as such means are available to aid these industries it does not forecast tariff protection for these sectors, inflation, or other forms of interference with market transactions.[2] The theory would not forecast an informal (untaxed) sector, at least beyond the sectors that are effective in lobbying the government. Unlike in the Gordon-Li model, tariff protection and subsidized credit should be for sectors that face relatively low tax rates, rather than relatively high tax rates. The two models also have contrasting forecasts for the size of government and the progressivity of the tax structure in poor versus rich countries.

In section 1.2, we look at the empirical evidence more closely to compare the evidence with the forecasts from these two models. Some forecasts are shared by the models and some contrast. This evidence is almost entirely consistent with the forecasts from the Gordon-Li model, and almost entirely inconsistent with the forecasts from the political economy model. Section 1.3 then contains a brief set of concluding remarks.

## 1.1 Alternative Forecasts for Economic Policies

### 1.1.1 Conventional Model

In this section, we develop the implications of a political economy model, and summarize the implications of the Gordon-Li model in a simple setting. To set the context, though, we first develop a model of policy in a more conventional setting.

Assume that the country is small and open, so is a price taker in the international market for the two consumption goods. These international prices are denoted by $p_1$ and $p_2$. Both goods are produced in the domestic economy, and the domestic wage rate, $w$, and domestic interest rate, $r$, adjust to clear factor markets. Assume that good 2 is imported and good 1 is exported.[3]

The government is considering the choice of tax rates on the domestic output of the two goods, denoted by $s_1$ and $s_2$, along with a tariff at rate $\tau_2$

2. If tax rates cannot vary by industry to the extent desired, however, then the model does forecast tariff protection and subsidized credit to favored firms.

3. Here we assume that workers and capital can move without cost between the two domestic industries, so that there is one set of factor prices characterizing the economy as a whole.

on imports of good 2, and a tax at rate $t_K$ on domestic capital.[4] Consumer prices are then equal to $p_i(1 + \tau_i)$. The net-of-tax prices domestic firms face for output of the two goods are $p_i(1 + \tau_i)(1 - s_i)$, while the user cost of capital to a firm is $r + t_K$.

The indirect utility function for individual $i$ is denoted by $V_i(p_i[1 + \tau_1], p_2[1 + \tau_2], r, w) + W_i(G)$, where $G$ measures expenditures on public services. A conventional model for optimal tax policy assumes that the government chooses Pareto efficient policies, so maximizes a weighted sum of the welfare of individuals and the utility of government officials, who consume what tax revenue is left net of the cost of public services:[5]

$$(1) \quad \max_{\tau_2,s_1,s_2,t_K,G} \sum_i \{V_i[p_1(1+\tau_1), p_2(1+\tau_2), r, w] + W_i[G]\} + U(R - G),$$

Using the aggregate economy's budget constraint, tax revenue $R$ equals gross domestic output minus domestic consumption, all evaluated at world prices: $R = \Sigma_j p_j(f_j - C_j)$.

By maximizing over the size of government services, $G$, trading off benefits to residents with foregone consumption of government officials, we can rewrite the government's objective function as:

$$(1a) \quad \max_{\tau_2,s_1,s_2,t_K} \sum_i \{V_i[p_1(1+\tau_1), p_2(1+\tau_2), r, w]\} + S\left[\sum_j p_j(f_j - C_j)\right]$$

for some function $S(\cdot)$ that captures the overall benefits from extra tax revenue.

This model is the basic framework used in deriving optimal tax rates. To replicate a tax rate on labor income, there would need to be a uniform sales tax rate ($s_1 = s_2$) along with implicit expensing for capital investments ($rt_K = -s_1$). Taxes on capital income may well arise in such a derivation, and would appear through a tax rate on capital above this figure. Distortions to relative consumer prices could be implemented through a tariff along with an offsetting tax on domestic production of that good, as happens with a VAT. Such distortions could arise, for example, if those with a low marginal utility of income have high relative demand for one of the two goods. To preserve productive efficiency, however, as forecast by Diamond and Mirrlees (1971), the model would require that

$$\frac{p_1(1 - s_1)}{p_2(1 + \tau_2)(1 - s_2)} = \frac{p_1}{p_2}$$

4. We also include in the notation a placeholder tariff on good 1, denoted $\tau_1$, just to simplify some of the notation, even though we normalize the tariffs by setting $\tau_1 = 0$.

5. This model simultaneously captures the behavior of both *benevolent* and *malevolent* governments, by allowing officials to extract private benefits from unspent tax revenue, but also having them care about individual utilities.

so that sales tax rates adjust to compensate for any tariffs, so as to leave the net-of-tax price faced by producers unchanged by the introduction of the tariff.

In such a setting, there are no grounds for interfering further with market allocations: as forecast by Diamond-Mirrlees, production should remain efficient. As a result, the model cannot help explain state ownership of firms or banks, or any government regulations interfering with market allocations. As set up here, the model does not include a role for *money,* so does not allow an analysis of the optimal inflation rate. One simplified way to introduce money into the model is by including real cash balances as a third consumer good. To replicate a proportional tax on labor income, the sales tax rates should again be equal across goods, implying an equal proportional mark-up over the real costs of each good. The real cost of money, as noted by Friedman (1969), is virtually zero, implying a price of money so a nominal interest rate of virtually zero.

### 1.1.2 Gordon-Li Model

Gordon and Li (2005) add one new issue into the previous model: tax enforcement. They assume that firms can be monitored and taxed only if they make use of the financial sector, thereby leaving a paper trail.[6] The real benefits of using the financial sector, per se, for a firm in industry $j$ is assumed to equal $a_j p_j(1 + \tau_j)f_j$, so is proportional to the value of the firm's output. The cost of using the financial sector is that the firm becomes subject to tax.[7] Since pretax output from a firm using the financial sector is $(1 + a_j)(1 + \tau_j)p_j f_j$, sales tax and capital tax payments would together equal $s_j p_j(1 + \tau_j)(1 + a_j)f_j + t_K K_j$. Firms then make use of the financial sector only if benefits exceed costs, or if

$$a_j(1 + \tau_j)p_j f_j > s_j(1 + \tau_j)p_j(1 + a_j)f_j + t_K K_j. \tag{2}$$

This adds to the conventional analysis a set of constraints on the feasible tax rates imposed on each industry. Any tax rates violating equation (2) will induce disintermediation and collect no revenue from that industry.

In richer countries, use of the financial sector may be valuable enough that none of these constraints are binding. In poorer countries, though, the financial sector may operate much less well (the $a_j$ are smaller), so that these constraints become an important consideration in any discussion of tax policy. The lower are the $a_j$ within a country, the lower are feasible tax rates and as a result the lower would be government revenue. As seen in the following, government revenue as a fraction of GDP is in fact much lower in poorer than in richer countries. The conventional model, in contrast,

6. The paper also explores more briefly the implications for tax policy if the government can only observe physical inputs to production (e.g., capital, the number of workers). Policy implications are largely the same, except for those specifically linked to the banking sector.

7. Tariffs are collected regardless.

does not help explain this unless government revenue is less valued in poorer countries.

The presumption in Gordon and Li is that capital-intensive industries will value much more the use of the financial sector, and so have a higher $a_j$.[8] To begin with, this will imply a higher $s_j$ in capital-intensive industries when some of the constraints in equation (2) become binding.

When firms *within* an industry are heterogeneous, though, then a higher $s_j$ will collect more revenue from some firms while inducing others to shift into the cash economy. Depending on the distribution of the $a_j$ within an industry, tax rates can potentially be quite high, with some firms paying this high tax rate and others avoiding it through disintermediation. The conventional model does not include any structure sufficient to explain the presence of an informal economy.

Given differences in the optimal $s_j$ across industries, Gordon and Li then explore the role of various other policies to lessen the misallocations resulting from differences in the optimal $s_j$ across industries in response to the constraints in equation (2). Tariffs may now be used even if they would not be used otherwise. Not only can tariffs help collect additional revenue, but they can also lessen the distortions created by the differential sales tax rates by industry by shifting domestic production into the heavily taxed industries. If the heavily taxed good is imported, then these two potential benefits reinforce and trade will be discouraged. In contrast, if the heavily taxed good is exported, then these two potential benefits conflict and trade may even be encouraged.

Given the efficiency costs arising from a shift of activity out of the most highly taxed (capital-intensive) sectors, one mechanism to reduce this shift is state ownership of the most capital-intensive firms. Through state ownership, the government can in principle ensure that the sector has the efficient scale and capital intensity. This potential efficiency gain can quickly become large as tax rates increase, and with high enough tax rates can dominate the efficiency loss that occurs due to state ownership per se.

An alternative mechanism to increase the scale of activity in the heavily taxed sectors is to provide them cheap credit. This can be done through state ownership of the banking sector. While providing cheap credit to heavily taxed firms results in losses for the state-owned banks, the government can in principle cover these losses through the resulting tax revenue collected from the extra capital invested in these heavily taxed sectors.

8. This could occur because capital-intensive firms are larger and so have more customers who are physically distant, making use of financial intermediaries to handle payments of more value. Capital-intensive firms will also face lumpy expenditures to purchase capital, making bank loans of more value. To convince banks of their credit worthiness, maintaining an active account with the bank may be essential. Larger firms may also not be able to effectively monitor all of the employees who handle cash, and prefer instead to shift to noncash payments through use of the banking sector.

When firms *within* each industry are homogeneous and the government can set a separate sales tax rate for each industry, then tax rates would be set so that all firms satisfy the constraints in equation (2). Any sales tax rate in an industry high enough to violate equation (2) would create a Pareto loss, since the government would lose its tax base in that industry while firms are left indifferent, relative to a rate that just satisfies equation (2).

Money is now demanded in particular by firms that avoid taxes by joining the cash economy, so that inflation becomes a targeted tax on firms otherwise avoiding tax.[9]

The larger the informal sector the higher the benefits relative to the costs of inflation.

Capital taxes can help focus tax liabilities on capital-intensive firms, who are the most tied to using the financial sector and so the least likely to shift into the informal sector in response.

Government red tape and regulatory controls on firm entry can be another mechanism to hinder activity in lightly taxed if not entirely untaxed sectors. Even if no revenue is collected directly through such intervention, to the extent domestic production shifts as a result into more heavily taxed sectors, there can still be a net efficiency benefit from such policies.

To see this more formally, consider an individual's choice between being an employee in the formal sector versus working in the informal sector. We assume that the individual makes this choice to maximize indirect utility of $V(w)$.[10] Within the formal sector, the effective wage rate for individual $j$ is $w_j = (1 - s_j)p_j f_{Lj}$, where $f_{Lj}$ measures the marginal product of labor in the industry. Let the effective wage rate in the informal sector be $(1 + n_j)p_j f_{Lj}$. Here, $n_j$ is a parameter that varies by individual, reflecting that individual's best available informal jobs and the value of $a_j$ (positive or negative) in that sector, so can be either positive or negative. There is some joint density function $g(w_j, n_j)$ for $w_j$ and $n_j$. Without government intervention, the individual shifts to the informal sector whenever $n_j > -s_j$.

The government is affected by this choice, though, given that output in the formal sector is taxable whereas output in the informal sector is not. If output in the formal sector is subject to a sales tax at rate $s$, then tax revenue drops by $sw_j L_j/(1 - s)$ if the individual leaves the formal sector. Individual choices are then inefficient, since they ignore this fiscal externality.

What if at some cost, $F$, the government can hire tax inspectors to locate and identify businesses operating in the informal sector? We assume that these inspectors cannot observe $(1 + n_j)p_j f_{Lj}$, nor hours of work, but only the fact that the individual is working in the informal sector. Many of the people working in the informal sector presumably are extremely poor,

9. The feasible *inflation* tax would itself be constrained, though, by the option firms have to use a foreign rather than a domestic currency for transactions.

10. The other arguments of $V$ are suppressed, to economize on notation.

making it unattractive on distributional grounds to impose a fixed monetary fee for working in the informal sector.[11] Instead, consider the imposition of nontax (time) costs on firms in the informal sector, generated through red tape. Assume in particular that the government can impose a time cost of $H$ on each individual in the informal sector.[12] Then the individual shifts into the informal sector if and only if $(1 + n_j)p_j f_{Lj}(L - H) > (1 - s_j)p_j f_{Lj} L$ or equivalently if $n_j > (H - s_j L)/(L - H)$.

Even though red tape imposes costs on those in the informal sector while collecting no revenue directly, still the government may well choose to create red tape. The key gain is the resulting shift of higher skilled individuals into the formal sector, with the resulting increase in tax revenue.

Stated formally, start from $H = 0$ and consider the change in the government's objective function from a marginal increase in $H$:

$$(3)\quad -\int_0^\infty \int_{-s}^\infty V_I(1 + n)wg(w, n)dndw + S' \int_0^\infty \left(\frac{s}{1 - s}\right) wL \frac{\partial n^*}{\partial H} g(w, -s)dw,$$

where $n^* = (H - sL)/(L - H)$ represents the skill level just indifferent between being in the formal or the informal sectors, so that $\partial n^*/\partial H = (1 - s)/L$, evaluated at $H = 0$. Expression (3) can easily be positive, in which case red tape is a useful means of expanding the formal sector. This is more likely to occur to the extent that $S' \gg V_I$ and $s \gg 0$, implying in addition that the average value of $n$ among those in the informal sector will be small or negative.

The Gordon-Li model took the range of values of the $a_j$, measuring the value to each firm $j$ of making use of the financial sector, as exogenous. While the state of skills and technology within the financial sector are largely outside of the direct control of the government, the government does control the regulatory environment under which the financial sector operates. Changes such as providing deposit insurance, or speeding the clearing of interbank payments, presumably will shift up the distribution of the $a_j$. Surprisingly, the government does not necessarily have an incentive to adopt such policies, even given the objective function we have assumed. Consider the welfare effects of an increase in the values of $a_j$ in industries at the bottom end of the distribution, sufficient to pull firms in these industries into the formal sector. They now pay at least some taxes,

11. One possible explanation for this poverty is that capital and skilled labor are complementary in production, so that the capital-intensive firms in the formal sector employ very few unskilled workers.

12. What if tax inspectors can learn each individual's productivity? They would then have an incentive to charge a firm an amount just sufficient to leave them indifferent to remaining in the informal sector, given $H$, enforced by the threat of revealing their income to the tax authorities. The only substantive change is a redistribution from informal firms to tax inspectors, leading in equilibrium to a fall in the amount $F$ they require in wages from the government. Given such a fall in the expense of imposing the costs $H$ on informal firms, the government may encourage such corruption.

which is in itself a welfare gain.[13] By documenting their activity with a bank, firms entering the formal sector should also now qualify for bank credit that they would not previously have had access to. This credit comes at the expense of loans to firms in industries already in the formal sector, who in this example face higher tax rates. On net, tax revenue could well fall, with the drop in payments from high-taxed sectors perhaps more than offsetting the taxes paid by firms newly entering the formal sector.

When the behavioral responses lead to a fall in tax revenue, efficiency falls as well, so that such an improvement in the performance of the financial sector may not be an attractive option to the government.

Of course, large enough improvements in the $a_i$ will necessarily be a welfare gain, since the constraints in equation (2) all become less binding and eventually nonbinding. Policy will change continuously with the relaxation of these constraints. In particular, as the financial sector improves, to begin with we expect to see a drop in the size of the informal sector, and with the broader tax base less extreme tax rates on the most capital-intensive firms. With smaller intersectoral distortions, the needs for distorting tariffs, inflation, state ownership of firms or banks, and use of capital taxes all drop.

One example of such a transition in policy, an example that led us to develop this model, is the case of China during the 1990s, as described in Gordon and Li (2005). At the beginning of this decade, the national government was unable to collect much of any revenue from small- and medium-sized firms, so that its tax revenue came almost entirely from taxes on larger state-owned firms.[14] Its observed policies were very much consistent with those forecast previously, with tax rates that varied strongly by sector, controls over the allocation of credit, and high tariff rates.[15] In 1994, there was a series of reforms that led to a sharp increase in the national government's ability to collect taxes from small- and medium-sized firms.[16] With this successful attempt to broaden its tax base, the national government shifted policy generally away from the policies forecast previously toward a set of more conventional policies, agreeing to cut tariffs through joining the World Trade Organization (WTO), eliminating government control over lending practices at the banks, shifting heavily away from re-

13. When firms just become willing to shift into the formal sector, by construction they are just indifferent. But the government receives extra revenue, so that there is a gain in overall welfare, and in efficiency.

14. In particular, local governments were responsible for monitoring and assessing taxes on small- and medium-sized firms, and were effective in hiding taxable activity from the national government.

15. There was little use of inflation, however.

16. An important part of this tax reform had the national government take over responsibility from local governments for monitoring and assessing taxes on smaller firms. In China, the role of the financial sector in tax enforcement was much more limited than in other developing countries, since each firm had a party representative whose job in part was to monitor the taxable activity of the firm. The level of government to which this party representative was responsible changed as of 1994.

liance on sector-specific excise taxes and taxes on capital (corporate income taxes) toward a broad-based value-added tax (VAT), and beginning the process of downsizing the size of the state-owned enterprises (SOE) sector, and the role of the government in this sector.

Even when increasing the value provided by the financial sector does raise welfare, however, it does not follow that subsidies to the financial sector, artificially raising the values of the $a_i$, raise welfare. Intuitively, a competitive banking sector will in equilibrium pass along the value of any subsidies to its customers, so that the maximum tax these customers will be willing to pay to make use of the banking sector goes up by just the size of the subsidy. The extra tax payments are then just sufficient to cover the cost of the subsidy.

More formally, assume that the costs to the bank of supplying services to firms in industry $j$, per dollar of sales that must be intermediated, is $x_j$, implying total costs of $x_j p_j(1 + \tau_j)f_j$. Similarly, assume the gross benefits to firms in industry $j$ from using the banks are $b_j p_j(1 + \tau_j)f_j$. With a competitive banking sector, the price firms pay for banking services equals the cost of provision of these services, so that the net benefits to firms equal $(b_j - x_j)p_j(1 + \tau_j)f_j \equiv a_j p_j(1 + \tau_j)f_j$. What if the government now provides a subsidy to the provision of financial services to this industry, paying some amount $\sigma_j p_j(1 + \tau_j)f_j$ to the banks? With a competitive banking sector, this subsidy will be passed along to the customers in the form of a lower price, so that the net benefits to a firm from using the financial sector rise to $(a_j + \sigma_j)p_j(1 + \tau_j)f_j$. Following the logic of equation (2), this figure now equals the maximum taxes that can be collected from this industry. Subtracting off the costs of the subsidy, however, the maximum *net* revenue from this industry remains equal to $a_j p_j(1 + \tau_j)f_j$. As long as all tax rates can adjust, the same revenue on net is collected with the subsidy as without.

The same argument also implies that taxes on the financial sector crowd out other sources of revenue one for one. Since it would be very difficult to design the tax structure on the financial sector to replicate the flexibility the government has in choosing each of the sales tax rates and the capital-income tax rate, taxes on the financial sector will normally end up being less effective than taxes on each of the industries making use of the financial sector.

### 1.1.3 Political Economy Model

There are a variety of modeling approaches taken within the political economy literature to characterize the nature of the implicit objectives faced by the government when choosing policies. The approach we take is inspired by the work of Grossman and Helpman (1994), who assume that special interests that have solved their internal free-rider problem can provide *contributions* to a party in power linked at the margin to the degree to which the party aids that interest group. The result is that the government

puts more weight on the utility of that interest group than it otherwise would.

To explain more perverse policies in developing countries, the presumption is then that these contributions distort policy more severely in developing than in developed countries. Distortions are least costly in the Grossman-Helpman framework when either no industries or all industries contribute, since in either case the weights remain undistorted across industries. If we assume that most all industries in developed countries actively lobby the government, then developing countries end up with worse policies if a smaller fraction of industries are able to lobby effectively.

Solving the free-rider problem within an industry is easier when there are fewer firms in the industry. We presume that capital-intensive industries have larger individual firms and fewer firms in the industry as a whole, so that the subset of industries able to lobby the government will largely represent the most capital-intensive sectors.

One issue, though, is how to capture the benefits going to an industry from any given government policies, since in the previous model the income of any individual simply depends on the amounts of labor and capital they provide to the market, and not on which industry they work for or invest in. In order to capture this, we instead assume that at the date that policy is being set factors cannot change industries, even if the supply of factors to their current industry can adjust in response to policy changes. In addition, for simplicity we assume that individuals work and invest in the same industry.

As shown in Bernheim and Winston (1986), the equilibrium bribes in such a setting are equivalent to those in which lobbying industries pay monetary bribes to officials equivalent to the benefits they receive due to the policies adopted by the government, relative to a given fallback position. The equilibrium bribe by industry $j$, denoted by $B_j$, then satisfies: $V_j(p_1(1 + \tau_1), p_2(1 + \tau_2), r_j, w_j; -B_j) + W_j(G) = U_j^*$. The default utility level, $U_j^*$, is determined from the constraint that the bribe must be sufficient to allow the government and the other bribing industries to do as well as they could have done collectively had this one industry not actively bribed the government—if not, the bribe would not be accepted.

For simplicity, we assume that bribes are as valuable to officials as explicit but unspent tax revenue. Certainly, both are cash that officials can use to finance perks if not private consumption. The only difference is that oversight and possible punishment for accepting under-the-table payments may be different than for using tax revenue for personal advantage.[17] To the extent bribes are less valuable to officials than extra tax revenue, then equi-

17. Grossman-Helpman (1994), in contrast, assume that bribes can only be spent on political campaigns, reflecting current institutional constraints in the United States. There are no similar constraints to our knowledge in any developing country.

librium tax rates in lobbying industries will be higher than we find in the following, and conversely.

If $j \in L$ is the set of industries that actively lobby the government, then the resulting objective function for the government is:

$$\max_{\tau_2,s_1,s_2,t_K,G}\left\{\sum_{j\notin L}(V_j + W_j) + \sum_{j\in L}(U_j^*) + S\left[\sum_j p_j(f_j - C_j) - G\right]\right\},$$

where we assume a composite individual working for each industry. Here, bribes show up implicitly in government revenue through their effects on equilibrium consumption among members of lobbying industries.

The resulting first-order conditions for $s_k$ equals

$$S'\left[\sum_j p_j\left(\frac{\partial f_j}{\partial s_k} - \frac{\partial C_j}{\partial s_k}\right)\right] = V_{kI}[p_k(1+\tau_k)f_k] \text{ for } k \notin L, \tag{4}$$

and

$$\sum_j p_j\left(\frac{\partial f_j}{\partial s_k} - \frac{\partial C_j}{\partial s_k}\right) = 0 \text{ for } k \in L,$$

where $V_{kI}$ denotes the marginal utility of income for the $k$th individual. For nonbribing industries, the government trades off the revenue it gets with the welfare loss to individuals. Since we assume that $S' > V_{kI}$, in equilibrium the efficiency costs of the tax must at the margin just offset the welfare gain from shifting a given amount of resources to the government. Note that an increase in the sales tax rate on lobbying industries matters only to the extent that it affects government revenue. No individual utilities change, since consumer prices are unaffected, while the effects on utility of any changes in factor prices in lobbying industries are fully offset through changes in the bribes.

The individuals' collective budget constraint equals

$$\sum_j p_j(1+\tau_j)C_j + \sum_{j\in L} B_j = \sum_j p_j(1-s_j)(1+\tau_j)f_j - t_K K, \text{ implying that} \tag{5}$$

$$\sum_j p_j\left(\frac{\partial f_j}{\partial s_k} - \frac{\partial C_j}{\partial s_k}\right) = \delta_k p_k(1+\tau_k)f_k + \sum_j p_j\tau_j\frac{\partial C_{jk}}{\partial s_k} + t_K\frac{\partial K_k}{\partial s_k} + p_k[s_k(1+\tau_k) - \tau_k]\frac{\partial k_k}{\partial s_k},$$

where $\delta_k = 1$ for $k \notin L$ and $\delta_k = 0$ otherwise.

Substituting into equation (4), it is straightforward to show that

$$\delta_k\left(1 - \frac{V_{kI}}{S'}\right) - \sum_j p_j\tau_j\varepsilon_I^{C_{jk}}\frac{C_{jk}}{I_k} - t_K\varepsilon_{p_k^*}^{K_k}\frac{K_k}{p_k^* f_k} = \frac{s_k(1+\tau_k) - \tau_k}{(1-s_k)(1+\tau_k)}\varepsilon_{p_k^*}^{f_k}, \tag{6}$$

where, $\varepsilon_Y^X$ represents the elasticity of $X$ with respect to $Y$, where $p_k^* \equiv p_k(1 + \tau_k)(1 - s_k)$ and where $I_k = p_k^* f_k - t_K K_k$. All three elasticities are positive under any reasonable assumptions.

To begin with, equation (6) suggests that the optimal effective tax rate $s_k(1 + \tau_k) - \tau_k$ will be negative for industries actively bribing the government to the extent $\tau_2 > 0$ and $t_K > 0$. At the optimum, a marginal increase in the subsidy to production in a lobbying industry should have no net effect on government revenue. While a marginal increase in the subsidy is in itself a net revenue cost, since more output needs to be subsidized, the extra production also generates extra revenue to the extent that the resulting increases in investment and consumption are taxable. At the optimal tax rates, these effects should exactly offset each other.

For firms not actively bribing the government, for whom $\delta_k = 1$, optimal tax rates presumably will be positive. If the three elasticities in equation (6) are the same among these industries, if there are no differences in the marginal utility of income across these industries, and if consumption patterns are the same for people in all industries, then the effective tax rate will be lower in more capital-intensive industries if $t_K > 0$, in effect to compensate for this other source of revenue from these industries.

The key forecasted difference in sales tax rates is then between industries that actively bribe officials and other industries. The forecast of a lower (or negative) tax rate on capital-intensive industries is one clear difference between the political economy model and the Gordon-Li model.

What about the optimal tariff rate? Consider the welfare effects of an increase in $\tau_m$ on imports of goods produced by bribing industries, with a compensating increase in $s_m$ so as to leave $s_m(1 + \tau_m) - \tau_m$ consistent with equation (6). This combined change in tax rates has no effects on the factor incomes of any individual, so does not help per se to redistribute to individuals in bribing industries. It does raise the consumer price for good $m$ faced by all individuals, and so helps aid those in lobbying industries to the extent that individuals in these industries tend *not* to consume the output from their own industries. As discussed in Saez (2002), such a tariff may also be justified on efficiency grounds if a drop in consumption of good $m$ leads to increases in factor supplies beyond what happens simply due to income effects.

Neither of these justifications for a tariff would exist if the utility function is weakly separable between consumption and factor supplies (e.g., $U[L, K, h\{C_1, C_2\}]$), and if the utility function is the same for individuals in different industries. Even if these assumptions are violated, there is no reason to expect that individuals working in favored industries tend *not* to consume output from these industries, or that factor supplies are more responsive to the prices of goods produced by capital-intensive industries. The model does not then help to explain the existence of tariffs protecting favored industries.

To what degree would subsidies to capital ($t_K < 0$) be used to aid bribing (capital-intensive) industries? Even better targeted would be a subsidy to capital invested in bribing industries, implemented for example through subsidized loans restricted to these industries.[18] Note that a reduction in the output tax rate, $s_k$, affecting bribing industries is equivalent to a proportional subsidy to both capital and labor employed within this industry. When could a further subsidy just to capital in the industry be chosen?

If all the individuals working in the industry collude together in bribing the government, then the government receives the benefits accruing to both groups, so a capital subsidy per se makes sense only if it has favorable efficiency effects. This could occur if the supply elasticity of capital is less than that for labor. As noted by Judd (1987), while the very short-run supply of capital is extremely inelastic, the long-run supply in contrast should be extremely elastic, suggesting if anything attempts to restrict taxes/subsidies to labor whenever the government has a longer time perspective.

If only the capital owners in an industry bribe the government, then the government does have an incentive to manipulate the returns to labor versus capital in the industry. Natural policies suggested by such an objective are subsidized loans to the industry or a tax structure within the industry favoring capital over labor income.

If capital but not labor is highly mobile across industries, the model would instead forecast a low uniform tax (or subsidy) rate on capital, a high tax rate on labor in the disfavored industries, and no tariffs. Following equation (6), the labor income tax rate in favored industries would have the opposite sign of the tax/subsidy rate on capital.

Whether capital is mobile or not, these results contrast sharply with the forecasts from the Gordon-Li model, which forecasts capital taxes as a way to focus the tax burden on firms that are most dependent on the financial sector, and heavier tax payments by capital-intensive than by labor-intensive firms.

If the government for some reason could not provide the desired differential sales or labor income tax rates in favored versus disfavored industries, then tariffs can be a second-best way of favoring certain industries. A tariff is second best since not only does it raise the returns earned within that industry but it also distorts consumer choices in ways that in general are not desired. In contrast to the Gordon-Li model, tariff protection would be given to sectors facing the lowest rather than the highest tax rates.

Grossman and Helpman (1994) fully recognized that their model would imply output subsidies for lobbying industries and no tariffs as long as the government can freely make use of this full range of policy tools. They as-

18. To induce banks to provide subsidized credit to particular customers, explicit subsidies to such loans, or loan guarantees, would be one approach. State ownership of the banking sector, with the government covering losses incurred on subsidized loans, is another.

sumed, though, that output subsidies were not available as an option to the government. The complication they note to justify this assumption arises from implications for the default utility levels $U_j^*$. Each industry must pay enough in bribes to ensure that the government plus other bribing industries together are at least as well off as they would be if they refuse the bribe. If these groups are in a position to aggressively exploit any given industry, then this industry will need to pay them a lot in exchange for changing policies. Their opportunity to exploit any given industry is less if policies are restricted to tariffs. They argue that this consideration dominates if there are few other industries that are not lobbying, since benefits to a newly lobbying industry then must come almost entirely from those who must be bribed. If the group of other industries that are not lobbying is large, however, then this issue will be second order relative to the gains from use of a more effective policy tool.

Among richer countries, where we presume that most industries actively lobby the government, their argument suggests that policies will be restricted to tariffs.[19] If the fraction of industries that actively lobby the government is small in developing countries, then even by their argument we would not expect to see any such restrictions on policy. In fact, excise taxes are an important component of the tax systems in developing countries. According to the political economy model, this should not be surprising. But given this, tariffs should not be used.

In the Grossman-Helpman model, the more industries that lobby the government, the lower is overall tax revenue. (Bribes of course do not show up in the reported revenue figures.) If fewer industries actively bribe the government in developing countries, then the size of government should be larger in developing countries, a forecast sharply contrary to the forecast from the Gordon-Li model.

Another implication of the political economy model is that as more industries actively bribe the government, concern with redistribution shrinks. In particular, the government has no ability left to affect the utility levels within bribing industries, since they are implicitly set at the default levels $U_j^*$ Any redistribution is restricted to individuals in nonbribing industries, yet the offsetting efficiency costs remain fully relevant. The larger the number of individuals working in bribing industries, therefore, the less is the concern with redistribution. If fewer industries are actively involved in bribery in developing countries, then these countries should focus more on redistributive effects of the tax structure, and so should place more weight on taxes, such as the personal income tax, that are particularly effective at

19. Lobbying industries would need to make this decision collectively, however, and in an enforceable way, since each industry on its own would prefer to be aided through output subsidies rather than tariff protection. While we know of no such explicit restrictions on policy, it is true that excise taxes/subsidies play much less of a role in richer countries than in poorer countries.

shifting the tax burden from rich to poor. This forecast is strongly contrary to that coming out of the Gordon-Li model, in which taxes on labor income should play little role in poorer countries.

Does the model help explain the greater prevalence of state ownership of firms among developing countries? One potential role for state ownership is to ensure that promised bribes are in fact paid, making it easier for the government to change policy as promised. Would we expect more pressure toward state ownership as a result in developing countries? We think not. State ownership presumably has high efficiency costs. Another potentially more effective mechanism for enforcing payments, assuming the government officials remain in power, is to ignore the industry's interests in future policy setting if it reneges on a promised payment now—a tit-for-tat strategy. This threat is more effective the longer the current government expects to remain in power. Our presumption is that tenure of government officials is longer in developing countries, making state ownership of less value as an enforcement mechanism there than in developed countries. State ownership would also plausibly be more prevalent when equilibrium bribes are larger. Equilibrium bribes should be larger in countries where more industries lobby the government, and so need to be compensated if chosen policies are not in their interests. Again, the model seems to suggest, if anything, more use of state ownership in developed countries.

Within this political economy model, there are no incentives per se to use inflation—there is no motivation for use of cash beyond those in the standard model. Similarly, there are no grounds for introducing red tape and other nontax forms of harassment. If activity in unfavored sectors is to be penalized, better to do it through the tax structure and collect revenue in the process.

### 1.2 Data on Behavior of Poorer Versus Richer Countries

We turn next to an analysis of available data on tax and related policies among a group of 125 countries for which we could obtain adequate data.[20] In the appendix, we list our data sources and the definition of the variables used in this paper. In reporting data, we have grouped these countries into four quartiles based on their GDP per capita in 1990 measured in constant 2000 U.S. dollars. Quartile 1 represents the richest countries, and quartile 4 the poorest.

We focus first on the evidence regarding forecasts from the Gordon-Li and the *political economy* models when they are the same, and then turn to forecasts that conflict between the two models.

20. We would very much like to thank Andrei Shleifer for making available to us the data used in La Porta, Lopez de Silanes, and Shleifer (2002), and Friedrich Schneider for making available to us his estimates of the size of informal economy.

Throughout we treat skill/technology differences across countries as exogenous, driving not only differences in GDP per capita but also the quality of the financial sector and the ease with which firms within an industry can coordinate on lobbying. Certainly, the types of policy differences we focus on can affect a country's long-run growth rate, and the utility provided from employing existing factor inputs, but these policy differences should have little direct effect on factor supplies or on overall output.

### 1.2.1 Similar Forecasts in the Two Models

Table 1.1 provides information regarding several forecasts that are comparable in the two models, even if the rationales are very different.

One forecast in common is that the tax structure in poorer countries will make more use of taxes with differential rates by industry. In the Gordon-Li model, tax rates will be higher on the capital-intensive industries, since they cannot so easily shift into the informal sector. In the political economy model, tax rates will be lower for capital-intensive industries, responding to their active lobbying efforts. So both models forecast rate differences by industry, though the direction of the forecasted rate differences are opposite.

The key tax whose rate easily varies by industry is nongeneral taxes on production and sales, primarily consisting of excise taxes. Column (2) of table 1.1 reports the fraction of tax revenue coming from nongeneral production taxes. The data show little variation in the use of excise taxes by income level, possibly because sin taxes and environmental (e.g., gasoline) taxes play a more important role in richer countries, offsetting the role of excise taxes both models focus on.

Unfortunately, at this point we have no data sufficient to test the conflicting forecasts between the two theories regarding which industries face lower versus higher tax rates. While our understanding is that poorer countries rely heavily on revenue from capital-intensive industries—particularly oil, mining, and other extractive industries, where tax collection is particularly easy—we have not at this point found data to confirm this impression.

**Table 1.1** **Tests when forecasts are similar**

| | GDP per capita in 1990 (2000 $) | Excise taxes (% of revenue) | Corporate taxes (% of revenue, 1990–2001 average) | Percent government ownership of banks, 1995 |
|---|---|---|---|---|
| Quartile 1 | 20,768 | 19.6 | 9.5 | 24.2 |
| Quartile 2 | 3,834 | 16.2 | 17.9 | 40.5 |
| Quartile 3 | 1,451 | 19.5 | 14.2 | 47.0 |
| Quartile 4 | 436 | 20.3 | 14.2 | 67.2 |

*Notes:* Countries are classified by GDP per capita in 1990 into four quartiles, with quartile 1 the richest and quartile 4 the poorest. The number in each cell is the average of each listed variable among countries in each income quartile.

Both models plausibly forecast more use of taxes on capital income among poorer countries. In the Gordon-Li model, this occurs in order to shift the tax burden onto the firms that are least likely to shift into the informal sector in response. If capital is mobile across sectors, then the political economy model trades off the desire to tax capital in nonlobbying industries and to subsidize capital in lobbying industries. If the aggregate size of the lobbying sectors is smaller in poorer countries, then capital-income taxes should be higher in these countries. We presume that the corporate income tax represents the main tax on income from capital and report the share of revenue coming from the corporate income tax in column (3) of table 1.1. This share shows a weak pattern of being higher in poorer countries, but the evidence is not dramatic.

Both models also suggest that poorer countries could well use state-owned banks as a mechanism to provide cheap credit to capital-intensive firms. In the Gordon-Li model, this is done to redirect credit to sectors paying high tax rates. In the political economy model, this is done if capital owners in particular lobby the government. As seen in column 4 in table 1.1, the fraction of the ten largest banks owned by the government is substantially higher in poorer than in richer countries, though state ownership of banks is still nontrivial even in rich countries. No data are available on whether firms receiving subsidized loans pay unusually low or unusually high tax rates.

### 1.2.2 Contrasting Forecasts in the Two Models

One clear difference in the forecasts from the two models regards the size of tax revenue relative to GDP. In the Gordon-Li (GL) model, enforcement is more difficult in poorer countries, due to a poorer quality financial sector, so that revenue is lower. In contrast, in the political economy (PE) model, tax revenue is higher in poorer countries given the assumption that fewer industries actively lobby the government. The evidence is reported in column 1 of table 1.2. Here, we find that revenue as a fraction of GDP in the richest quartile is double that in the poorest quartile, and a strongly increasing function of per capita GDP, consistent with the GL but not the PE model.

The two models also have conflicting forecasts regarding the use of tariffs. In the Gordon-Li model, tariffs would clearly be attractive if the country is a net importer of capital-intensive goods.[21] In the political economy model, tariffs would not be used unless lobbying industries collectively manage to restrict any aid they receive to take the form of tariff protection. The model forecasts that this restriction could well be imposed in richer countries, where most industries lobby the government, but not in

21. In standard trade models, poor countries specialize in labor-intensive industries, and so should be importers of capital-intensive goods.

**Table 1.2** **Tests when forecasts differ**

| | Tax revenue (% of GDP, 1990–2001 average) | Tariff revenue (% of revenue) 1990–2001 average | Personal income plus sales taxes (% of tax revenue, 1990–2001 average) | Seigniorage (% of GDP, 1990–2001 average) | SOE output (% of GDP) | Cost to register a business (% of GNI per capita, 2001–02 average) | Informal economy (% of GDP, 1990–91) |
|---|---|---|---|---|---|---|---|
| Quartile 1 | 26.6 | 6.0 | 50.0 | 0.5 | 0.1 | 0.11 | 13.5 |
| Quartile 2 | 21.4 | 17.7 | 37.0 | 1.7 | 1.8 | 0.21 | 26.9 |
| Quartile 3 | 17.5 | 22.3 | 32.7 | 2.1 | 1.5 | 0.50 | 34.2 |
| Quartile 4 | 13.3 | 28.8 | 30.2 | 2.3 | 8.4 | 1.97 | 28.8 |

*Note:* See table 1.1 notes.

poorer countries. The evidence on tariffs is reported in column 2 of table 1.2. Tariffs are used far more heavily in poorer countries, consistent with the GL but not the PE model.

Another forecast that differs across the two models regards the use of the personal income tax or broad-based taxes on consumption. In the GL model, such taxes on labor income (when earned or spent) should play little role, since this shifts the tax burden onto the firms least tied to the financial sector. In contrast, in the PE model, redistribution should matter more in poorer countries, where a smaller fraction of the economy is actively involved in lobbying. The data on the fraction of tax revenue collected by the personal income tax and general taxes on goods and services is reported in column 3 of table 1.2, and shows much more of a role for broad-based taxes in richer countries, consistent with GL.

Another difference between the two models regards inflation. The GL model forecasts inflation as a way to tax the informal sector, representing the only sector that relies heavily on cash transactions. The PE model follows the conventional optimal tax model in forecasting no use of an inflation tax. The size of seigniorage as a fraction of GDP is reported in column 4 of table 1.2. Here we do find that poorer countries rely far more heavily on inflation taxes than do richer countries, consistent with GL.

The models also differ in their forecasts regarding the prevalence of state ownership of firms. In the GL model, state ownership is used to offset the distortions created by the high tax rates on these firms. In the PE model, state ownership is one mechanism to ensure that bribes are in fact paid in response to favorable policies. Since equilibrium bribes should be larger in developed countries, where more industries must be compensated if the chosen policies are contrary to their interests, the model suggests greater pressure toward state ownership among developed countries. Column 5 of table 1.2 documents that the output of SOEs as a share of GDP is much larger in poorer countries, consistent with the GL model.

A further difference regards the use of red tape to hinder activity in labor-intensive sectors, and in the informal sector. Such policies fall out naturally in the GL model as a way to hinder activity in sectors that pay little or no taxes. In the PE model, regular income and sales taxes dominate use of red tape. In column 6 of table 1.2 we report data on one possible indicator of red tape: the cost to register a new business.[22] These costs are clearly higher in poorer countries, consistent with GL.

The two models focus on very different attributes of an economy in making forecasts for policy. In the GL model, the driving force is a poorly functioning financial sector, making it all too easy for firms to shift into the cash economy in order to avoid taxes. We should then see poorer countries

22. Results are qualitatively the same using another possible indicator: the time required to start a business legally.

having much larger informal sectors, because of their more poorly functioning financial sectors. In the PE model, rather than having the small firms that constitute the informal sector being de facto tax exempt, taxes should fall primarily on these firms. Data on the size of the informal sector are reported in column 7 of table 1.2. The size of the informal sector as a fraction of GDP in the poorest quartile is more than double that in the richest quartile, consistent with GL.

To test for evidence that the informal sector tends to be large when the financial sector functions poorly, we ran a regression forecasting the size of the informal sector as a function of one or another indicator of the quality of the financial sector, along with log (per capita GDP), average literacy, and population density as control variables.[23]

Results are reported in table 1.3. Columns 1 and 2 report results for unweighted regressions. As robustness checks, in columns 3 and 4 we weight observations by GDP (in U.S. dollars) while in columns 5 and 6 we weight by population. In all of these specifications, a poorly functioning financial sector strongly predicts a large informal sector, whereas the other control variables play little role.

In the PE model, the key driving force of course is political lobbying pressure that leads governments to favor one sector over another. If politics is playing such a dominant role in the choice of tax policy, we would expect to see very different tax policies chosen by governments that are classified as left wing versus right wing. To provide some evidence on this, we recalculate the figures on tax policy reported in table 1.1, instead classifying countries into four quartiles based on their ideological orientation, with quartile 1 being the most right wing and quartile 4 being the most left wing. Results appear in table 1.4. Here, we find that ideology has no obvious connection to tax policy, except perhaps for a higher reliance on tariffs by the most left-wing governments.

## 1.3 Conclusions

Tax policies in practice differ dramatically between poorer and richer countries. Richer countries rely primarily on broad-based income and consumption taxes, and make little use of tariffs or seigniorage as sources of revenue. Poorer countries, in contrast, make much less use of broad-based taxes, relying instead on excise taxes, tariffs, and seigniorage. In the process, though, they collect much less revenue as a fraction of GDP than is collected in richer countries. Corruption and red tape are also far more common in poorer countries.

23. One indicator is overhead costs in the financial sector, relative to its total assets. The other is the interest rate spread, measured by net interest revenue divided by the stock of interest-bearing assets.

**Table 1.3** **Factors affecting size of informal economy**

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Overhead costs | 1.752 | | 1.772 | | 2.028 | |
| | (0.584)*** | | (0.494)*** | | (0.624)*** | |
| Interest rate spread | | 1.081 | | 1.571 | | 1.430 |
| | | (0.53)** | | (0.388)*** | | (0.550)** |
| Log(GDP per capita) | –0.031 | –0.030 | –0.010 | –0.011 | 0.002 | 0.007 |
| | (0.016)* | (0.017)* | (0.013) | (0.013) | (0.016) | (0.016) |
| Adult literacy rate | –0.060 | –0.026 | –0.065 | –0.028 | –0.176 | –0.166 |
| | (0.097) | (0.101) | (0.108) | (0.102) | (0.090)* | (0.094)* |
| Log(population density) | –0.003 | –0.005 | –0.012 | –0.008 | –0.027 | –0.023 |
| | (0.010) | (0.010) | (0.010) | (0.010) | (0.012)** | (0.013)* |
| No. of observations | 60 | 60 | 60 | 60 | 60 | 60 |
| Adjusted $R^2$ | 0.23 | 0.16 | 0.41 | 0.44 | 0.35 | 0.31 |

*Notes:* In all the regressions, the dependent variable is the size of informal economy in 2001. An intercept term is included in all regressions, but its estimates are not reported in the table. Columns (1) and (2 show estimates of coefficients and their standard errors resulting from ordinary least squares regressions on the cross-section of countries. Columns (3) and (4) report results from weighted least squares regressions using the 1999 GDP in current U.S. dollars as the weighting variable. Columns (5) and (6) report results from weighted least squares regressions using the 1999 population as the weighting variable. Numbers in parentheses are standard errors.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

**Table 1.4 Tests for role of ideology in tax policy**

| | GDP per capital, 1990 (2000 $) | Tax revenue (% of GDP) | Tariff revenue (% of GDP) | Income taxes (% of revenue) | Income taxes + VAT (% of revenue) |
|---|---|---|---|---|---|
| Quartile 1 | 6,956 | 20.0 | 15.8 | 31.9 | 45.6 |
| Quartile 2 | 10,778 | 22.3 | 13.6 | 36.2 | 48.9 |
| Quartile 3 | 8,465 | 23.9 | 11.3 | 31.7 | 48.3 |
| Quartile 4 | 2,556 | 17.7 | 26.3 | 30.5 | 46.1 |

*Notes:* Countries are classified into four quartiles by the average ideological orientation of the chief executive's party in the period 1980 to 1989, with quartile 1 the most right wing and quartile 4 the most left wing. The number in each cell is the average of each listed variable among countries in each income quartile.

The question this paper focuses on is why these policy differences arise. We develop the implications of two alternative models for such policy differences. One, a model initially developed in Gordon-Li (2005), focuses on the tax enforcement problems that arise when firms find it easy to shift into the cash economy, thereby avoiding leaving any paper trail and making tax enforcement extremely difficult. The government is then left relying for revenue on the remaining industries that cannot so easily shift into the cash economy to evade tax. With such large differential tax rates, a wide range of other policies may make sense as second-best means to lessen the resulting misallocations. Within this model, the policies forecast are *third* best, handling as well as is feasible the informational problems faced in collecting revenue.

The second model assumes that the political pressures faced in poorer countries are very different than in richer countries, leading to a very different set of policy choices. If particular industries in poorer countries have been able to lobby the government effectively for protection, then the chosen policies can be very different than when political support for the government is more broad based, at least across industries. If such political pressures explain the perverse policies chosen in poorer countries, then there are clear grounds for using international agencies to help induce countries to shift to policies more in the interests of their population as a whole.

In this paper, we explore the implications of such a political economy model in detail, building on the framework developed in Grossman-Helpman (1994). While such a model easily forecasts more favorable sales tax rates or income tax rates on factors employed in favored industries, it does not so easily explain tariffs, seigniorage, or red tape. Only if sales or income tax rates cannot vary by industry to the extent desired might tariffs make sense.

The paper then reexamines the data to see to what degree each model is

consistent with the data. Some forecasts are naturally in common, while others are very different. As discussed in the paper, the forecasts from the two models differ sharply with regard to the relative use of tariffs, seigniorage, capital-income taxes, personal-income taxes, and the overall size of tax revenue in poorer versus richer countries. In each case, the forecasts from the Gordon-Li model are very much consistent with the data, while those from the political economy model are not.

The paper in addition examines data related to the key underpinnings of each model. In the Gordon-Li model, a weak financial sector implies that little is lost by a firm from shifting to the cash economy as a means of evading taxes. Countries with a poorly functioning financial sector should then as a result have a large informal economy, and with a large informal economy choose a *perverse* tax structure to deal with the resulting pressures. We document both such relationships.

In the political economy model, tax policy should depend heavily on the nature of the political pressures faced by the government. Left-wing governments represent ones that face very different pressures than right-wing governments, and so should choose very different tax policies. We examine to what degree this is true, and find little difference in tax policies across governments of different ideologies.

Unfortunately, some of the key differences are not at this point testable; for example, the Gordon-Li model forecasts that the highest tax rates will be paid by capital-intensive industries (that find it hardest to shift to the cash economy), whereas in the political economy model these industries should face the lowest tax rates (since they can most easily solve the internal free-rider problems and lobby the government for support).

The data at this point are limited, so no tests are definitive. That the implications of the two models for policy are so different implies that much is at stake in such tests. Within the political economy model, the key problem is differences in the political pressures faced in poorer than in richer countries, and in particular the smaller fraction of industries in poorer countries that are organized enough to lobby the government. Outside pressure to adopt more conventional tax policies can potentially compensate as a way to aid the population as a whole. In the Gordon-Li model, in contrast, the key problem is a weak financial sector, making tax evasion easy. Reform efforts then need to focus on improving the quality of the financial sector. Outside pressure to shift to more conventional tax policies, without simultaneously improving the financial sector, will likely cause more harm than good.

There certainly is a large body of empirical work at this point suggesting the importance of financial sector reforms in economic growth. The Gordon-Li model provides a different underpinning for the role financial reform plays, arguing that financial reform improves not only the allocation of credit across firms but also induces a shift in government policies more broadly to ones that create fewer distortions to market allocations.

# Appendix

**Table 1A.1 Description of the variables**

| Variable name | Description and source |
|---|---|
| | *Taxation* |
| Tax revenue (% of GDP) | Tax revenue (GFS line 11) as a proportion of GDP, average for the period 1990 to 2001. *Source:* Authors' calculations based on IMF (2004). |
| Tariff revenue (% of GDP) | Taxes on international trade and transactions (GFS line 115) as a proportion of GDP, average for the period 1990 to 2001. *Source:* Authors' calculations based on IMF (2004). |
| Income taxes (% of revenue) | Sum of personal and corporate income taxes (GFS line 1111 and 1112) as a proportion of tax revenue (GFS line 11), average for the period 1990 to 2001. *Source:* Authors' calculations based on IMF (2004). |
| VAT (% of revenue) | Value-added taxes (GFS line 11411) as a proportion of tax revenue (line 11), average for the period 1990 to 2001. |
| Corporate income taxes (% of revenue) | Corporate income taxes (GFS line 1112) as a proportion of tax revenue (GFS line 11), average for the period 1990 to 2001. *Source:* Authors' calculations based on IMF (2004). |
| Seigniorage (% of revenue) | Seigniorage is measured as the increase in reserve money (IFS line 14). *Source:* Authors' calculations based on IFS (2005). |
| | *Regulation of entry* |
| Cost to Register a Business (% of GNI per capita) | The cost of obtaining legal status to operate a firm as a share of per capita GNI, average for 2001 and 2002. It includes all identifiable official expenses. *Source:* World Bank (2005). For data methodology, see Djankov, La Porta, Lopez de Silanes, and Shleifer (2002). |
| Time to Start a Business (days) | The time it takes to obtain legal status to operate a firm, in business days, average for 2001 and 2002. *Source:* World Bank (2005). For data methodology, see Djankov, La Porta, Lopez de Silanes, and Shleifer (2002). |
| | *Informal economy* |
| Size of informal economy (% of GDP) | Measured as the size of shadow economy estimated by Schneider (2004), using methodology documented in Schneider and Enste (2000). Estimates for 1990–91 and 2001–02 are used in this paper. |
| | *Government ownership* |
| Government ownership of banks in 1995 | Share of the assets of the top 10 banks in a given country owned by the government of that country in 1995. *Source:* La Porta, Lopez de Silanes, and Shleifer (2002). |
| SOE output (% of GDP) | SOE value added of all nonfinancial SOEs as a proportion of GDP of the economy at market prices, average for the period 1978 to 1981. *Source:* La Porta, Lopez de Silanes, and Shleifer (2002). |
| | *Quality of the financial sector* |
| Overhead costs, 1980–89 | Accounting value of a bank's overhead costs as a share of its total assets, average for the period 1980 to 1989. *Source:* Beck, Demirgüç-Kunt, and Levine (2000), updated data published March 14, 2005. |

(*continued*)

**Table 1A.1** (continued)

| Variable name | Description and source |
|---|---|
| Interest rate spread, 1980–89 | Accounting value of bank's net interest revenue as a share of its interest-bearing (total earning) assets, average for the period 1980 to 1989. *Source:* Beck, Demirgüç-Kunt, and Levine (2000), updated data published March 14, 2005. |
| | *Ideology* |
| Right-wing ideology, 1980–89 | Average of the ideological orientation of the chief executive's party for the period 1980 to 1989. The ideological orientation is coded as 1 for right, 0 for center, and –1 for left. |
| | *Other variables* |
| GDP per capita, 1990 | GDP per capita in 2000 constant dollar, converted using market or official exchange rate. *Source:* World Bank (2005). |
| Adult literacy rate, 1980–89 | Percent of people ages 15 and above who are literate, average for the period 1980 to 1989. *Source:* World Bank (2005). |
| Population density, 1980–89 | Number of people per square kilometer, average for the period 1980 to 1989. |

*Source:* World Bank (2005).

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## Comment

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The Gordon-Li paper provides a stimulating and insightful analysis on why certain *perverse* economic policies are adopted in developing countries. For instance, why do they adopt possibly harmful inflationary policy, set up high tariffs, pursue state ownership of firms and banks, and tolerate resource-wasting red tapes? In the literature, the rent-seeking approach, or its variants, such as the political economy model advanced by Grossman and Helpman (1994), can be used to address some of these issues. Interest groups, who have different degrees of political influences, can lobby the government to choose policies in their favor. The outcomes are often undesirable from the perspective of efficient allocation of resources.

The Gordon-Li paper proposes a competing hypothesis to the political economy approach. It highlights the difficulties of tax collection in many developing countries. The significant transaction costs involved could induce them to adopt various kinds of second or third best policies for making tax collection more effective.

According to Gordon and Li, their model can generate some outcomes that are similar to those of Helpman and Grossman, but there are also sharply different implications. The more important ones are as follows. First, companies in capital-intensive industries are more likely to pay lower taxes in the Grossman-Helpman model because they are lobbyists that are more powerful. On the other hand, in the Gordon-Li model, they are viewed as those that cannot escape from the tax agencies and therefore are forced to pay more. Second, Gordon and Li believe that the Grossman-Helpman model is not able to explain why governments, especially those in developing countries, adopt inflationary policies. But in the Gordon-Li model, this is taken as a convenient means for governments that lack effective tax agencies to collect revenues. Third, Gordon and Li believe that the Grossman-Helpman model cannot explain why red tape exists. The former

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