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Controlling Fiscal Corruption

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Abstract

This paper examines the issue of controlling fiscal corruption by providing incentives to fiscal officers. First, a case study of a successful attack on corruption is presented that shows the importance of attending to the conditions of service of fiscal officers. Second, a model is developed drawing on the conclusions of the case study that shows their consistency with optimization behavior. It confirms that simply providing bonuses is not enough. Corruption at higher levels of management has to be contained so as to allow bonuses to become more effective, and thereby to initiate a virtuous circle.

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Contents

SUMMARY

It is increasingly recognized, when developing strategies to improve fiscal performance, that issues of fiscal corruption should be addressed in addition to the design of taxes and expenditures and their administration. However, the literature, especially in its modeling efforts, has tended to emphasize the behavior of the briber. Remedies frequently suggested are the lowering of tax rates, imposing adequate penalties on both the briber and bribee, and reducing the discretionary power of fiscal officers.

It may be as, if not more, important to improve the conditions of service of fiscal officers and provide adequate incentives for the desired behavior. The paper adopts a two-pronged approach in developing this aspect. First, a case study of how rampant fiscal corruption was brought under control is presented. Second, key findings from it are used to motivate an analytical framework that is set up. The resulting model is then employed to examine the responses of the involved parties and to analyze the circumstances under which bonus payments to tax officers can promote less corrupt outcomes. The model confirms the appropriateness of the reform strategy discussed in the case study.

The overall conclusions are that incentive payments to fiscal officers can work, but that simply providing bonuses is not enough: corruption at higher levels of management must also be contained so as to allow the bonuses to become more effective. If properly handled, a virtuous circle could be initiated that progressively shrinks the gap between reported and true tax liabilities.

I. INTRODUCTION

It has been widely observed that insufficient domestic resource mobilization is at the root of the adjustment and growth problems faced by many countries, including especially those transiting to a market economy. To remedy this situation the basic strategy has relied on reforming the design of taxes and expenditures and their administration. The often less than satisfactory outcome of this strategy has led to a growing perception that corruption and its corrosive effects on fiscal performance should also be addressed.[2]

It is difficult, however, to obtain adequate information on corruption because the involved parties naturally strive for concealment. Broadly, some indication of the extent of corruption can be obtained by comparing the theoretical yield of taxes and actual collections, but the shortfall could also be caused by other factors such as the poor organization and administration of the tax departments. Detailed information on behavioral responses is not readily available and recourse is therefore often had to anecdotal accounts. Such a situation does not facilitate the construction of an analytical framework to explain corruption and ways to control it.

In the literature, three basic factors have been identified as contributing to corruption.[3] The first, is the overall level of potential benefits, which concerns the payoffs from evasion in the case of taxes or excessive billing of government expenditures. The second, relates to the costs of bribery, or the penalties and sanctions applicable to the briber and bribee. The third, concerns the bargaining power of officials, or the extent of exclusive discretionary powers in the hands of individual bureaucrats. An environment riddled with high tax rates, a poor record of applying sanctions, and considerable powers vested in the hands of officers is likely to exhibit high levels of corruption. Suggested remedies follow readily: lower tax rates; apply adequate penalties more rigorously; and reduce the discretionary powers of fiscal officers, with the last two applicable in the area of government outlays.

However, these remedies may not be adequate. It may also be necessary to address issues concerning the conditions of service and more generally the motivation of fiscal officers. Obviously, if officers are poorly paid, or become so as a consequence of an adjustment strategy, for example, wage control in a context of massive price increases, they might be more inclined to engage in corruption.[4] Should the top echelons of government be

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[2]See, among others, Klitgaard (1988), Rose-Ackerman (1978, 1997), and Tanzi (1997). For institutional recognition in a multilateral context see the just released Governance Guidance Note of the IMF (1997).

[3]Thus see Rose-Ackerman (1978)

[4]Van Rijckeghem and Weder (1996)

corrupt there is likely to be a contagion effect on lower levels.[5] This effect could become more pronounced if it is generally perceived that the administrative structures are being used to promote the self-interest of their managements rather than the mandated objectives, and if officers view their own career progression to be based not on objective criteria linked to the latter, but on the extent to which they compromise with higher levels. Establishing an organizational structure that is less conducive to compromising behavior, with the appropriate *esprit de corps*, can help contain contagion effects, as would payment of a bonus, especially if emoluments are inadequate. For such measures to gain in effectiveness it would seem essential to reduce corruption at higher levels.

Much of the discussion in the literature, especially the attempts at formal modeling, have focussed on the behavior of the briber, for example, the taxpayer.[6] Less attention has been paid to the behavior of the fiscal officer, their conditions of service, and their motivation, which is the focus of this paper.[7] To address these issues, a two-pronged approach is adopted. First, a case study of how rampant fiscal corruption was brought under control, and revenue performance markedly improved, is presented in Section 2. Key features of this case study underlie the framework that is set up in Section 3 to analyze how bonus payments to tax officers can promote less corrupt outcomes. Obviously, generalizations based on a single case study should be viewed with caution, but if they can be shown to accord with optimization behavior they gain in plausibility.

II. A Case Study

Developments in the Ghanaian economy are of considerable interest to the study of the adverse effects of fiscal corruption and how they may be contained. In the 1960s and 1970s the economy underwent a sustained decline. This was a result of adverse terms of trade and domestic policies that became increasingly more interventionist. Price and income controls became widespread and drove much of the economy underground.[8] This, of course, contributed to a decline in taxable capacity.

Growth in corruption

Initially, attempts to recoup revenue relied largely on raising tax rates. However, the revenue response was inadequate as the tax bases declined further. To supplement the

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[5] See Andvig and Moene (1990).

[6] The classic reference is Allingham and Sandmo (1972).

[7] See, however, Besley and McLaren (1993), Flatters and MacLeod (1995), and Haque and Sahay(1996), who examine incentive effects but without the explicit treatment of bonuses as is done here. Our approach is closer to that of Mokherjee and Png (1995).

[8] See Chand (1993).

dwindling resources of the state a variety of quasi-fiscal measures were also introduced such as multiple exchange rates, foreign exchange rationing, negative real interest rates and credit rationing. Rent seeking was thereby stimulated, which expanded to the point where the productive economy collapsed. Declining state resources forced eventually a curtailment of expenditures, including deep cuts in the salaries of captive civil servants and in essential infrastructure and social outlays. The result was a series of major breakdowns, including in critical areas such as telecommunications, energy generation, the transport network and ports, which contributed to a collapse in exports and in economic growth. The consequent shortages in domestic supply, compounded by the severe rationing of foreign exchange in the face of export collapse, growing external debt arrears and eventual exclusion from the international capital markets, led to high rates of inflation. In turn this contributed to a highly skewed distribution of income. Civil servants, in particular, who had been amongst the most highly paid in the country, had by 1983 experienced a real erosion in their salaries to about one-sixth of what they had been in earlier times.

Tax evasion became rampant. As is indicated in Table 1, by 1983 the tax ratio had progressively collapsed to 4.5 percent of GDP from around 13 percent in 1973 and even higher in earlier years. The tax system became riddled with all sorts of devices that were used by fiscal officers to supplement their incomes. A prominent instrument was the use of tax clearance certificates, which were required for a growing range of transactions, for example, acquiring trading licences, a passport, and so on. The tax and customs administration became increasingly disorganized. This manifested itself in several ways including the haphazard storage of taxpayer files, which were in any case poorly organized, the mixing up of assessment and collection functions in the hands of the same officers, and the virtual cessation of properly conducted audits. Such practices of course made it easier for corrupt tax officers to collect rents.

The reform

The takeover by the Rawlings regime at end-1981, on an anti-corruption platform, was the start of a far reaching reform of the economy. At first, in an attempt to contain corruption and to raise revenue extreme measures were taken. Some officers charged with being corrupt were executed; untrained revolutionary cadres were assigned to identify potential taxpayers and to collect taxes; general exhortations to pay taxes were made; and sanctions were threatened in the event of nonpayment. An ominous sounding "National Investigations Committee (NIC)" paralleled by another body called the "Office of Revenue Commissioners (ORC)" were set up to enforce fiscal obligations, if necessary through arrest and seizure. However, these measures appeared to have had only temporary effects. A frightened population or terrified tax officers may turn in more revenue for a time, but if the overall organizational setup is not reformed and adequate incentives provided to tax collectors, revenue will subside. The likelihood for such an outcome increases when tax collectors continue to be paid below subsistence levels and the population remains harassed and subject to very high transaction costs.

Table 1. Ghana: Fiscal Collapse and Recovery[1]

(ratios to GDP)

	1973[2]	1976[2]	1983	1988	1994
Total Revenue and grants	15.0	9.1	5.6	14.6	25.9
Tax revenue	12.8	8.1	4.6	12.3	17.0
Direct taxes	2.8	1.7	1.0	3.9	3.4
Taxes on domestic goods and services	2.8	2.7	0.9	3.7	6.2
Taxes on international trade	7.2	3.5	2.7	4.8	7.3
Total expenditure and net lending	19.1	14.5	8.2	14.3	23.5
Current expenditure	14.6	8.9	7.4	10.6	18.1
Capital expenditure	3.2	2.4	0.6	2.8	4.1
Overall deficit	-4.1	-5.4	-2.7	0.4	2.5

Source: Statistical Service of Ghana and Fund Staff Estimates

[1]Refers to Central Government

[2]Refers to fiscal year on a July/June basis. From 1983 onwards, the fiscal year was converted to a calendar year basis.

What can be done to improve the fiscal situation in a sustainable manner and, in particular, the revenue position? Three essential elements are involved that are inter- related: first, tax bases need to be coaxed back from the underground; second, taxpayers must be induced to pay taxes; and, third, tax officers must be motivated to collect them. A piecemeal solution involving only one or other of the preceding elements may not work. Simply improving the motivation of tax officers but not reforming a tax system that had become, at least on paper, punitive could wreak havoc on the private sector, which in collusion with the tax administration had in the past largely managed to escape the tax burden. Indeed, the tax system had become one of more or less voluntary payments of tax, where the amount to be paid bore little relation to the true tax liability, but was the outcome of a self-serving bargain between the taxpayer and the tax collector.

Subsequently, in 1984, the Rawlings Government initiated an integrated approach that was pursued over several years involving all of the three mentioned requirements. Tax rates were lowered in stages to more reasonable levels, for example, the top marginal rate of tax on income was reduced from 55 percent (65 percent on personal income) to 25 percent. The large number of excise duties was reduced and merged into a revamped manufacturer's sales tax, while the tax mix was changed in favor of indirect taxes on domestic production and consumption. In particular, reliance on harder to evade excise duties on gasoline products increased sharply. The taxes were generally simplified and steps taken to properly document them so as to render them more transparent. There was more recourse to withholding, rather than self-declarations, and also greater use of presumptive methods. These fiscal reforms were paralleled by actions to reduce key distortions such as the overvalued exchange rate, and its concomitant of rationing, so as to encourage tax bases to emerge from the underground.

A central element of the strategy, which was vigorously pursued from 1985 onwards, was to reorganize the revenue service. Considerable emphasis was placed on improving the conditions of service of tax and customs officers. Owing to the legal restrictions imposed by civil service rules, their pay could not be raised without parallel increases for the rest of the civil service. But a general pay increase could not be provided because of the lack of fiscal resources. The solution adopted to break this version of the chicken and egg problem was to introduce a bonus scheme. However, this could not be granted to each tax officer without providing similar bonuses to other ministry of finance officials. It was therefore decided to move the tax departments out of the Ministry of Finance and Economic Planning (MFEP) into a separately constituted revenue authority that would be headed by an exceptional individual of known integrity and drive.[9] The two revenue departments (Customs, Excise and Preventive Service (CEPS) and the Internal Revenue Service (IRS)), were taken out of the Ministry of Finance and Economic Planning and set up as autonomous institutions under the supervision of a new authority called the National Revenue Secretariat (NRS), which was headed by a minister of state with a very clear mandate. The newly constituted revenue service would be

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[9] In 1991, the NRS was placed under the control of the MFEP, but continues, together with the two revenue departments, to enjoy a high degree of autonomy.

fully responsible for collecting taxes but the formulation of tax policy would remain under the purview of the MFEP.

An important aspect involved strengthening the surveillance functions of the NRS, thereby making credible the minister's threat to keep an eye on the tax officers. A key measure was to weed out at the outset those officers who were regarded as irredeemably corrupt. Facilities were also set up to enable the general public to complain about corrupt officers. The internal structures of the income tax and customs departments were modified to ensure adequate separation between different revenue functions such as assessment and collection; offices were organized more efficiently; and taxpayer audits undertaken more frequently.

A mechanism for sizable, across-the-board, bonus payments to tax and customs officers was organized. Funds for the bonus payments were obtained by setting aside a significant percentage of the excess of any revenue collected over a target level. Part of the proceeds could, at the discretion of the heads of the two tax departments, be used for the improvement of facilities.[10] The use of such funds were subjected to *ex post* auditing. In effect this strategy involved substituting departmental rent seeking for individualized rent seeking, with the treasury as the intended beneficiary. This bonus system lasted until the end of 1992, by which time it was presumably felt that sufficient improvements in the conditions of service had occurred.[11] To further improve the general conditions of service conscious steps were taken to create an *esprit de corps.*

The outcome

Table 1 shows that the results from pursuing the integrated reform strategy were highly favorable. Despite the major reductions in tax rates, the tax ratio rose sharply from 4.5 percent in 1983 to over 12 percent of GDP by 1988, reaching 17 percent by 1994. To some extent, these increases reflect the success of the strategy implemented to reduce the size of the unofficial sector. However, a large part of the improvement is attributable to the reform of the tax administration and its better motivated officers. This can be established by noting that simply bringing into the open the unofficial sector and subjecting it to taxation need not raise the tax ratio. While revenue will rise, the GDP denominator also increases. Ignoring for the moment tax administration, increases in the tax ratio can occur provided new taxes are introduced or the tax system is progressive. Regarding the last, as noted above, the reforms reduced the nominal progressivity of the tax system. Although there were significant increases

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[10] Parallel with the bonus system, an incentive-based mechanism was employed for some years to provide resources to the revenue departments to cover their routine operations. The two departments were allowed to keep a certain percentage of the revenue collected, with the incentive being that if they needed more resources they would aim at a higher level of collections. See Terkper (1994).

[11] Terkper op.cit., mentions additional reasons why the bonus scheme was discontinued including that the practice was never backed by legislation.

in revenue from the introduction of the essentially new tax on petroleum products, this would account for only a part of the increase in tax ratios between 1983 and 1994. The conclusion has to be that administrative factors accounted for the bulk of the observed rise in tax ratios. Doubtless, revamped administrative procedures will have been a positive factor, but in the end it is the superior performance of the fiscal officer that makes the difference.

The revenue improvement enabled the government to increase both its current and capital expenditures. Together with a policy of civil service retrenchment, major wage increases were granted to civil servants. This resulted in sharp improvements in average real emoluments and was accompanied by an incentive-oriented decompression of the salary scale. Aside from contributing to greater efficiency of the government machine, the revenue increases made possible higher maintenance, infrastructural, and social outlays, which had for long been neglected, and paved the way for the rehabilitation of the economy. On the whole, the expenditure increases were undertaken responsibly as is indicated by the reduction in the overall deficit and its eventual conversion into sizeable surpluses.

A key conclusion emerges from this case study. Bonus payments can stimulate fiscal officers to greater efficiency provided the administrative set up is properly organized and corrupt managers weeded out or otherwise restrained.

III. Modeling Incentive Effects

The analysis is developed by reference to taxpayers, tax collectors, and their managers. In order to abstract from the diverse characteristics of taxpayers, the analysis refers to a "firm" that engages in the quintessential activity of attempting to increase its net profits which may include tax evasion. *Mutatis mutandis*, the same principle applies to other categories of taxpayers. We derive the impact of a bonus for the amount of tax collected by modeling the case with a bonus parameter γ, and then comparing the cases $\gamma = 0$ with $\gamma > 0$. The tax rate on profits is t.

The model

Assume the following sequence:

Stage (1) – the firm's behavior. The true profit is Π, but the firm may find it advantageous to report lower profits than the true level. According to the books, the reported profit is $R \leq \Pi$. The main idea below is that the firm chooses how much of its profits to report. To disguise the true profit, however, involves costs. The firm cannot run activities that are easily monitored by tax collectors, it must keep double accounts and so on. The costs of trying to evade taxes is captured by assuming that the true profit Π and the reported level R are related as $\Pi(R)$. It is assumed that $\Pi'(R) \geq 0$ for $R \leq \Pi$ and $\Pi'(R) = 0$ for $R = \Pi$. Moreover, $\Pi''(\cdot) < 0$.

Stage (2) – the tax collectors' behavior. The tax collector checks the books with an intensity μ implying that tax evasion is discovered with a probability μ. The tax collector chooses μ by the choice of how much work effort he is willing to put in. The cost of effort is denoted c and μ is increasing in c at a decreasing rate, hence $\mu = \mu(c)$ with $\mu'(\cdot) > 0$ and $\mu''(\cdot) < 0$. With a bonus scheme, the tax collector receives a fraction γ of all taxes he collects.

Stage (3) – threat points and the bribe. A tax collector who has found evidence for tax evasion may take a bribe b_1 for not reporting the firm. The level of the bribe b_1 is determined by bargaining between the firm and the tax collector. The agreement is constrained by the possibilities of both the firm and the tax collector to appeal the case to higher-level tax authorities.

Stage (4) – behavior of higher-level bureaucrats. Higher-level tax authorities handle the case if no agreement is found between the firm and the tax collector who claims to have evidence of tax evasion. By inspecting the books in the light of the evidence provided by the tax collector, higher-level tax authorities can always find out what the true profit is. But not all bureaucrats employed at this level are honest. A fraction θ of the higher level bureaucrats is corrupt and willing to take a bribe b_2 for reporting a taxable profit equal to R. Honest bureaucrats report what they find. The presence of corrupt officials implies that when a tax case is appealed, it is handled by a corrupt official with probability θ and by a non-corrupt official with a probability $(1 - \theta)$.

The analysis

We start backwards at stage (4) when the case is considered by higher level tax authorities. If the case is handled by a non-corrupt official, he collects the tax $t\Pi$. If the case is handled by a corrupt bureaucrat, he reports tR and receives a bribe b_2, determined by bargaining between the firm and the bureaucrat. The profit of the firm above the disagreement-level $(1 - t)\Pi$, is

$$\Pi - tR - b_2 - (1 - t)\Pi = t(\Pi - R) - b_2 \qquad \textbf{(1)}$$

The corresponding surplus to the corrupt bureaucrat is simply the bribe b_2. By applying the asymmetric Nash bargaining approach, the equilibrium bribe is just a share of the tax saved

$$b_2 = \alpha t(\Pi - R) \qquad \textbf{(2)}$$

where α is the bargaining power of the bureaucrat.

At stage (3), if tax evasion is identified, the bribe to a non-reporting tax collector b_1 is determined by bargaining. Both can use an appeal to higher-level tax authorities as a threat

against the other. Both sides perceive what will happen in that case: the firm obtains π_1 and the tax collector u_1 (in expected terms), given by

$$\pi_1 = \theta[\Pi - tR - b_2] + (1 - \theta)[(1 - t)\Pi] \quad (3)$$

$$u_1 = \theta\gamma tR + (1 - \theta)\gamma t\Pi \quad (4)$$

where, in both expressions, the probabilities of being treated by a corrupt official is θ. Letting the bargaining power of the tax collector be β and that of the firm be $(1 - \beta)$, the equilibrium level of the bribe is the value of b_1 that maximizes

$$[\Pi - tR - b_1 - \pi_1]^{1-\beta}[\gamma tR + b_1 - u_1]^{\beta} \quad (5)$$

which by inserting for π_1, u_1, and b_2 can be expressed as

$$b_1 = \phi t(\Pi - R) \quad (6)$$

where

$$\phi = \phi(\gamma,\theta) \equiv [(1 - \beta)(1 - \theta)\gamma + \beta(1 - \theta) + \beta\theta\alpha] \quad (7)$$

Observe that ϕ is less than unity and that ϕ, and, therefore, the bribe b_1 is increasing in the bonus parameter γ. The intuition is straight forward. The higher the bonus the more income the tax collector forgoes by not reporting the true level of profits, thus the higher the bribe has to be. It is also clear from (6) and (7) that ϕ and the bribe b_1 is decreasing in the incidence of corruption θ among higher-level tax authorities. The reason is that an appeal from the tax collector is a less severe threat to the firm as long as it can bribe its way also at this level, while an appeal by the firm would lead to a lower expected bonus to the tax collector the more corruption there is at this higher level. Thus a high level of corruption among higher-level bureaucrats makes the tax collector weaker and the firm stronger. Finally, it might also be noted that increases in the tax rate raise the level of the bribe.

At stage (2) the tax collector decides his work intensity μ. Consider the case where all tax collectors are dishonest. Thus the tax collector maximizes

$$U = \mu(c)(\gamma tR + b_1) + (1 - \mu(c))\gamma tR - c \qquad \textbf{(8)}$$

which give us the first order condition

$$\phi t(\Pi - R)\mu'(c) = 1 \qquad \textbf{(9)}$$

It is clear from (7) and (9) that the μ is positive even without a bonus, that is with (γ = 0). Without a bonus ϕ in (9) is just $\phi(0,\theta) \equiv \beta(1 - \theta) + \beta\theta\alpha$. Thus the possibility to obtain bribes provides work incentives for the tax collector. Moreover, since ϕ is increasing in the bonus parameter γ, the chosen work intensity μ goes up with the bonus for each level of tax evasion. Finally, it should be observed that the impact of an increase in the bonus on work effort becomes smaller when corruption of higher level bureaucrats goes up. In the limit, the impact of γ on work effort is zero when $\theta = 1$. The tax collector then obtains no expected gain in bonus income by appealing the case to higher level authorities. Thus there is no bonus income foregone by accepting the bribe for not reporting. Accordingly, there are no incentives to the tax collector to work harder with a bonus than without when all higher level bureaucrats are corrupt.

At stage (1) the firm determines R in order to maximize expected profits net of taxes and bribes. The maximand is

$$V = \mu[\Pi(R) - tR - b_1] + (1 - \mu)[\Pi(R) - tR] \qquad \textbf{(10)}$$

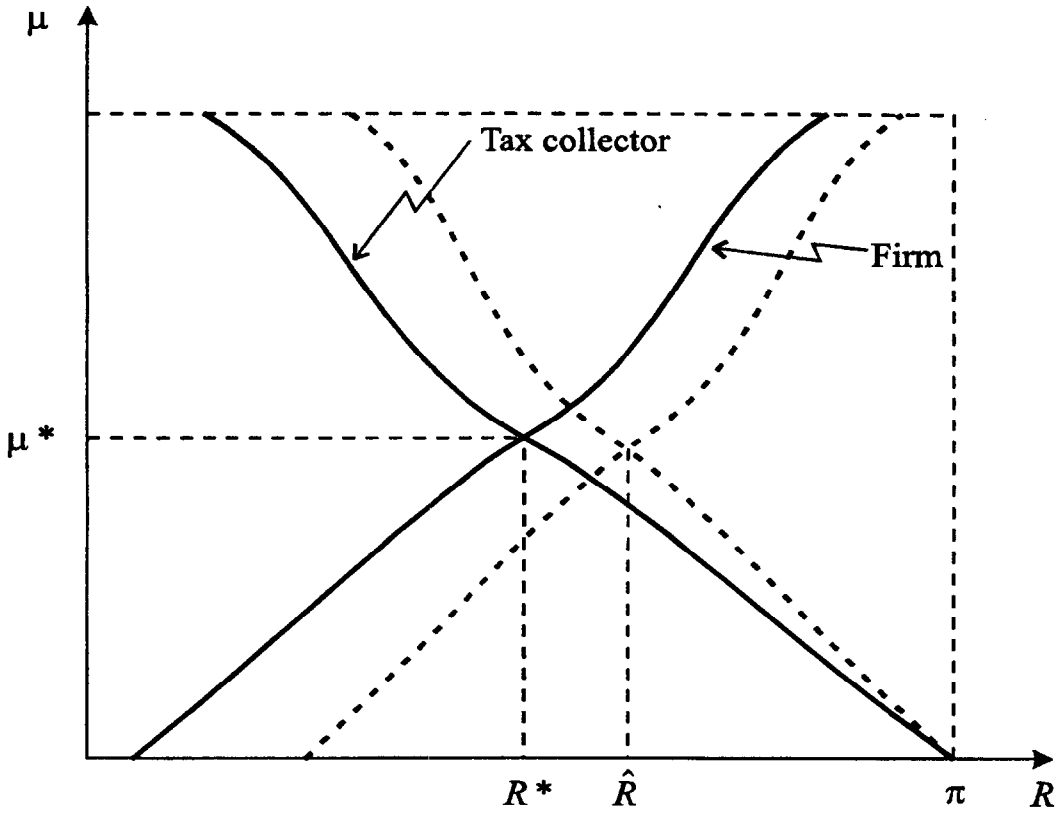
The first order condition for maximizing V with respect to R is

$$\Pi'(R) = \frac{t(1 - \mu\phi)}{1 - \mu\phi t} \qquad \textbf{(11)}$$

Since ϕ is increasing in the bonus parameter, the level of reported profits R is higher, the higher the bonus. The firm would know that with a bonus scheme tax collectors have to be paid higher bribes to be willing not to report any acts of tax evasion that they identify. This is captured by the impact on the RHS of (11) via the dependence of ϕ on γ in (7). In addition, firms can infer that with a bonus, tax collectors would work harder in order to identify tax evasions. This is captured by the impact on the RHS of (11) of the dependence of μ on γ from (9).

The equilibrium levels of μ and R are those that solve (9) and (11) simultaneously as illustrated in Figure 1. The downward sloping curve shows the tax collectors choice of μ for

Figure 1: Incentive Policies and Revenue Yield



each level of R (since for each R there is a unique $[\Pi I(R) - R]$). The upward sloping curve shows the firm's choice of reported profits R for each level of μ.

As illustrated in the Figure, an increase in the bonus parameter shifts both curves to the right, implying that the equilibrium level of reported profits goes up. An increase in corruption among higher level bureaucrats, however, shifts both curves to the left, implying that the equilibrium level of reported profits R goes down.

Some implications

It may seem as if a higher bonus parameter implies increasing corruption among tax collectors since the bribe b_1, all else being given, goes up with the bonus. All else, however, is not given. Tax collectors work harder and firms have less incentives to hide their true profits both because they have to pay higher bribes when detected and because for each level of tax evasion the probability of being detected goes up with the bonus. As a consequence, the gap between $\Pi - R$ narrows and even though tax collectors obtain a higher share of the gap with a bonus than without, the equilibrium bribes may very well decline with the introduction of a bonus.

As demonstrated, the efficiency of the bonus scheme depends on the incidence of higher-level corruption. It is, therefore, important to incorporate how the incidence of higher level corruption θ may be affected by the bonus to tax collectors. A simple and robust way to make θ endogenous is to assume that the incidence is increasing in the potential gain from acting corruptly captured by b_2. Thus let

$$\theta = F(\alpha t(\Pi(R) - R)) \qquad \textbf{(12)}$$

where $F'(\cdot) > 0$. Now we have an even more interesting closed loop of the impact of a bonus to tax collectors on the functioning of the tax system: A bonus implies that tax collectors work harder and that firms voluntarily report higher profits. This implies again that the gap between the true and reported profits $(\Pi - R)$ narrows which again reduces the incidence of corruption among higher-level bureaucrats according to (12). As θ goes down, work effort of tax collectors increase and reported profits of firms go up both because μ is higher for each level of tax evasion and because there is less to be gained by an appeal to higher level authorities. Thus introducing a bonus scheme leads to more honesty in parts of the administration that are not directly affected by the bonus. Moreover, a more honest administration makes the bonus scheme more efficient. Thus there is an honesty multiplier in the sense that a bonus makes firms act more honestly which also induces higher-level bureaucrats to act more honestly as there is less to gain from corruption. In turn this outcome induces firms to engage in less tax evasion and so on.

The tax collected is proportional to

$$T = tR \tag{13}$$

since in equilibrium the same amount is reported whether the tax collector detects tax evasion or not. In both cases, he only reports tR. The value of T is of course a gross tax and one may be concerned that even though R goes up, the net tax income after the bonus to tax collectors is paid, may go down. A bonus scheme, however, does not have to be excessively generous and adjustments can always be made to initial salary levels. The salary could be reduced by an amount not far from that of expected bonus incomes. If a target level of emoluments including bonuses is maintained, then the relevant tax income is rendered proportional to T in (13) and tax incomes unambiguously go up with the introduction of the bonus scheme.

IV. Conclusion

An extensive bonus scheme can be criticized as leading to an overly zealous tax collection authority. Such criticisms are appropriate when dealing with a country that has a settled, well run, tax system, decently paid tax officers, taxpayers who understand their obligations, proper accounting and reporting systems, etc. But in a situation where tax officers cannot be paid a living wage and where the general climate is one of pervasive rent seeking--unfortunately, a widespread condition in many transition and other developing countries--a less orthodox solution that has been successfully tried in some countries may be much more effective in the interim. Most fiscal officers, if properly trained, have a sense of professional pride and would not condone corruption. They become corrupt partly out of necessity or because of peer group pressure. The more senior the level at which corruption occurs, the more widespread the contagion.

The model set out above provides analytical support to the basic strategy that was pursued in Ghana to restrain corruption and to improve revenue performance. It brings out clearly the importance of attending, in an integrated manner, both to the conditions of service of fiscal officers and the organizational setup. Simply providing bonuses is not enough: corruption at higher levels of management has to be contained so as to allow bonuses to become more effective. The analysis of the model shows that once this process is initiated a virtuous circle can result that involves the progressive shrinkage of the gap between reported and true tax liabilities thereby reducing the incentive for corruption.

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