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Wages as Anti-Corruption Strategy: A Note

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Abstract

This note is concerned with a commitment towards incentive wages to tax auditors as anti-corruption strategy. We shall clarify a scheme that pays allowances tax auditors so that they do not tempted to take bribes is not socially desirable

Keywords: Anti-Corruption, Wages, Tax evasion

1. Introduction

For example, the Vietnam government has a scheme in place that pays allowances public servants so that they do not tempted to take bribes. Is this strategy desirable to society?

The subject of this note is corrupt practices in tax administration. In research on corruption in tax administration, with respect to which Virmani (1987) provided a pioneering work, the latest research is the three-tier structure model articulated by Singh (2008). On the other hand, Sosa (2004) provided a formal model of wage-corruption tradeoff using expected-utility model. In this paper, I will shed light on the social desirability of incentive wages to tax auditors using three-tier structure model.

In this note, regarding the corruptibility of tax auditors, two cases are considered: Cases where tax auditors adhere to service regulations (no-collusion) and cases where tax auditors are complicit with taxpayers (collusion).

Concerning the latter, the following two cases are considered: Cases where the government does not prevent complicity among tax auditors and taxpayers (collusion-free) and cases where the government prevents complicity by paying incentives to tax auditors (collusion-proof).

In the next Section, I establish the basic model and compare the economic welfare by introducing the optimal taxation structure with respect to no-collusion (Section 3), collusion-free (Section 4) and collusion-proof (Section 5). Lastly, I mention the policy implications.

2. Model

A three-tier structure composed of the government, tax auditors and taxpayers is considered.

The true income level of taxpayers is either I_L or I_H ,where $0 < I_L < I_H$. Subsequently, I_L (I_H) is called Type L(H). The probability density of Type $i, i = L, H$ is $q_i \in (0,1)$,where $q_L + q_H = 1$. The “Type” represents information that is observable by tax auditors. Taxpayers pay income tax T_i in accordance with the income level they declared, where $0 < T_i < I_i, i = L, H$ and $T_H > T_L > 0$.

(Because a fraudulent declaration by Type L is irrational) Tax auditors effect a tax examination with respect to low income declarers at probability p and exact penalty F against fraudulent declarers.

Taxpayers appropriate their disposable income to one kind of private consumption, with Type i private consumption as x_i. To introduce the optimal taxation structure, the utility function is assumed as follows.

$$u_i = \log(x_i) \qquad (1)$$

The government must finance a constant level of spending R with income tax. The purpose of the government is to establish a taxation structure that maximizes utilitarian economic welfare as follows.

$$W = q_L \log(I_L - T_L) + q_H \log(I_H - T_H) \qquad (2)$$

3. No-collusion case

Regarding incentive compatibility, Type H is presented in the following formula.

$$\log\left(I_H - T_H\right) \geq p\log\left(I_H - T_L - F\right) + \left(1-p\right)\log\left(I_H - T_L\right) \qquad (3)$$

The left side is the utility level when Type H taxpayers file appropriate declarations. The right is the expected utility level when Type H taxpayers, faced with monitoring risk probability p, file fraudulent declarations.

A solution of p in the formula above results in the following.

$$p \geq \frac{\log\left(I_H - T_L\right) - \log\left(I_H - T_H\right)}{\log\left(I_H - T_L\right) - \log\left(I_H - T_L - F\right)} \qquad (4)$$

Since the right side is positive, $\tilde{p}$ is set at the lower bound value of p and calculating its relation to F results in the following.

$$\partial\tilde{p}/\partial F = -\frac{\log\left(I_H - T_L\right) - \log\left(I_H - T_H\right)}{\left(\log\left(I_H - T_L\right) - \log\left(I_H - T_L - F\right)\right)^2\left(I_H - T_L - F\right)} < 0 \qquad (5)$$

In other words, $\tilde{p}$ is the decreasing function of F. Therefore, when $F = T_H - T_L$, $p = 1$. When this occurs, defining $\Delta I = I_H - I_L$ would result in the following proposition.

Proposition 1 For a no-collusion, the optimal income tax is the following.

$$T_H^* = R + q_L \Delta I + (1 - q_L)c \text{ ; } T_L^* = R - (1 - q_L)\Delta I + (1 - q_L)c$$

Because an economic welfare is

$$W^{NC} = \log\left((1 - q_L) I_H + q_L I_L - R - (1 - q_L) c\right) \qquad (6)$$

at equilibrium, if $R + (1 - q_L) c < q_H I_H + q_L I_L$, then $W^{NC} > 0$.

4 Collusion-free case

From Proposition 1, the amount of tax evasion is $T_H^* - T_L^* = \Delta I$. Then, regarding ΔI, the existence of cases where bribery is commonplace. Here, regarding the "pie" of bribery called ΔI, the proportion of bribery σ ($1-\sigma$) is customarily given. And, if exogenously giving penalty (α) for bribes , then

$$\alpha < (1 - \sigma)\Delta I \qquad (7)$$

thus creating bribery. When this occurs, the Type H utility level is the following.

$$u_H' = \log\left(I_H - T_L^* - (1 - \sigma)\Delta I\right) \qquad (8)$$

Concerning additional burden of Type H,

$$T_L^* + (1 - \sigma)\Delta I < T_H^* \qquad (9)$$

forms, therefore, as long as the government considers the transfer rate of bribery as impossible to verify, economic welfare increases at equilibrium. However, the government fails to finance R.

5 Collusion-proof case

When formula (7) forms, theoretically, corrupt practices can be prevented merely by having the government give remunerations to tax auditors only in the order of $s = q\left(\left(1-\sigma\right)\Delta I - \alpha\right)$. When the government attempts to finance tax revenue to match R, the following proposition is formed:

Proposition 2 For a collusion-proof case, the optimal income tax is the following.

$$T_H^* = R + q_L \Delta I + (1-q_L)c + s\ ; T_L^* = R - (1-q_L)\Delta I + (1-q_L)c + s$$

In the table below, the optimal taxation structure is summarized in chart form, where $\Delta T \equiv T_H - T_L$ and $I^* \equiv q_H I_H + q_L I_L - R$.

	No-collusion	Collusion-free	Collusion-proof
T_H	$R + q_L \Delta I + q_H c$	$R + q_L \Delta I + q_H c$	$R - q_L \Delta I + q_H c + s$
T_L	$R - q_H \Delta I + q_H c$	$R - q_H \Delta I + q_H c$	$R - q_H \Delta I + q_H c + s$
ΔT	ΔI	ΔI	ΔI

From Proposition 2, economic welfare is the following.

$$W^* = \log\left(\left(1-q_L\right) I_H + q_L I_L - R - \left(1-q_L\right) c - s\right) \qquad (10)$$

Clearly, the following proposition is formed.

Proposition 3 $W^{NC} > W^{*}$

6. Conclusion

In this note, using the three-tier model, I introduced the optimal taxation structure and compared the resulting economic welfare under it with the economic welfare resulting from each of the no-collusion, collusion-free and collusion-proof. Because it became clear that the collusion-proof case engenders the worst circumstances, I state the governmental implications of this paper as follows: when an anti-corruption scheme is formulated, namely regarding a commitment towards incentive wages to public servants, then caution should be taken from the perspective of economic welfare.

References

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Appendix 1:Proof of Proposition 1

When $F = T_H - T_L$, the auditing cost is $(1-q_L)c$, therefore, the optimal income tax is the solution of the following problem.

$$\underset{\{T_L, T_H\}}{Max}\, W$$
$$s.t. \quad q_L T_L + (1-q_L)T_H = R + (1-q_L)c$$

Replacing the constraint with $T_L = \dfrac{R + (1-q_L)(c - T_H)}{q_L}$ and substituting it for the objective function to find the first-order condition for T_H results in the following.

$$-q_L \frac{\dfrac{1-q_L}{q_L}}{I_L - \left(\dfrac{R + (1-q_L)(c - T_H)}{q_L} \right)} - \frac{1-q_L}{I_H - T_H} = 0$$

Considering $1 - q_L > 0$, a solution of T_H in the above formula would result in the following.

$$T_H^* = R + q_L \Delta I + (1-q_L)c$$

Replacing this result for the constraint would give the following.

$$T_L^* = R - (1-q_L)\Delta I + (1-q_L)c$$

(Q.E.D.)

Appendix 2: Proof of Proposition 2

The government's problem is as follows.

$$\underset{\{T_L, T_H\}}{Max}\, W$$
$$s.t. q_L T_L + (1-q_L)T_H = R + (1-q_L)c + s$$

Because replacing the constraint with $T_L = \dfrac{R + s + (1-q_L)(c - T_H)}{q_L}$ and substituting it for the objective function to obtain the first-order condition for T_H results in $1-q_L > 0$, then

$$(1-q_L)\frac{\dfrac{1-q_L}{q_L}}{I_L - \left(\dfrac{R+(1-q_L)(c-T_H)+s}{q_L}\right)} - \frac{q_L}{I_H - T_H} = 0$$

A solution of T_H would result in the following.

$$T_H^* = R + q_L \Delta I + (1-q_L)c + s$$

Substituting this result for the constraint results in the following.

$$T_L^* = R - (1-q_L)\Delta I + (1-q_L)c + s$$

(Q.E.D.)