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Abstract

We present a simple model of corporate tax evasion allowing for potentially bad governments that abuse their fiscal powers to extort monies from firms. Our model shows that the potential existence of extortionist governments provides incentives for corporate tax evasion and increases enforcement cost.

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1 Introduction

The right of governments to exercise fiscal power through taxation sometimes leads to its abuse by public officials. Tax enforcement provides a very powerful tool for extortion in countries where the government has control over enforcing agencies and courts. Extortion can take the form of overstated tax obligations or arbitrary financial punishment of (not existent) tax evasion by firms.[1] It is easier for a malicious government to control enforcement agencies and courts if law institutions are week and/or a lack of separation of power exists. Week institutions allow for control through bribery, while the lack of separation of power provides leeway for direct influence. Both corrupt courts and the lack of checks and balances is readily observed in developing and transition economies. These countries quite regularly already suffer from problems to create sufficient revenue from taxation. So it is interesting to investigate the influence of potentially extortionist governments on tax revenues and enforcement cost.

This paper models the tax evasion decision of a firm if it is uncertain about the kind of government is faces. So far, the not particularly extensive literature on corporate tax evasion has mainly focused on the influence of tax evasion and enforcement on production decisions.[2] Recently, the oganization structure of firms and its influence on tax evasion has been analyzed by Chen and Chu (2002) and by Crocker and Slemrod (2004). The papers most closely related to our analysis are Hindriks, Keen and Muthoo (1999), who propose an optimal tax system in the presence of evasion, corruption and extortion, and Cule and Fulton (2005), who explain the positive correlation of evasion and corruption by the complementary nature of the shadow economy and corruption activity.

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[1]The russion YUKOS case is considered by many observers as such government extortion. Mikhail Khodorkovsky, owner of energy giant YUKOS was jailed for 9 years after he was found guilty of tax evasion. The most profitable parts of the firm were auctioned off in order to settle the tax repayments. In the intransparent auction a firm with Kremlin links purchased the assets. US congressman Tom Lantos comented: "It seems that this political trial before a kangaroo court has come to a shameful conclusion." See the BBC's website for further details (http://news.bbc.co.uk/1/hi/business/4595289.stm).

[2]Examples are Marrelli (1984), Wang and Conant (1988), Marrelli and Martina (1988), Virmani (1989), Lee (1998) and Bayer and Cowell (2006).

In our model a firm decides on its profit declaration for tax purposes, while being uncertain about the objective of the government. A government may be "good" or "bad", where a good government just wants to collect revenue and prevent tax evasion, while a bad government engages in extortion. We find that the prior probability of facing an extortionist government increases tax-evasion incentives. Therefore the potential for extortion undermines revenue collection of good governments. Moreover, the prior probability of firms facing a bad government increases the expected equilibrium audit-effort of good governments, which reduces net revenue and increases inefficiencies.

2 The model

Consider two players: a firm i and the government (or its tax authority) g. The firm may be profitable or not. This is private information to the firm. The gross profit is $\rho \in \{0, \pi\}$, with $\lambda \in (0,1)$ denoting the commonly known prior probability for $\rho = \pi$.

The government may be of type $\theta^g = 0$ (a well meaning good government) or of type $\theta^b = 1$ (a malicious extortive government). The prior probability for $\theta = \theta^b$ is denoted by $\gamma \in (0,1)$.

2.1 Timing

1. Nature independently draws the types of the firm and the government.
2. Both players learn their own types.
3. The firm declares its profit $d_i \in \{0, \pi\}$.
4. The government observes d_i and takes an action $a_g \in \{nothing; audit; extort\}$.
5. The payoffs are realized.

2.2 Payoffs

The ex post payoffs are given below. We start with the firm

$$\Pi_i(\rho, d_i, a_g) := \begin{cases} \rho - td_i & if \quad a_g = nothing \\ \rho - td_i - (f+t)\max\{0, \rho - d_i\} & if \quad a_g = audit \\ \rho - \rho F - td_i & if \quad a_g = extort \end{cases} \tag{1}$$

where t is the (linear) tax rate, f is the surcharge on detected tax evasion, and F denotes the fraction of the profit that can be extorted.

The ex post payoff of the government is defined as:

$$\Pi_g(\theta, a_g, d_i, \rho) := \begin{cases} td_i & if \quad a_g = nothing \\ td_i + (f+t)\max\{0, \rho - d_i\} - K & if \quad a_g = audit \\ td_i + \rho F - C(\theta) & if \quad a_g = extort \end{cases} \tag{2}$$

Here K denotes the audit cost, while $C(\theta)$ denotes the cost a government has to bear whenever it extorts. This cost can be interpreted as the sum of transaction, bribery and reputation cost arising from extortion. We assume $C(\theta) = cK/\theta$, with $c < 1$ to ensure that a good government does not want to extort, while a bad government has no scruples to do so.[3] Additionally, we assume that the gross revenue from extortion exceeds that from punishing an evading firm:

$$F > f + t. \tag{3}$$

[3] Note that $1 - c$ measures the relative cost effectiveness of extortion compared to auditing.

The fraction of the profit that can be extorted F in reality depends on the degree of control the government has over courts and enforcement agencies. A tighter grip increases the fraction of profit that can be extorted.

2.3 Solving the game

We use Perfect Bayesian Nash Equilibrium as a solution concept for this dynamic game of incomplete information. We see - by using equations (2) and (3) - that for a bad government auditing is a dominated strategy. Furthermore in case of a declaration of $d_i = \pi$, extortion always pays for a bad government

$$a_g^*(\theta^b, d_i = \pi) = \{extort\}.$$

Whether a bad government tries to extort if a zero declaration is observed or just does nothing depends on the believed probability that the firm's true profit is π. Denoting this belief as μ the condition for extortion becomes:

$$\mu F\pi - cK \geq 0. \tag{4}$$

Using Bayes' Rule and denoting the probability that a profitable firm evades as δ_i we can derive the optimal strategy for a bad government observing a zero declaration.[4] The extortion probability in this case is denoted by σ_g^*:

$$\sigma_g^* = \begin{cases} 1 & if \quad \delta_i > \frac{cK(1-\lambda)}{(F\pi-cK)\lambda} \\ \in [0,1] & if \quad \delta_i = \frac{cK(1-\lambda)}{(F\pi-cK)\lambda} \\ 0 & if \quad \delta_i < \frac{cK(1-\lambda)}{(F\pi-cK)\lambda} \end{cases}.$$

A good government does not want to extort, but has to decide whether to audit or not. Given that a good government observes a declaration of π it is a dominant strategy not to audit, as no fines would ever be collected after an audit:

$$a_g^*(\theta^g, d_i = \pi) = \{nothing\}.$$

We now turn to the case where a good government observes a zero declaration. The decision of the government depends on μ the believed probability that a zero declaration comes from a profitable firm.[5] Then a good government audits whenever

$$\mu(f+t)\pi - K > 0.$$

Using Bayes' rule and denoting the equilibrium audit probability of a good government conditional on $d_i = 0$ as α_g^* we can summarize the optimal reaction as:

$$\alpha_g^* = \begin{cases} 1 & if \quad \delta_i > \frac{K(1-\lambda)}{\lambda(\pi(f+t)-K)} \\ \in [0,1] & if \quad \delta_i = \frac{K(1-\lambda)}{\lambda(\pi(f+t)-K)} \\ 0 & if \quad \delta_i < \frac{K(1-\lambda)}{\lambda(\pi(f+t)-K)} \end{cases}$$

We now turn to the firm. It is a dominant strategy for an unprofitable firm to declare no profit, $d_i^*(\rho = 0) = 0$. A firm anticipating the reaction of the two types of governments has the following expected net profits from evasion and compliance:

$$\begin{aligned} E\Pi_i(d_i &= 0|\rho = \pi) = \pi\left(1 - \gamma\sigma_g^* F - (1-\gamma)\,\alpha_g^*\,(f+t)\right) \\ E\Pi_i(d_i &= \pi|\rho = \pi) = \pi(1 - t - \gamma F) \end{aligned}$$

[4]The believed probability of facing a profitable firm given a zero declaration is $\mu = \lambda\delta/(\lambda\delta + 1 - \lambda)$. This takes into account that it never pays for a firm to declare a profit if it is not profitable.

[5]Note that in equilibrium the beliefs of good and bad governments have to be identical. So we can use the same notation for both types.

Comparing these two expected payoffs shows that the optimal evasion decision is the following:

$$\delta_i^* = \begin{cases} 1 & if \quad \alpha_g < \frac{\gamma F(1-\sigma_g)+t}{(1-\gamma)(f+t)} \\ \in [0,1] & if \quad \alpha_g = \frac{\gamma F(1-\sigma_g)+t}{(1-\gamma)(f+t)} \\ 0 & if \quad \alpha_g > \frac{\gamma F(1-\sigma_g)+t}{(1-\gamma)(f+t)} \end{cases}$$

2.4 Parameter configurations and equilibria

Different partitions in the parameter space lead to different equilibria. One equilibrium we can rule out is totally mixed equilibrium. It is easy to see that for any parameter configuration $\sigma_g^* \geq a_g^*$ holds, since the critical evasion probability for extortion (by a bad government) is smaller than that for audits (by a good government). An evasion probability that makes the good government indifferent induces extortion. Possible equilibria are:

1. The surrender-to-evasion equilibrium. If

$$\frac{K(1-\lambda)}{\lambda\left(\pi\left(f+t\right)-K\right)} > 1$$

then a good government will never audit $\alpha_g^* = 0$, and a profitable firm will always evade $\delta_i^* = 1$ as $0 < \left[t + F(1-\sigma_g^*)\right] / \left[(1-\gamma)(f+t)\right] \; \forall \sigma_g^* \in [0,1]$. Extortion is possible in this equilibrium. Eq. (4) with $\delta_i^* = 1$ gives the condition for extortion

$$\frac{cK\left(1-\lambda\right)}{\left(F\pi - cK\right)\lambda} \leq 1.$$

2. The audit-evasion equilibrium. If

$$\begin{aligned} \frac{K(1-\lambda)}{\lambda\left(\pi\left(f+t\right)-K\right)} &< 1 \quad \text{and} \\ \frac{t}{(1-\gamma)(f+t)} &> 1 \end{aligned}$$

then a profitable firm will always evade ($\delta_i^* = 1$), even though that a good government will audit all zero declarations ($\alpha_g^* = 1$), which implies bad governments extorting with certainty ($\sigma_g^* = 1$). This equilibrium is driven by a high probability of facing a crook government. It pays to evade for high γ because the payoff will be higher under evasion if extortion is certain. Note that there is a critical $\gamma > 0$ needed for this equilibrium to exist. A firm who understands that it will always be audited by a good government evades only if there is a certain likelihood of facing a bad government that will extort.

3. Full-extortion mixed-evasion equilibrium. If

$$\begin{aligned} \frac{K(1-\lambda)}{\lambda\left(\pi\left(f+t\right)-K\right)} &\leq 1 \quad \text{and} \\ \frac{t}{(1-\gamma)(f+t)} &\leq 1 \end{aligned}$$

then both the profitable firm and the good government will randomize. Solving the simultaneous indifference conditions yields the equilibrium strategies:

$$\begin{aligned} \alpha_g^* &= \frac{t}{(1-\gamma)(f+t)}, \\ \delta_i^* &= \frac{K(1-\lambda)}{\lambda\left(\pi\left(f+t\right)-K\right)}, \\ \sigma_g^* &= 1. \end{aligned}$$

In this equilibrium an increased prior probability of bad governments increases the equilibrium audit probability ($d\alpha_g^*/d\gamma > 0$). The presence of bad governments provides incentives for more evasion, which induces good governments to audit more frequently in order to keep the firm indifferent between evasion and truthful declaration. The expected welfare loss for a good government, measured as its expected audit cost, is given by

$$E(K \mid \theta = 0) = \frac{tK}{(1-\gamma)(f+t)} \left[(1-\lambda) + \frac{K(1-\lambda)\lambda}{\lambda\pi(f+t) - K} \right],$$

which increases in γ. Also remarkable is that only bad governments make positve expected profits in equilibrium. This shows how the potential existence of bad governments makes life difficult for good governments.

3 Conclusion

In this paper we analyzed tax-evasion decisions of firms when extortion is possible. We showed that the potential existence of bad, extortionist governments provides incentives for corporate tax evasion, which undermines good governments' ability to raise revenue. Moreover, the resources wasted for enforcement increase with the likelihood of governments being bad. We conclude that countries with evasion and extortion problems will receive a double-dividend from curbing extortion - a better climate for investment and reduced expenditure for tax enforcement.

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