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A note on the neutrality of profit taxes with tax evasion and tax avoidance

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Abstract

Traditional literature exploring the relationship between production and tax evasion ignores the impact of other activities on these two decisions. This paper incorporates firms' tax avoidance activities into the model of tax evasion. In contrast to conventional results, we find that profit tax is not necessarily neutral. In addition, the independency or separability of tax evasion and production decisions may not hold either whenever tax avoidance is present.

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1. Introduction

Following the classical work of Allingham and Sandmo (1972) on tax evasion, Wang and Conant (1988) and Yaniv (1995) show that a monopolistic firm's production and tax evasion decisions are separable and profit taxes are neutral. Thereafter, various models have been constructed under which tax evasion affects output decision and hence profit taxes cannot be neutral [Marrelli (1984), Virmani (1989), Lee (1998), Goerke and Runkel (2006), Ueng and Wu (2009), and Baumann and Friehe (2010).]. However, none of the above literature discusses the scenario in which a firm engages in a third activity that could be a channel through which production and tax evasion can interactively affect each other. In this paper, we argue that tax avoidance commonly used by firms to reduce tax burden is a proper candidate of the third activity.

The classic distinction between tax avoidance and tax evasion is made by Oliver Wendell Holmes, who wrote:

"When the law draws a line, a case is on one side of it or the other, and if on the safe side is none the worse legally that a party has availed himself to the full of what the law permits. When an act is condemned as evasion, what is meant is that it is on the wrong side of the line..." (Bullen v. Wisconsin (1916), 240. U.S. 625 at p.630).

Thus, the distinguished characteristic of evasion and avoidance is legality.[1] In reality, there are many gray areas between tax evasion and tax avoidance and sometimes the tax authorities may inappropriately characterize particular cases since the dividing line is not clear. Generally, tax avoidance, if appropriately implemented, are not illegal, thus no punishment will be imposed by tax authorities whenever detected.[2] This is the main difference of these two tax dodging activities.[3]

Discussions of tax avoidance are not rare in literature (see Slemrod (2007)) but often overlooked when exploring the topics on tax evasion. The only exception is Lee (2001) which includes tax avoidance in his model of tax evasion. However, Lee's model explores the evasion of personal income tax rather than the production and evasion decisions of firms. Tax avoidance often involves some (legal but undesirable) activities merely to reduce tax burden. These activities may be correlated with the firm's production decision as well as the

[1] Kay (1980, p. 136) offers a different pair of definitions for evasion and avoidance: "Evasion is concerned with concealing or misrepresenting the nature of a transaction; when avoidance takes place the facts of the transaction are admitted but they have been arranged in such a way that the resulting tax treatment differs from that intended by the relevant legislation."

[2] For example, an international firm may transfer its profit offshore by mispricing its transactions with foreign affiliates. This may not be illegal but the price would be adjusted by the arm's length rule if detected by the tax authority.

[3] Stiglitz (1985) suggests three basic principles of tax avoidance under income taxation: postponement of taxes, tax arbitrage across individuals facing different tax brackets, and tax arbitrage across income streams facing different tax treatments.

firm's tax evasion decision.[4] Hence, we later incorporate tax avoidance into the model of profit tax evasion, reexamine the neutrality of profit taxes and investigate the separability of production and tax evasion decisions.

2. The model

Following Wang and Conant (1988) and Yaniv (1996) [hereafter W-C-Y], consider a firm facing a proportional profit tax rate, t with $0 \le t \le 1$. Denote the firm's pre-tax profit function as $\pi(Q) = R(Q) - C(Q)$ where Q is the output level. $R(Q)$, $C(Q)$ are revenue and cost functions respectively. Suppose that the firm is a risk averter, with its utility function $U(\cdot)$ satisfying von Neumann-Morgenstern expect utility axioms, $U' > 0$ and $U'' < 0$. The firm may evade profit taxes by underreporting its profit. In this case, tax evasion may be detected with a probability of p and fined with a rate of $f > 0$. In addition, we consider the case in which the firm may also engage in tax avoidance activities. This is the main difference between this paper and W-C-Y. Under these settings, the expected utility of the firm is

$$EU = (1-p)U(\pi(Q) - t\tilde{\pi}(Q,B) + tK - \phi(B,K)) + pU(\pi(Q) - t\tilde{\pi}(Q,B) - ftK - \phi(B,K)), \quad (1)$$

where K denotes the underreported amount of profit. Notice that in equation (1), $\tilde{\pi}(Q,B)$ is the taxable profit after tax avoidance which depends on the output level Q and the effort of avoidance B. It is reasonable to assume $\tilde{\pi}(Q,0) = \pi(Q)$ and $\partial\tilde{\pi}/\partial B < 0$. Another item worth noting is $\phi(B,K)$, the cost of tax dodging, which depends not only on the effort of tax avoidance but also on the level of tax evasion.[5] It is the resources expended by the firm to make tax dodging activity profitable. Since tax avoidance is not illegal, tax payment of this part (i.e. $t\tilde{\pi}(Q,B)$) is the same no matter the firm is audited or not. In addition to tax avoidances, the firm may also engaged in tax evasions. By contrast, the outcome of tax evasion depends on the state of auditing. If not audited, the firm gets a payment of $+tK$; if audited, the firm gets a payment of $-ftK$.

Solving the optimization problem of equation (1) derives the first order conditions as

$$\frac{\partial EU}{\partial Q} = [(1-p)U'_G + pU'_B] \cdot \left(\pi' - t\frac{\partial\tilde{\pi}}{\partial Q}\right) = 0, \quad (2)$$

$$\frac{\partial EU}{\partial K} = (1-p)U'_G \cdot (t - \phi_K) + pU'_B(-tf - \phi_K) = 0, \quad (3)$$

$$\frac{\partial EU}{\partial B} = \left[(1-p)U'_G + pU'_B\right]\left(-t\frac{\partial\tilde{\pi}}{\partial B} - \phi_B\right) = 0, \quad (4)$$

where ϕ_B and ϕ_K denote the partial derivatives of ϕ w.r.t. B and K, respectively. From the above equations, we can derive the firm's optimal decisions as (Q^*, K^*, B^*). It is

[4] For example, if the firm can transfer its profit offshore, it may reduce the extent of tax evasion.

[5] Such a setting can be referred to Cremer and Gahvari (1993), but they explored the issue of indirect tax evasion.

worth noting that when tax avoidance is ignored, equation (4) vanishes and $\pi' = 0$ is the optimal choice of the firm. In such a case, the production decision is independent of the tax evasion decision which is the main argument of Yaniv (1996). Once tax avoidance is considered, the optimization behavior of the firm must satisfy $\pi' = t\partial\tilde{\pi}/\partial Q$ in Eq. (2). Therefore, the neutrality of profit taxes will not hold unless $\partial\tilde{\pi}/\partial Q = 0$. This result is different from W-C-Y. When $\partial\tilde{\pi}/\partial Q \neq 0$, the production decision is related with the tax avoidance activity but may or may not be independent of tax evasion decision. If the partial derivatives of ϕ_B, i.e. ϕ_{BK}, equals zero, we can derive Q^* and B^* from Eq.(2) and Eq.(4). In this case, both production and tax avoidance activities are independent of tax evasion decision. However, if $\phi_{BK} \neq 0$, equations (3) and (4), as well as B^*, are related with the choice of tax evasion K^*. In this case, tax evasion will affect both the firm's production and avoidance decisions. Consequently the firm's production decision is not independent of its evasion decision; this conclusion is clearly different from that in Yaniv (1996).[6]

The assumption of $\phi_{BK} < 0$ is plausible because a larger tax base makes evasions less costly at the margin. In our model, the tax base is the taxable profit after avoidance. The assumption of $\partial\tilde{\pi}/\partial Q > 0$ is also valid since with more output the firm's after-avoidance taxable profit should be higher as long as the avoidance activities are unchanged. As a result, the neutrality of profit taxes cannot hold anymore, and the firm's production and evasion decisions are not independent either. Moreover, if we replace K, the underreported amount of profit, by over-reporting production cost $\delta C(Q)$ where δ is the over-reported ratio as in Wang and Conant (1988), the production and tax evasion decisions are not separable.

3. An example

According to the regulations of Income Tax Law in Taiwan, a firm whose reported annual revenue not over 30 million NT dollars is qualified to be inspected its tax return (thus rule out the probability of being audited) if its reported net income ratio (the ratio of net income over revenue) above or equal to a comparatively lower threshold.[7] This offers a channel of tax avoidance for small size enterprises. However, as the qualified firms may also evade profit taxes by underreporting revenue, tax evasions are subjected to auditing as well. Consider a firm whose annual revenue is 60 million NT dollars. To be qualified for inspection, by some costly manipulation, it can be divided into two equal size enterprises first (thus the annual

[6] Yaniv (1996) argues that when the decision variable is the amount of tax evasion, rather than over-reporting a ratio of cost as in Wang and Conant (1988), the firm's production and evasion decisions will be independent to each other. That is to say, no matter what the choice of evasion is, the firm's optimal choice of production will be on the condition which makes marginal revenue equal marginal cost.

[7] The purpose of inspection is to verify calculative errors in the tax return that not accordance with the Income Tax Law.

revenue of each is 30 million), and underreport revenues to evade income taxes later. While the former is tax avoidance, the latter is tax evasion. Suppose its net profit rate is 10% and the required threshold is 6%, in this case, $\pi(Q)$ equals 6 million and $\tilde{\pi}(Q)$ equals 3.6 million. In addition, if the firm owners decide to underreport revenue by an amount of 5 million for each separated enterprise, the evaded profit K equals 0.6 million NT dollars. Notice that the firm can also be divided into three equal size units (or two unequal size units with one's annual revenue over 30 million NT dollars and the other's under), and the marginal evasion cost under this condition may different from the previous case. We can expect that increasing one activity can reduce the marginal cost of the other, *i.e.* $\phi_{BK} < 0$. It is also reasonable for the firm to curtail its output to fit this channel of tax avoidance, thus tax avoidance affect production decisions as well.

4. Conclusion

It is conventionally believed that profit taxes are neutral, and a firm's output and tax evasion decisions are separable under a fixed probability auditing scheme. However, re-examining neutrality and inseparability by taking other activities such as tax avoidance into account reaches different results. As a result, we find that the profit tax is not necessarily neutral, the separability conclusion may not hold in general.

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