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Tax evasion as an optimal tax device

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Abstract

For an economy where goods are taxed at the same rate, we present conditions under which firms self-select into a black market such that effective taxation is closer to an optimal discriminatory tax system.

Keywords: Optimal taxation; Tax evasion; Black markets; Underground economy

JEL classification: H21; H26

In his well-known textbook, Rosen (2005, p. 353) claims that a black market, or "underground economy", might improve welfare by effectively allowing some economic activities to be taxed at lower rates than others, in a manner consistent with optimal tax rules. We investigate this reasoning by introducing a black market into an economy where different goods are taxed at the same rate. We present conditions under which the black market moves the economy closer to an optimal discriminatory tax system, where goods are taxed at different rates. In some cases, the black market can be used to replicate this tax system.

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Consider an economy with a continuum of consumers, indexed by a taste parameter, α. Each consumer is endowed with E units of a composite commodity, or "endowment good", which may be interpreted as labor. By supplying this endowment to competitive firms, a consumer obtains income that is used to purchase one or zero units of a variable-quality good, at a price equal to $P(\theta)$ for a quality-θ good, and E–$P(\theta)$ units of a consumption good. The utility function is

$$U(E - P(\theta), \theta; \alpha) = E - P(\theta) + \alpha v(\theta) \tag{1}$$

for a type-α consumer, where v is concave and public goods are suppressed because they are fixed in supply for the analysis. The parameter α possesses a continuous distribution, $h(\alpha)$, on [0,1], and the population is normalized to equal one. From Eq. (1), higher values of α represent a greater marginal willingness to pay for quality. In this paper, we assume two qualities, θ_H and θ_L, with $\theta_H > \theta_L$, and we define $v_L = v(\theta_L)$ and $v_H = v(\theta_H)$.[1]

The consumption good is produced from the endowment good, interpreted as "labor", by means of a constant-returns technology. In contrast, the variable-quality good is produced in fixed proportions from labor and capital, where a unit of capital is itself produced from one unit of labor. The critical difference between labor and capital is that capital is durable, remaining after production, whereas an hour of labor services spent in production is an hour unavailable for other uses. For simplicity, we assume no depreciation of capital, in which case all the capital is returned to consumers after production, at which point it is consumed. The consumer must be indifferent between supplying labor or capital. With the wage rate equal to one, the value of a unit of capital must equal one. Again using subscripts to denote goods, the quantities of labor, W, and capital, A, needed to produce a unit of each variable-quality good are W_H, W_L, A_H, and A_L.

Before introducing tax evasion, we first derive the optimal discriminatory tax system, where low- and high-quality goods are taxed at separate rates to finance a given revenue requirement. Given the absence of depreciation and assuming a zero interest rate, zero profits in equilibrium implies that prices satisfy, $P_j(1-t_j) = W_j$ for $j = L$ and H, where t_j is the tax rate on good j. Let α_H be the α possessed by a consumer who is indifferent between the low- and high-quality goods, and let α_L be the α for a consumer who is indifferent between the low-quality good and consuming neither good. High-α consumers tend to choose a high quality. In particular, a consumer with an $\alpha > \alpha_H$ buys the high-quality good, a consumer with $\alpha \in [\alpha_L, \alpha_H]$ buys the low-quality good, and a consumer with $\alpha < \alpha_L$ buys neither good. Indifference between the low- and high-quality goods requires identical consumer surpluses: $\alpha_H v_H - P_H = \alpha_H v_L - P_L$, or,

$$\alpha_H = \frac{P_H - P_L}{v_H - v_L}. \tag{2}$$

For the consumer who is just indifferent between consuming the low-quality good and neither good, consumer surplus must be zero: $\alpha_L v_L - P_L = 0$, or

$$\alpha_L = \frac{P_L}{v_L}. \tag{3}$$

[1] Davidson et al. (2004) conduct the lengthier analysis of the continuum case, which produces additional insights but not the conclusion that the black market replicates the optimal discriminatory tax system in some cases.