On the Relative Size of Direct and Indirect Taxation

Soldatos, Gerasimos T.

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Gerasimos T. SOLDATOS, American University of Athens, 15232 Athens, Greece, soldgera@yahoo.com

Abstract

Modifying the standard analytical apparatuses for direct and indirect tax evasion to incorporate forward indirect tax shift in a monopolistically competitive environment, this paper maintains that indirect tax evasion would exceed for sure direct tax evasion only under consumer risk neutrality and a tax policy zeroing the tax shift. Also, in the presence of tax evasion, there cannot be optimal direct-indirect tax mix, because tax evasion is accompanied by uncertainty and hence, nonlinearities in the tax schedules that cannot be dealt with at least practically.

1. Introduction

Direct tax evasion has been a matter of extensive investigation (see e.g. Andreoni, Erard and Feinstein 1998, and Slemrod 2007), but much less so the issue of indirect tax evasion (see e.g. Arias 2005), which explains why to my knowledge, there is only Fedeli's (1998) paper linking the two. She argues that the technical differences between direct and indirect taxation favor size-wise indirect tax evasion. Modifying the standard analytical apparatuses for direct and indirect tax evasion to incorporate forward indirect tax shift, this paper qualifies Fedeli's conclusion by noting that intuitively the presence of such shift weakens firms' and strengthens consumers' incentive to evade taxes. If firms know that the indirect tax will be paid ultimately by the consumer, they have no reason to alter their tax report strategy. But, the consumer does have an incentive to do so, once the shifted indirect tax comes to add to its income-tax burden. This is very important, because as Gillis and Kannekens (2014) report about the current trends in taxation, corporate tax rates have begun to stabilize and indirect taxation is rising under overwhelming changes to indirect tax regimes. In view of these trends, the analysis below suggests that an in-crease in consumer tax evasion should be expected. The next section presents this analysis, followed by a concluding section putting it into further perspective with the literature.

2. The Analysis

Assuming identical monopolistically competitive firms, one might contemplate profit maximization with regard to a consumption good in general as follows. Let q be the quantity of this good as a function of its price, p, produced under constant marginal cost, c. Let also, φ be the audit probability, α the proportion of sales reported, t the sales tax, ε the proportion of the tax which cannot be shifted forward to consumers, h the tax evasion cost, and μ the penalty in case tax evasion is detected. The expected utility (u) on profit (Π) will then be:

$$Eu(\Pi) = (1 - \varphi)[pq(p) - cq(p) - \varepsilon tapq(p) - h(1 - \alpha)q(p)]^b$$
$$+ \varphi[pq(p) - cq(p) - \varepsilon tapq(p) - h(1 - \alpha)q(p)$$
$$- \varepsilon t(1 - \alpha)\mu pq(p)]^b$$

where $b > 0$ captures risk aversion, neutrality, or lovingness depending on whether $b < 1, b = 1$, or $b > 1$, respectively. Setting $dEu(\Pi)/dq(p) = 0$ and solving for t, one obtains that:

$$\varepsilon = \frac{[(1 - \varphi)^{1/b} + \varphi^{1/b}]\{p - [c + h(1 - \alpha)]\}}{tp\{\alpha[(1 - \varphi)^{1/b} + \varphi^{1/b}] + \varphi^{1/b}\mu(1 - \alpha)\}} \quad (1)$$

This is the optimal value of ε for firms. Setting it equal to one in (1) and solving for t, one obtains the value of t that the policymaker should choose to nullify indirect tax shift to the consumer.

Let, next, the typical consumer's purchasing power, Y, be reduced by an income tax, τY, and by the amount $t(1 - \varepsilon)pq(p) = t(1 - \varepsilon)(1 - \tau)Y$ of the indirect tax shift, given that $Y(1 - \tau)$ would be available to spend on q were $\varepsilon = 1$. Firms set presumably ε so that to equalize consumer revenue loss with tax shifts gain. Now, if $x < Y$ is the income reported to the tax authority,   the audit probability, and ϑ the fine in case the consumer is caught cheating, the expected utility of the consumer will be:

$$Eu(Y) = (1 - \psi)\{Y[1 - \tau - t(1 - \varepsilon)(1 - \tau)] + \tau(Y - x)\}^\beta$$
$$+ \psi\{Y[1 - \tau - t(1 - \varepsilon)(1 - \tau)] - \vartheta(Y - x)\}^\beta$$

where $\beta > 0$ captures risk aversion, neutrality, or lovingness depending on whether $\beta < 1, \beta = 1$, or $\beta > 1$, respectively. Setting $dEu(Y)/dY = 0$ and solving for Y, one obtains that:

$$Y = \frac{x\{\tau[(1 - \psi)\Gamma]^{1/(\beta-1)} + \vartheta(\psi\Lambda)^{1/(\beta-1)}\}}{\Gamma[(1 - \psi)\Gamma]^{1/(\beta-1)} + \Lambda(\psi\Lambda)^{1/(\beta-1)}} \quad (2)$$

where $\Gamma = [1 - t(1 - \varepsilon)(1 - \tau)]$ and $\Lambda = [\tau + \vartheta + t(1 - \varepsilon)(1 - \tau) - 1]$. In view of (1), (2) suggests that indirect tax evasion, $t\alpha(1 - \tau)Y$, affects Y and thereby direct tax evasion, $\tau(Y - x)$, because simply $\varepsilon \neq 1$.

And, when $\varepsilon \neq 1$, it is not clear that $t\alpha(1 - \tau)Y > \tau(Y - x) =>$

$$\frac{t\alpha(1 - \tau)}{\tau} > \frac{Y - x}{Y}$$
$$= \frac{[1 - \tau - t(1 - \varepsilon)(1 - \tau)](\psi\Lambda)^{1/(\beta-1)} - (1 - \tau)[(1 - \psi)\Gamma]^{1/(\beta-1)}}{\vartheta(\psi\Lambda)^{1/(\beta-1)} + \tau[(1 - \psi)\Gamma]^{1/(\beta-1)}}.$$

As a matter of fact, it is not clear even if $\varepsilon = 1$, because setting it in the last inequality and utilizing (1), the comparison would be given by the even more cumbersome relationship:

$$\frac{\alpha\left[(1-\varphi)^{1/b} + \varphi^{1/b}\right]\{p - [c + h(1-\alpha)]\}}{p\{\alpha[(1-\varphi)^{1/b} + \varphi^{1/b}] + \varphi^{1/b}\mu(1-\alpha)\}}$$
$$> \frac{\tau\psi^{1/(\beta-1)}(\tau+\vartheta-1)^{1/(\beta-1)} - \tau(1-\psi)^{1/(\beta-1)}}{\vartheta\psi^{1/(\beta-1)}(\tau+\vartheta-1)^{1/(\beta-1)} + \tau(1-\psi)^{1/(\beta-1)}}.$$

What complicates the comparison is the presence of uncertainty. Fedeli's conclusion obtains with certainty only when consumer at least risk neutrality is assumed beyond $\varepsilon = 1$, because the right-hand side of the last inequality is simply zeroed in this case. It turns out that indirect tax evasion would exceed for sure direct tax evasion iff $\varepsilon = 1 \, and \, \beta = 1$.

Critical to this discussion has been the assumption about identical monopolistically competitive firms. For a big monopoly and a formal or informal cartel known to the authorities, it does not make much sense to be talking about tax evasion, because the audit probability is equal to one, and because it can manipulate ε at will. The same might be said about the audit probability with regard to a few large rival firms, but ε can certainly become under these circumstances a means of rivalry. Although this rivalry does not qualify the zero indirect tax evasion case under such market regimes, it does suggest that it would matter in a monopolistically competitive or dominant firm environment. Indirect tax evasion on the part of the small firms does pay within such an environment of anonymity, because simply $\varphi \neq 1$ for them, and because the indirect tax shift becomes one more instrument through which the monopolistically competitive long-run equilibrium can emerge, or through which a dominant firm might be confronted. Finally, under perfect competition, a $\varphi \neq 1$ is still possible, because the authorities do know that tax evasion would increase short-run profit and postpone long-run marginal cost pricing, much more so under a tax shift in which case. But, the firm that would decide to compete by internalizing the tax and lowering the price would be followed *ex hypothesi* by all other firms, rendering thereby meaningless a discussion about indirect tax evasion under perfect competition.

3. Concluding Remarks

To conclude, note that no optimal direct-indirect taxation mix obtains from this discussion. In the presence of tax evasion, there cannot be such optimality, because tax evasion is accompanied by uncertainty and hence, nonlinearities in the tax schedules that cannot be dealt with practically. Boadway et al. (1994) attest to the opposite but only in the presence of income taxation evasion modeled as tax avoidance with costs, and disregarding the possibility of indirect tax evasion. They formalize thus De Marco's (1936) argument that in the face of income tax evasion, indirect taxation should supplement the direct one, because: "income which escapes, in whole or in part, direct valuation at the moment of its production is watched for and seized in the successive moments in which its possessor spends it" (p. 131). But, "if indirect taxation is joined to direct taxation, with unethical agents, the equivalence in terms of government's revenues does not hold" (Fedeli 1998, p. 385), because if not

anything else of practical considerations. As noted earlier, the state nowadays is increasingly relying on indirect taxation, expanding it to new fields such as banking and energy. And, for the tax administration, tax reporting is equivalent to the collection and processing of data whose sheer volume, variety and velocity present technological challenges in securing, storing and tracking them. The concern for tax compliance has thereby increased but good results will be obtained only if the taxpayer who previously had a motive to tax evade, adopts systems that would enable the tax authorities to track him/her down!

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