PRESUMPTIVE TAXATION, MARKETS, AND REDISTRIBUTION

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1. *Introduction*

One of the major obstacles governments face in their efforts to reach equity goals through income taxation is represented by the various forms of tax dodging. This concern is particularly serious when the opportunities for tax evasion or avoidance are not uniformly distributed among taxpayers, for tax dodging is then likely to bring about both vertical and horizontal inequities in the distribution of the tax burden. The empirical evidence shows indeed that there are some «hard to tax» groups, such as self-employed workers, professionals, small business, for which tax dodging is a relatively lucrative and riskless activity. On the other hand, there are taxpayers, such as employees of large corporations, pensioners, and civil servants, that are entirely unable to escape their tax obligations.

To face this problem, policy makers may try to improve the efficiency of the tax collection system. This goal can be achieved by increasing the penalties for tax evasion and/or the frequency and the quality of tax audits, or by reforming the tax code so as to reduce the opportunities of exploiting the so called «tax loopholes». Of course, any potential gain so obtained in terms of a more equitable distribution of tax burdens must be confronted with the increased costs in tax administration. In some cases, moreover, these traditional «weapons» are almost entirely ineffective in controlling tax evasion or avoidance. In fact, there are circumstances in which tax dodging is impossible to detect, monitor and verify. For instance, a sale «under the counter» for cash does not leave any direct evidence in the accounting books; at most, indirect evidence can be obtained if the taxpayer is unable to make «under the counter» purchases of inputs.

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The awareness of these problems has lead some governments to rely on various forms of presumptive taxes [1] in which tax liabilities are computed using indirect methods for assessing the effective tax bases. For example, presumptive taxes are employed, or have been employed, in developed countries like France, Israel, Italy and the Netherlands, in Latin America (Argentina, Chile and Colombia), in Sub-Saharan Africa, and in Central and Eastern Europe (Albania, Hungary, Macedonia and Poland, among others) – see Tanzi and Casanegra (1989), Taube and Tadesse (1996), Harrison (1997), Cnossen and Bovenberg (2001). Often, they are used in the agricultural sector and more generally in all the situations in which income is difficult to ascertain (e.g. small individual firms). The basic idea is to estimate the effective tax base using a set of variables that (*i*) are highly correlated with the effective tax base, (*ii*) tax authorities can monitor at low cost and (*iii*) cannot be easily «manipulated» by the taxpayers; some instances are labour costs, telephone and electricity bills, the number of employees, the size of the store, and so on.

If it were clear that presumptive taxes could significantly increase the government's capability to collect taxes in an equitable way and to perform some redistribution through the tax system, then they would represent an interesting option for all those countries which are plagued by large-scale evasion and avoidance of taxation. These would include some European countries like Italy, Belgium, Spain, Portugal or Greece, and the vast majority of the developing and of the Eastern European countries;[2] in particular, most developing and transition countries lack the expertise to properly administrate a conventional income tax and are therefore prone to the insurgence of large loopholes in the tax code.

Of course, it is not at all obvious that presumptive taxes can really help the governments in reaching their equity aims. This paper tries to investigate the effectiveness of taxation of presumptive income as a redistributive device [3], as-

[1] The distinction between effective and presumptive taxes is not always neat, since «(t)he conceptually pure tax base – be it the flow of income, wealth, sales revenue, or something else – cannot be perfectly measured, and the tax authority is constrained to rely on some correlate of the concept» (Slemrod and Yitzhaki, 2002, p. 1457).

[2] For a wide set of empirical estimates of the size of the shadow economy in developing, transition, and OECD countries, see Schneider and Enste (2000; 2002).

[3] To the best of our knowledge, there are only three theoretical contributions on presumptive taxation, namely Bennet (1987), Sadka and Tanzi (1993) and Slemrod and Yitzhaki (1994); however, they focus on different aspects of the problem than those addressed in this paper. On the other hand, there are some theoretical works on optimal taxation that, while not dealing explicitly with presumptive taxation, could be usefully applied to analyse this issue. For instance, Stern's (1982) lump-sum taxation with systematic measurement errors can be viewed as a form of presumptive taxation.

suming that a conventional income tax is in place and assessing the desirability of introducing presumptive taxes by means of small balanced-budget reforms. We set up an occupational choice model in which two kinds of taxpayers exist: entrepreneurs, who are able to engage in costly avoidance [4] of the income tax, and workers (employees), who are not [5].

In the simple version of our model, in which firms are of equal size, we get a sharp and counter-intuitive result: a presumptive tax complementing income taxation takes the form of a lump sum subsidy to entrepreneurs. The intuition is that a subsidy, by raising the wage rate, reduces entrepreneurs' gross income, and this in turn reduces tax avoidance costs. The efficiency gain so obtained, distributed to everybody through the lump sum component of the income tax, shows up as a Pareto improvement. In the extended model, in which firms are of different size, two forms of presumptive taxes can be used: a lump sum tax on entrepreneurs (a tax on occupational choice) and a proportional tax on input costs (that are positively correlated with income). In this setting, presumptive taxation is an effective redistributive device also when income taxation is absent. Occupational-choice presumptive taxation takes the form of a lump sum subsidy to entrepreneurs, as in the simple model. On the contrary, the optimal input-costs presumptive tax can be either a tax or a subsidy, depending on the level of income taxation. On the one hand, if the income tax is absent or low, it is desirable to introduce a tax on input-costs as a redistributive device, although at the cost of an efficiency loss. On the other hand, if the income tax rate is high, it is better to subsidize input-costs so as to reap an efficiency gain, both in the form of higher output and lower tax avoidance costs.

Of course, our results hinge on the model employed. Given the frictionless occupational choice framework, were entrepreneurs to increase tax dodging, an increase in the equilibrium wage would result in order to clear the labour market, thus partially offsetting the negative impact on workers'

[4] We model tax dodging in terms of tax avoidance, as opposed to tax evasion. We are using a distinction between the two based on the economic concept of risk: avoidance is costly and riskless, while evasion is risky because taxpayers are fined if found guilty – see Cowell (1990a, pp. 10-14) for a definition and Cowell (1990b) and Balestrino and Galmarini (2003) for discussions of how the two concepts may be related. An alternative distinction, not used here, is based on whether the activity is legal (avoidance) or not (evasion).

[5] Of course, while most OECD and transition countries levy an income tax on workers, most developing countries do not; our qualitative results, however, carry over to the case in which only entrepreneurs are subject to the income tax. For simplicity, we use a one-good model, and therefore we do not consider indirect taxation explicitly; as long as indirect taxes can be avoided too, we expect however that the general thrust of our arguments would remain the same.

welfare of increased tax avoidance. For the same reason, a presumptive subsidy on entrepreneurs, by raising workers' wage and reducing wasteful tax avoidance costs, performs better in some circumstances than a presumptive tax. Clearly, with less than perfect markets, our results may take a different direction. Other restrictive features of our framework that could be addressed in future research are the assumption of exogenous labour supply and entrepreneurial effort, the assumption of an exogenous tax enforcement policy, and the assumption of Leontief technology.

The paper is outlined as follows. In section 2 we illustrate a simplified version of the model which allows us to make the case for presumptive taxation in a very sharp way. In section 3 we present the full model and discuss the desirability of presumptive taxation in greater detail. Section 4 offers some concluding remarks.

2. *Presumptive taxation in a simple occupational choice model* [6]

Consider a large population of individuals whose size is normalized to unity. Each individual is identified by a parameter n, which we can think of as representing entrepreneurial skill; we take n to be a continuous variable uniformly distributed [7] over the [0,1] interval. Importantly, n is private information. Each agent can choose among two options: to become an *entrepreneur* (*e*) or to become a *worker* (*w*). An individual that chooses **e** hires $s > 0$ units of labour at a wage rate w, in order to produce sn units of a consumption good. The exogenous parameter s can be interpreted as representing the «size» of the firm, perhaps depending on some exogenous endowment of capital goods. In this section, we consider the simple case in which s takes one value only; the extension to two s-groups is considered in section 3. Hence, if a type-n agent becomes an entrepreneur, she activates s production processes, each requiring one unit of labour and producing n units of output. Her gross income is $s(n - w)$, where the skill level, n, represents revenue (the output price is normalized to unity) and w represents labour costs. An individual that chooses w supplies one unit of labour to an entrepreneur. There is no labour-leisure choice on the part of both entrepreneurs and workers. Also, shifting between occupations is costless.

Within this simple model, there are two possible tax bases that the government can use for redistributive purposes: income and occupational choice.

[6] Our framework is based on Boadway *et al.* (1991).

[7] The assumption is for expositional convenience. The model can readily be extended to other distributions of the parameter n.

As regards income, tax authorities observe workers' wage directly, whereas they have no direct knowledge of the skill level n, and hence of income, of each entrepreneur. Thus, while workers are unable to avoid income taxation, taxation of entrepreneurs' income must rely on *reported* income, which may differ from *actual* income [8]. As a result, entrepreneurs will engage in tax avoidance, i.e. will not report their actual income level, so as to gain a more favourable tax treatment. Income taxation is restricted to be linear and unrelated to occupational choice. However, as tax authorities are assumed to observe the occupational choice (e or w) of each individual, they can, in principle, levy differentiated lump-sum taxes on workers and entrepreneurs to supplement the income tax. This is a very simple form of presumptive taxation that assesses the ability to pay on the basis of the type of occupation; hence we label it Occupational Choice Presumptive Taxation (**OC-PT**) [9].

2.1. *Market equilibrium*

Let y^i, $i \in \{w,e\}$, be net income (consumption) associated to option **i**. The following assumption characterizes agents' preferences.

Assumption 1. (**i**) *If* $y'^i > y''^i$, $i \in \{w,e\}$, *then* $y'^i \succ y''^i$. (**ii**) *If* $y^i > y^j$, $i, j \in \{w,e\}$, $i \neq j$, *then* $y^i \succ y^j$. (**iii**) *If* $y^w > y^e$, *then* $y^w \succ y^e$.

A1(*i*) simply says that, within each option, a higher income is preferred to a lower one. A1(*ii*) says that whenever two options give a different income then the one with the higher income is preferred. A1(*iii*) strikes a choice whenever the two options give the same income: **w** is preferred to **e** (but, nothing of substance changes if we make the opposite assumption).

To define entrepreneurs' net income, let $a \in [0,1]$ be the fraction of avoided income. Tax avoidance costs are assumed to be linear in gross income: the per-unit-of-gross-income tax-avoidance-costs, $c(a)$, depend on the fraction of concealed income [10]. $c(\cdot)$satisfies the following restrictions [11]:

8 In a companion paper, Balestrino and Galmarini (2005), we treat the case in which also workers can engage in tax avoidance.

9 Fixed lump-sum payments, or licence fees, are widely used in Central and Eastern Europe (Azerbaijan, Albania and Hungary, among others – see Harrison, 1997).

10 Linearity in gross income of tax avoidance costs means that the tax avoidance technology exhibits constant returns to scale, see Slemrod (2001). Constant returns are also assumed by Boadway *et al.* (1994).

11 Throughout the paper, subscripts denote partial derivatives.

Assumption 2. (**i**) $c(0) = 0$; $c > 0$ *for* $a > 0$; (*ii*) $c_a(0) = 0$, $c_a > 0$ *for* $a > 0$, $c_{aa} > 0$, $c_a(1) \geq 1$.

A2(*i*): Full reporting is costless, whereas tax avoidance is always costly. A2(*ii*): The marginal cost of concealing the first unit of income is zero; then the marginal cost is positive and increasing in the level of concealed income; the marginal cost of concealing the last unit of income is greater than or equal to one.

Provided that $n - w \geq 0$ [12], the net income of a type-n entrepreneur is thus equal to:

$$\alpha - \beta + [1 - t + ta - c(a)]s(n - w),$$

where β is the **OC-PT** tax levied on entrepreneurs (a subsidy when negative), $t \in [0,1]$ is the marginal income tax rate and α is the lump-sum component of the income tax (when $\alpha > 0$, the tax is progressive, as the average tax rate rises with income) [13]. By A1(*i*), tax avoidance is chosen by maximizing net income with respect to a (entrepreneurs are price-takers on the labour market). The first order condition for an interior solution is $t = c_a$ that can be solved for the optimal a. Let $\hat{a}(t)$ be the optimal choice for a and let $\hat{c} = c(\hat{a})$. The following Lemma characterizes the agent's behaviour and notes some results which we will use later on.

Lemma 1. *Under* A2: (**i**) $\hat{a}(0) = 0$, $\hat{a} \in (0,1)$ *for* $t \in (0,1)$, $\hat{a}(1) \leq 1$. (**ii**) $\hat{a}_t = 1/\hat{c}_{aa} > 0$. (**iii**) $t\hat{a} \geq \hat{c}$, $(1 - t + t\hat{a} - \hat{c}) > 0$.

Proof. Part (*i*) comes directly from A2(*ii*) and $t = c_a$. Part (*ii*) follows from totally differentiating $t - c_a = 0$ and using A2(*ii*). Part (*iii*) follows because if $t > 0$ then $\int_0^{\hat{a}} [t - c_a]\, \mathrm{d}a = t\hat{a} - c(\hat{a}) > 0$, since $t > c_a$ for $a \in [0, \hat{a}]$; if $t = 0$, then $\hat{a} = \hat{c} = 0$. Finally, $(1 - t + t\hat{a} - \hat{c}) > 0$, since $(1 - t) > 0$ for $t < 1$ and $(t\hat{a} - \hat{c}) > 0$ for $t > 0$.

[12] Since we assume that losses are not subsidized at the margin, we may take it that a type-n individual never chooses **e** whenever $n - w < 0$.

[13] The **OC-PT** tax is not deductible from the income tax base, but, as it is immediate to show, the alternative assumption (deductibility) would not affect the results. Note that α can be interpreted, when positive, either as a monetary or as an in-kind transfer. While formally equivalent within our framework, the distinction between the two types of transfers is an important one for fiscal policy. Most developing countries, for instance, use in-kind rather than monetary transfers (Bearse *et al.*, 2000).

Lemma 1 says that tax avoidance is zero when income is not taxed at the margin, and positive when taxed; 100% tax avoidance never occurs, unless $t = 1$ and $c_a(1) = 1$. The proportion of avoided income is increasing in the tax rate. Finally, the *effective* marginal tax rate, $(t + t\hat{a} - \hat{c})$, is smaller than the *statutory* tax rate, t.

To shorten notation, let $\hat{\theta} = 1 - t + t\hat{a} - \hat{c}$. With a optimally chosen, net income associated to **e** is thus $y^{e} = \alpha - \beta + \hat{\theta}s(n - w)$. Workers cannot avoid paying the income tax, hence their net income is $y^{w} = \alpha + \theta w$, where $\theta = 1 - t$ (notice that, by Lemma 1, $\hat{\theta} \geq \theta$). There is no **OC-PT** on workers [14].

Occupational choices are defined by the following arbitrage equation:

$$[1] \qquad y^{e} \equiv \alpha - \beta + \hat{\theta}s(n^{s} - w) = \alpha + \theta w \equiv y^{w}$$

where n^s is the marginal skill. This condition establishes that the net income of the marginal workers (the most able among them) must equal the net income of the marginal entrepreneurs (the least skilled). Thus, by A1(*ii*) and A1(*iii*), those individuals whose ability goes from 0 to n^s (included) choose w, while those whose ability goes from n^s (excluded) to 1 choose e. The *market clearing equation* is written:

$$[2] \qquad n^{s} = s(1 - n^{s}),$$

where the l.h.s. represents total labour supply, and the r.h.s. total labour demand.

Eqs. [1] and [2] determine the equilibrium value of the marginal skills, $\tilde{n}^s$, and the equilibrium wage rate, $\tilde{w}$, as a function of the policy variables,

$$[3] \qquad \tilde{n}^{s} = \frac{s}{1+s}, \quad \tilde{w} = \frac{-\beta + \hat{\theta}s\tilde{n}^{s}}{\hat{\theta}s + \theta},$$

from which we get:

$$[4] \qquad \tilde{w}_{\beta} = -(\hat{\theta}s + \theta)^{-1} < 0.$$

The intuition is straightforward. For a given wage rate, an increase in β would result in an excess of labour supply as some entrepreneurs (the least

[14] This restriction is without loss of generality; as can be seen from the arbitrage equation [1] an increase in a workers' lump sum tax would be actually equivalent to a reduction of entrepreneurs' **OC-PT**.

skilled among them) would now prefer to shift to a salaried job; $\tilde{w}$ thus lowers so as to clear the labour market. Notice finally that $\tilde{w}$ depends on t but is independent of α.

2.2. *Occupational Choice Presumptive Taxation (OC-PT)*

The income distribution in the economy described by our model is far from equal, with workers (all earning the same income) at the bottom, and entrepreneurs at the top. This leaves ample scope for action to an equity-oriented government. Suppose then that the government has a Rawlsian objective. This is not only an important benchmark case; it also covers a basic requirement of any redistributive program: as long as the government cares about equality, it will not endorse policies such that the welfare of the workers – the poorest individuals – is unchanged. Indeed, it can be shown that our results concerning the desirability of presumptive taxation would hold for any quasi-concave social welfare function; however, the analysis is simpler in the Ralwsian case, especially in the full version of the model explored below. Our starting point will be an economy in which the government uses the linear income tax, with (t,α) fixed at some arbitrary level [15]. Using this conventional tax, the government will generally be able to tax more heavily those who earn a higher income, but it will also induce tax avoidance. Indeed, we saw from Lemma 1 that the marginal tax rate effectively faced by the entrepreneurs, $t - t\hat{a} - \hat{c}$, is *lower* than the statutory tax rate, t, faced by the workers $(\hat{\theta} \geq \theta)$. The presence of tax avoidance therefore impairs the government's capability to redistribute income using the income tax.

The obvious response to that is to engage in some forms of tax enforcement. Since however tax enforcement is costly and not always effective (see our Introduction), the government may also wish to use presumptive taxes [16]. To investigate the usefulness of presumptive taxation as a redistributive device, we will focus on small revenue-neutral reforms; that is, we look for in-

[15] We do not provide an optimal taxation analysis (see, however, fn. 16), although our results would also hold in case the income tax were optimised. Some relevant contributions on optimal income taxation with tax avoidance or evasion are Sandmo (1981), Pestieau and Possen (1991), Cremer and Gahvari (1994; 1995), Schroyen (1997) and Parker (1991). Optimal taxation in occupational choice models (without tax dodging) is instead studied by Boadway *et al.* (1991), Kanbur (1981), Kihlstrom and Laffont (1983) and Moresi (1998).

[16] We assume that tax enforcement is exogenously given. In the context of tax avoidance, see Slemrod (2001), it is usual to assume that an increase in the enforcement activity raises the avoidance costs, thereby reducing tax dodging. To focus the analysis on presumptive taxes, we do not address welfare-improving revenue-neutral reforms in tax enforcement.

finitesimal adjustments in the policy instruments such that the budget constraint is still satisfied but welfare has improved. It turns out to be easier to work with the resource constraint, rather than with the budget constraint. Assuming a given revenue requirement, $\overline{R}$, we must have that total output equals total disposable income, plus the total cost of avoidance, plus the revenue target:

[5] $$R = \int_{\tilde{n}^s}^{1} sn \,\mathrm{d}n - \int_{0}^{\tilde{n}^s} \tilde{y}^{\mathrm{w}} \,\mathrm{d}n - \int_{\tilde{n}^s}^{1} \tilde{y}^{\mathrm{e}} \,\mathrm{d}n - \int_{\tilde{n}^s}^{1} \hat{c}s(n - \tilde{w}) \,\mathrm{d}n = \overline{R},$$

where $\tilde{y}^{\mathrm{w}}$ and $\tilde{y}^{\mathrm{e}}$ denote equilibrium payoffs. Given that the government has a Rawlsian objective, a welfare improvement is simply an increase in the workers' net income. Let us then consider the possibility of finding a small reform $(\mathrm{d}\alpha,\mathrm{d}\beta)$ such that the budget is unaffected but the net income of the workers goes up. A small change in the presumptive tax levied on entrepreneurs $(\mathrm{d}\beta)$ is thus financed by adjusting the lump-sum component of the income tax $(\mathrm{d}\alpha)$.

From $\tilde{y}^{\mathrm{w}} = \alpha + \theta\tilde{w}$, and since $\tilde{w}_a = 0$, a Rawlsian-improving reform is characterized as follows:

[6] $$\mathrm{d}\tilde{y}^{\mathrm{w}} = \mathrm{d}\alpha + \theta\tilde{w}_{\beta}\mathrm{d}\beta > 0.$$

Differentiating now the equilibrium pay-offs of the agents with respect to α and β and using [4], one obtains:

[7] $$\tilde{y}^{\mathrm{w}}_{\alpha} = \tilde{y}^{\mathrm{e}}_{\alpha} = 1; \quad \tilde{y}^{\mathrm{w}}_{\beta} = \tilde{y}^{\mathrm{e}}_{\beta} = \theta\tilde{w}_{\beta} < 0.$$

We use these to differentiate [5]:

[8] $$\mathrm{d}R = -(\mathrm{d}\alpha + \theta\tilde{w}_{\beta}\mathrm{d}\beta) + (1 - \tilde{n}^s)\hat{c}s\tilde{w}_{\beta}\mathrm{d}\beta.$$

Using [2] and applying the implicit function theorem to solve $\mathrm{d}R = 0$ yields:

[9] $$\left.\frac{\mathrm{d}\alpha}{\mathrm{d}\beta}\right|_{\mathrm{d}R=0} = (\tilde{n}^s\hat{c} - \theta)\tilde{w}_{\beta}.$$

Substituting [9] into [6], and rearranging gives:

[10] $$\left.\mathrm{d}\tilde{y}^{\mathrm{w}}\right|_{(\mathrm{d}\alpha,\mathrm{d}\beta)|\mathrm{d}R=0} = \tilde{n}^s\hat{c}\tilde{w}_{\beta}\mathrm{d}\beta.$$

As long as entrepreneurs avoid taxes, i.e. as long as $\hat{c} > 0$, this is positive for $d\beta < 0$, since $\tilde{w}_\beta < 0$. In our model, tax avoidance only takes place if there is a positive rate of income tax – $\{t = 0\} \Rightarrow \{\hat{a} = \hat{c} = 0\}$. Tax reforms, however, are feasible only for income tax rates below unity – $\{t = 1, \beta = 0\} \Rightarrow \{\tilde{w} = \tilde{n}^s\}$, hence $d\beta < 0$, by increasing $\tilde{w}$, would cause marginal entrepreneurs' gross income, $\tilde{n}^s - \tilde{w}$, to become negative. We have thus established the following local result:

Proposition 1. *A revenue-neutral* **OC-PT** *reform is always Rawlsian-improving as long as $t > 0$ and feasible as long as $t < 1$; the reform consists of a marginal reduction in the entrepreneurs' poll tax,* $d\beta < 0$*, and, correspondingly, a marginal reduction in the lump-sum component of the income tax,* $d\alpha$ [17].

What is the intuition behind Proposition 1? We may distinguish between two aspects of our result. First, we showed that **OC-PT** reforms are Ralwsian-improving whenever there is a group of taxpayers who engage in tax avoidance. Clearly, if that were not the case, the income tax would be a perfectly appropriate redistributive device (since, by assumption, labour supply and entrepreneurial effort are exogenous), and no additional instrument would be needed. However, the fact that a group of citizens can avoid taxes, while the other cannot, implies that the effective marginal tax rate is no longer the same across groups; indeed, we saw that the *richest* segment of the population is confronted with the *lowest* effective tax rate. Then, something can be gained by introducing a tax that treats in different ways groups who have different avoidance opportunities. Second, we found that the direction of the reform is somewhat counterintuitive, since it involves subsidizing those who have a larger disposable income and avoid taxes. It turns out that choosing this direction for the tax reform reduces the amount of resources wasted by the entrepreneurs trying to avoid the income tax, and therefore generates an efficiency gain which shows up as a revenue increase. To see why, simply note that (*i*) a subsidy for the entrepreneurs ($d\beta < 0$) increases $\tilde{w}$, hence decreases their gross income, $s(n - \tilde{w})$, and, crucially, tax avoidance costs, $\hat{c}s(n - \tilde{w})$, and (*ii*) changes in α and β bear the same impact on entrepreneurs' and workers' incomes by [7], an outcome arising from the general equilibrium effects of the tax rates in the labour market.

One might wonder how robust is the result stated in Proposition 1. For

[17] Strictly speaking, we cannot rule out the possibility that while β is reduced, α goes up, as [9] might be positive. However, this seems somewhat improbable (too good to be true!); for instance, simulations with a quadratic cost-of-avoidance function, $c = 0.5a^2$ ($\hat{c} = 0.5t^2$) showed that a sufficient condition for [9] to be negative, independently of the value of s, is that $t < 0.73$, a range that covers all plausible values for a marginal income tax rate.

the special case analysed in this Section, in which all firms have the same size, it is easy to generalize our finding in two important directions. First, we can show that the result does not only hold for small reforms, as [10] is satisfied for arbitrary values of α and β. Hence, starting from any (α,β) pair, it is always possible to increase the workers' pay-off by decreasing marginally β; the process will stop when the gross income of the marginal entrepreneurs reaches zero – see fn. 12. The local result therefore carries over as a global result, which we state as:

Proposition 2. *For any* given $t > 0$, the *optimal* β *is such that* $\tilde{n}^s - \tilde{w} = 0$, *i.e.* *i.e.* $\beta = -\theta\tilde{n}^s$ [18].

Second, we already mentioned that all our findings concerning the desirability of presumptive taxation are valid for any quasi-concave social welfare function. When firms have all the same size, an even stronger result is available. Noting that:

$$\mathrm{d}\tilde{y}^{\mathrm{e}} = \mathrm{d}\alpha - \mathrm{d}\beta - \hat{\theta}s\tilde{w}_{\beta}\mathrm{d}\beta, \ \ \forall n > \tilde{n}^s;$$

substituting [9] and using [4] to simplify we get:

$$\mathrm{d}\tilde{y}^{\mathrm{e}}\Big|_{(\mathrm{d}\alpha,\mathrm{d}\beta)\big|\mathrm{d}R=0} = \tilde{n}^s\hat{c}\tilde{w}_{\beta}\mathrm{d}\beta, \ \ \forall n > \tilde{n}^s,$$

which is identical to [10]. Combining our previous observations, we can therefore state the following:

Proposition 3. *For any given $t > 0$, a revenue-neutral* **OC-PT** *reform is Pareto-improving.*

3. *Presumptive taxation when firms differ in size*

We now extend the model of the previous section by allowing the population to be characterized by a pair of parameters: n, representing entrepreneurial ability, and s, representing firm size. We consider two levels of s, namely $s = l, h, l < h$. The two s-groups are assumed to be of equal size (normalized to unity), and within each s-group n is distributed uniformly over

[18] Notice that, consistently with our derivation of proposition 1, $t = 1$ implies $\beta = 0$. Also, with β optimised, it is easy to see that the optimal t is such that $(1-\hat{a})t$ is maximized, which gives the first order condition $1 - \hat{a} - t\hat{a}_t = 0$. For instance, with $c = 0.5a^2$ (hence $\hat{a} = t$), the optimal taxes are $t = .5$ and $\beta = -.5\tilde{n}^s$.

the continuous interval [0,1]. In this case, there are actually *three* tax bases that the government can use: income and occupational choice as before, plus labour costs, sw (recall that both s and w are observed by the government). We restrict this more sophisticated form of presumptive taxation to be proportional (input costs are taxed at rate τ) and we label it Input Costs Presumptive Taxation (**IC-PT**) [19].

It is possible to show that occupational choice presumptive taxation (**OC-PT**) is desirable also in this enlarged setting; a generalized version of Proposition 1 holds also when firms differ in size (intuitively, the same rationale continues to be valid, because tax avoidance is still present). However, since the joint consideration of **OC-PT** and **IC-PT** excessively complicates the derivation of the results, we solve the model with **IC-PT** only, leaving the comparison between the two types of presumptive taxes to the numerical simulation in section 3.3. We start by describing the market equilibrium in the enlarged setting.

3.1. *Market equilibrium*

Occupational choices are now defined by the following pair of *arbitrage equations*, one for each s-group:

$$[11] \qquad y^{e,s} \equiv \alpha - \tau sw + \hat{\theta} s(n^s - w) = \alpha + \theta w \equiv y^w \quad s = l, h,$$

where n^s is the marginal skill within group s.

The *market clearing equation* is written:

$$[12] \qquad n^h + n^l = (1 - n^h)^h + (1 - n^l)^l,$$

where the l.h.s. represents aggregate labour supply and the r.h.s. aggregate labour demand.

Eqs. [11] and [12] determine the equilibrium wage rate, $\tilde{w}$, and the equilibrium values of the marginal skills, $\tilde{n}^s$, $s = l, h$, as a function of the policy variables t and τ (they are independent of α) [20]:

[19] Presumptive taxes based on input costs are mainly used in developed countries, e.g. France, Israel and Italy, but there are also examples of this kind in Eastern Europe. For instance, in Azerbaijan individual entrepreneurs are taxed on the basis of a given percentage of the minimum wage of average workers. In other countries, simple presumptive taxes based on inputs are often used (typically relying on quantities instead of monetary values): for instance, in Poland taxation is related to the number of employees, and not to the wage bill (Harrison, 1997).

[20] We assume interior solutions, i.e. $\tilde{n}^l \in (0,1)$ and $\tilde{n}^h \in (0,1)$.

[13] $$\tilde{w} = \Delta^{-1}\hat{\theta}lh(l+h),$$

[14] $$\tilde{n}^l = \Delta^{-1}h[(\hat{\theta}+\tau)l+\theta](l+h),$$

[15] $$\tilde{n}^h = \Delta^{-1}l[(\hat{\theta}+\tau)h+\theta](l+h),$$

where $\Delta = lh(2+l+h)(\hat{\theta}+\tau)+\theta(2lh+l+h)$. The presumptive tax rate, τ, affects equilibrium variables as follows:

[16] $$\tilde{w}_\tau = -\Delta^{-1}lh(2+l+h)\tilde{w} < 0,$$

[17] $$\tilde{n}^l_\tau = -(\hat{\theta}\Delta)^{-1}(h-l)(1+h)\theta\tilde{w} < 0,$$

[18] $$\tilde{n}^h_\tau = -(\hat{\theta}\Delta)^{-1}(h-l)(1+h)\theta\tilde{w} > 0.$$

Since τ taxes entrepreneurs, its increase will result in a lower wage because, were $\tilde{w}$ to stay fixed, some entrepreneurs (the least skilled among them) would try to shift to a salaried job, causing thus an excess of labour supply. An increase in τ increases the number of entrepreneurs in the l-group, while it reduces their number in the h-group (the effects are symmetric due to the assumption of Leontief technology) [21].

The market equilibrium can be illustrated with the help of figure 1. The left-graph shows the agents' net incomes as a function of skill level (n) and firm size (s). More type-h than type-l individuals become entrepreneurs ($\tilde{n}^h < \tilde{n}^l$) and conversely more type-l than type-h individuals are workers, as type-h individuals, for any given n, are more productive than type-l individuals. In the right-graph, we then see that type-l entrepreneurs have (observable) input costs of $l\tilde{w}$, and (unobservable) income ranging from $\alpha+\theta\tilde{w}$ to $\alpha-\tau l\tilde{w}+\hat{\theta}l(1-\tilde{w})$, while type-$h$ entrepreneurs input costs are $h\tilde{w}$ with income ranging from $\alpha+\theta\tilde{w}$ to $\alpha-\tau h\tilde{w}+\hat{\theta}h(1-\tilde{w})$; workers are bunched at the bottom of the income distribution. Note that entrepreneurial income and input costs are positively correlated, which suggests that the latter are a good presumptive tax base. Since **IC-PT** would hit the entrepreneurs and not the workers, we could then expect it to be useful to do some redistribution in favour of the latter, e.g. by raising some revenue to fund an increase in the lump-sum subsidy, α; moreover, since type-h entrepreneurs are, on average,

[21] Different assumptions about technology (e.g. decreasing returns of labour inputs or substitutability between labour and entrepreneurial effort) may lead to less clear-cut comparative statics results.

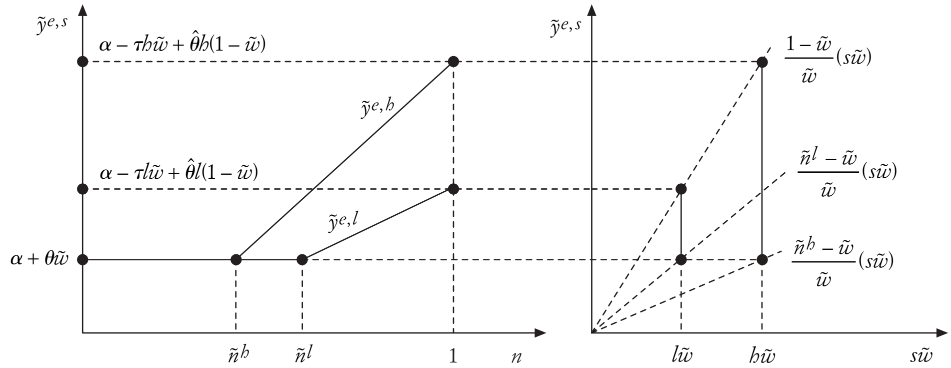

FIG. 1. Income distribution and input costs.

richer than type-l, and have larger labour costs, we might also expect that **IC-PT** fosters some redistribution between the two groups of entrepreneurs [22]. We shall see however that things are somewhat more complicated than it may appear on the surface.

3.2. *Input Costs Presumptive Taxation (IC-PT)*

To investigate the usefulness of presumptive taxation as a redistributive device, we will focus, as in section 2.2, on small revenue-neutral reforms, in which the government has a Rawlsian objective. Let us then consider the possibility of finding a small reform ($d\alpha$, $d\tau$) such that the budget is unaffected but the workers' net income goes up.

From $\tilde{y}^{\mathrm{w}} = \alpha + \theta w$, and since $\tilde{w}_\alpha = 0$, a Rawlsian-improving reform is characterized as follows:

$$d\tilde{y}^{\mathrm{w}} = d\alpha + \theta\tilde{w}_\tau d\tau > 0. \quad [19]$$

The resource constraint is written as:

$$R \equiv \sum_s \left(\int_{\tilde{n}^s}^1 sn\,dn - \int_0^{\tilde{n}^s} \tilde{y}^{\mathrm{w}} dn - \int_{\tilde{n}^s}^1 \tilde{y}^{\mathrm{e},s} dn - \int_{\tilde{n}^s}^1 \hat{c}s(n-\tilde{w})dn \right) = \overline{R}. \quad [20]$$

[22] However, notice that **IC-PT** is horizontally inequitable, as there are some equal-income type-l and type-h individuals that end up paying a different presumptive tax (because they have different production costs).

It is immediate to see that $\tilde{y}^{\mathrm{w}}_{\alpha} = \tilde{y}^{\mathrm{e},l}_{\alpha} = \tilde{y}^{\mathrm{e},h}_{\alpha} = 1$; hence, $R_{\alpha} = -2$. Using this to differentiate [20], and applying the implicit function theorem, we obtain:

[21] $$\left.\frac{\mathrm{d}\alpha}{\mathrm{d}\tau}\right|_{\mathrm{d}R=0} = \frac{1}{2} R_{\tau}.$$

Substituting [21] into [19], gives:

[22] $$\mathrm{d}\tilde{y}^{\mathrm{w}}\Big|_{(\mathrm{d}\alpha,\mathrm{d}\tau)|\mathrm{d}R=0} = (R_{\tau} / 2 + \theta\tilde{w}_{\tau})\mathrm{d}\tau.$$

This shows that a Rawlsian-improving self-financing tax reform requires $\mathrm{d}\tau > (=<) 0$ whenever $R_{\tau} > (=<) -2\theta\tilde{w}_{\tau}$. Since $\tilde{w}_{\tau} < 0$, to have presumptive *taxation* ($\mathrm{d}\tau > 0$) R_{τ} must be positive and large enough to outweigh the negative impact of τ on the wage rate. If τ is not effective in raising revenue (e.g. R_{τ} positive but small) so that the factor multiplying $\mathrm{d}\tau$ in [22] is negative, then it is better to use a presumptive *subsidy* ($\mathrm{d}\tau < 0$). Therefore, the formal analysis does not confirm the intuition suggested by our inspection of figure 1, as there are circumstances in which it may be preferable to subsidize the entrepreneurs, rather than taxing them.

To have a better understanding of what determines the direction of the Rawlsian-improving reform, we need a closer look at the partial derivative R_{τ}. By differentiating [20] with respect to τ we get:

[23] $$R = R^1_{\tau} + R^2_{\tau} + R^3_{\tau},$$

where

$$R^1_{\tau} = -\textstyle\sum_s s\tilde{n}^s\tilde{n}^s_{\tau},$$

$$R^2_{\tau} = \textstyle\sum_s [\hat{c}s(\tilde{n}^s - \tilde{w})\tilde{n}^s_{\tau} + (1-\tilde{n}^s)\hat{c}s\tilde{w}_{\tau}],$$

$$R^3_{\tau} = -\textstyle\sum_s \left(\int_0^{\tilde{n}^s} \tilde{y}^{\mathrm{w}}_{\tau}\mathrm{d}n + \int_{\tilde{n}^s}^{1} \tilde{y}^{\mathrm{e},s}_{\tau}\mathrm{d}n\right).$$

While the reader is referred to the Appendix for the details of derivation, we will indicate here the sign of the three terms in which [23] has been decomposed, and describe intuitively their interpretation.

The first term, R^1_{τ}, represents the impact of τ on aggregate output and can be proven to be negative at $\tau = 0$, $t > 0$; that is, $\mathrm{d}\tau > 0$ reduces aggregate output and consequently tax revenue. To see why, notice first that the *lais-*

sez-faire market equilibrium turns out to be Pareto-efficient in the sense that output is maximized. Indeed, one can use the arbitrage equations [11] to show that, in the absence of government intervention, the following condition holds:

$$\frac{h\,\tilde{n}^h}{1+h} = \frac{l\,\tilde{n}^l}{1+l}. \tag{24}$$

This says that marginal l-entrepreneurs are as productive as marginal h-entrepreneurs, since their output/input ratios are the same; intuitively, this is the condition which ensures that total output is maximized. Since $h/(1+h) > l/(1+l)$, [24] can be satisfied only if $\tilde{n}^h < \tilde{n}^l$. This latter inequality holds true also when proportional income taxation with tax avoidance is present (cfr. figure 1), but equality [24] is not satisfied, because $\tilde{n}^l$ is too small and $\tilde{n}^h$ is too large; when taxes can be avoided by the self-employed only, too many low-productivity (and too few high-productivity) individuals will choose to become entrepreneurs [23]. As a result, marginal h-entrepreneurs will be more productive than marginal l-entrepreneurs. Now, adding a presumptive tax on input costs ($d\tau > 0$) would only make matters worse, as far as production efficiency is concerned, since this would bring $\tilde{n}^l$ further down and would push $\tilde{n}^h$ up in view of [17] and [18], thereby widening the productivity differential.

The second term, R_τ^2, represents the impact of τ on total tax avoidance costs. Since by construction these are given by a fraction $\hat{c}$ of the difference between aggregate output and labour costs, the fact that a marginal increase in τ causes a reduction of output works in favour of reducing avoidance costs as well; however, this effect is clearly dominated by the efficiency loss associated with the reduction of output (because $\hat{c} < 1$). On the other hand, since $\tilde{w}_\tau < 0$ by [16], the effect of increasing τ will be that of increasing avoidance costs, because of the reduction of labour costs. The ensuing waste of resources will determine a fall in revenue. Hence, we can be certain that $R_\tau^1 + R_\tau^2 < 0$.

So far, we have found that the overall impact of **OC-PT** on output and avoidance costs calls for a presumptive subsidy on labour costs. The third term, R_τ^3, however, can readdress the balance in favour of a presumptive tax. This term represents the direct change in tax liabilities, since it accounts for changes in disposable incomes; it is positive, since an increase in τ reduces

[23] Note that this is a specific effect of tax avoidance; there being no labour/leisure choice, a proportional income tax without avoidance would not cause production inefficiency.

agents' aggregate net income and hence raises tax revenue. If this last term is large enough to outweigh the first two, then a presumptive tax might be desirable; otherwise, the government should use a presumptive subsidy.

3.3. *A numerical simulation*

To gain more insights on the conditions which determine the Rawlsian-improving direction of reform, it may be helpful to employ a numerical analysis. We use the numerical simulation also to make a comparison between OC-PT and IC-PT both in the presence and in the absence of income taxation (IT). We assume a quadratic cost of avoidance function, $c = 0.5a^2$. Hence, $\hat{a} = t$ and $\hat{c} = 0.5t^2$. Table 1 presents the results. In all cases, we set $l = 2$, $h = 4$ (the main qualitative results are independent of the l and h values), and $\overline{R} = 0$ (pure redistributive policy). As for notation, $\tilde{y}^{e,s}(1)$ denotes the income of the entrepreneurs who are at the top of the income distribution in each s-group (those with $n = 1$) and $Y = \int_{\tilde{n}^l}^1 l\, n \,\mathrm{d}n + \int_{\tilde{n}^h}^1 h\, n \,\mathrm{d}n$ denotes aggregate output.

Table 1 is divided into four panels. In panel I there is no income taxation ($t = 0$) and only presumptive taxes are employed; the second column contains the optimal IC-PT policy, in which τ is set so as to maximize $\tilde{y}^{w}$; the third column shows the optimal OC-PT tax rate (β) and, finally, the fourth column contains the optimal combination of IC-PT and OC-PT. In all cases, α is the residual tax instrument that balances the government's budget. Since $t = 0$, the first column in panel I shows market equilibrium in *laissez-faire* (LF). The remaining panels (II, III and IV) present: income taxation (IT) in the first column, IT plus IC-PT in the second, IT plus OC-PT in the third, and IT plus IC-PT plus OC-PT in the fourth. While in panels II and III presumptive tax rates are optimised for a given value of t (0.2 and 0.4, respectively), in panel IV t is optimised too.

The results of the numerical analysis can be summarized as follows:

1. When t is relatively small (0 and 0.2), τ is positive; for higher values of t, τ is negative (column two in each panel). Hence, a presumptive tax (subsidy) should be used when income taxation is low (high) [24]. This is consistent with our intuition: when the income tax rate is very low, redistribution is limited, and therefore setting $\tau > 0$ allows a relevant equity gain, large enough to

[24] For $t \geq 0.4$, the constraint $\tilde{n}^b - \tilde{w} \geq 0$ is binding, and hence there is a corner solution for τ.

TAB. 1. *Rawlsian-Optimal Tax Structures*

	I (t = 0)				**II** (t = 0.2)			
					IT	IT	IT	IT
	LF	IC-PT	OC-PT	IC-PT OC-PT		IC-PT	OC-PT	IC-PT OC-PT
τ		2.6875		0.2121		0.3009		–0.0579
t					0.2000	0.2000	0.2000	0.2000
β			–0.5000	–0.3800			–0.4289	–0.4153
α		0.3779	–0.1221	–0.0021	0.1233	0.2207	0.0214	–0.0054
$\tilde{y}^{w}$	0.5581	0.5640	0.5640	0.5640	0.5726	0.5731	0.5784	0.5791
$\tilde{y}^{e,l}(1)$	0.8837	1.0058	1.0058	1.0058	0.8422	0.8730	0.9484	0.9362
$\tilde{y}^{e,h}(1)$	1.7674	1.6337	1.6337	1.6337	1.5611	1.5253	1.4465	1.4626
$\tilde{w}$	0.5581	0.1860	0.6860	0.5660	0.5616	0.4406	0.6963	0.7306
$\tilde{n}^{l}$	0.8372	0.7791	0.7791	0.7791	0.8356	0.8172	0.7744	0.7822
$\tilde{n}^{h}$	0.6977	0.7326	0.7326	0.7326	0.6986	0.7097	0.7354	0.7307
$\tilde{n}^{l} - \tilde{w}$	0.2791	0.5930	0.0930	0.2131	0.2740	0.3766	0.0781	0.0516
$\tilde{n}^{h} - \tilde{w}$	0.1395	0.5465	0.0465	0.1665	0.1370	0.2691	0.0391	0.0000
Y	1.3256	1.3198	1.3198	1.3198	1.3256	1.3249	1.3188	1.3204

	III (t = 0.4)				**IV** (t optimised)			
	IT	IT	IT	IT	IT	IT	IT	IT
		IC-PT	OC-PT	IC-PT OC-PT		IC-PT	OC-PT	IC-PT OC-PT
τ		–0.1500		–0.0429		–0.1189		–0.0350
t	0.4000	0.4000	0.4000	0.4000	0.3387	0.5243	0.5000	0.4773
β			–0.4500	–0.3140			–0.3750	–0.2811
α	0.2296	0.1644	0.1350	0.1465	0.1985	0.2489	0.2109	0.2026
$\tilde{y}^{w}$	0.5748	0.5800	0.5850	0.5862	0.5753	0.5815	0.5859	0.5867
$\tilde{y}^{e,l}(1)$	0.8069	0.7901	0.9250	0.8869	0.8169	0.7842	0.8984	0.8728
$\tilde{y}^{e,h}(1)$	1.3843	1.4159	1.2650	1.3133	1.4353	1.3194	1.2109	1.2620
$\tilde{w}$	0.5755	0.6927	0.7500	0.7327	0.5698	0.6991	0.7500	0.7348
$\tilde{n}^{l}$	0.8293	0.8455	0.7500	0.7789	0.8319	0.8348	0.7500	0.7753
$\tilde{n}^{h}$	0.7024	0.6927	0.7500	0.7327	0.7008	0.6991	0.7500	0.7348
$\tilde{n}^{l} - \tilde{w}$	0.2539	0.1528	0.0000	0.0462	0.2621	0.1356	0.0000	0.0405
$\tilde{n}^{h} - \tilde{w}$	0.1269	0.0000	0.0000	0.0000	0.1311	0.0000	0.0000	0.0000
Y	1.3255	1.3255	1.3125	1.3197	1.3255	1.3256	1.3125	1.3190

more than compensate the costs in term of production inefficiency and increased avoidance costs; instead, when the income tax rate grows, having $\tau > 0$ for redistributive purposes is not so important, while it may be useful to have $\tau < 0$ in order to foster production and to reduce avoidance costs. Interestingly, when all instruments are optimised in a Rawlsian sense, we have a positive rate of income tax, and a negative tax on labour costs – see panel IV.

2. Presumptive taxes are all equivalent in the absence of income taxation (panel I): OC-PT, IC-PT, or a combination of the two, bear a different impact on the wage rate and on gross profits, but have the same impact on net incomes and on real variables.

3. OC-PT takes the form of a subsidy ($\beta < 0$) for all values of t (see column three in each panel) confirming that the result of proposition 1, obtained in the case of identical s, carries over to the more general model with two s-values.

4. OC-PT performs better than IC-PT in maximizing $\tilde{y}^w$, and is also preferred by l-entrepreneurs. This is an interesting and striking result, which says that *simple* presumptive taxes (such as licence fees) may be better than *complex* ones (as those based on input costs). Indeed, OC-PT is equivalent to IC-PT in the absence of income taxation, but performs strictly better in its presence. The reason for this result is that IC-PT distorts aggregate production more than OC-PT, since with the former $\tilde{n}^l$ is larger and $\tilde{n}^h$ is smaller. As a further check, note that, comparing the fourth with the third column of panels II to IV, we see that adding IC-PT to OC-PT results in negligible improvements in workers' welfare.

5. Finally, panel IV shows another interesting result: presumptive taxation allows for higher marginal progressivity of the income tax. In the numerical example, the optimal marginal income tax rate is 33.8% in the absence of presumptive taxation, while it is above 47.7% when presumptive taxes accompany the income tax.

4. *Conclusions*

It is often the case that certain groups of citizens can escape their tax obligations more easily than others. The presence of these «hard-to-tax «groups may severely limit the redistributive action of the governments. One of the possible responses to that is for the governments to engage in some form of presumptive taxation. In this paper, we have argued that presumptive taxation may indeed be a useful instrument for raising the welfare of the less well-off, although it may achieve this outcome in a somewhat unexpected fashion. Indeed, we saw that there are circumstances in which the entrepreneurs, who are at the top of the income distribution and can avoid the income tax, have to be *subsidised* in order to achieve an improvement of the workers' welfare. The reason why this occurs is that presumptive taxes have not only a redistributive action, but also affect production efficiency as well as the amount of resources devoted to tax avoidance. Our occupational choice model can indeed capture the general equilibrium effects of taxation, and we are therefore able to show that some forms of presumptive *subsidies* can have positive effects on output and reduce tax avoidance costs, thereby allowing an improvement in social welfare. Several authors, including Kaplow (1996), have emphasized that the interaction between market forces and taxation is crucial for understanding the effect of the latter in the presence of tax avoidance [25]. Ours is basically an attempt at taking a step in that direction, and we hope therefore that the present paper has some value as a methodological contribution as well as for its specific results.

Appendix

In this appendix, we derive the signs of the three terms in which [23] has been decomposed. It turns out to be easier to work with a somewhat different expression for R. Rearranging the terms in [20], one has:

$$R \equiv \sum_s \left(\left[\int_{\tilde{n}^s}^{1} (1-\hat{c}) sn \, \mathrm{d}n + \int_{\tilde{n}^s}^{1} \hat{c} s \tilde{w} \, \mathrm{d}n \right] - \int_0^{\tilde{n}^s} \tilde{y}^{\mathrm{w}} \mathrm{d}n - \int_{\tilde{n}^s}^{1} y^{\mathrm{e},s} \mathrm{d}n \right) = \overline{R}\,.$$

Clearly, the derivative of the term in brackets with respect to τ equals $R_\tau^1 + R_\tau^2$. Using [17] and [18], then [13], [14], [15] and [12], we get:

$$R_\tau^1 + R_\tau^2 = \frac{[\hat{\theta} + (1-\hat{c})(\tau - \theta)] lh(h^2 - l^2)\tilde{n}_\tau^l}{(1+h)\Delta} + (\tilde{n}^l + \tilde{n}^h)\hat{c}\tilde{w}_\tau\,,$$

which is negative at $\tau = 0$, $t > 0$, since $\tilde{n}_\tau^l < 0$, $\hat{\theta} > \theta$ and $\tilde{w}_\tau < 0$.

To derive R_τ^3, we first need to compute, using [16], the following partial derivatives:

$$\tilde{y}_\tau^{\mathrm{w}} = \theta \tilde{w}_\tau = -\Delta^{-1} lh\theta(2 + l + h)\tilde{w} < 0\,,$$

$$\tilde{y}_\tau^{\mathrm{e},l} = -(\hat{\theta} + \tau) l\tilde{w}_\tau - l\tilde{w} = -\Delta^{-1} l\tau(2lh + l + h)\tilde{w} < 0\,,$$

$$\tilde{y}_\tau^{\mathrm{e},h} = -(\hat{\theta} + \tau) h\tilde{w}_\tau - h\tilde{w} = -\Delta^{-1} h\theta(2lh + l + h)\tilde{w} < 0\,.$$

Substituting these into R_τ^3 and rearranging, we finally obtain:

$$R_\tau^3 = \Delta^{-1}(\tilde{n}^l + \tilde{n}^h)[lh(2 + l + h) + (2lh + l + h)]\theta\tilde{w}\,,$$

which is positive for all $t < 1$.

[25] Watson (1985), Kesselman (1989), Jung, Snow and Trandel (1994) and Trandel and Snow (1999) examine under different perspectives the interaction between labour market, income taxation, tax dodging and the size of the underground economy.

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Summary: In several Western countries, as well as in virtually all developing and transition ones, the government's ability to redistribute income in favour of the less well-off is severely limited by the fact that certain groups of citizens can escape their tax obligations more easily than others. In this paper, we focus our attention on one of the possible responses to that problem, namely the recourse to presumptive taxation, whereby not income as such, but a proxy for income, is selected as the tax base. To study this issue, we employ an occupational choice model where an individual can either be a worker or an entrepreneur. We assume that a conventional income tax is in place and that only entrepreneurs, who are at the top of the income distribution, can partially avoid the income tax. In this setting, we show that presumptive taxation based either on occupational choice or on the firms' input costs can raise the welfare of the workers, who are the poorest members of the society. This outcome is not necessarily achieved, however, by taxing entrepreneurs: in a number of circumstances, presumptive subsidies for the entrepreneurs are preferable to presumptive taxes, the reason being that the latter may cause production inefficiency as well as increase tax avoidance costs.

J.E.L. *Classification*: H21, H26