Veblen's Theory of the Leisure Class Revisited: Implications for Optimal Income Taxation[**]

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Abstract

Almost all previous studies on public policy under relative consumption concerns have ignored the role of leisure for status comparisons. Inspired by Veblen (1899), this paper considers a two-type optimal income tax model, where people care about their relative consumption, and where the importance of relative consumption increases with the use of leisure due to increased consumption visibility. We show that increased consumption positionality typically implies higher marginal income tax rates for both ability-types. Using a leisure-weighted measure of reference consumption, rather than a measure where leisure plays no role as in the previous literature, increases the marginal income tax rate implemented for the low-ability type and decreases the marginal income tax rate implemented for the high-ability type, i.e., it gives rise to a regressive tax component.

Keywords: optimal taxation, redistribution, public goods, relative consumption, status, positional goods.

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> Closely related to the requirement that the gentleman must consume freely and of the right kind of goods, there is the requirement that he must know how to consume them in a seemly manner. His life of leisure must be conducted in due form…
>
> Veblen (1899)

1. Introduction

The *Theory of the Leisure Class* by Veblen (1899) remains the classic reference to the idea of "conspicuous consumption," according to which individuals may signal wealth – or status more generally – via their consumption behavior. Today, a substantial body of empirical evidence suggests that people care about their *relative* consumption, i.e., their consumption relative to that of others – a possible indication of status seeking – and hence not just their *absolute* consumption as in conventional economic theory.[1] Yet, and somewhat paradoxically given the title and content of Veblen's book, almost the entire (rapidly growing) policy-oriented literature dealing with optimal tax and expenditure responses to relative consumption comparisons has ignored the role of leisure in such comparisons.[2] The only exception that we are aware of is a paper on optimal income taxation by Aronsson and Johansson-Stenman (2009), in which both private consumption and leisure are treated as positional goods, i.e., individuals derive

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[1] This empirical evidence includes happiness research (e.g., Easterlin 2001; Blanchflower and Oswald 2004; Ferrer-i-Carbonell 2005; Luttmer 2005), questionnaire-based experiments[1] (e.g., Johansson-Stenman et al. 2002; Solnick and Hemenway 2005; Carlsson et al. 2007), and, more recently, brain science (Fliessbach et al. 2007). There are also recent evolutionary models consistent with relative consumption concerns (Samuelson 2004; Rayo and Becker 2007). Stevenson and Wolfers (2008) constitute a recent exception in the happiness literature, claiming that the role of relative income is overstated.

[2] Earlier studies dealing with public policies in economies where agents have positional preferences address a variety of issues such as optimal taxation, public good provision, social insurance, growth, environmental externalities, and stabilization policy; see, e.g., Boskin and Sheshinski (1978), Layard (1980), Oswald (1983), Frank (1985, 2005, 2008), Ng (1987), Blomquist (1993), Corneo and Jeanne (1997, 2001), Brekke and Howarth (2002), Abel (2005), Blumkin and Sadka (2007), Aronsson and Johansson-Stenman (2008, in press), Wendner and Goulder (2008), Kanbur and Tuomala (2010), and Wendner (2010a, b). An alternative approach is to assume conventional preferences where, instead, relative consumption has instrumental value; see, e.g., Cole et al. (1992, 1998). Clark et al. (2008) provide a good overview of both the empirical evidence and economic implications of relative consumption concerns.

utility from their own consumption and use of leisure, respectively, relative to the consumption and use of leisure among others. They find that relative consumption concerns typically contribute to increase the optimal marginal income tax rates for all individuals, whereas concern for relative leisure has an offsetting role. Furthermore, this offsetting role is not symmetric: concern about relative leisure implies a progressive income tax component, i.e., a component that is larger for high-ability than for low-ability individuals.

The present paper concerns optimal nonlinear income taxation in an economy where consumers derive utility from their own consumption relative to that of others. In line with the ideas of Veblen (1899), we assume that leisure has a displaying role in making relative consumption more visible, rather than being a positional good in itself. Thus, in our model, we do not assume that individuals care about their own use of leisure relative to that of other people; instead, their own and others' use of leisure will matter in the sense of making their own and others' private consumption more visible. Intuitively, people will have a hard time noticing a person's new BMW if he/she works all the time. We believe that this approach is closer to the spirit of Veblen.

There are (at least) two aspects of such consumption visibility. First, the utility gain (loss) to an individual with higher (lower) relative consumption may increase with his/her use of leisure. Second, the positional consumption externality that each individual imposes on others may increase with the time he/she spends on leisure. We discuss both these aspects below, and show that only the latter directly affects the policy rules for marginal income taxation.

Section 2 presents the basic model, which is based on the assumption that each individual compares his/her own consumption with a leisure-influenced average of other people's consumption, and analyzes the outcome of private optimization. The optimal tax problem is characterized in Section 3, where we utilize the two-type model with optimal nonlinear income taxation with asymmetric information between the government and the private sector developed by Stern (1982) and Stiglitz (1982) as our basic workhorse. This model provides a simple – yet very powerful – framework for capturing redistributive and corrective aspects of income taxation as well as for capturing the policy incentives caused by interaction between the incentive constraint and the desire to internalize positional externalities. The reason why such interaction is important is that policies designed to internalize positional externalities may either contribute to relax or tighten the incentive constraint. In other words, pure externality correction may affect the scope for redistribution.

The optimal taxation results are presented in Section 4, showing for example *i*) that increased concern for relative consumption typically implies higher marginal income tax rates for both ability types, and *ii*) that the displaying role of leisure gives rise to *regressive* income taxation in the sense of increasing the marginal income tax rate faced by the low-ability type while decreasing the marginal income tax rate faced by the high-ability type. The intuition behind the latter finding is that an increase in the use of leisure by the low-ability type contributes to reduce the positional consumption externality, whereas an increase in the use of leisure by the high-ability type leads to an increase in this externality.

Section 5 extends the analysis by introducing a more general measure of reference consumption, which allows for comparisons upwards and downwards in the income distribution. This extension is shown to have important policy implications. For example, if individuals compare their own consumption solely with that of the high-ability type, then the consumption of the low-ability type does not give rise to positional externalities, and there will consequently be no efficiency-based reason for taxing the income of the low-ability type. Relative consumption concerns would then induce a progressive tax element. Section 6 provides some concluding remarks, while proofs are presented in the Appendix.

2. The Consumers' Preferences and Labor Supply Problem

There are two types of individuals, where the low-ability type (type 1) is less productive than the high ability type (type 2), and n^i denotes the number of individuals of ability type *i*. An individual of ability type *i* cares about his/her private consumption, x^i, and leisure, z^i, which is given by a time endowment, H, less the number of hours of work, l^i.

In accordance with the bulk of earlier comparable literature on relative consumption comparisons, we assume that each individual compares his/her own private consumption with a measure of reference consumption, and that the relative consumption can be described by the *difference* between the individual's own consumption and the appropriate reference measure.[3] However, contrary to the same earlier literature – and in accordance with Veblen (1899) – we also assume that leisure has a displaying role in making relative consumption more visible. To be more specific, we assume (i) that the utility gain to the individual with higher relative consumption increases with his/her own use of leisure, and (ii) that the positional consumption externality that each individual imposes on other people tends to increase with the time he/she spends on leisure. The first aspect is captured simply by defining the "gain of relative consumption" by the function $h^i(z^i, \Delta^i)$, where z^i is the time spent on leisure and Δ^i is the relevant measure of relative consumption. We assume that $h^i_z > 0$ and $h^i_\Delta > 0$, where subindices denote partial derivatives.

The second aspect is captured by measuring the relative consumption as $\Delta^i = x^i - \Omega$, where Ω is a leisure-influenced measure of others' consumption, in the sense that the consumption carries a higher weight if accompanied with more use of leisure by the same person, such that

$$\Omega = \frac{\sum_j n^j f(z^j) x^j}{\sum_j n^j f(z^j)},$$

where $f'(z^j) > 0$ for j = 1,2. This means that increased use of leisure by a particular individual increases the weight that this individual's consumption carries in the

[3] See, e.g., Akerlof (1997), Corneo and Jeanne (1997), Ljungqvist and Uhlig (2000), Bowles and Park (2005), Carlsson et al. (2007), and Aronsson and Johansson-Stenman (2008, in press). Alternative approaches include ratio comparisons (Boskin and Sheshinski 1978; Layard 1980; Wendner and Goulder 2008) and comparisons of ordinal rank (Frank 1985; Hopkins and Kornienko 2004, 2009).

reference consumption level. We also assume that the curvature of *f* is non-extreme in the sense that $f(z^j)f''(z^j) < \left(f'(z^j)\right)^2$, implying $\partial\left(f'(z^j)/f(z^j)\right)\big/\partial z^j < 0$.[4]

For further use, note that

$$\frac{\partial\Omega}{\partial x^i} = \frac{n^i f(z^i)}{\sum_j n^j f(z^j)}$$

and

$$\frac{\partial\Omega}{\partial z^i} = \frac{f'(z^i)n^i}{\sum_j n^j f(z^j)}\left(x^i - \frac{\sum_j n^j f(z^j)x^j}{\sum_j n^j f(z^j)}\right) = \frac{f'(z^i)n^i}{\sum_j n^j f(z^j)}\left(x^i - \Omega\right).$$

Therefore, $\partial\Omega/\partial x^i > 0$ for i=1,2. By adding the assumption that the private consumption of the high-ability type always exceeds the private consumption of the low-ability type – which is reasonable and also in line with the assumptions underlying redistributive policy (to be presented below) – we have $x^1 < \Omega$ and $x^2 > \Omega$ and, as a consequence, $\partial\Omega/\partial z^1 < 0$ and $\partial\Omega/\partial z^2 > 0$.

The utility function of ability type *i* can then be written as

$$U^i = V^i(x^i, z^i, h^i(z^i, \Delta^i)) = v^i(x^i, z^i, \Delta^i) = u^i(x^i, z^i, \Omega). \tag{1}$$

The functions $V^i(\cdot)$ and $v^i(\cdot)$ are increasing in each argument, implying that $u^i(\cdot)$ is decreasing in Ω (a property that Dupor and Liu 2003 denote “jealousy”) and increasing in the other arguments; $V^i(\cdot)$, $v^i(\cdot)$ and $u^i(\cdot)$ are assumed to be twice continuously differentiable in their respective arguments and strictly concave. We assume that the individual treats Ω as exogenous. The second equality follows because the direct effect of z^i on $h^i(\cdot)$ – following from the assumption that the utility of relative consumption to the individual increases with his/her own use of

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[4] An obvious example of such a function is $f(z^j) = z^j$, i.e., a simple proportional relationship. Yet, this special case has some unattractive features, e.g., that the consumption weight is zero when leisure is equal to zero. In reality, it makes more sense to assume that $f(0) > 0$, such that an individual’s

leisure – will be fully internalized by the individual via the labor supply choice. Therefore, without loss of generality, we may replace $V^i(\cdot)$ with the "reduced form" $v^i(\cdot)$, in which the direct effect of z^i on $h^i(\cdot)$ is embedded in the marginal utility of leisure.[5] The function $u^i(\cdot)$ represents the most general utility formulation and resembles a classic externality problem; here, we do not specify anything about the structure of the social comparisons beyond that others' consumption gives rise to externalities. In fact, much of the analysis to be carried out below will be based on the function $u^i(\cdot)$. Yet, we need the more restrictive utility formulation based on the function $v^i(\cdot)$, where we specify that people care about additive comparisons, to establish a relationship between the optimal tax policy on the one hand and the degree to which the utility gain of higher consumption is associated with increased relative consumption on the other. The latter will be referred to as the "degree of positionality," to which we turn next.

By extending the definition in Johansson-Stenman et al. (2002) to allow for leisure-weighted consumption comparisons, we define the *degree of positionality* for ability type *i*, α^i, as

$$\alpha^i = \frac{v^i_\Delta}{v^i_x + v^i_\Delta}, \qquad (2)$$

where $0 < \alpha^i < 1$ follows from our earlier assumptions. The subindices attached to the function $v^i(\cdot)$ denote partial derivatives, so $v^i_x \equiv \partial v^i / \partial x^i$ and $v^i_\Delta \equiv \partial v^i / \partial \Delta^i$. The parameter α^i can then be interpreted as the fraction of the overall utility increase for ability type *i* from the last dollar spent that is due to the increased relative consumption. The *average degree of positionality* then becomes

consumption affects the reference consumption also when the person works all the time, i.e., has zero leisure. The more general expression $f(z^j)$ allows for this.

[5] This means that $V^i_z + V^i_h h^i_z = v^i_z$.

$$\bar{\alpha} \equiv \frac{n^1\alpha^1 + n^2\alpha^2}{n^1 + n^2}, \quad (3)$$

where $0 < \bar{\alpha} < 1$. Empirical estimates of $\bar{\alpha}$ (yet based on models where leisure does not have a displaying role for consumption comparisons) vary considerably across studies, although many of them suggest that the average degree of positionality might be substantial (e.g., in the interval 0.2-0.8).[6] We will return to the implications of these estimates below.

Let $T(w^i l^i)$ denote the income tax payment of ability type *i*. The individual budget constraint is given by $w^i l^i - T(w^i l^i) = x^i$, implying the following first order condition for the number of hours of work:

$$u_x^i w^i \left[1 - T'(w^i l^i)\right] = u_z^i, \quad (4)$$

where $u_x^i = \partial u^i / \partial x^i$, $u_z^i = \partial u^i / \partial z^i$, and $T'(w^i l^i)$ is the marginal income tax rate.

Turning to the production side of the economy, we follow much of the earlier literature on optimal income taxation in assuming that output is produced by a linear technology, which is interpreted to mean that the gross wage rates are fixed. This assumption simplifies the calculations, but is not of major importance for the qualitative results to be derived below.

3. The Optimal Tax Problem

The objective of the government is assumed to be a Pareto efficient resource allocation, which it accomplishes by maximizing the utility of the low-ability type, while holding the utility constant for the high-ability type, subject to a self-selection

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[6] See, e.g., Alpizar et al. (2005), Solnick and Hemenway (2005), Carlsson et al. (2007), and Wendner and Goulder (2008).

constraint and the budget constraint.[7] The informational assumptions are conventional. The government is able to observe income; yet ability is private information. We follow the standard approach in assuming that the government wants to redistribute from the high-ability to the low-ability type. This means that the most interesting aspect of self-selection is to prevent the high-ability type from pretending to be a low-ability type. The self-selection constraint that may bind then becomes

$$U^2 = u^2(x^2, z^2, \Omega) \geq u^2(x^1, H - \phi l^1, \Omega) = \hat{U}^2, \tag{5}$$

where $\phi = w^1 / w^2$ is the wage ratio, i.e., relative wage rate. The expression on the right-hand side of the weak inequality is the utility of the mimicker. Although the mimicker enjoys the same consumption as the low-ability type, he/she spends more time on leisure as the mimicker is more productive than the low-ability type.

As we are considering a pure redistribution problem under positional externalities, and by using $T(w^i l^i) = w^i l^i - x^i$ from the private budget constraints, it follows that the government's budget constraint can be written as

$$\sum_i n^i w^i l^i = \sum_i n^i x^i \, . \tag{6}$$

Therefore, and by analogy with earlier literature based on the self-selection approach to optimal income taxation, the marginal income tax rates can be derived by choosing the number of hours of work and private consumption for each ability type to maximize the Lagrangean

$$£ = U^1 + \mu\left[U^2 - U_0^2\right] + \lambda\left[U^2 - \hat{U}^2\right] + \gamma\left[\sum_i n^i \{w^i l^i - x^i\}\right],$$

where U_0^2 is an arbitrarily fixed utility level for the high-ability type, while μ, λ, and γ are Lagrange multipliers associated with the minimum utility restriction, the

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[7] This approach is standard. An alternative approach would be to assume that the government is maximizing a social welfare function (again subject to the relevant self-selection and budget constraint). This approach would give the same qualitative results in terms of policy rules for the marginal income tax rates as those derived below.

self-selection constraint and the budget constraint, respectively. This will be described in more detail below. The first order conditions for z^1, x^1, z^2, and x^2 are then given by

$$u_z^1 - \lambda\phi\hat{u}_z^2 - \gamma n^1 w^1 + \frac{\partial \pounds}{\partial \Omega}\frac{\partial \Omega}{\partial z^1} = 0\,, \tag{7}$$

$$u_x^1 - \lambda\hat{u}_x^2 - \gamma n^1 + \frac{\partial \pounds}{\partial \Omega}\frac{\partial \Omega}{\partial x^1} = 0\,, \tag{8}$$

$$\left(\mu + \lambda\right)u_z^2 - \gamma n^2 w^2 + \frac{\partial \pounds}{\partial \Omega}\frac{\partial \Omega}{\partial z^2} = 0\,, \tag{9}$$

$$\left(\mu + \lambda\right)u_x^2 - \gamma n^2 + \frac{\partial \pounds}{\partial \Omega}\frac{\partial \Omega}{\partial x^2} = 0\,, \tag{10}$$

in which we have used $\hat{u}^2 = u^2(x^1, H - \phi l^1, \Omega)$. As before, a subindex attached to the utility function represents a partial derivative.

4. Optimal Income Taxation

Let $MRS_{z,x}^i = u_z^i / u_x^i$ and $M\hat{R}S_{z,x}^2 = \hat{u}_z^2 / \hat{u}_x^2$ denote the marginal rate of substitution between leisure and private consumption for ability type i and the mimicker, respectively. By combining equations (7) and (8) and equations (9) and (10), respectively, with the private first order condition for number of work hours given by equation (4), we show in the Appendix that the optimal marginal income tax rates can be written as (for i=1, 2)

$$T'(w^i l^i) = \tau^i + \frac{1}{n^i \gamma w^i}\frac{\partial \pounds}{\partial \Omega}\left(\frac{\partial \Omega}{\partial z^i} - MRS_{z,x}^i \frac{\partial \Omega}{\partial x^i}\right). \tag{11}$$

Here, τ^i represents the marginal income tax rate implemented for ability type i in the standard two-type model without positional preferences, i.e.,

$$\tau^1 = \frac{\lambda^*}{n^1 w^1}\left(MRS_{z,x}^1 - M\hat{R}S_{z,x}^2 \phi\right) \text{ and } \tau^2 = 0\,,$$

where $\lambda^* = \lambda \hat{u}_x^2 / \gamma > 0$. The formulas for τ^1 and τ^2 coincide with the marginal income tax rates derived by Stiglitz (1982) for an economy with fixed before-tax wage rates. The intuition behind them is that the government may relax the self-selection constraint by imposing a marginal income tax on the low-ability type, whereas no such option exists with respect to the marginal income tax rate of the high-ability type.

Turning to the second term on the right hand side of equation (11), two things are worth noticing. First, relative consumption concerns lead to a simple additive modification of the tax formula. Second, the only reason why the presence of positional preferences directly affects the tax formula is that z^i and x^i directly affect Ω (our measure of reference consumption), i.e., that the consumption and leisure choices made by each individual directly affect the utility of relative consumption perceived by others. Therefore, this extra component is due solely to that each individual imposes externalities on others. The other assumption about consumption-visibility, namely that the private utility gain related to relative consumption increases with the individual's own use of leisure, does not affect the policy rules for marginal income taxation, as this effect is already internalized at the individual level and does not justify policy intervention. However, this mechanism might of course affect the levels of the marginal income tax rates.

Note that when deriving equation (11), we have only assumed that individual utility depends (negatively) on Ω according to the function $u^i(\cdot)$ in equation (1). To go further, we make use of the function $v^i(\cdot)$, which specifies *how* each individual's utility depends on relative consumption comparisons. By using equations (7)-(10), we show in the Appendix that the welfare effect of an increase in reference consumption, Ω, can be written as

$$\frac{\partial \pounds}{\partial \Omega} = u_\Omega^1 + (\mu + \lambda) u_\Omega^2 - \lambda \hat{u}_\Omega^2 = -\frac{\gamma N \bar{\alpha}}{1-\tilde{\alpha}} + \frac{\lambda \hat{u}_x^2 (\hat{\alpha}^2 - \alpha^1)}{1-\tilde{\alpha}}, \tag{12}$$

where $N = n^1 + n^2$, while

$$\tilde{\alpha} = \frac{\sum_i \alpha^i n^i f(z^i)}{\sum_j n^j f(z^j)} \in (0,1)$$

measures a leisure-influenced average of the degree of positionality through the function $f(z^i)$. This term arises here due to the fact that the effect of x^i on Ω depends on the relative "leisure-share," $n^i f(z^i) / \sum_j n^j f(z^j)$, of ability type *i*.

Consider the expression after the second equality in equation (12), showing that the welfare effect of increased reference consumption can be decomposed into two terms. The first reflects the average degree of positionality and contributes negatively to welfare, as it represents a negative consumption externality (recall that the individual utilities depend negatively on Ω), while the second reflects the difference in the degree of positionality between the mimicker and the low-ability type. The latter effect is positive if the mimicker is more positional than the low-ability type, in which case an increase in Ω contributes to relax the self-selection constraint. On the other hand, if the low-ability type is more positional than the mimicker, then this component is negative, as an increase in Ω then contributes to tighten the self-selection constraint.

For pedagogical reasons, we begin by analyzing how the appearance of positional preferences contributes to the marginal income tax rates when the self-selection constraint does not bind, in which case the government may implement a first best policy, and we then continue with the second best model.

First Best Taxation

In the first best, where the self-selection constraint does not bind, we have $\lambda = 0$. Let us use the short notation

$$\pi^i = \frac{\partial \Omega}{\partial x^i} \bigg/ \frac{n^i}{N} = \frac{N}{n^i} \frac{n^i f(z^i)}{\sum_j n^j f(z^j)},$$

reflecting how the measure of reference consumption changes in response to increased consumption by ability type *i*, relative to the population share of ability type *i*. As such, π^i also reflects the relative leisure weight attached to x^i in the measure of reference consumption. Clearly, when $z^1 = z^2$ it follows that $\pi^1 = \pi^2 = 1$, and when $z^i > z^j$, it follows that $\pi^j < 1 < \pi^i$. By using equations (11) and (12), along with the variable (to be explained below)

$$\rho^i = \frac{1-\tilde{\alpha}}{\pi^i} + \bar{\alpha} > 0\,, \tag{13}$$

we can then derive the following result:

Proposition 1. *In the first best, where* $\lambda = 0$, *the marginal income tax rate for ability type i (i=1, 2) can be written as*

$$T'(w^i l^i) = \frac{\bar{\alpha}}{\rho^i}\left(1 - \frac{1}{w^i}\frac{f'(z^i)}{f(z^i)}\left(x^i - \Omega\right)\right). \tag{14}$$

Proof: see the Appendix.

To interpret Proposition 1, it is instructive to begin by considering the simplified (and somewhat unrealistic) case where both ability types use the same amount of leisure, so $z^1 = z^2 = \bar{z}$ and $\tilde{\alpha} = \bar{\alpha}$, and therefore $\rho^i = 1$ for *i*=1,2, implying that equation (14) reduces to

$$T'(w^i l^i) = \bar{\alpha}\left(1 - \frac{1}{w^i}\frac{f'(z^i)}{f(z^i)}\left(x^i - \Omega\right)\right). \tag{15}$$

The first term on the right hand side of equation (15) is the average degree of positionality, $\bar{\alpha}$, and contributes to increase the marginal income tax rate for both ability types. The intuition is that private consumption causes a *negative externality*, due to others' reduced relative consumption, equal to $\bar{\alpha}$ per unit of consumption. Note also that if the consumption externality that each individual imposes on others were independent of the individual's use of leisure, in which case $\Omega = \sum_i n^i x^i / N$, then $f'(z^i) = 0$ for *i*=1,2 and the second term on the right hand side of equation (15) would vanish. In this case, therefore, $T'(w^i l^i) = \bar{\alpha}$ for i=1, 2 (see Aronsson and Johansson-Stenman 2008).

The second term on the right hand of equation (15) is novel and arises because the use of leisure affects the externality that each individual imposes on others. Since $x^1 < \Omega$ and $x^2 > \Omega$, this effect means that the tax system becomes regressive in the sense that $T'(w^2 l^2) < \bar{\alpha} < T'(w^1 l^1)$. The interpretation is straightforward: an increase in the use of leisure by the low ability type contributes to reduce the consumption externality, whereas an increase in the use of leisure by the high-ability type causes an increase in the consumption externality, *ceteris paribus*, i.e., $\partial\Omega / \partial z^1 < 0$ and $\partial\Omega / \partial z^2 > 0$. Therefore, and in addition to the conventional Pigouvian tax component associated with relative consumption comparisons, i.e., the first term on the right hand side, there is an incentive for the government to decrease the labor supply of the low-ability type and increase the labor supply of the high-ability type, which explains the regressive tax structure implicit in equation (15).

Now, returning to the more general equation (14), where the use of leisure differs between the ability types, the effects described above are still present – in the square bracket – although the tax structure is no longer necessarily regressive in the sense that the low-ability type faces a higher marginal income tax rate than the high-ability type. The reason is that the factor of proportionality, $1/\rho^i$, is ability-type specific. This component represents an adjustment of the tax structure due to that the relationship between x^i and Ω depends on the relative use of leisure by ability type *i*, i.e., $\partial\Omega / \partial x^i = n^i f(z^i) / \sum_j n^j f(z^j)$. In other words, the greater this leisure-influenced weight attached to ability type *i*, *ceteris paribus*, the more an increase in x^i will contribute to the positional consumption externality. One can show that $\rho^i > 1$ (<1) if $z^k > z^i$ ($z^k < z^i$) for i=1,2 and $k \neq i$. Therefore, this mechanism works to increase the marginal income tax rate for the ability type who spends relatively more time on leisure and to decrease the marginal income tax rate for the ability type who spends relatively less time on leisure at the optimum.

The following result is a direct consequence of Proposition 1:

Corollary 1. *If* $z^1 \geq z^2$*, the optimal income tax structure is regressive in the sense that* $T'(w^2 l^2) < T'(w^1 l^1)$.

The intuition behind the corollary is that if $z^1 \geq z^2$, then the proportionality factors $1/\rho^1 \geq 1$ and $1/\rho^2 \leq 1$ reinforce the regressive tax component in equation (15). If on the other hand $z^1 < z^2$, the proportionality factors work in the opposite direction, which means that the marginal income tax rate implemented for the low-ability type may either exceed, be equal to, or fall short of the marginal income tax rate implemented for the high-ability type. Therefore, a sufficient condition for a regressive tax structure is that the high-ability type supplies more labor than the low-ability type.[8]

Returning to the Second Best Model

We will now return to the second best model to analyze how a binding self-selection constraint ($\lambda > 0$) modifies the first best policy discussed above. To shorten the notations, let

$$\alpha_d = \frac{\lambda \hat{u}_x^2 (\hat{\alpha}^2 - \alpha^1)}{\gamma N}$$

be an indicator of the difference in the degree of consumption positionality between the mimicker and the low-ability type. Note that $\alpha_d > 0$ if the mimicker is more positional than the low-ability type; conversely, $\alpha_d < 0$ if the low-ability type is more positional than the mimicker. Then, by using

$$\zeta^i = \frac{1}{w^i} \frac{f'(z^i)}{f(z^i)} \left[x^i - \Omega \right]$$

we can derive the result:

[8] This condition corresponds well with empirical evidence for both men and women in Europe and for women in the U.S. See Blundell and MaCurdy (1999).

Proposition 2. *The second best marginal income tax rate is given by (for i=1, 2)*

$$T'(w^i l^i) = \tau^i + \frac{(1-\tau^i-\zeta^i)}{\rho^i}\left[\bar{\alpha} - \frac{(\rho^i-\bar{\alpha})\alpha_d}{\rho^i-\alpha_d}\right]. \quad (16)$$

Proof: see the Appendix.

Once again, it is useful to start with the simplified case where both ability types use the same amount of leisure, so $z^1 = z^2 = \bar{z}$, $\tilde{\alpha} = \bar{\alpha}$ and $\rho^i = 1$ for i=1,2, in which equation (16) reduces to

$$T'(w^i l^i) = \tau^i + (1-\tau^i-\zeta^i)\left[\bar{\alpha} - \frac{(1-\bar{\alpha})\alpha_d}{1-\alpha_d}\right]. \quad (17)$$

Equation (17) reflects a combination of three incentives for marginal income taxation: (*i*) an incentive to relax the self-selection constraint by exploiting that the mimicker and the low-ability type differ with respect to use of leisure, as reflected in the variable τ^i; (*ii*) an incentive to internalize the positional externality; and (*iii*) an incentive to relax the self-selection constraint by exploiting that the mimicker and the low-ability type may differ with respect to degree of positionality, i.e., via α_d. In equation (15) above, only incentive (*ii*) was present.

The first term on the right hand side of equation (17), τ^i, represents the marginal income tax rate that the government would implement in the standard two-type model without positional preferences. This component is likely to be positive for the low-ability type (at least if the form of the utility function does not differ among individuals) and zero for the high-ability type. The incentive to internalize the positional externality, i.e., the pure correction element, is here captured by the expression $(1-\tau^i-\zeta^i)\bar{\alpha}$, which differs from equation (15) in that this component is here reduced by τ^i times the average degree of positionality. The intuition is that the fraction of an income increase that is already taxed away for other reasons does not give rise to positional externalities. Note also that if α_d is equal to zero (i.e., if the mimicker and the low-ability type do not differ with respect to degree of positionality), then the redistributive (i.e., τ^i) and corrective components reinforce each other in the sense that their joint effect is a regressive income tax structure. In this case, therefore, and by analogy to equation (15), we have $T'(w^2l^2) < \bar{\alpha} < T'(w^1l^1)$.

Finally, the sign of the third component in equation (17), i.e., the expression proportional to α_d, depends on the difference in degree of positionality between the mimicker and the low-ability type. Suppose first that $\alpha_d > 0$, meaning that the mimicker is more positional than the low-ability type. This suggests that increased reference consumption, i.e., an increase in Ω, causes a larger utility loss for the mimicker than for the low-ability type.[9] As a consequence, the government may relax the self-selection constraint by implementing policies that lead to increased reference consumption. This means that the third term on the right hand side of equation (17) contributes to decreased marginal income taxation for both ability types. On the other hand, if $\alpha_d < 0$, then the opposite argument applies as the government may, in this case, relax the self-selection constraint by implementing a policy that leads to lower reference consumption.

Note also that the tax-regression result derived earlier will continue to hold under certain conditions also in the context of equation (17). For instance, if the self-selection effect caused by positional concerns, as represented by α_d, does not dominate the effect of the average degree of positionality, so that $\bar{\alpha} > \alpha_d$, and if $\tau^1 > 0$ (as in the original Stiglitz 1982 model), then $T'(w^1l^1) > T'(w^2l^2)$. The condition $\bar{\alpha} > \alpha_d$ always applies if the low-ability type is at least as positional as the mimicker, in which case $\alpha_d \leq 0$. The intuition is, of course, that the desire to internalize positional externalities and the incentive to relax the self-selection constraint via policy-induced changes in the reference consumption, i.e., incentives (*ii*) and (*iii*) referred to above, affect the optimal marginal income tax rates in the same direction. However, even if the mimicker is more positional than the low-ability type, meaning that $\alpha_d > 0$, the income tax structure will still be regressive in the

[9] Strictly speaking, this interpretation also presupposes that $1-\alpha_d > 0$, which we assume here.

sense mentioned above if the condition $\bar{\alpha} > \alpha_d$ still applies. On the other hand, if $\bar{\alpha} < \alpha_d$, and if we continue to assume that $\tau^1 > 0$, then the marginal income tax rate implemented for the low-ability type need no longer exceed the marginal income tax rate implemented for the high-ability type; in fact, we cannot in this case determine whether the low-ability type faces a higher or lower marginal income tax rate than the high-ability type.

Returning to the general second best formula in equation (16), it remains to analyze the effect of the variable ρ^i, which was equal to one in the simplified case where both ability types use the same amount of leisure. This component works in the same general way here as it did in the first best scenario discussed above, with one important exception: that it matters for the qualitative effect of an increase or decrease in ρ^i whether $\bar{\alpha}$ exceeds or falls short of α_d. To see this more clearly, let us rewrite equation (16) as

$$T'(w^i l^i) = \tau^i \left[\frac{\rho^i - \bar{\alpha}}{\rho^i - \alpha_d} \right] + (1 - \zeta^i) \left[\frac{\bar{\alpha} - \alpha_d}{\rho^i - \alpha_d} \right]. \tag{18}$$

To interpret equation (18), suppose that $\tau^1 > 0$ (as in the original Stiglitz 1982 model where the utility function does not differ between the ability types), meaning that the low-ability type would face a positive marginal income tax rate in the absence of any positional concerns. For the high-ability type, the marginal income tax rate reduces to the second term on the right hand side of equation (18) because $\tau^2 = 0$ by the assumptions made earlier. Now, since $\zeta^1 < 0$ and $\zeta^2 > 0$, and by adding the assumption that $\bar{\alpha} > \alpha_d$, we again find that the condition $\rho^1 \leq \rho^2$ implies that the marginal income tax rate implemented for the low-ability type exceeds that implemented for the high-ability type. Therefore, the following result is an immediate consequence of Proposition 2:

Corollary 2. *If $\tau^1 > 0$, $\bar{\alpha} > \alpha_d$, and $z^1 \geq z^2$, then the income tax structure is regressive in the sense that $T'(w^1 l^1) > T'(w^2 l^2)$.*

The intuition behind Corollary 2 is straightforward: if $\tau^1 > 0$ and $\bar{\alpha} > \alpha_d$, we may relax the self-selection constraint *and* internalize the positional externality by implementing a higher marginal income tax rate for the low-ability type than for the high-ability type. An important mechanism behind this result – captured by the variables $\zeta^1 < 0$ and $\zeta^2 > 0$ – is that increased use of leisure by the low-ability type contributes to reduce the positional externality, whereas increased use of leisure by the high-ability type leads to an increase in the positional externality, *ceteris paribus*.

5. Extension: A More General Measure of Reference Consumption

The analysis carried out so far assumes that the appropriate measure of reference consumption at the individual level is given by a leisure-influenced consumption-average for the economy as a whole, Ω, defined in Section 2. This approach is analogous to earlier literature on public policy and relative consumption, where the average consumption typically constitutes the reference point. However, it is plausible that individuals compare themselves more with some people than with others. For instance, Veblen (1899), Duesenberry (1949), and Schor (1998) have argued for the importance of an asymmetry, such that “low-income groups are affected by consumption of high-income groups but not vice versa” (Duesenberry, 1949, p. 101). This is also consistent with the empirical findings of Bowles and Park (2005) that more inequality in society tends to imply more work hours. In the context of optimal taxation and relative consumption, Aronsson and Johansson-Stenman (in press) address such “upward comparisons” as an alternative to the conventional mean-value comparison; yet without considering the displaying role of leisure discussed here.[10]

In this section, we allow for the asymmetry mentioned above while still retaining the displaying role of leisure. Consider the following generalized measure of reference consumption (which replaces the measure Ω used in earlier sections):

[10] As their study is based on an OLG model, they also addressed within-generation comparisons.

$$\breve{\Omega} = \frac{\sum_j n^j \beta^j f(z^j) x^j}{\sum_j n^j \beta^j f(z^j)},$$

where $\beta^i \in [0,1]$ for i=1,2, and $\sum_j \beta^j = 1$. The parameter β^i represents the weight given to ability type i's contribution to reference consumption. In other words, we allow the ability types to differ with respect to their influences on the reference point. Note that $\beta^2 = 1$ implies that $\breve{\Omega} = x^2$, meaning that each individual only compares himself/herself with the high-ability type. Similarly, $\beta^1 = 1$ gives $\breve{\Omega} = x^1$, in which case each individual only compares himself/herself with the low-ability type. If $\beta^2 \in (0.5,1]$, this is interpretable to mean that the leisure-influenced consumption by the high-ability type has a more than proportional influence on the measure of reference consumption. If, instead, $\beta^1 \in (0.5,1]$, we have an analogous interpretation for the low-ability type. The analysis carried out in previous sections may, in turn, be interpreted as the special case where $\beta^1 = \beta^2 = 0.5$.

With the variable $\breve{\Omega}$ at our disposal, it is straightforward to generalize the expressions for the marginal income tax rates in Proposition 2. Define

$$\breve{\alpha} = \sum_i \alpha^i \frac{n^i \beta^i f(z^i)}{\sum_j n^j \beta^j f(z^j)} \in (0,1),$$

$$\breve{\rho}^i = \frac{\sum_j n^j \beta^j f(z^j)}{\beta^i f(z^i) N}(1 - \breve{\alpha}) + \bar{\alpha} > 0, \text{ and}$$

$$\breve{\zeta}^i = \frac{1}{w^i} \frac{f'(z^i)}{f(z^i)} \left[x^i - \breve{\Omega} \right],$$

which replace the variables $\tilde{\alpha}$, ρ^i, and ζ^i, respectively, in the previous section, and consider the following result:

Proposition 3. *With the generalized measure of reference consumption, $\breve{\Omega}$, the marginal income tax rates can be written as (for i=1,2)*

$$T'(w^i l^i) = \tau^i \left[\frac{\breve{\rho}^i - \bar{\alpha}}{\breve{\rho}^i - \alpha_d} \right] + (1 - \breve{\zeta}^i) \left[\frac{\bar{\alpha} - \alpha_d}{\breve{\rho}^i - \alpha_d} \right]. \tag{19}$$

Proof: see the Appendix.

Equation (19) has been written using the same format as equation (18), as this makes it easy to relate equation (19) to Corollary 2. Equation (19) can be interpreted in the same general way as equation (18); however, given that $\tau^1 > 0$ and $\bar{\alpha} > \alpha_d$, as we assumed in the interpretation of equation (18), the sufficient condition for a regressive tax structure in Corollary 2, i.e., $z^1 \geq z^2$, must here be replaced with $\breve{\rho}^1 \leq \breve{\rho}^2$. Even if the high-ability type were to supply more labor than the low-ability type, this condition becomes less likely to hold the larger β^2 relative to β^1. Therefore, with "upward comparisons" in the sense that the leisure-weighted consumption by the high-ability type has a more than proportional influence on the measure of reference consumption, the case of regressive taxation becomes somewhat weaker than before. To see this, let us consider the two special cases with $\beta^1 = 1$ and $\beta^2 = 1$, respectively. The following result is an immediate consequence of Proposition 3:

Corollary 3. *Suppose that* $\tau^1 > 0$ *and* $\bar{\alpha} > \alpha_d$. *Then, if*

(i) $\beta^1 = 1$, *the marginal income tax rates can be written as*

$$T'(w^1l^1) = \tau^1 \left[\frac{n^1(1-\alpha^1)}{n^1(1-\alpha^1) + N(\bar{\alpha} - \alpha_d)} \right] + \frac{N(\bar{\alpha} - \alpha_d)}{n^1(1-\alpha^1) + N(\bar{\alpha} - \alpha_d)} > 0$$

$T'(w^2l^2) = 0$, *and if*

(ii) $\beta^2 = 1$, *the marginal income tax rates become*

$$T'(w^1l^1) = \tau^1 > 0$$

$$T'(w^2l^2) = \frac{N(\bar{\alpha} - \alpha_d)}{n^2(1-\alpha^2) + N(\bar{\alpha} - \alpha_d)} > 0 .$$

Corollary 3 means that if each individual (of both ability types) only compares his/her own consumption with that of other low-ability individuals, then the tax structure is regressive in the sense that $T'(w^1l^1) > T'(w^2l^2)$ independently of whether the high-ability type supplies more labor than the low-ability type. On the other hand, if each individual solely compares his/her own consumption with that of high-ability individuals – which is arguably more realistic and in line with some earlier research mentioned above – then externality correction works in the direction of a more progressive income tax structure. Therefore, the marginal income tax rate implemented for the low-ability type may either exceed or fall short of the marginal income tax rate implemented for the high-ability type. From a policy perspective beyond the two-type model, the distributional pattern induced by externality correction is probably even more important. This is because simulations have shown that in an economy with many ability types, yet without positional concerns, there is no general pattern showing that lower-ability types should face higher marginal tax rates than higher-ability types; see, e.g., Kanbur and Tuomala (1994).

Note also that the first best special case, in which $\tau^1 = \alpha_d = 0$, we have $T'(w^1l^1) > T'(w^2l^2)$ if $\beta^1 = 0$, and $T'(w^1l^1) < T'(w^2l^2)$ if $\beta^2 = 1$. This means that upward comparisons give rise to a pattern of externality correction that works in the direction of a more progressive income tax structure.

6. Conclusion

As far as we know, this is the first paper that has highlighted a displaying role of leisure in the context of relative consumption comparisons when theoretically analyzing optimal public policy. In line with Veblen (1899), we assume that leisure has a displaying role in making relative consumption more visible. Our main results are summarized as follows. First, increased consumption positionality typically implies higher marginal income tax rates for both ability types. Second, the consumption-displaying role of leisure provides an argument for regressive income taxation in the sense that it contributes to increased marginal income taxation of the low-ability type and decreased marginal income taxation of the high-ability type. This can be compared to the findings of Aronsson and Johansson-Stenman (2009), where concern for relative leisure implies an argument for progressive taxation. Third, the levels of optimal marginal income tax rates – as well as whether the tax system ought to be progressive or regressive – are largely dependent on how the measure of reference consumption is determined. For example, if agents tend to compare their own consumption more with that of high-ability than low-ability individuals, this will influence the optimal tax structure in a progressive direction.

Future research may take several directions. One possible extension follows by observing that our analysis assumes full employment. However, as equilibrium unemployment is an important phenomenon in real world market economies, the use of leisure might not always be the outcome of an optimal choice by the individual. It is, therefore, also relevant to combine the study of optimal taxation in economies with positional preferences (at least if leisure plays a role in this particular context) with imperfect competition in the labor market. There is clearly also room for more empirical research regarding relative consumption comparisons in general, and regarding how reference consumption levels are determined and the role of leisure in particular.

Appendix

Derivation of Equation (11)

Let us start with the marginal income tax rate facing the low-ability type. Combine equations (7) and (8) to derive

$$MRS_{z,x}^{1}[\lambda \hat{u}_{x}^{2} + \gamma n^{1} - \frac{\partial £}{\partial \Omega}\frac{\partial \Omega}{\partial x^{1}}] = \lambda \phi \hat{u}_{z}^{2} + \gamma n^{1} w^{1} - \frac{\partial £}{\partial \Omega}\frac{\partial \Omega}{\partial z^{1}}. \tag{A1}$$

Using $T'(w^{1}l^{1})w^{1} = w^{1} - MRS_{z,y}^{1}$ from equation (4), substituting into equation (A1) and rearranging, we get the expression for the marginal income tax rate of the low-ability type. The marginal income tax rate of the high-ability type can be derived analogously. ■

Derivation of Equation (12)

Start by differentiating the Lagrangean with respect to Ω:

$$\frac{\partial £}{\partial \Omega} = u_{\Omega}^{1} + \left(\mu + \lambda\right) u_{\Omega}^{2} - \lambda \hat{u}_{\Omega}^{2} . \tag{A2}$$

From equation (1), $u_{\Omega}^{i} = -v_{\Delta}^{i}$, for i=1,2, and $\hat{u}_{\Omega}^{2} = -\hat{v}_{\Delta}^{2}$. We can then use equation (2) to derive

$$u_{\Omega}^{i} = -\alpha^{i} u_{x}^{i} \text{ for } i\text{=1,2} \tag{A3}$$

$$\bar{u}_{\Omega}^{2} = -\hat{\alpha}^{2} \hat{u}_{x}^{2} . \tag{A4}$$

Substituting equations (A3) and (A4) into equation (A2) gives

$$\frac{\partial £}{\partial \Omega} = -\alpha^{i} u_{x}^{1} - \left(\mu + \lambda\right) \alpha^{2} u_{x}^{2} + \lambda \hat{\alpha}^{2} \hat{u}_{x}^{2} . \tag{A5}$$

Now, solving equation (8) for u_{x}^{1} and equation (9) for $(\mu + \lambda) u_{x}^{2}$ and substituting into equation (A5) gives

$$\frac{\partial £}{\partial \Omega} = -\alpha^{1} \left(\lambda \hat{u}_{x}^{2} + \gamma n^{1} - \frac{\partial £}{\partial \Omega} \frac{\partial \Omega}{\partial x^{1}} \right) - \alpha^{2} \left(\gamma n^{2} - \frac{\partial £}{\partial \Omega} \frac{\partial \Omega}{\partial x^{2}} \right) + \lambda \hat{\alpha}^{2} \hat{u}_{x}^{2} . \tag{A6}$$

Using $\partial \Omega / \partial x^{i} = n^{i} f(z^{i}) / \sum_{j} n^{j} f(z^{j})$ for i=1,2, substituting into equation (A6), collecting terms, and rearranging gives equation (12). ■

Proofs of Propositions 1 and 2

Substituting equation (12) into equation (11), while using

$$\frac{\partial \Omega}{\partial x^{i}} = \frac{n^{i} f(z^{i})}{\sum_{j} n^{j} f(z^{j})} \text{ and } \frac{\partial \Omega}{\partial z^{i}} = \frac{n^{i} f'(z^{i})}{\sum_{j} n^{j} f(z^{j})} \left(x^{i} - \Omega \right)$$

gives

$$T'(w^i l^i) = \tau^i + \frac{1}{n^i w^i} \frac{N\left[-\bar{\alpha} + \alpha_d\right]}{1-\tilde{\alpha}} \left[\frac{n^i f'(z^i)(x^i - \Omega)}{\sum_j n^j f(z^j)} - MRS^i_{z,x} \frac{n^i f(z^i)}{\sum_j n^j f(z^j)} \right]. \qquad \text{(A7)}$$

Using $MRS^i_{z,x} = w^i(1 - T'(w^i l^i))$, substituting into equation (A7), and then solving for $T'(w^i l^i)$, we obtain equation (16) in Proposition 2. The special case where $\tau^i = 0$ and $\lambda = 0$, which also means that $\alpha_d = 0$, gives equation (14) in Proposition 1. ■

Proof of Proposition 3

Substitute equation (12) into equation (11). Then, by using

$$\frac{\partial \breve{\Omega}}{\partial x^i} = \frac{n^i \beta^i f(z^i)}{\sum_j n^j \beta^j f(z^j)} \text{ and } \frac{\partial \breve{\Omega}}{\partial z^i} = \frac{n^i \beta^i f'(z^i)}{\sum_j n^j \beta^j f(z^j)} \left(x^i - \breve{\Omega} \right),$$

we can derive the expression

$$T'(w^i l^i) = \tau^i + \frac{1}{n^i w^i} \frac{N\left[-\bar{\alpha} + \alpha_d\right]}{1-\breve{\alpha}} \left[\frac{n^i \beta^i f'(z^i)(x^i - \breve{\Omega})}{\sum_j n^j \beta^j f(z^j)} - MRS^i_{z,x} \frac{n^i \beta^i f(z^i)}{\sum_j n^j \beta^j f(z^j)} \right]. \qquad \text{(A8)}$$

We can then use equation (A8) to derive equation (19) in exactly the same way as we used equation (A7) to derive equation (16) in the proof of Proposition 2 above. ■

In Corollary 3, it follows that $\partial \breve{\Omega} / \partial x^1 = 1$ and $\partial \breve{\Omega} / \partial x^2 = \partial \breve{\Omega} / \partial z^1 = \partial \breve{\Omega} / \partial z^2 = 0$ if $\beta^1 = 1$, while $\partial \breve{\Omega} / \partial x^2 = 1$ and $\partial \breve{\Omega} / \partial x^1 = \partial \breve{\Omega} / \partial z^1 = \partial \breve{\Omega} / \partial z^2 = 0$ if $\beta^2 = 1$. With this modification, the marginal income tax rates in the corollary can be derived in the same way as we derived equation (19). ■

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