Paternalism against Veblen: Optimal Taxation and Non-Respected Preferences for Social Comparisons[**]

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Abstract

This paper deals with optimal income taxation and relative consumption under a welfarist government that fully respects people's preferences and a paternalist government that does not share the consumer preference for relative consumption. Consistent with previous findings, relative consumption concerns typically lead to higher marginal income tax rates in the welfarist case. A remarkable result is that the optimal tax rules turn out to be very similar when people's preferences for social comparisons are not respected. Indeed, if the relative consumption concerns are based on mean value comparisons and all consumers are equally positional, or if they are driven by within-type comparisons, the paternalist and welfarist governments can implement their respective first-best allocations through exactly the same marginal income tax formulas. Yet, also in these cases, there are some remaining differences that follow from second-best considerations.

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1. Introduction

Ever since the writings of Adam Smith in the 18th century, it has been well-known in economics that people care about status and social comparisons, and that relative consumption indeed matters to most of us.[1] Tax and other policy implications of such comparisons have more recently been explored from different points of departure in a number of studies, including Boskin and Sheshinski (1978), Oswald (1983), Tuomala (1990), Persson (1995), Corneo and Jeanne (1997), Ljungqvist and Uhlig (2000), Dupor and Liu (2003), Abel (2005), Frank (2008), and Aronsson and Johansson-Stenman (2008, 2010, 2013).[2] A typical finding in this literature is that the externalities generated by relative consumption concerns motivate considerably higher marginal tax rates than in the conventional model of optimal taxation without social comparisons. However, as is always the case, the theoretical results depend on the underlying assumptions. Indeed, a common assumption in all these studies is that the tax policy is decided by a welfarist government, i.e., a government that fully respects all aspects of consumer preferences, including concerns for relative consumption. While the welfarist assumption in normative economic analysis is standard, and often seen as uncontroversial, one may argue that this is less obvious when it comes to social comparisons. Indeed, Harsanyi (1982, p. 56) argues that the government should not respect what he refers to as anti-social preferences, of which envy is one example given. Since positional concerns imply that an individual's utility depends negatively on other people's consumption, one could interpret this as envy and, following Harsanyi, argue that the government should not respect such

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[1] This argument also finds strong support in recent research on happiness and questionnaire-based experiments showing that relative consumption is an important determinant of individual well-being (e.g., Easterlin, 1995, 2001; Johansson-Stenman et al., 2002; Blanchflower and Oswald, 2004; Ferrer-i-Carbonell, 2005; Solnick and Hemenway, 2005; Carlsson et al., 2007; Clark and Senik, 2010).

[2] Although there was for a long time in the 20th century little discussion on normative implications of relative consumption concerns, there were of course exceptions. Moreover, such issues were often taken more seriously by classical economists. For example, Mill (1848) argued that quite often consumer choice "is not incurred for the sake of the pleasure afforded by the things on which the money is spent, but from regard to opinion, and an idea that certain expenses are expected from them, as an appendage of station." He concluded that: "I cannot but think that expenditure of this sort is a most desirable subject of taxation" (Principles of Political Economy, Book 5, Chapter 6).

preferences and hence not include the effects of relative consumption in the social objective function.[3]

In the present paper we do not take a stand on the appropriateness of different assumptions regarding the social objective. Instead, we simply analyze the implications of a paternalist approach and compare them with those of the welfarist approach. One may presume that the induced higher marginal income taxes due to social comparisons based on the welfarist approach will simply vanish if the analysis is instead based on a paternalist approach where preferences for social comparisons are not respected. It turns out, however, that such a conjecture is importantly wrong. In fact, a paternalist government may respond in a way similar to – or even in exactly the same way as – a welfarist government, although for a different reason.

The present paper thus supplements earlier research based on the welfarist approach to first-best (e.g., Persson, 1995; Ljungqvist and Uhlig, 2000; Dupor and Liu, 2003) and second-best optimal income taxation (e.g., Aronsson and Johansson-Stenman, 2008, 2010) by considering the case where consumer preferences for relative standing are of no concern to the government. The point of departure is the discrete variant of the Mirrleesian optimal income tax model with two productivity types developed by Stern (1982) and Stiglitz (1982), which will be extended to accommodate consumer preferences for relative consumption, and where information asymmetries typically prevent the government from implementing a first-best resource allocation. This model gives a useful analytical framework – based on a reasonably simple structure – for understanding the policy incentives associated with correction and redistribution as well as their interaction through the incentive constraint. Also, in this model, a first-best tax policy follows naturally from the special case where the incentive constraint does not bind, which simplifies comparisons with earlier research considerably.

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[3] According to Frank (2005), this is also one likely reason why many economists have been reluctant to base policy analyses on models where the consumers are positional. Yet, as also argued by Frank, positional concerns need not necessarily reflect anti-social preferences. Instead they might reflect instrumental reasons such as the need for families to keep up with community spending to be able to live in areas where their children may attend schools of reasonable quality.

As far as we know, our study is the first to more systematically compare the paternalist and welfarist approaches to optimal taxation under relative consumption concerns from a theoretical point of view. Yet, there are a few previous studies on paternalist approaches to optimal taxation in economies where the consumers are concerned with their relative consumption. Dodds (2010) and Kanbur and Tuomala (2010)[4] compare the optimal income tax policy of welfarist and paternalist governments in the context of numerical models. A linear income tax is considered in the former paper, whereas the latter deals with optimal nonlinear income taxation. The numerical results show that relative consumption concerns among consumers may motivate much higher marginal tax rates than in the absence of such concerns, even if the consumer preference for relative consumption does not affect the policy objective (provided, of course, that the government, nevertheless, recognizes the associated behavioral effects). Eckerstorfer and Wendner (2013) instead examine the optimal structure of commodity taxation and allow the consumption-externality caused by relative consumption comparisons to be non-atmospheric (such that individuals differ in their contribution to this externality) and asymmetric (meaning that people use different reference points). They show that both a welfarist and a paternalist government may implement a first-best resource allocation through personalized commodity taxation and that the principle of targeting does not generally apply if the (welfarist or paternalist) government is restricted to using uniform commodity taxes.

The paper closest to ours is Micheletto (2011), who analyzes optimal income taxation in a second-best setting where he also considers the case of paternalism. He uses a quite specific model, where each productivity type compares his/her consumption with that of the adjacent type with higher productivity (meaning that the highest productivity type is not concerned with relative consumption). We will return to his results below. Our study is more general and differs from his in several important ways. First, we consider a broader spectrum of possibilities by analyzing the tax policy implications of (i) the mean value comparison (which is the conventional assumption in earlier comparable studies based on the welfarist approach), (ii) within-

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[4] This is the working paper version, which was subsequently published as Tuomala and Kanbur (2013). However, in the journal version the section based on a paternalist government is dropped.

type comparisons, and (iii) upward comparisons.[5] Second, we consider the incentives underlying both first-best and second-best taxation, meaning that we are able to compare our results with a fairly large body of literature on tax policy and relative consumption based on welfarist models. Third, we present the optimal tax policy in terms of *degrees of positionality*, i.e., the extent to which people's utility gain from increased consumption is driven by the preferences for relative consumption, which makes it possible to interpret the results in the light of such estimates from the empirical literature on social comparisons.

The outline of the study is as follows. In Section 2, we present a benchmark model where each individual compares his/her consumption with the average consumption in the overall economy. The implications for first-best and second-best taxation are analyzed in Section 3. Section 4 concerns the tax policy implications of the alternative comparison forms mentioned above, i.e., within-type and upward comparisons, respectively, while Section 5 provides a summary and a discussion. Proofs are presented in the Appendix.

2. A Two-Type Economy with Relative Consumption and Nonlinear Taxation

Consider an economy with two types of consumers, a low-productivity type (type 1) and a high-productivity type (type 2), where productivity is measured by the before-tax wage rate. There are n^1 individuals of the low-productivity type and n^2 individuals of the high-productivity type; $N = n^1 + n^2$ denotes total population. Output

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[5] The empirical evidence here is scarce. Some evidence suggests that people compare their own consumption with that of people who are similar to themselves (e.g., Runciman, 1966; McBride, 2001; Clark and Senik, 2009), which in our setting may justify comparisons within productivity groups, while other evidence is more in accordance with upward comparisons (e.g., Bowles and Park, 2005). We also interpret Veblen (1899) in terms of upward comparisons, as he argued that people in other social classes are influenced by the behavior of, and try to emulate, the wealthy leisure class.

in this economy is produced by a linear technology such that the before-tax wage rates are fixed.[6]

2.1 Consumer Behavior and Preferences for Relative Consumption

Each consumer derives utility from his/her absolute consumption and use of leisure, respectively, as well as from his/her consumption relative to that of referent others. The utility function faced by a consumer of productivity type i ($i=1,2$) is given by

$$U^i = v^i(x^i, z^i) + \sigma^i(\Delta^i), \tag{1}$$

where x^i denotes consumption, z^i leisure, and Δ^i the individual's relative consumption. For technical convenience, the relative consumption is defined as the difference between the individual's own consumption and a measure of reference consumption, x^r, such that $\Delta^i = x^i - x^r$ (as in, e.g., Akerlof, 1997; Corneo and Jeanne, 1997; Ljungqvist and Uhlig, 2000; Bowles and Park, 2005; and Carlsson et al., 2007).[7] To begin with, we consider the conventional mean value comparison, where the reference consumption is given by the average consumption in the economy as a whole, i.e.[8]

$$x^r = \bar{x} \equiv \frac{n^1 x^1 + n^2 x^2}{N}.$$

We assume that the functions $v^i(\cdot)$ and $\sigma^i(\cdot)$ are strictly quasi-concave and increasing in their respective arguments. Note also that equation (1) allows for differences in

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[6] This assumption simplifies the calculations; it is of no significance for how relative consumption concerns affect the optimal tax policy.

[7] An obvious alternative would be to assume that the individual's relative consumption is determined by the ratio between the individual's own consumption and the relevant reference measure (e.g., as in Boskin and Sheshinski, 1978; Layard, 1980; Abel, 2005; and Wendner and Goulder, 2008). It is not important for the qualitative results which option is chosen.

[8] Earlier studies on optimal income taxation and relative consumption typically assume that individuals compare their own consumption with the average consumption in the economy as a whole. Exceptions are Aronsson and Johansson-Stenman (2010), who also analyze the policy implications of within-generation and upward comparisons, respectively, faced by a welfarist policy maker, and Micheletto (2011), who considers a variant of upward comparisons.

preferences between types. The separable structure is convenient, as it makes it easy to distinguish between a welfarist government (which respects consumer preferences for relative consumption) and a paternalist government (which does not). However, none of the results derived below depend on this functional form assumption. Alternative comparison forms and measures of reference consumption will be addressed in Section 4.

We show below that the strengths of the relative consumption concerns are important determinants of the optimal tax policy, irrespective of whether the government has a paternalist or welfarist objective. Based on Johansson-Stenman et al. (2002), the strength of the consumer preference for relative consumption will be measured by "the degree of positionality," which is interpretable as the fraction of an individual's overall utility gain from an additional dollar spent on consumption that is due to increased relative consumption. This means that if the degree of positionality equals zero then only absolute consumption matters, as in the conventional model, whereas a value equal to one means that only relative consumption matters on the margin. An alternative interpretation is that the degree of positionality reflects the welfare cost to the individual, measured per unit of consumption, of an increase in the level of reference consumption. For an individual of productivity type i, the degree of positionality is given by

$$\alpha^i = \frac{\sigma^i_\Delta}{v^i_x + \sigma^i_\Delta} .$$

(2)

Throughout the paper, subscripts attached to the utility function denote partial derivatives such that $v^i_x = \partial v^i / \partial x^i$ and $\sigma^i_\Delta = \partial \sigma^i / \partial \Delta^i$. The assumptions made earlier imply that $\alpha^i \in (0,1)$, whereas α^i would be equal to zero in the absence of any preference for relative consumption. The average degree of positionality measured over all consumers in this economy can then be written as

$$\bar{\alpha} \equiv \frac{n^1 \alpha^1 + n^2 \alpha^2}{N} .$$

(3)

The average degree of positionality gives an indication of how important the relative consumption concerns are on average in the economy as a whole. With mean-value comparisons, it is also a measure of the marginal positional externality per unit of consumption (since all individuals contribute to this externality to the same extent under such comparisons). Empirical estimates of the average degree of positionality suggest that relative consumption is an important determinant of individual well-being; Wendner and Goulder (2008) argue that this number is typically found in the interval 0.2-0.4, whereas Alpizar et al. (2005) and Carlsson et al. (2007) find that the average degree of positionality (measured for income) is around 0.5. Some estimates from happiness studies suggest even higher values. These numbers are clearly consistent with Frank's (2005) argument that positional externalities cause large welfare losses.

The individual budget constraint can be written as

$$w^i l^i - T(w^i l^i) - x^i = 0, \tag{4}$$

where w^i denotes the before-tax wage rate and l^i the hours of work, measured by a time endowment less the time spent on leisure. The function $T(\cdot)$ represents the income tax. We assume that each consumer is small relative to the economy as a whole and behaves as an atomistic agent by treating w^i and x^r as exogenous. The first-order condition for work hours can then be written as

$$\left(v_x^i + \sigma_\Delta^i\right) w^i (1 - T'(w^i l^i)) - v_z^i = 0. \tag{5}$$

In equation (5), $T'(\cdot)$ is the marginal income tax rate. Note that this optimality rule is of course independent of whether the government is paternalist or welfarist.

2.2. The Government

The government is assumed to be able to observe income, i.e., the product of the before-tax wage rate and the hours of work, whereas individual productivity (and consequently the hours of work) is private information. Similar to a great deal of other

literature on optimal taxation, we assume that the government wants to redistribute income from high-productivity to low-productivity individuals, meaning that it must prevent the high-productivity individuals from becoming mimickers. The following self-selection constraint is therefore imposed:

$$U^2 = v^2(x^2, z^2) + \sigma^2(\Delta^2) \geq v^2(x^1, 1 - \phi l^1) + \sigma^2(\Delta^1) = \hat{U}^2 . \tag{6}$$

The weak inequality (6) constrains the redistribution policy: It implies that this policy must not be such that a high-productivity individual will prefer the allocation intended for the low-productivity type (which the high-productivity individual can reach by reducing his/her hours of work and select the income-consumption point intended for the low-productivity type). $\hat{U}^2$ denotes the utility of a high-productivity mimicker and $\phi = w^1 / w^2 < 1$ the relative wage rate. Therefore, ϕl^1 represents the labor supply chosen by the mimicker, and $1 - \phi l^1 = \hat{z}^2$ is interpretable as the leisure used by the mimicker (with the time-endowment normalized to unity).

By using $\sum_i n^i T(w^i l^i) = 0$ together with the private budget constraints given in equation (4), we can write the public budget constraint as

$$\sum_i n^i w^i l^i = \sum_i n^i x^i . \tag{7}$$

The public decision problem is to design a Pareto-efficient tax policy by maximizing utility for one of the productivity types subject to a minimum utility restriction for the other, as well as subject to the self-selection and budget constraints given in equation (6) and (7), respectively. We follow convention in writing the public decision-problem as a direct decision problem, where consumption and work hours serve as direct decision variables. We can then infer the marginal income tax rates implicit in the socially optimal resource allocation simply by comparing the first-order conditions of the social decision problem with the private first-order conditions for work hours. Note that both the self-selection constraint and the public budget constraint are of course independent of whether the government is paternalist or welfarist.

2.2.1 The Paternalist Government

The paternalist government does not share the consumer preference for relative consumption. Instead it behaves as if $v^i = v^i(x^i, z^i) = U^i - \sigma^i(\Delta^i)$ is the objective faced by productivity type *i*. In other words, it wants the consumer to maximize utility net of the relative consumption term. The public decision problem then becomes

$$\underset{l^1, x^1, l^2, x^2}{Max} \ v^1 \text{ s.t. } v^2 \geq \bar{v}^2, \text{ (6) and (7)}. \qquad \text{(P-Gov)}$$

In problem (P-Gov), $\bar{v}^2$ is a fixed minimum utility level that the government imposes on the high-productivity type. Note that although the government does not derive utility from the consumers' preferences for relative consumption, these preferences are, nevertheless, part of the self-selection constraint given in equation (6), since the purpose of this constraint is to make each high-productivity individual choose the combination of work hours and consumption intended for his/her productivity type. Also, the government is assumed to recognize that the reference consumption is *endogenous* and given by $x^r = \bar{x} \equiv (n^1 x^1 + n^2 x^2)/(n^1 + n^2)$.

The Lagrangean corresponding to this decision problem can be written as

$$\mathcal{L}_P = v^1 + \mu \left[v^2 - \bar{v}^2 \right] + \lambda \left[U^2 - \hat{U}^2 \right] + \gamma \sum_i n^i (w^i l^i - x^i), \qquad (8)$$

where subscript *P* refers to "paternalist," while μ, λ, and γ are Lagrange multipliers. The first-order conditions for l^1, x^1, l^2, and x^2 become

$$-v_z^1 + \lambda \phi \hat{v}_z^2 + \gamma n^1 w^1 = 0, \qquad (9a)$$

$$v_x^1 - \lambda(\hat{v}_x^2 + \hat{\sigma}_\Delta^2) - \gamma n^1 + \frac{n^1}{N} \frac{\partial \mathcal{L}_P}{\partial \bar{x}} = 0, \qquad (9b)$$

$$-(\mu + \lambda) v_z^2 + \gamma n^2 w^2 = 0, \qquad (9c)$$

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$$\mu v_x^2 + \lambda \left(v_x^2 + \sigma_\Delta^2 \right) - \gamma n^2 + \frac{n^2}{N} \frac{\partial \mathcal{L}_P}{\partial \overline{x}} = 0. \tag{9d}$$

The partial derivative of the Lagrangean with respect to $\overline{x}$, $\partial \mathcal{L}_P / \partial \overline{x}$, measures the change in social welfare (from the perspective of the paternalist government) of increased reference consumption, ceteris paribus, and will be analyzed more thoroughly below.

2.2.2 The Welfarist Government

For purposes of comparison, we also address the optimal tax policy decided by a welfarist government, which incorporates the consumer preferences for relative consumption in its own objective. This decision problem was previously examined by Aronsson and Johansson-Stenman (2008) and is given by

$$\underset{l^1, x^1, l^2, x^2}{Max} U^1 \text{ s.t. } U^2 \geq \overline{U}^2, \text{ (6) and (7)}. \tag{W-Gov}$$

The corresponding Lagrangean becomes

$$\mathcal{L}_W = U^1 + \mu \left[U^2 - U_0^2 \right] + \lambda \left[U^2 - \hat{U}^2 \right] + \gamma \sum_i n^i (w^i l^i - x^i). \tag{10}$$

The first-order condition for l^1 and l^2 coincides with equation (9a) and (9c), respectively, whereas the first-order conditions for x^1 and x^2 change to read

$$v_x^1 + \sigma_\Delta^1 - \lambda(\hat{v}_x^2 + \hat{\sigma}_\Delta^2) - \gamma n^1 + \frac{n^1}{N} \frac{\partial \mathcal{L}_W}{\partial \overline{x}} = 0, \tag{9b'}$$

$$\left(\mu + \lambda \right) \left(v_x^2 + \sigma_\Delta^2 \right) - \gamma n^2 + \frac{n^2}{N} \frac{\partial \mathcal{L}_W}{\partial \overline{x}} = 0. \tag{9d'}$$

In equations (9b') and (9d'), $\partial \mathcal{L}_W / \partial \overline{x}$ measures the partial welfare effect of increased reference consumption from the perspective of the welfarist government. In the following section, we will address the implications of equations (9) for optimal income taxation.

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3. Optimal Taxation Results

In the economy set out above, the government is unable to observe individual productivity and must, therefore, redistribute subject to the self-selection constraint. As such, if the self-selection constraint binds, the government cannot rely on productivity type-specific lump-sum taxes for purposes of redistribution. However, if the self-selection constraint does not bind, asymmetric information no longer prevents the government from redistributing through productivity type-specific lump-sum taxes, meaning that the sole purpose of marginal income taxation will be to correct for market failures (under a welfarist government) or behavioral failures (under a paternalist government). In turn, this provides a natural starting point by allowing us to discuss first-best taxation before turning to the second-best tax policy.

3.1 Corrective Policy in a First-Best Setting

Consider a simplified version of the model set out above where the self-selection constraint does not bind, in which $\lambda = 0$, implying that both the paternalist and welfarist governments may implement their respective first-best (i.e., full information) resource allocation. It is important to emphasize that the concept of "first best" just means the best that each government can accomplish under full information about individual productivity, given its objective and resource constraint. Therefore, since the paternalist and welfarist governments have different objective functions, it follows that the first-best allocation based on a paternalist objective typically differs from the first-best based on a welfarist objective. Our purpose here is to compare the marginal tax policy used by a paternalist government to implement its first best allocation with the corresponding marginal tax policy used by a welfarist government.

If $\lambda = 0$, it is straightforward to derive (see the Appendix)

$$\frac{\partial \mathcal{L}_P}{\partial \bar{x}} = 0, \tag{11a}$$

$$\frac{\partial \mathcal{L}_W}{\partial \bar{x}} = -\gamma N \frac{\bar{\alpha}}{(1-\bar{\alpha})} < 0. \tag{11b}$$

Therefore, while increased reference consumption is of no concern to the paternalist government as long as the self-selection constraint does not bind, increased reference consumption leads to a welfare loss from the point of view of the welfarist government through increased positional externalities. Despite this, the corrective tax policy implemented by a paternalist government need not necessarily differ from that of its welfarist counterpart. To see this, let $T'(w^i l^i)_P$ and $T'(w^i l^i)_W$ denote the marginal income tax rate implemented for productivity-type *i* by the paternalist and welfarist government, respectively, and consider Proposition 1.

Proposition 1. *Suppose that the self-selection constraint does not bind ($\lambda = 0$) and that the relative consumption concerns are based on mean value comparisons. The optimal marginal income tax rates implemented by the paternalist government can then be written as*

$$T'(w^i l^i)_P = \alpha^i \text{ for } i=1,2,$$

while the welfarist government implements the following rates:

$$T'(w^i l^i)_W = \bar{\alpha} \text{ for } i=1,2.$$

Proof: See the Appendix.

Proposition 1 relates the optimal tax policy to the degrees of positionality, i.e., the extent to which the utility gain of increased consumption is driven by the preferences for relative consumption. Recall that the welfarist government respects the consumer preferences for relative consumption and tries to internalize the externalities that the consumers impose on one another through these concerns. With mean value comparisons, each consumer contributes to the positional externalities to the same extent and the average degree of positionality, $\bar{\alpha}$, represents the value of the marginal externality per unit of consumption, which explains the second formula in the proposition. This welfarist tax formula is analogous to results derived in the context of representative agent models by, e.g., Ljungqvist and Uhlig (2000) and Dupor and Liu (2003), and of course also to the two-type model in Aronsson and Johansson-Stenman (2008).

A paternalist government, on the other hand, is not concerned with externality correction, as it gives no weight to relative consumption concerns in the social objective function, which can also be seen from equation (11a). In the light of this observation, the optimal tax policy of the paternalist government may seem both highly surprising and unintuitive. Yet, the underlying intuition is actually straightforward to explain, as follows:

Since the paternalist government does not include relative consumption concerns in its objective function, it wants the consumers to behave as if they were not concerned with their relative consumption. Hence, the government designs the marginal tax policy accordingly, and correspondingly taxes away people's utility gains from increased relative consumption. The size of this "relative utility gain" is, in turn, obviously measured by the individual's own degree of positionality, α^i. Therefore, the marginal income tax rate imposed by the paternalist government depends on the individual's own degree of positionality.

The following corollary is an immediate consequence of Proposition 1:

Corollary 1. *Suppose that (a) the self-selection constraint does not bind ($\lambda = 0$), (b) the relative consumption concerns are based on mean value comparisons, and (c) the type-specific degrees of positionality, α^1 and α^2, are fixed parameters.*
(i) A paternalist government imposes a lower marginal income tax rate than the welfarist government on the less positional type and a higher marginal income tax on the more positional type.
(ii) If all consumers are identical and share the common degree of positionality $\bar{\alpha} = \alpha^1 = \alpha^2$, then $T'(w^i l^i)_P = T'(w^i l^i)_W = \bar{\alpha}$ for all i.

Under the conditions of Corollary 1, the common marginal income tax rate decided by the welfarist government would equal the economy-wide average of the two rates (one for each productivity type) introduced by the paternalist government. The second part of the corollary is a very strong result, as it reconciles the paternalist approach with results in earlier studies on optimal taxation based on representative agent

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models with a welfarist government.[9] If all consumers were identical, the paternalist government would implement exactly the same marginal tax policy as its welfarist counterpart, although for a different reason. As such, and given the redistribution between types, it does not matter at all whether or not the government respects the consumer preferences for envy or jealousy – the marginal tax policy implications would be the same in both cases.

3.2 Corrective and Redistributive Taxation under Asymmetric Information

If the self-selection constraint binds, we are back in the second-best setting where asymmetric information prevents the government from redistributing through productivity type-specific lump-sum taxes. As such, the marginal tax structure will reflect both the self-selection constraint and a motive for correction (for market failures in the welfarist case and behavioral failures in the paternalist case). The welfare effects of increased reference consumption in the paternalist and welfarist cases, i.e., equations (11a) and (11b), will then change to read

$$\frac{\partial \mathcal{L}_P}{\partial \bar{x}} = \lambda\left(-\sigma_\Delta^2 + \hat{\sigma}_\Delta^2\right) = \lambda\left(-\alpha^2(v_x^2 + \sigma_\Delta^2) + \hat{\alpha}^2(\hat{v}_x^2 + \hat{\sigma}_\Delta^2)\right), \tag{12a}$$

$$\frac{\partial \mathcal{L}_W}{\partial \bar{x}} = \gamma N \frac{\alpha^d - \bar{\alpha}}{(1 - \bar{\alpha})}, \tag{12b}$$

where $\alpha^d = \lambda(\hat{v}_x^2 + \hat{\sigma}_\Delta^2)(\hat{\alpha}^2 - \alpha^1)/(\gamma N)$ is an indicator of the difference in the degree of positionality between the mimicker and the low-ability type. If the mimicker is more (less) positional than the low-ability type, so that $\hat{\alpha}^2 > (<)\, \alpha^1$, then $\alpha^d > 0\ (<0)$.

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[9] A utility function consistent with the second part of the corollary has been analyzed by Ljungqvist and Uhlig (2000) and later discussed by Dupor and Liu (2003),

$$U^i = \frac{(x^i - \alpha\bar{x})^{1-\beta}}{1-\beta} - \phi z^i = \frac{(x^i(1-\alpha) + \alpha(x^i - \bar{x}))^{1-\beta}}{1-\beta} - \phi z^i \text{ for } i=1,2,$$

where α, β, and ϕ are fixed parameters. The parameter α is interpretable as the common degree of positionality.

Equation (12b) was originally derived by Aronsson and Johansson-Stenman (2008) and shows that a welfarist government has two different motives for adjusting $\bar{x}$ through tax policy: internalize the positional externality (captured by $\bar{\alpha}$) and relax the self-selection constraint by exploiting that the relative consumption concerns may differ between the mimicker and the low-ability type (captured by α^d). The latter effect provides an incentive for the welfarist government to relax the self-selection constraint through an increase in $\bar{x}$ if the mimicker is more positional than the low-ability type ($\hat{\alpha}^2 > \alpha^1$), and through a decrease in $\bar{x}$ if the low-ability type is more positional than the mimicker ($\hat{\alpha}^2 < \alpha^1$). The paternalist government, on the other hand, is not concerned with the positional externality *per se*, which explains why $\bar{\alpha}$ does not appear in equation (12a). As such, the partial welfare effect of an increase in $\bar{x}$ faced by the paternalist government is due solely to the self-selection constraint. Furthermore, for a paternalist government, it is not an issue whether a mimicker is more or less positional than the low-productivity type, since $\bar{x}$ has no direct effect on the objective that the government imposes on the low-productivity type. Instead, what matters is just that $\bar{x}$ directly affects the self-selection constraint through U^2 and $\hat{U}^2$, which, in turn, explains equation (12a).

In what follows, we distinguish between marginal rates of substitution based on the functions $v^i(\cdot)$ and $v^i(\cdot) + \sigma^i(\cdot)$. If based on $v^i(\cdot)$, the marginal rate of substitution between leisure and private consumption for productivity type i and the mimicker is given by

$$MRS_{z,x}^{P,i} = \frac{v_z^i}{v_x^i} > 0 \text{ for } i=1,2, \text{ and } M\hat{R}S_{z,x}^{P,2} = \frac{\hat{v}_z^2}{\hat{v}_x^2} > 0, \qquad \text{(MRS-P)}$$

respectively, whereas the corresponding marginal rates of substitution based on $v^i(\cdot) + \sigma^i(\cdot)$ become

$$MRS_{z,x}^{W,i} = \frac{v_z^i}{v_x^i + \sigma_\Delta^i} > 0 \text{ for } i=1,2, \text{ and } M\hat{R}S_{z,x}^{W,2} = \frac{\hat{v}_z^2}{\hat{v}_x^2 + \hat{\sigma}_\Delta^2} > 0 . \text{(MRS-W)}$$

Now, to be able to shorten the notation in the subsequent analyses, note that the optimal tax policy implicit in the original Stiglitz (1982) model (the version with fixed before-tax wage rates) follows as the special case where we disregard the effect of $\bar{x}$

on the Lagrangean, i.e., where we set $\partial \mathcal{L}_P / \partial \overline{x} = \partial \mathcal{L}_W / \partial \overline{x} = 0$. If based on the utility functions $v^i(\cdot)$ and the associated MRS-P-functions, the optimal marginal income tax rates in the original Stiglitz (1982) model can be written as

$$\tau_P^1 = \frac{\lambda \, \hat{v}_x^2}{\gamma n^1 w^1} \left[MRS_{z,x}^{P,1} - \phi M\hat{R}S_{z,x}^{P,2} \right] \text{ and } \tau_P^2 = 0, \tag{13a}$$

and as follows if based on the utility functions $v^i(\cdot) + \sigma^i(\cdot)$ and associated MRS-W-functions:

$$\tau_W^1 = \frac{\lambda (\hat{v}_x^2 + \hat{\sigma}_\Delta^2)}{\gamma n^1 w^1} \left[MRS_{z,x}^{W,1} - \phi M\hat{R}S_{z,x}^{W,2} \right] \text{ and } \tau_W^2 = 0. \tag{13b}$$

The implications of equations (13a) and (13b) are well known from previous studies: In the original two-type model with fixed before-tax wage rates, there is an incentive to relax the self-selection constraint through marginal income taxation of the low-productivity type. In doing this, one utilizes the difference in the marginal value attached to leisure between the mimicker and the low-productivity type, while there are no such effect for the high-productivity type for which the marginal income tax rate is instead zero. The reason for presenting these formulas here is that the variables τ_P^1 and τ_P^2 are part of the paternalist policy characterized below, whereas the variables τ_W^1 and τ_W^2 play a corresponding role for a welfarist policy. Consider Proposition 2.

Proposition 2. *Suppose that the self-selection constraint binds ($\lambda > 0$) and that the relative consumption concerns are based on mean value comparisons. The optimal marginal income tax rates implemented by a paternalist government can then be written as*

$$T'(w^1 l^1)_P = \tau_P^1 + (1 - \tau_P^1)\alpha^1 + (1 - \alpha^1)\frac{\lambda_P^1}{w^1}\frac{n^2 \hat{\sigma}_\Delta^2 + n^1 \sigma_\Delta^2}{n^1 N}$$

$$T'(w^2 l^2)_P = \alpha^2 - (1 - \alpha^2)\frac{\lambda_P^2}{w^2}\frac{n^1 \sigma_\Delta^2 + n^2 \hat{\sigma}_\Delta^2}{n^2 N},$$

where $\lambda_P^i = \lambda \, MRS_{z,c}^{P,i} / \gamma > 0$ for i=1,2, while a welfarist government implements the following marginal income tax rates:

$$T'(w^i l^i)_W = \tau_W^i + \bar{\alpha}(1 - \tau_W^i) - (1 - \bar{\alpha})(1 - \tau_W^i)\frac{\alpha^d}{1 - \alpha^d} \quad \text{for i=1,2.}$$

Proof: See the Appendix.

Note first that the tax formulas presented in Proposition 1 follow as the special case where $\lambda = 0$, in which also $\tau_P^1 = \tau_P^2 = \tau_W^1 = \tau_W^2 = \lambda_P^1 = \lambda_P^2 = \alpha^d = 0$. The welfarist formulas in Proposition 2 can also be found in Aronsson and Johansson-Stenman (2008) and reflect three basic incentives for tax policy: (i) relaxation of the self-selection constraint by exploiting that the low-productivity type and the mimicker attach different marginal values to leisure, i.e., through τ_W^1, (ii) internalization of positional externalities as reflected in the average degree of positionality, $\bar{\alpha}$, and (iii) relaxation of the self-selection constraint by exploiting that a mimicker may either be more or less positional than the low-productivity type as measured by α^d. If $\tau_W^1 > 0$ (as in the original Stiglitz 1982 model where all consumers have the same preferences), and since $\tau_W^2 = 0$, it follows that the corrective component in the formula for the low-productivity type, i.e., the second term on the right-hand side, is scaled down by the factor $(1 - \tau_W^1) < 1$. The reason is that the fraction of the marginal income that is already taxed away for other reasons does not give rise to any positional externalities. Note also that the welfarist government implements lower (higher) marginal income tax rates for both productivity types than it would otherwise have done if the mimicker is more (less) positional than the low-productivity type, ceteris paribus, i.e., if $\alpha^d > 0 \, (< 0)$, in which case an increase (decrease) in the reference consumption contributes to relax the self-selection constraint.

The paternalist formulas are novel and written in a format comparable to the corresponding welfarist formulas. As such, there are three basic policy incentives here as well: (i) relaxation of the self-selection constraint by exploiting that the low-productivity type and the mimicker attach different marginal values to leisure, as reflected in τ_P^1, (ii) correction for behavioral failures, and (iii) relaxation of the self-

selection constraint through policy-induced changes in the reference consumption. The first two aspects are reminiscent to their counterparts in the welfarist case in terms of qualitative implications for tax policy, whereas the third aspect is different. The first term on the right-hand side of the expression for $T'(w^1l^1)_P$ is again the standard incentive for marginal income taxation of low-productivity individuals found in the original Stiglitz (1982) model, although in this case it is based on utility function $v^i(\cdot)$ instead of $v^i(\cdot) + \sigma^i(\cdot)$. With this modification, the component τ_P^1 in the paternalist tax formula for the low-productivity type is interpretable in the same general way as τ_W^1 in the corresponding welfarist formula. There is no similar component in the expression for marginal income taxation of the high-productivity type, since $\tau_P^2 = 0$.

The motive to correct for behavioral failures is captured by the second term in the formula for $T'(w^1l^1)_P$ and the first term in the formula for $T'(w^2l^2)_P$. As explained in the context of Proposition 1, this behavioral failure is captured by the individual's own degree of positionality. By analogy to the welfarist case, the corrective tax component imposed on the high-productivity type is the same as under first-best taxation, i.e., α^2, whereas the corrective component is scaled down for the low-productivity type. The intuition behind the scale factor is, in this case, that marginal income taxes imposed for other reasons than correction will, nevertheless, eliminate part of the behavioral failure that the government wants to correct for. As such, if the fraction τ_P^1 of an additional dollar is already taxed away, only the fraction $1 - \tau_P^1$ may be used for private consumption.

The final component of each paternalist tax formula is connected to the welfare effect of increased reference consumption in equation (12a), i.e., $\partial \mathcal{L}_P / \partial \overline{x}$, as well as to direct effects of x^i on the self-selection constraint. As such, it reflects an incentive to relax the self-selection constraint through policy-induced changes in the reference consumption, and differs in a fundamental way from its counterpart in the welfarist case. Whereas the corresponding effect under a welfarist tax policy takes the same form and sign for both productivity types (where the sign depends on whether the mimicker is more or less positional than the low-productivity type), it differs in sign

between the productivity types under a paternalist tax policy. More specifically, and although $\partial \mathcal{L}_P / \partial \overline{x}$ cannot be signed unambiguously, the final term in the tax formula for the low-productivity type is positive, while it is negative in the formula for the high-productivity type. This result follows because x^i affects the self-selection constraint through two channels, i.e., a direct effect and an indirect effect via $\overline{x}$. These two effects partly cancel out, leaving a positive net effect in the formula for the low-productivity type and a negative net effect in the formula for the high-productivity type (see the Appendix for technical details). The intuition is that the government may relax the self-selection constraint by encouraging the relative consumption concerns among high-productivity individuals while discouraging them for low-productivity individuals to make mimicking less attractive.

Therefore, and if we assume that $\tau_P^1 > 0$ in accordance with the Stiglitz (1982) model where the consumers share a common utility function, the following result is an immediate consequence of Proposition 2:

Corollary 2: *With a paternalist government and under mean-value comparisons, the optimal second-best policy satisfies*

$$T'(w^1 l^1)_P > \alpha^1$$

$$T'(w^2 l^2)_P < \alpha^2.$$

Corollary 2 contains a strong message: to relax the self-selection constraint, a paternalist government will tax the income of the low-productivity type at a higher marginal rate and the income of the high-productivity type at a lower marginal rate than motivated by pure (first best) correction for behavioral failures.

Finally, the main insights from the first-best analysis prevails also in the second-best scenario, namely that there are no reasons to expect the optimal marginal income tax rates to be smaller with a paternalist government than with a welfarist one, despite the fact that relative consumption concerns are likely to imply higher marginal income taxes than without such concerns.

4. Extension with Alternative Reference Points

As mentioned in the introduction, it is by no means obvious whom people compare their own consumption with. The benchmark model in Sections 3 and 4 simply follows the convention in most earlier literature in assuming that each consumer compares his/her own consumption with the economy-wide average. Yet, some existing empirical evidence points in the direction of more narrow social comparisons, such that individuals compare their own consumption with that of people who are either similar to and/or wealthier than themselves. As such, we will here examine how the results presented above will change, and hence the robustness of the above findings, if the mean value comparison is replaced with within-type and upward comparisons. As will be demonstrated, the main qualitative insights continue to hold also with these alternative reference points.

4.1 Within-type Comparisons and Optimal Income Taxation

With type-specific social comparisons, the reference consumption will also differ between types in the sense that $x^{1,r} = x^1$ and $x^{2,r} = x^2$. The utility function faced by an individual of productivity type i can then be written as $U^i = v^i(\mathrm{x}^i, z^i) + \sigma^i(\Delta^i)$, where the relative consumption is given by $\Delta^i = x^i - x^{i,r}$ for $i=1,2$. Also, recall that each individual consumer is assumed to behave as an atomistic agent in the sense of treating the relevant reference measure as exogenous. The individual's first-order condition for work hours will then remain as in equation (5), with the modification that the reference measure is type-specific.

We assume that the high-productivity mimicker, who pretends to be a low-productivity individual, compares his/her own consumption with the reference point characterizing the low-productivity type, meaning that the utility of the mimicker is given by

$$\hat{U}^2 = v^2(\mathrm{x}^1, 1 - \phi l^1) + \sigma^2(\Delta^1).$$

The decision-problem of the *paternalist* government then implies maximizing the following Lagrangean with respect to l^1, x^1, l^2, and x^2:

$$\mathcal{L}_P = v^1 + \mu\left[v^2 - \bar{v}^2\right] + \lambda\left[U^2 - \hat{U}^2\right] + \gamma\sum_i n^i (w^i l^i - x^i). \tag{14}$$

The first-order conditions for l^1 and l^2 remain as in equations (9a) and (9c), while those for x^1 and x^2 become

$$v_x^1 - \lambda(\hat{v}_x^2 + \hat{\sigma}_\Delta^2) - \gamma n^1 + \frac{\partial \mathcal{L}_P}{\partial x^{1,r}} = 0, \tag{15a}$$

$$\left(\mu + \lambda\right)v_x^2 + \lambda\sigma_\Delta^2 - \gamma n^2 + \frac{\partial \mathcal{L}_P}{\partial x^{2,r}} = 0, \tag{15b}$$

where the final term in each equation measures the partial social welfare effect of increased reference consumption,

$$\frac{\partial \mathcal{L}_P}{\partial x^{1,r}} = \lambda\hat{\sigma}_\Delta^2 = \lambda\hat{\alpha}^2(\hat{v}_x^2 + \hat{\sigma}_\Delta^2) > 0, \tag{16a}$$

$$\frac{\partial \mathcal{L}_P}{\partial x^{2,r}} = -\lambda\sigma_\Delta^2 = -\lambda\alpha^2(v_x^2 + \sigma_\Delta^2) < 0. \tag{16b}$$

For purposes of comparison, we also define the corresponding decision problem faced by a *welfarist* government, whose Lagrangean is given by

$$\mathcal{L}_W = U^1 + \mu\left[U^2 - \bar{U}^2\right] + \lambda\left[U^2 - \hat{U}^2\right] + \gamma\sum_i n^i (w^i l^i - x^i). \tag{17}$$

The first-order conditions for x^1 and x^2 can be written as (while the first-order conditions for l^1 and l^2 are again given by equations [9a] and [9c])

$$v_x^1 + \sigma_\Delta^1 - \lambda(\hat{v}_x^2 + \hat{\sigma}_\Delta^2) - \gamma n^1 + \frac{\partial \mathcal{L}_W}{\partial x^{1,r}} = 0, \tag{18a}$$

$$\left(\mu + \lambda\right)\left(v_x^2 + \sigma_\Delta^2\right) - \gamma n^2 + \frac{\partial \mathcal{L}_W}{\partial x^{2,r}} = 0, \tag{18b}$$

where

$$\frac{\partial \mathcal{L}_W}{\partial x^{1,r}} = \frac{-\gamma n^1 \alpha^1 + \lambda(\hat{v}_x^2 + \hat{\sigma}_\Delta^2)(\hat{\alpha}^2 - \alpha^1)}{1 - \alpha^1} = \gamma n^1 \frac{\alpha^{dd} - \alpha^1}{1 - \alpha^1}, \tag{19a}$$

$$\frac{\partial \mathcal{L}_W}{\partial x^{2,r}} = -\gamma n^2 \frac{\alpha^2}{1 - \alpha^2} < 0. \tag{19b}$$

In equation (19a), $\alpha^{dd} = \lambda(\hat{v}_x^2 + \hat{\sigma}_\Lambda^2)(\hat{\alpha}^2 - \alpha^1) / \gamma n^1$ is a slightly modified measure of the difference in the degree of positionality between the mimicker and the low-ability type, which is interpretable in the same general way as its counterpart in Section 3.

Let us once again begin by considering a simplified version of the model in which the self-selection constraint does not bind, i.e., where $\lambda = 0$, meaning that the optimal tax policies will implement first-best (full information) resource allocations. We derive the following result:

Proposition 3. *Suppose that the self-selection constraint does not bind ($\lambda = 0$) and that the relative consumption concerns are based on within-type comparisons. The optimal marginal income tax rates implemented by the paternalist and welfarist governments can then be written as*

$$T'(w^i l^i)_P = \alpha^i$$
$$T'(w^i l^i)_W = \alpha^i$$

respectively, for i=1,2.

Proof: See the Appendix.

Proposition 3 does not imply that the marginal income tax rate for each productivity type will take the same numerical value irrespective of whether the government is paternalist or welfarist, since the degrees of positionality are typically endogenous variables (except for very specific forms of the utility function). It means, instead, that the marginal tax rates are based on *exactly the same policy rule* in both cases. The intuition is that α^i measures the relative consumption concerns of an individual of productivity type i (which determines the behavioral failure that the paternalist government wants to correct for) as well as the value of the marginal externality that this individual imposes on referent others (which the welfarist government wants to correct for). As such, a paternalist and welfarist government will use the same policy rule for corrective taxation, although for different reasons.

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Turning to the second-best setting with a binding self-selection constraint, the policy rules presented in Proposition 3 will be modified, since both the paternalist and welfarist government have incentives to relax this constraint through tax policy. This is described in Proposition 4 below:

Proposition 4. *Suppose that the self-selection constraint binds ($\lambda > 0$), and that the relative consumption concerns are based on within-type comparisons. The optimal marginal income tax rates implemented by a paternalist government can then be written as*

$$T'(w^1 l^1)_P = \tau_P^1 + (1 - \tau_P^1)\alpha^1$$

$$T'(w^2 l^2)_P = \alpha^2,$$

while a welfarist government implements the following marginal income tax rates:

$$T'(w^1 l^1)_W = \tau_W^1 + \alpha^1 (1 - \tau_W^1) - (1 - \alpha^1)(1 - \tau_W^1)\frac{\alpha^{dd}}{1 - \alpha^{dd}}$$

$$T'(w^2 l^2)_W = \alpha^2.$$

Proof: See the Appendix.

First, note that the marginal income tax rate implemented for the high-productivity type is still based on the first-best policy rule, measured by the type-specific degree of positionality, both in the paternalist and welfarist cases. This is so because if the relative consumption concerns are based on within-type comparisons, the allocation chosen for the high-productivity type will not directly affect the utility faced by the mimicker, i.e., $x^{1,r}$ does not directly depend on x^2. Second, the policy rules for marginal income taxation of the low-productivity type closely resemble those under mean value comparisons, with the exception that the externalities are type-specific in the welfarist case. As such, we can see that the corrective component of the tax formula falls short of α^1 both with paternalist and welfarist policy.

Finally, note that the third policy incentive that we described in the context of mean value comparisons (i.e., policy-induced changes in the reference consumption to relax the self-selection constraint) does not affect the marginal income tax rates implemented by a paternalist government under within-type comparisons. The

intuition is simply that direct effects of x^1 and x^2 on the self-selection constraint exactly cancel out the corresponding indirect effects via $x^{1,r}$ and $x^{2,r}$, respectively, meaning that the paternalist government cannot relax the self-selection constraint through policy-induced changes in the levels of reference consumption. On the other hand, in the welfarist tax formula for the low-productivity type, there is an incentive to relax the self-selection constraint through changes in the level of $x^{1,r}$, which depends on the difference in the degree of positionality between the mimicker and the low-productivity type. This component has the same interpretation as in the corresponding tax formula based on mean-value comparisons.

4.2 Briefly on Upward Comparisons

As mentioned in the introduction, Micheletto (2011) compares paternalist and welfarist tax policy under upward social comparisons. He considers a model where each consumer compares his/her consumption with that of the adjacent higher productivity type, meaning that individuals of the highest productivity type are not concerned with their relative consumption. As such, he finds that individuals of the highest productivity type face lower marginal income tax rates under paternalism than welfarism, since these individuals cause positional externalities without having preferences for relative consumption. The opposite holds for individuals of the lowest productivity type, who are concerned with their relative consumption without causing any positional externalities. Therefore, upward comparisons constitute an extreme case in the sense of giving rise to potentially much larger differences between paternalist and welfarist policy than the comparison forms addressed above.

We will consider another, and equally plausible, variant of the upward comparison where all consumers compare their own consumption with that of the high-productivity type. A similar approach to modeling upward comparisons was employed by Aronsson and Johansson-Stenman (2010) under the assumption of a welfarist government, and we shall here contrast the marginal income tax rates chosen by a welfarist government with the marginal income tax rates implemented by a paternalist

government.[10] As such, we have a common reference measure for all consumers, $x^r = x^2$, which means that only the high-productivity type gives rise to positional externalities, whereas all consumers are concerned with their relative consumption (i.e., the keeping-up-with-the-Joneses motive also exists among high-productivity individuals). Compared with the first-order conditions of the benchmark model in Sections 2 and 3, the only differences are that $\partial x^r / \partial x^1 = 0$ (instead of n^1 / N) and $\partial x^r / \partial x^2 = 1$ (instead of n^2 / N), resulting in a slight modification compared with equations (9b) and (9d).

As we have seen above, the first-best policy rules for the paternalist government always take the same form, i.e., $T'(w^i l^i)_P = \alpha^i$ for i=1,2, irrespective of comparison form. In addition, and since all positional externalities are generated by the high-productivity type under upward comparison, a first-best policy for a welfarist government does not contain any corrective tax imposed on the low-productivity type. Therefore, we settle here by briefly characterizing the second-best policy under a binding self-selection constraint.

Proposition 5. *Suppose that the self-selection constraint binds ($\lambda > 0$) and that the relative consumption concerns are based on upward comparisons such that $x^r = x^2$. The optimal marginal income tax rates implemented by a paternalist government can then be written as*

$$T'(w^1 l^1)_P = \tau_P^1 + (1 - \tau_P^1)\alpha^1$$

$$T'(w^2 l^2)_P = \alpha^2 - (1 - \alpha^2)\frac{\lambda_P^2}{n^2 w^2}\hat{\sigma}_\Delta^2,$$

where $\lambda_P^2 > 0$,[11] while a welfarist government implements the following marginal income tax rates:

$$T'(w^1 l^1)_W = \tau_W^1$$

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[10] Aronsson and Johansson-Stenman (2010) analyze an OLG model where each consumer lives for two periods. In their model, all young consumers compare their current consumption with the current consumption of the young high-productivity type, and all old consumers compare their current consumption with the current consumption of the old high-ability type.

[11] See Proposition 1.

$$T'(w^2 l^2)_W = \frac{1}{\omega} \frac{N}{n^2} \frac{\alpha^2 - \alpha^d}{1 - \alpha^2},$$

where $\omega = \dfrac{1 - \alpha^2 + (N/n^2)(\bar{\alpha} - \alpha^d)}{(1 - \alpha^2)}.$

The proof of Proposition 5 is analogous to the proofs of Propositions 2 and 4 and is therefore omitted. With a welfarist policy objective, there is no corrective component in the marginal income tax rate faced by the low-productivity type, since low-productivity individuals do not generate any positional externalities, whereas the marginal income tax rate implemented for the high-productivity type reflects both externality correction and an incentive to relax the self-selection constraint through policy-induced changes in the level of reference consumption (the sign of the latter effect is ambiguous and depends on α^d).

Turning to the marginal income tax rates implemented by the paternalist government, at least three things are worth noting. First, the paternalist government has an incentive to use corrective taxation for both productivity types since both are concerned with their relative consumption (even if only the high-productivity type contributes to the externality). Second, if we assume (as we did above) that $\tau_P^1 > 0$, the marginal income tax rate is higher for the low-productivity type and lower for the high-productivity type than would follow from a first-best tax policy to correct for behavioral failures, i.e., we have $T'(w^1 l^1)_P > \alpha^1$ and $T'(w^2 l^2)_P < \alpha^2$. Third, while the welfarist results are also close to those presented in Micheletto (2011), the paternalist tax policy presented above differs from his results as he assumes that the highest productivity type is not concerned with relative consumption (in which case the first term on the right-hand side of the tax formula vanishes).

5. Conclusion

This paper analyzes the tax policy implications of relative consumption concerns from the perspective of a paternalist government, which does not share the consumer preferences for such concerns, and also compares the policy outcome with that following from a traditional welfarist government. The analysis is based on a model

with two productivity types and nonlinear income taxation, where we examine the first-best corrective tax policy implemented by each type of government as well as the second-best policies that follow under asymmetric information about individual productivity.

There is one major take-away message from the present paper: Although the tax policy motives differ in a fundamental way between paternalist and welfarist governments, the policy rules for optimal income taxation may be remarkably similar. Indeed, in a first-best setting, where the self-selection constraint does not bind, we show that welfarist and paternalist governments implement exactly the same policy rules for marginal income taxation if either of the following two conditions is fulfilled: 1. The relative consumption concerns are driven by mean value comparisons and the consumers are equally positional. 2. The relative consumption concerns are driven by within-type comparisons (regardless of whether the consumers are equally positional). The intuition is that the externality that each individual imposes on other people (which is of importance for the welfarist government) coincides with the individual's own behavioral failure as perceived by the paternalist government. As such, it is not necessarily of major importance for the policy outcome whether the government aims at correcting for positional externalities or tries to make the consumers behave as if they were not concerned with their relative consumption.

In a second-best world, there are somewhat larger differences in marginal tax policy between the paternalist and welfarist governments, since the welfare effect of increased reference consumption only works through the self-selection constraint in the paternalist case. The qualitative differences between first-best and second-best taxation are also typically sharper in the paternalist case, where the incentives to relax the self-selection constraint imply a higher marginal income tax rate for the low-productivity type and a lower marginal income tax rate for the high-productivity type than motivated solely by correction for behavioral failures. The corresponding policy incentive for a welfarist government is ambiguous and depends on whether the mimicker is more or less positional than the low-productivity type. Nevertheless, the major conclusion above holds also in the second-best case, i.e., there are no a priori reasons why social comparisons would affect the marginal income tax rates more with a welfarist than a paternalist government. Moreover, we show that this conclusion

prevails also with alternative reference points such that individuals instead compare their consumption with others of their own type or solely with those displaying the highest consumption level.

Appendix

Mean value comparisons

In the paternalist case, the partial welfare effect of increased reference consumption follows from differentiation of $\mathcal{L}_P$ with respect to $\bar{x}$, i.e.,

$$\frac{\partial \mathcal{L}_P}{\partial \bar{x}} = \lambda \left[-\sigma_\Delta^2 + \hat{\sigma}_\Delta^2 \right] = \lambda \left[-\alpha^2 (v_x^2 + \sigma_\Delta^2) + \hat{\alpha}^2 (\hat{v}_x^2 + \hat{\sigma}_\Delta^2) \right], \qquad \text{(A1)}$$

which is equation (12a). For the welfarist government, the corresponding expression reads

$$\begin{aligned} \frac{\partial \mathcal{L}_W}{\partial \bar{x}} &= -\sigma_\Delta^1 - \mu \sigma_\Delta^2 + \lambda \left[-\sigma_\Delta^2 + \hat{\sigma}_\Delta^2 \right] \\ &= -(v_x^1 + \sigma_\Delta^1)\alpha^1 - (\mu + \lambda)(v_x^2 + \sigma_\Delta^2)\alpha^2 + \lambda(\hat{v}_x^2 + \hat{\sigma}_\Delta^2)\hat{\alpha}^2 \end{aligned} \qquad \text{(A2)}$$

Solving equation (9b') for $v_x^1 + \sigma_\Delta^1$ and equation (9d') for $(\mu + \lambda)(v_x^2 + \sigma_\Delta^2)$, respectively and then substituting into equation (A2) gives equation (12b).

Proof of Propositions 1 and 2

Consider first the low-productivity type. For the paternalist case, combining equations (9a) and (9b) gives

$$\begin{aligned} \gamma n^1 (w^1 - MRS_{z,x}^{P,1}) = \lambda \hat{v}_x^2 \left[MRS_{z,x}^{P,1} - \phi M\hat{R}S_{z,x}^{P,2} \right] \\ + MRS_{z,x}^{P,1} \left[\lambda \hat{\sigma}_\Delta^2 - \frac{n^1}{N} \lambda (-\hat{\sigma}_\Delta^2 + \sigma_\Delta^2) \right] \end{aligned} \qquad \text{(A3)}$$

Then, by using equation (5) to derive

$$w^1 - MRS_{z,c}^{P,1} = w^1 T'(w^1 l^1)_P - MRS_{z,c}^{P,1} \alpha^1,$$

substituting into equation (A3) and rearranging gives the marginal income tax rate for the low-productivity type in Proposition 2 under a paternalist policy. The marginal income tax rate for the high-productivity type can be derived in the same general way by combining equations (5), (9c), and (9d).

With a welfarist policy, the marginal income tax rate for the low-productivity type is based on equations (9a) and (9b'). Combining these equations gives

$$\gamma n^1 (w^1 - MRS_{z,x}^{W,1}) = \lambda(\hat{v}_x^2 + \hat{\sigma}_\Delta^2)\left[MRS_{z,x}^{W,1} - \phi M\hat{R}S_{z,x}^{W,2} \right] - MRS_{z,x}^{W,1} \frac{n^1}{N} \frac{\partial \mathcal{L}_W}{\partial \overline{x}}. \quad (A4)$$

Using $w^1 - MRS_{z,x}^{W,1} = w^1 T'(w^1 l^1)_W$ and the expression for $\partial \mathcal{L}_W / \partial \overline{x}$ in equation (12b), substituting into equation (A4) and rearranging gives the marginal income tax rate implemented for the low-productivity type in Proposition 2 under a welfarist policy. Again, the marginal income tax rate of the high-productivity type can be derived in an analogous way by combining equations (5), (9c), and (9d').

Finally, note that the marginal income tax rates in Proposition 1 follow as the special case where $\lambda = 0$. ∎

Within-type comparisons

By using equation (14), we can immediately derive

$$\frac{\partial \mathcal{L}_P}{\partial x^{1,r}} = \lambda \hat{\sigma}_\Delta^2 = \lambda \hat{\alpha}^2 (\hat{v}_x^2 + \hat{\sigma}_\Delta^2) > 0 \quad (A5a)$$

$$\frac{\partial \mathcal{L}_P}{\partial x^{2,r}} = -\lambda \sigma_\Delta^2 = -\lambda \alpha^2 (v_x^2 + \sigma_\Delta^2) < 0 \quad (A5b)$$

for the paternalist case. Similarly, for the welfarist case, differentiation of equation (17) with respect to each type-specific measure of reference consumption gives

$$\frac{\partial \mathcal{L}_W}{\partial x^{1,r}} = -\sigma_\Delta^1 + \lambda \hat{\sigma}_\Delta^2 = -(v_x^1 + \sigma_\Delta^1)\alpha^1 + \lambda(\hat{v}_x^2 + \hat{\sigma}_\Delta^2)\hat{\alpha}^2 \tag{A6a}$$

$$\frac{\partial \mathcal{L}_W}{\partial x^{2,r}} = -(\mu + \lambda)\sigma_\Delta^2 = -(\mu + \lambda)(v_x^2 + \sigma_\Delta^2)\alpha^2 < 0. \tag{A6b}$$

Solving equation (18a) for $v_x^1 + \sigma_\Delta^1$, substituting into equation (A6a), and rearranging gives equation (19a). Similarly, solving equation (18b) for $(\mu + \lambda)(v_x^2 + \sigma_\Delta^2)$, substituting into equation (A6b), and rearranging gives equation (19b).

Proofs of Propositions 3 and 4

Consider again the low-productivity type. Starting with the paternalist case, we use equations (5), (9a), and (15a) to derive

$$\gamma n^1 w^1 T'(w^1 l^1)_P = \lambda \hat{v}_x^2 \left[MRS_{z,x}^{P,1} - \phi M\hat{R}S_{z,x}^{P,2} \right] + \gamma n^1 \, MRS_{z,c}^{P,1} \, \alpha^1. \tag{A7}$$

Rearranging gives the marginal income tax rate for the low-productivity type in Proposition 4 under a paternalist policy. The marginal income tax rate for the high-productivity type can be derived analogously.

In the welfarist case, we use equations (5), (9a), and (18a) to derive

$$\gamma n^1 w^1 T'(w^1 l^1)_W = \lambda(\hat{v}_x^2 + \hat{\sigma}_\Delta^2) \left[MRS_{z,x}^{W,1} - \phi M\hat{R}S_{z,x}^{W,2} \right] - MRS_{z,x}^{W,1} \frac{n^1}{N} \frac{\partial \mathcal{L}_W}{\partial x^{1,r}} \tag{A8}$$

for the low-productivity type. Substituting equation (19a) into equation (A8) and rearranging gives the marginal income tax rate for the low-productivity type in Proposition 4. Analogous calculations based on equations (5), (9c), (18b), and (19b) give the marginal income tax rate of the high-productivity type.

Finally, the marginal income tax rates in Proposition 3 follow as special cases of those presented in Proposition 4 when $\lambda = 0$.∎

References

Abel, A. B. (2005) Optimal Taxation When Consumers Have Endogenous Benchmark Levels of Consumption. *Review of Economic Studies* **72**, 1-19.

Akerlof, G. A. (1997) Social Distance and Social Decisions. *Econometrica* **65**, 1005-1027.

Alpízar, F., F. Carlsson, and O. Johansson-Stenman (2005) How Much Do We Care about Absolute versus Relative Income and Consumption? *Journal of Economic Behavior and Organization* **56**, 405–21.

Aronsson, T. and O. Johansson-Stenman (2008) When the Joneses' Consumption Hurts: Optimal Public Good Provision and Nonlinear Income Taxation. *Journal of Public Economics* **92**, 986-997.

Aronsson, T. and O. Johansson-Stenman (2010) Positional Concerns in an OLG Model: Optimal Labor and Capital Income Taxation. *International Economic Review* **51**, 1071-1095.

Aronsson, T. and O. Johansson-Stenman (2013) Conspicuous Leisure: Optimal Income Taxation When Both Relative Consumption and Relative Leisure Matter. *Scandinavian Journal of Economics* **115**, 155-175.

Boskin, M. J. and E. Sheshinski (1978) Individual Welfare Depends upon Relative Income. *Quarterly Journal of Economics* **92**, 589-601.

Bowles, S. and Y.-J. Park (2005) Inequality, Emulation, and Work Hours: Was Thorsten Veblen Right? *Economic Journal* **15**, F397-F413.

Carlsson, F., O. Johansson-Stenman, and P. Martinsson (2007) Do You Enjoy Having More Than Others? Survey Evidence of Positional Goods. *Economica* **74**, 586-598.

Corneo, G. (2002) The Efficient Side of Progressive Income Taxation. *European Economic Review* **46**, 1359-1368.

Clark, A. and C. Senik (2010) Who Compares to Whom? The Anatomy of Income Comparisons in Europe. *Economic Journal* **120**, 573-594.

Corneo, G. and O. Jeanne (1997) Conspicuous Consumption, Snobbism and Conformism. *Journal of Public Economics* **66**, 55-71.

Corneo, G. and O. Jeanne (2001) Status, the Distribution of Wealth, and Growth. *Scandinavian Journal of Economics* **103**, 283-293.

Dodds, S. (2012) Redistributive Taxation and Heterogeneous Relative Consumption Concerns. *Canadian Journal of Economics* **45**, 220-246.

Dohmen, T., A. Falk, K. Fliessbach, U. Sunde, and B. Weber (2011) Relative Versus Absolute Income, Joy of Winning, and Gender: Brain Imaging Evidence. *Journal of Public Economics* **70**, 279-285.

Dupor, B. and W. F. Liu (2003) Jealousy and Overconsumption. *American Economic Review* **93**, 423-428.

Easterlin, R. A. (1995) Will Raising the Incomes of All Increase the Happiness of All? *Journal of Economic Behavior and Organization* **27**, 35-47.

Easterlin, R. A. (2001) Income and Happiness: Towards a Unified Theory. *Economic Journal* **111**, 465-484.

Eckerstorfer, P. and R. Wendner (2013) Asymmetric and Non-Atmospheric Consumption Externalities, and Efficient Consumption Taxation. *Journal of Public Economics* **106(C)**, 42-56.

Ferrer-i-Carbonell, A. (2005) Income and Well-being: An Empirical Analysis of the Comparison Income Effect. *Journal of Public Economics* **89**, 997-1019.

Frank, R. H. (2005) Positional Externalities Cause Large and Preventable Welfare Losses. *American Economic Review* **95**, 137-41.

Frank, R. H. (2008) Should Public Policy Respond to Positional Externalities? *Journal of Public Economics* **92**, 1777-1786.

Hopkins, E. and T. Kornienko (2009) Status, Affluence, and Inequality: Rank-Based Comparisons in Games of Status. *Games and Economic Behavior* **67**, 552-568.

Harsanyi, J. (1982) Morality and the Theory of Rational Behavior. In Sen, A. and Williams, B. (eds) *Utilitarianism and Beyond*. Cambridge: Cambridge University Press.

Ireland, N. J. (2001) Optimal Income Tax in the Presence of Status Effects. *Journal of Public Economics* **81**, 193-212.

Johansson-Stenman, O., F. Carlsson, and D. Daruvala (2002) Measuring Future Grandparents' Preferences for Equality and Relative Standing. *Economic Journal* **112**, 362-383.

Layard, R. (1980) Human Satisfaction and Public Policy. *Economic Journal* **90**, 737-750.

Ljungqvist, L. and H. Uhlig (2000) Tax Policy and Aggregate Demand Management Under Catching Up with the Joneses. *American Economic Review* **90**, 356-366.

Kanbur, R. and M. Tuomala (2010) Relativity, Inequality and Optimal Nonlinear Income Taxation. Tampere University, working paper no 75.

Kanbur, R. and M. Tuomala (2013) Relativity, Inequality and Optimal Nonlinear Income Taxation. *International Economic Review* 54, 1199-1217.

Micheletto, L. (2011) Optimal Nonlinear Redistributive Taxation and Public Good Provision in an Economy with Veblen Effects. *Journal of Public Economic Theory* **13**, 71-96.

Mill, J. S. (1848) *Principles of Political Economy*. London: John W. Parker.

Oswald, A. (1983) Altruism, Jealousy and the Theory of Optimal Non-Linear Taxation. *Journal of Public Economics* **20**, 77-87.

Pingle, M. and M. Mitchell (2002) What Motivates Positional Concerns for Income? *Journal of Economic Psychology* **23**, 127-148.

Senik, C. (2009) Direct Evidence on Income Comparisons and their Welfare Effects. *Journal of Economic Behavior and Organization* **72**, 408-424.

Solnick, S. and D. Hemenway (1998) Is More Always Better?: A Survey on Positional Concerns. *Journal of Economic Behavior and Organization* **37**, 373-383.

Solnick, S. and D. Hemenway (2005) Are Positional Concerns Stronger in Some Domains than in Others? *American Economic Review, Papers and Proceedings* **45**, 147-151.

Stern, N. H. (1982) Optimum Taxation with Errors in Administration. *Journal of Public Economics* **17**, 181-211.

Stiglitz, J. E. (1983) Self-Selection and Pareto Efficient Taxation. *Journal of Public Economics* **17**, 213-240.

Tuomala, M., *Optimal Income Tax and Redistribution* (Oxford: Clarendon Press, 1990).

Veblen, T. (1899) *The Theory of the Leisure Class*. New York: Macmillan.

Wendner, R. and L. H. Goulder (2008) Status Effects, Public Goods Provision, and the Excess Burden. *Journal of Public Economics* **92**, 1968-1985.