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Asymmetric and non-atmospheric consumption externalities, and efficient consumption taxation☆

Paul Eckerstorfer [a], Ronald Wendner [b,*]

[a] Department of Economics, University of Linz, Austria
[b] Department of Economics, University of Graz, Austria

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ABSTRACT

We analyze the effects of a generalized class of negative consumption externalities (asymmetric and non-atmospheric) on the structure of efficient commodity tax programs. Households are not only concerned about consumption reference levels — that is, they gain utility from "keeping up with the Joneses" — but they also exhibit altruism. Two sets of efficient tax regimes are compared, based, on a welfarist- and a non-welfarist optimality criterion, respectively. Altruism turns out not to be at odds with the consumption externalities. Rather, altruism implicates a bound on efficient utility allocations. A non-welfarist government tolerates less inequality than a welfarist one. In the welfarist (non-welfarist) case, first-best personalized commodity tax rates respond highly sensitively (barely) to whether or not a consumption externality is asymmetric or non-atmospheric. If personalized commodity tax rates are not available (second-best case), the tax rate on a non-positional good is typically different from zero for corrective reasons. For plausible functional forms and parameter values, numerical simulations suggest that second-best tax rates are rather insensitive with respect to both the optimality criterion and the "nature" of the consumption externality.

Since … appearance tyrannizes over truth and is lord of happiness to appearance I must devote myself.

[— Plato, The Republic (Book II)]

1. Introduction

This paper addresses the effects of a generalized class of *negative* consumption externalities (asymmetric and non-atmospheric) on the structure of efficient commodity taxation in a framework with both a positional and a non-positional commodity. That is, individual utility is *not* independent of other individuals' consumption. In fact, households form consumption reference levels, a fact well established in the literature (cf. the discussion below). Consumption reference levels give rise to a consumption externality. This externality is often referred to as a keeping up with the Joneses externality.[1]

In contrast to the prior literature, the present analysis takes four important facts into account. First, some people typically contribute more to a consumption reference level than others. In this case, we refer to the consumption externality as a non-atmospheric one. In other words, not every household belongs to one's consumption reference group (to the same degree). In addition, not every household shares the same consumption reference group — a situation we refer to as an *asymmetric* consumption externality. Second, households are not only concerned about consumption reference levels, they also exhibit altruism (cf. Johansson, 1997). Third, we consider both welfarist and non-welfarist welfare criteria for evaluating efficient tax programs. Fourth, we offer a simulation section to indicate the relevance of the theoretical model.

This paper is motivated by the recent literature on consumption externalities and happiness. Psychologists and behavioral economists have established that individuals experience happiness by doing well relative to some reference group (Brekke and Howarth, 2002; Easterlin, 1995; Frank, 1985, 1999).[2] The main response of economic theory to this evidence has regularly consisted in allowing for a uniform consumption reference term — commonly the economy's average consumption — in the utility functions of households. While

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* Corresponding author.
E-mail address: ronald.wendner@uni-graz.at (R. Wendner).

[1] Different authors employ various terms, with slightly varying meanings. These terms include (*negative*) *consumption externality*, *positional-*, *status-*, *relative consumption*, *jealousy*, *envy*, *catching up with the Joneses*. As made precise below, we focus on the case of keeping up with the Joneses in this paper.

[2] A large number of further empirical studies add significant evidence. Cf. Alvarez-Cuadrado et al. (2012),Carlsson et al. (2007),Ferrer-i-Carbonell (2005), Johansson-Stenman et al. (2002),Johansson-Stenman and Martinsson (2006),Luttmer (2005),Maurer and Meier (2008),McBride (2001),Neumark and Postlewaite (1998), and Ravina (2007).

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consideration of the consumption reference level in an otherwise standard framework has delivered important insights,[3] the usual specification of "the" reference level still exhibits, in our view, three major shortcomings.

The first shortcoming refers to a household's reference group(s). There may be different reference groups, and even within a reference group, some individuals may be considered more influential than others. For example, Cowan et al. (2004) argue that some activities become more desirable when they can be shared with a group of peers (peer group effect). Other activities become more desirable if they allow the consumer to emulate the consumption of an elite group that he or she aspires to join (aspiration effect). Still other activities become more desirable when the individual can, through wealth or personal endowments, outshine its peers (distinction effect). In the jargon adopted in this paper, within a reference group, a household may be more concerned with some individuals rather than with others. That is, a consumption externality is usually non-atmospheric. In addition, the consumption of a given household might matter more for some individuals than for others, that is, a consumption externality commonly is asymmetric. Put differently, even if two households are concerned with the *same* reference group, this does *not* imply that these households also share the same consumption reference level.

The second shortcoming concerns the fact that in reality both positional and non-positional forms of consumption coexist (see, e.g., Alpizar et al., 2005; Solnik and Hemenway, 1998, 2005). Typically more visible goods such as houses or cars tend to be more positional than less visible goods such as food or insurance consumption.[4] Models with only one consumption good cannot account for this difference. A further motivation to include both positional and non-positional commodities to the analysis was our objective to numerically quantify the magnitude of the *corrective* second-best tax rates on the *non*-positional commodity.

The third shortcoming refers to the fact that households not only care about consumption reference levels but also about inequality or redistribution (Brekke and Howarth, 2002). As has been shown, individuals dislike being "too different" from their peers. Fehr and Schmidt (1999), find that people dislike income inequality, but they are more upset when their own income falls short than they are pleased by an excess in comparison to their reference levels.

In this paper, we take these shortcomings into account for the derivation of efficient tax programs under both a welfarist and a non-welfarist government. A welfarist government fully respects individual preferences in the formulation of the welfare criterion. On the other hand, a non-welfarist government does not tolerate status preferences — those are basically a form of envy — to be part of the welfare criterion.[5] That is, in the non-welfarist case the government's and individuals' preferences differ. Our analysis sheds light on the optimal policies that emerge from these two different welfare criteria.

This paper is related to the prior literature on optimal taxation and consumption externalities (see, e.g., Aronsson and Johansson-Stenman, 2008, 2010; Boskin and Sheshinsky, 1978; Layard, 1980; Ljungqvist and Uhlig, 2000). From this literature it is well established that an externality due to relative consumption concerns calls for some corrective element in the tax system. Aronsson and Johansson-Stenman (2008) show that the presence of a keeping up with the Joneses externality implies substantially higher marginal income tax rates. The issue of a consumption externality being non-atmospheric rather than atmospheric has also already been taken up by Eckerstorfer (forthcoming), Micheletto (2008) and Wendner (forthcoming). From these studies it has become evident that the nature of a consumption externality indeed matters for the optimal tax structure. However, this literature does not consider asymmetric consumption externalities. Our paper is also related to the literature that studies optimal tax policy from the perspective of a non-welfarist government (see, e.g., Besley, 1988; Blomquist and Micheletto, 2006; O'Donoghue and Rabin, 2006). These studies are concerned with the taxation of sin goods and (de)merit goods where the government does not fully respect households' preferences.

This paper shows four results. First, efficient welfarist first-best tax rates on the positional good are personalized and directly depend on the specific features of the non-atmospheric and asymmetric consumption externality. Specifically, households contributing more than others to the generation of the consumption externality face a higher first-best tax rate. However, in the non-welfarist case, efficient first-best tax rates directly depend on the specific features of the consumption externality only if the consumption reference level does have an impact on the marginal rate of substitution of the positional good for leisure. Second, if the consumption externality is non-atmospheric, the efficient corrective second-best tax rate on the *non*-positional good is generally different from zero, once a *personalized* tax on the positional good is not available. Third numerical simulations reveal that the first-best tax rates are highly sensitive with respect to the specific features of the consumption externality. In contrast, the second-best tax rates barely respond to the specific features of the consumption externality. Moreover, the second-best corrective tax rate on the non-positional good turns out to be quite low. Fourth, altruism and keeping up with the Joneses preferences are not contrasting motives — even if the consumption externality is non-atmospheric or asymmetric. Rather, altruism requires the distribution of utility not to be too unequal, in a well-defined sense. It imposes a fairness condition which narrows the set of efficient allocations to those that are not too distant from an egalitarian allocation. The specific set of fair allocations is strongly affected by the features of the consumption externality. More inequality is tolerated towards households contributing more than others to the generation of the consumption externality. Moreover, for a given consumption externality, the set of fair allocations under a non-welfarist government is smaller than that under a welfarist government. A non-welfarist government tolerates less inequality compared to a welfarist government.

Section 2 of this paper presents the model and defines non-atmospheric and asymmetric consumption externalities as well as the type of altruism adopted. It also characterizes a welfarist efficient first-best tax program. Section 3 discusses both a welfarist efficient second-best tax program (with uniform tax rates) and the impact of altruism on "fair" (utility) allocations. Section 4 considers efficient first- and second-best tax programs under a non-welfarist government. The efficient tax rates differ between the welfarist- and non-welfarist optimality criteria. Therefore, Section 5 presents numerical simulations in order to give a rough indication of the magnitude of the differences in efficient tax rates between the welfarist- and non-welfarist cases. Section 6 concludes the paper. The Appendix A contains proofs and mathematical results that support the analysis of the main text.

2. The model

We consider a static economy with n households. A household $i \in N = \{1,..., n\}$ has preferences over two private goods x_i and z_i, leisure l_i and a reference consumption level $\bar{z}_i$. In addition, households derive utility from the average utility of all households in the economy. We consider spending on x as a non-positional form of consumption and spending on z as status consumption, i.e. for good z households care about their relative consumption with respect to others.

[3] Consumption externalities have shed light for example on the analysis of renewable resource extraction (Alvarez-Cuadrado and Van Long, 2011), envy and inequality (Alvarez-Cuadrado and Van Long, 2012), happiness (Easterlin, 1995; Frank, 1985, 1999; Scitovsky, 1992), economic growth (Brekke and Howarth, 2002; Carroll et al., 1997; Liu and Turnovsky, 2005), or asset pricing (Abel, 1999; Campbell and Cochrane, 1999; Dupor and Liu, 2003).

[4] We are aware that in practice it might be a difficult task to determine whether certain goods are positional or not, and if yes to what extent. Nevertheless we argue that incorporating both status and non-status goods into the analysis adds further insight and that a tax system which is able to treat these forms of consumption differently is superior to one which is not able to.

[5] For example, Harsanyi (1982) claims that antisocial preferences such as envy or jealousy should not be allowed to be part of a social welfare function.