Research in Economics 70 (2016) 89–100

Contents lists available at ScienceDirect

Research in Economics

journal homepage: www.elsevier.com/locate/rie

Optimal commodity taxation with varying quality of goods

Spencer Bastani [a,b,c,d,g,*,1], Sören Blomquist [a,b,d,2], Luca Micheletto [e,f,b,d,2]

[a] Department of Economics, Uppsala University, Uppsala, Sweden
[b] Uppsala Center for Fiscal Studies, Uppsala, Sweden
[c] Uppsala Center for Labor Studies, Uppsala, Sweden
[d] CESifo, Germany
[e] Department of Law, University of Milan, Italy
[f] Dondena Center for Research on Social Dynamics, Bocconi University of Milan, Italy
[g] Linnaeus University Centre for Labour Market and Discrimination Studies, Växjö, Sweden

ARTICLE INFO

Article history:
Received 2 November 2015
Accepted 26 November 2015
Available online 11 December 2015

Keywords:
Nonlinear income taxation
Commodity taxation
Redistribution
Varying quality

ABSTRACT

A standard result in the optimal taxation literature is that when agents differ in market ability and the government aims at redistributing from high- to low-skilled agents by means of an optimal nonlinear labor income tax and a set of commodity taxes, an optimally designed commodity tax structure should encourage (discourage) the consumption of goods/services that are complement with labor (leisure). In this paper we highlight that when agents can choose both the quality and the quantity of a given good/service, this standard commodity tax result needs to be qualified. First, we show that it becomes relevant to distinguish between *specific* and *ad valorem* taxes/subsidies. Second, whether the standard result holds or not depends on how the concept of labor (leisure) complement is defined, namely, whether it is defined in terms of number of units or in terms of expenditure. We also show that levying *specific* and *ad valorem* taxes at opposite signs on a given good can be a feature of the second-best optimum.

1. Introduction

A standard result in the optimal taxation literature is that when agents differ in market ability and the government aims at redistributing from high- to low-skilled agents by means of a nonlinear income tax and a set of commodity taxes (either *specific* or *ad-valorem*), an optimally designed commodity tax structure should encourage (discourage) the consumption of goods/services that are complement with labor (leisure).[3]

In a model with just two private consumption goods plus leisure, where one of the consumption goods is chosen as the untaxed *numéraire*, this requirement implies that the non-*numéraire* good should be subsidized (taxed at a positive rate) if it is a complement with labor (leisure), meaning that, for any given amount of disposable income, the demand for the non-*numéraire* good is an increasing function (a decreasing function) of labor supply.[4] The rationale for this policy prescription is

* Corresponding author at: Department of Economics, Uppsala University, Box 513, SE-751 20, Sweden.
E-mail addresses: spencer.bastani@nek.uu.se (S. Bastani), soren.blomquist@nek.uu.se (S. Blomquist), luca.micheletto@unimi.it (L. Micheletto).

[1] Financial Support from the Jan Wallander and Tom Hedelius Foundation is gratefully acknowledged.
[2] Financial support from Riksbankens Jubileumsfond is gratefully acknowledged.

[3] The result is derived in a setting where all private goods consumed by the agents are purchased in the market. For a model allowing for some goods to be produced within the household, see Cremer and Gahvari (2015).

[4] See, for instance, Mirrlees (1976), Christiansen (1984), and Edwards et al. (1994).

http://dx.doi.org/10.1016/j.rie.2015.11.005
1090-9443/

that, by doing so, one can relax the binding self-selection constraint requiring high-skilled agents not to "mimic" low-skilled agents which descends from the fact that the government has only a statistical information about the distribution of agents' types in the population and does not know "who is who" .

The intuition for the result is the following. Given that a high-skilled agent is paid a higher wage rate than a low-skilled agent, if a high-skilled agent behaves as a mimicker he/she will work fewer hours than a low-skilled agent; thus, he/she will consume more (less) of goods/services that are complements with leisure (labor). Starting from a pure income tax optimum where commodity taxes are not used, it is then possible to introduce a small tax (subsidy) on a good that is a leisure (labor) complement, while adjusting the income tax schedule in such a way that the overall tax reform is both budget-neutral for the government and welfare-neutral for all non-mimicking agents, in such a way to make a high-skilled mimicker worse-off and thereby relaxing the binding self-selection constraint.[5,6] This, in turn, will open the way for a further change in the income tax schedule that allows enhancing the redistribution in favor of low-skilled agents, and hence increasing social welfare.

The commodity tax result that we have described above has been obtained in the context of models where no attention has been devoted to the possibility that a given good/service is available in the market at different quality levels. In this paper, instead, we consider a model where, at least for some goods/services, agents have both a quantity and a quality choice. We show that in such a context the aforementioned commodity tax result needs to be qualified.

First of all, it becomes important to distinguish between *specific* and *ad valorem* taxes/subsidies, a distinction that is of no relevance in the standard model that has been analyzed in the previous literature.

Second, whether the standard result holds or not depends on how the concept of labor complement is defined, namely, whether it is defined in terms of the difference between the number of units purchased by two agents with identical disposable income but different labor supply, or in terms of the difference between their total expenditure on a given good.

Finally, a last result that we show is that jointly levying *specific* and *ad valorem* taxes at opposite signs on a given good can be a feature of a second-best optimum.

To appreciate the importance of distinguishing between *specific* and *ad valorem* taxes/subsidies, and to properly define the concept of labor complement, consider the case of child-care services, one of the prominent examples in the literature of a good that ought to be subsidized (or taxed at a lower rate than other goods) due to its complementarity with labor supply.

The case for subsidizing child care expenditures has been derived in models where the hourly price of child-care services does not differ across child-care facilities and where, therefore, the only margin of choice for households pertains to the number of hours that their child is at a child-care center. Under these assumptions, it is quite reasonable to expect that since a high-skilled mimicker works fewer hours than a true low-skilled parent, more hours of child-care services will be needed by the latter, and in this sense child-care services can unambiguously be regarded as a labor complement.

However, things differ if child-care services are available in the market at different quality levels, and households can choose both the quality of the facility and the number of hours that their child is at the child-care center. In this case, one cannot in general rule out the possibility that a mimicker would choose a higher quality of child-care services than a low-skilled. If that happens, it might be that a mimicker would spend more on child-care services than a low-skilled, while at the same time using child-care services for fewer hours. Child-care services would then still be a labor complement when the concept is defined in terms of number of hours that the service is used, but it would no longer characterize as a labor complement if the concept were to be defined in terms of total expenditure on the service. Also, one would still like to subsidize (or tax at a relatively low rate) the purchase of child-care services if the government uses *specific* taxes/subsidies; however, one would like to tax (or subsidize at a relatively low rate) the purchase of child-care services if the government resorts to *ad valorem* taxes/subsidies.

The remainder of the paper is organized as follows. In Section 2 we describe the structure of the model. Section 3 characterizes the optimal commodity tax structure for the general case when the government can jointly use *specific* and *ad valorem* taxes/subsidies on the purchase of a good that is available in the market at different quality levels. Section 4 characterizes the optimal marginal income tax rates and the optimal marginal effective tax rates generated by the combined effect of income and commodity taxation. Section 5 provides a numerical example illustrating the possibility that, at a second-best optimum, the government may want to jointly impose on a given good *specific* and *ad valorem* taxes at opposite signs. Finally, Section 6 offers concluding remarks.

[5] As recently stated by Stiglitz (2015, p. 42), "…in the presence of an (optimal) income tax, … commodity taxation can be viewed as a particular type of Pigouvian corrective tax. The focus is not on the impact on tax revenues, or even directly on dead weight losses (as usually conceived), but on impacts on the self-selection constraints that are central to the design of the optimal income tax. 'Loosening' the self-selection constraints has a first order effect on welfare, while the distortions associated with small commodity taxation have a second order effect on welfare."

[6] This type of reasoning underpins the Atkinson and Stiglitz (1976) theorem on the redundancy of commodity taxes in the presence of an optimal nonlinear income tax. The theorem shows that if individual preferences are weakly separable between leisure and other goods, an optimal nonlinear income tax is sufficient to implement any incentive-compatible Pareto-efficient allocation. On the Atkinson and Stiglitz (1976) theorem see, more recently, Boadway and Song (this issue).