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Groupings and the gains from tagging ☆

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ABSTRACT

The central assumption of the large literature on "tagging" is that the groupings available to the government are given and fixed. But how many and which types of groups should the government choose to tag? This is the question addressed in this paper. Starting with a simple framework and ending with numerical simulations based on data from Finland, we show how groupings should be formed for tagging, and provide a quantitative assessment of how group differences affect the gains from tagging, and of the marginal welfare gains from increasing the number of groups being tagged.

1. Introduction

It is widely recognized that there are potentially severe incentive and other costs of administering income-related transfers. One way of overcoming these costs is to differentiate the population by easily observable indicators that are correlated with the unobservable characteristic of interest. An individual's labor market status or demographic attributes, for instance, may convey information on underlying productivity.[1] Transfers can then be made contingent upon such characteristics. Akerlof (1978) [2] was among the first to recognize that the use of contingent information to implement several tax/transfer schedules, one for each group, was bound to be superior to being restricted to a single schedule for the whole population. However, he did not say much about the quantitative gain from such differentiation, nor about the shapes of the schedules for the different groups.

The two decades following Akerlof's (1978) seminal publication saw the application and extension of the idea in a number of different directions and settings. Kanbur (1987) and Besley and Kanbur (1988) applied the idea to the targeting of anti-poverty transfers in developing countries. Kanbur and Keen (1989) provide some characterizations of linear group specific tax/transfer schedules with incentive effects. The design of distinct nonlinear income tax/transfer schemes for sub-groups of the population linked by intergroup transfers was provided by Immonen et al (1998) (hereafter IKKT), with a focus on two key issues: what are the shapes of optimal tax/transfer schedules when categorical information can be used to apply different schedules to different groups, and how substantial are the potential welfare gains from applying distinct schedules to distinct groups? The interplay between income-relation and categorical benefits is also examined by Stern (1982).

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[1] Mirrlees (1971) noticed: "One might obtain information about a man's income-earning potential from his apparent I.Q., the number of his degrees, his address, age or color…".

[2] In fact the two-tier social dividend system in Meade Report (1978) p.271–276 is a very similar idea.

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A number of other papers have considered optimal taxes with tagging. For example, Bennett (1987) explores lump-sum transfers between different types of individuals, and Parsons studies the optimal benefit structure of an earnings insurance program when "eligibility requirements" are used as a tag to (imperfectly) identify those who are out of work.

The continuing power of the tagging idea is shown by a burgeoning literature post-2000, which has become more specific and considers tagging across different types of groupings. Viard studies tagging in an optimal linear income tax framework allowing the demogrants to differ across groups but not the income tax rates; Alesina et al. (2011) advocate tagging based on gender; Blumkin et al (2009) examine the redistributive role of affirmative action policy, asking whether supplementing the tax-transfer system with an affirmative action policy would enhance social welfare; Mankiw and Weinzierl (2010) study a model with many skill types who can be tagged on the basis of height; Jacquet and Van Der Linden (2006) consider stigma in the tagging model; Cremer et al (2010) study the properties of tagging in an optimal income tax framework assuming quasi-linear preferences and a Rawlsian social welfare function; and Boadway and Pestieau (2006) have studied the issue of tagging with optimal income taxation in a two-group-two-skill-level setting.[3]

Following Kremer (2001), age based taxation, in particular, has received especially close attention in the last decade. Banks and Diamond (2010) argued that tagging based on age may be socially acceptable because everyone can reach a given age at some time during their life. The Mirrlees et al. (2011) found this argument to be persuasive in advocating some age-related tax reforms to influence labour market participation decisions by older workers and parents with school-age children. Blomquist and Micheletto (2008) consider age-dependent nonlinear taxation in a dynamic Mirrleesian setting with heterogeneous agents and private savings using an overlapping generations (OLG) model where individuals face a stochastic wage process. Bastani et al. (2013) examine the quantitative implications of implementing an optimal age-dependent nonlinear labor income tax and Weinzierl (2011) similarly provides a quantitative assessment of the welfare gains from age-dependent nonlinear income taxes.[4]

The tagging literature has thus grown, and is growing, by leaps and bounds. But its central assumption is still that the groupings available to the government are given and fixed. The government cannot rearrange these groupings—it cannot increase or decrease the number of groups at the margin, nor can it choose one type of grouping over another. Thus on the one hand the assumption is that the groupings are available to the government without cost, yet on the other hand that it is too costly for the government to deviate from the groupings specified by the analyst. However, if the implementation of tagging is itself costly, and if the costs are a function of the number and type of grouping available, the question arises—how many and which types of groups should the government choose to tag? This is the question addressed in this paper.

It should be intuitively obvious, and it is clear from the literature, that there are gains of moving from no grouping to some grouping, unless of course the groups chosen are identical to each other. But how do these gains depend on the nature of the groups? How do they depend on the differences between groups? And how do they depend on the number of groups? Answers to these questions are the building blocks for a deeper analysis of the design of tagging, where the groupings can also be chosen by the government. This paper takes the first steps in such an analysis. Starting with a simple framework and ending with numerical simulations based on data from Finland, we show how groupings should be formed for tagging, and provide a quantitative assessment of how group differences affect the gains from tagging, and of the marginal welfare gains from increasing the number of groups being tagged.

The plan of the paper is as follows. Section 2 of the paper sets out a starting framework, with two groups, simple transfers, and no behavioral responses. It derives results for special cases in order to sharpen intuition on the determinants of the gains from grouping. Section 3 introduces Finnish data on the age structure of income distribution, and provides illustrations of the simple results in the previous section. Section 4 moves to a more general framework of optimal non-linear income taxation with labor supply responses, where the optimal grouping problem can only be addressed through numerical simulations based on Finnish data, albeit guided by the intuitions developed in the previous section. Section 4 also takes up the case of more than two groups and, again using Finnish data for application, provides a quantitative assessment of the gains from increasing the number of groups to be tagged. Section 5 concludes.

2. A simple framework

In this section we develop a simple framework for assessing the gains from different types of groupings. We assume that there are no behavioral responses and we restrict attention to very simple tax and transfer regimes. The government's objective is to maximize a utilitarian social welfare function. Only two groups are allowed. The question of course is: which two groups? Because of its simplicity, the analytical framework allows us to derive closed form solutions, which in turn help to develop intuitions on what sorts of group differences are relevant for tagging. After an illustration of the simple results with Finnish data in Section 3, Section 4 presents a more general model which relaxes many of these assumptions.

[3] Further, Kanbur-Tuomala analyze optimal aid allocation when the donor is faced with two potential recipient countries with their own specific characteristics. Each recipient government chooses its policies in light of its technology, preferences, and aid allocation. The donor has the task of choosing the aid allocation from a fixed pool of aid resources, to optimize the donor's welfare function. Bastani explores the optimal tax implications in a model with both singles and couples and inequality across as well as within households.

[4] Yet other analyses of age-dependent taxes include Gervais (2003) and Lozachmeur (2006).