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ELSEVIER Journal of Economic Dynamics & Control 27 (2003) 1639–1662
JOURNAL OF Economic Dynamics & Control
www.elsevier.com/locate/econbase

Taxation and the intergenerational transmission of human capital

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Abstract

How do taxes affect human capital accumulation? This question has been studied extensively in the context of two model classes: overlapping generations (OLG) and infinite horizon (IH) models. These embody very different assumptions about the intergenerational transmission of physical and human capital. OLG models typically abstract from intergenerational linkages, while IH models implicitly assume that new agents inherit human and physical capital from their parents. This paper investigates how such differences in intercohort persistence affect the responsiveness of human capital to taxation. A model is developed that nests OLG and IH models as special cases. Analytical expressions for the steady state tax elasticities of human capital are derived for versions of the model with varying degrees of persistence. The main finding is that higher persistence increases the responsiveness of human capital to both wage and capital income taxes. As a result, IH models generate larger tax elasticities than do OLG models with incomplete persistence, even if cohorts are altruistically linked. In a calibrated version of the model, moving from no persistence to complete persistence increases the tax elasticity of human capital by a factor between two and three.

JEL classification: H2; J24

Keywords: Human capital; Taxation

1. Introduction

A large share of total wealth in industrialized countries consists of human capital (Davies and Whalley, 1991). Understanding how taxation affects human capital accumulation is therefore important for the evaluation of alternative tax schemes. A recent literature has addressed this issue in the context of two classes of models: overlapping

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0165-1889/02/$ - see front matter
PII: S0165-1889(02)00074-X

generations (OLG) and infinite horizon (IH) models.[1] As noted by Lucas (1990), the two model classes have very different theoretical structures. In particular, they embody different assumptions about the intergenerational transmission of human and physical capital. In OLG models, it is typically assumed that the capital endowments of new agents are exogenously given. In this sense, there is no intercohort persistence.[2] I shall refer to such models as "pure OLG" models. An IH model, by contrast, may be interpreted as an environment in which children literally inherit not only physical but also human capital from their parents. Intercohort persistence is then complete. The findings obtained from both model classes therefore rely on extreme specifications of persistence.

The question addressed in this paper is how these differences in intercohort persistence affect the sensitivity of human capital to income taxation. To clarify the motivation, consider a researcher who wishes to study the effects of income taxation on human capital accumulation. To measure these effects, he/she must decide whether to study the issue in the context of an IH or and OLG model. This raises two questions: Under what conditions do OLG and IH models yield similar tax elasticities, given that both models are parameterized to match the same aggregate statistics? How do alternative specifications of intercohort persistence alter the outcomes of tax experiments?

To study these questions, I develop a model that nests pure OLG and IH models as special cases. I derive analytical solutions for the steady-state tax elasticities of human capital for versions of the model that include pure OLG and IH models as well as intermediate cases. This approach allows one to precisely identify the sources of any differences that may exist between the two model classes.

The main finding is that intercohort persistence affects the tax sensitivity of human capital in important ways. Stronger persistence increases the steady-state tax elasticity of human capital for both wage and capital income taxes. An important implication is that the two model classes studied in the literature generate systematically different predictions, if both are parameterized to match the same aggregate statistics. IH models yield larger tax elasticities than do OLG models, even if cohorts are altruistically linked and even if human capital is imperfectly transmitted from parents to children. The conditions under which the two model classes yield identical tax elasticities are restrictive. In the case of wage taxes, the elasticities are the same if the persistence of human *and* physical capital is complete. But even in this case, capital tax elasticities are larger in IH models than in OLG models.

Numerical solutions of parameterized versions of the model suggest that intercohort persistence is quantitatively important. The steady-state tax elasticity of human capital increases two to three-fold when moving from no persistence to complete persistence, even if cohorts are altruistically linked. These findings contrast sharply with the common view that IH and pure OLG models "have very different theoretical structures, yet

[1] Important examples include Lucas (1990) and Trostel (1993) using IH models and Davies and Whalley (1991) using OLG models.

[2] I use the term "intercohort persistence" for the degree to which human capital acquired by parents is transmitted to their children. How this concept is related to the notion of persistence used in the literature on intergenerational mobility is discussed below.