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On the interaction between education and social security

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Abstract

This paper uses an overlapping generations model with endogenous fertility choices to analyze the quantitative costs and benefits of subsidizing higher education, paying particular attention to the interaction between such policy and the sustainability of the social security system. The paper focuses on the demographic change as the mechanism that link both policies. It is found that an increase in education subsidies changes the educational composition of the population and lowers average fertility. Lower average fertility and higher life expectancy of educated individuals translates into changes in the age structure of the population that requires an increase in the social security tax rate in order to balance the pension budget. Such process reduces the welfare benefits of this educational policy since the rise in social security taxes lowers the after-tax lifetime earnings of almost all individuals born in the period of the policy reform and over.

JEL classification: D58; H55; I28; J10

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1. Introduction

Public expenditure on social security pensions is expected to grow rapidly between 1998 and the end of the first quarter of the next century. Demographic trends imply a

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substantial increase in the number of retired people as the baby-boom generation reaches retirement age. This fact has motivated an increasing concern about the sustainability of the pension systems in developed countries. In this sense, the recent research effort on social security has mainly concentrated on the optimality of the current pay-as-you-go pension system (e.g., Imrohoroglu et al., 1995) and the design of a feasible reform to a funded system (e.g., Huang et al., 1997). These studies have a feature that is crucial for the type of questions I want to address in this paper, namely they abstract from the interaction between the financial viability of the social security system and the way other public policies are designed. This is an important shortcoming since abstracting from this interaction may prevent governments from facing the real consequences of the implementation of a policy reform. The purpose of this paper is firstly to investigate the interaction between a policy aimed at subsidizing higher education and the sustainability of the social security system paying particular attention to the demographic change as the critical mechanism that relates both policies. And secondly, to analyze to what extent this interaction affects the quantitative evaluation of the costs and benefits of education subsidies.

With some exceptions, the existing literature has studied the economic effect of both policies (public education and social security) separately. On the one hand, there are some studies that analyze the efficiency gains produced by the investment of public resources in education. The existence of borrowing constraints that prevent young agents from borrowing against future income (Fernandez and Rogerson, 1998) and the possible gains stemming from externalities in the accumulation of human capital (Docquier and Michel, 1999) are examples of this effort. Other studies have stressed the link between education and the optimal number of children, e.g., Barro and Becker (1989) and Becker et al. (1990). These frameworks could be potentially useful to qualitatively study the interaction between public education and social security. However, these are mostly overlapping generations models where agents live two periods and consequently they cannot incorporate great demographic detail. More recently, Heckman et al. (1999) use a large overlapping generations model with endogenous educational attainment to address the quantitative costs and benefits of tuition subsidies in a general equilibrium framework. This work is more close in spirit to mine, although in their work the demographic characteristics of individuals in terms of mortality risk and fertility are ignored.

On the other hand, many recent studies have identified the aging process as the critical variable that limits the financial sustainability of the social security system in western countries (e.g., Franco and Munzi, 1996). The work of Auerbach and Kotlikoff (1987) provides a useful framework to quantify the effect of an aging process on the viability of a pay-as-you-go system. However, they assume that the aging process is exogenous to the model and in contrast to Heckman et al. (1999) agents cannot choose their education attainment.

Finally, there are some studies that analyze the interaction between education and social security. Glomm and Kaganovich (2002) have studied the effects of public education on the distributional effects of human capital in an economy with social security. In Ehrlich and Lui (1998) children provide support to parents in old age, so that parents have an interest in the education of their children over and above any altruistic motives. Therefore, it is possible that social security weakens the link between a parent's retirement income and the earnings of his own children (since part of the child's earnings are taxed away to