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Social security and risk sharing ☆

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Abstract

In this paper we identify conditions under which the introduction of a pay-as-you-go social security system is ex ante Pareto-improving in a stochastic OLG economy with capital accumulation and land. We argue that these conditions are consistent with realistic specifications of the parameters of the economy. In our model financial markets are complete and competitive equilibria interim Pareto efficient. Therefore, a welfare improvement can only be obtained if agents' welfare is evaluated ex ante, and arises from an improvement in intergenerational risk sharing. We also examine the optimal size of a given social security system as well as its optimal reform.
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1. Introduction

The pay-as-you-go social security system in the US was introduced as a tool to mitigate the effects of economic crises. In a special message to Congress accompanying the draft of the social

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security bill President Roosevelt said “No one can guarantee this country against the dangers of future depressions, but we can reduce those dangers. ... we can provide the means of mitigating their results. This plan for economic security is at once a measure of prevention and a measure of alleviation.” (see e.g. Kennedy [14, p. 270]). In this paper we examine to what extent enhanced intergenerational risk sharing through a pay-as-you-go social security can alleviate the consequences of economic downturns. This idea dates back to at least Enders and Lapan [9]. More recently, it is used as an argument against privatization of social security. For example, Shiller [18] writes “If risk management is to be really effective, it is most important that it help out in the most desperate situations, and this is what the US government’s social security, financed with income taxes, does.”

To properly evaluate whether a social security system allows to improve risk-sharing it is important to specify the welfare criterion that is used (and hence the market failures social security may address). If agents’ utility is evaluated at an interim stage, conditionally on the state at their birth, an improvement can only be obtained if some financial markets are missing, or the economy is dynamically inefficient. While one might argue that in reality crucial markets are missing (in particular annuity markets and markets for securities that pay contingent on idiosyncratic shocks), this source of inefficiency is not specific to economies with overlapping generations and other insurance schemes could be introduced which are Pareto-improving (in particular new financial assets, fully funded annuities, etc.). Hence the presence of some missing markets might provide a justification for some government intervention but does not directly point to social security as an ideal instrument. Using an interim welfare criterion, several authors have examined the potential benefits of pay-as-you-go social security systems in realistically calibrated, dynamically efficient economies with missing markets (see e.g. Imrohoroglu et al. [13] or Krueger and Kubler [16]). They find that the negative effects of social security on the capital stock and wages clearly outweigh, quantitatively, any positive risk sharing effects of such a system.

However, if agents’ welfare is evaluated at an ex ante stage competitive equilibria in stochastic overlapping generation models are generally suboptimal, even when markets are complete, because agents are unable to trade to insure against the realization of the uncertainty at their birth. There must then be some transfers between generations which improve intergenerational risk sharing and constitute a Pareto-improvement. It is then particularly of interest to investigate under what conditions a pay-as-you-go social security system (or, more generally, one-sided transfers from the young to the old) is Pareto-improving according to an ex ante welfare criterion in economies where equilibria are interim Pareto efficient. In these economies the only possible source of an improvement is the imperfection in intergenerational risk sharing due to the limitations on trading imposed by the demographic structure.

In this paper we consider a class of overlapping generations economies where markets are complete, there is capital accumulation and land, an infinitely lived asset used in the production process together with labor and capital. The presence of land together with the completeness of markets ensure that competitive equilibria are interim Pareto efficient. We show that, for a wide range of realistic specifications of the parameters of the economy, a pay-as-you-go social security system is ex ante Pareto improving and we demonstrate that the effects on the equilibrium price of land play a crucial role in enhancing the welfare benefits of social security.

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