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Social security, life insurance and annuities for families[☆]

Jay H. Hong[a], José-Víctor Ríos-Rull[b,*]

[a]*Department of Economics, University of Rochester, RC Box 270156, Rochester, NY 14627-0156, USA*
[b]*Department of Economics, University of Pennsylvania, 3718 Locust Walk, Philadelphia, PA 19104-6297, USA, CAERP, CEPR, NBER*

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Abstract

In this paper we ask whether an aspect of social security, namely its role as a provider of insurance against uncertain life spans, is welfare enhancing. To this end we use an OLG model where agents have a bequest motive and differ in sex and marital status and where families are formed and destroyed and their characteristics evolve (exogenously) according to U.S. demographic patterns of marriage, divorce, fertility and mortality. We compare the implications of social security under a variety of market structures that differ in the extent to which life insurance and annuities are available. We find that social security is a bad idea. In economies where the private sector provides annuities and life insurance, it is a bad idea for the standard reason that it distorts the intertemporal margin by lowering the capital stock. In the absence of such securities social security is still a very bad idea, only marginally less so compared with economies with annuities and life insurance. We also explore these issues in a world where people live longer and we find no differences in our answers. As a by-product of our analysis we find that the existence of life insurance opportunities for people is important in welfare terms while that of annuities is not.

JEL classification: D12; D91; J10; D64

Keywords: Life insurance; Annuity; Social security; Life cycle model; Altruism

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[*]Corresponding author. Tel.: +1 215 898 7767; fax: +1 215 573 2057.
E-mail addresses: jay.hong@rochester.edu (J.H. Hong), vr0j@econ.upenn.edu (J.-V. Ríos-Rull).

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1. Introduction

One of the possible rationales for social security is market failure. A particular type of market failure is the absence of annuities, or insurance against surviving beyond a certain age. In the U.S. annuities are either very expensive or inexistent which may indicate that there is a market failure and social security provides benefits that are effectively annuities. The usefulness of social security as a provider of annuities has been explored in a variety of papers such as Abel (1986), Hubbard and Judd (1987), Imrohoroğlu et al. (1995), and Conesa and Krueger (1999), but always in a context that identifies agents with households or with individuals that have no concerns over others. In the environments postulated by these papers there is no rationale for insuring against dying too early (or life insurance as is known) just against living too long (annuities). Yet, the average adult holds up of \$50,000 (in face value) of life insurance. We think that because life insurance and annuities are securities that insure the same event (even if with opposite signs) they should be studied in an environment that provides a role for both type of securities.

In this paper we revisit the issue of the usefulness of social security under a variety of market structures with respect to the existence of life insurance and annuities. What we bring to the table is that we do model households as families and not as individual agents which provides a rationale for the existence of life insurance and hence it provides for a much better modeling of the margins that may be of concern when facing death. Models where all households are single individuals are badly suited to answer questions about the possible role of social security as a substitute for market imperfections because they assume that all people would purchase annuities if available and this is just wrong. Most people purchase life insurance which makes it unlikely that they would also purchase annuities. Moreover, our model environment also allows us to incorporate altruism towards dependents, providing a unified picture of the various risks and considerations associated to the timing of death.

We use a two-sex OLG model where agents are indexed by their marital status, which includes never married, widowed, divorced, and married (specifying the age of the spouse) as well as whether the household has dependents. Agents change their marital status as often as people do in the U.S. Our environment, that is placed in a model that replicates an aggregate (small open) economy, poses that individuals in a married household solve a joint maximization problem that takes into account that, in the future, the marriage may break up because of death or divorce. This paper uses the theory of multiperson households and the estimates in Hong and Ríos-Rull (2006) where agents in multiperson households have access to life insurance markets and where we estimated preference parameters that generate equilibrium patterns of life insurance holdings like those in the data. In that paper we looked at the effects of publicly provided life insurance, specifically the Survivors' Benefits portion of the U.S. social security system.[1] In this paper, we extend Hong and Ríos-Rull (2006) to incorporate alternative market structures with respect to the existence of securities contingent on the survival of individuals. We take the benchmark economy to be one with existence of life insurance and inexistence of annuities markets but where the assets of those that die and do not have survivors are rebated lump sum among survivors[2]—which we believe most closely resembles the U.S. economy; a *Pharaoh*

[1]This structure has also been used in Hong (2005) to measure the value of nonmarket production over life cycle.
[2]This means that agents receive it *independently* of their savings.