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Social security reform with self-control preferences☆

Cagri S. Kumru [a,*], Athanasios C. Thanopoulos [b,c,1]

[a] Australian National University, Research School of Economics, ANU, Canberra, ACT 0200, Australia
[b] Council of Economic Advisers of the Government of Greece, Ministry of Finance, 5-7 Nikis St. 10180, Athens, Greece
[c] UADPhilEcon, Department of Economics, University of Athens, 14 Evripidou St. 10559, Athens, Greece

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ABSTRACT

This paper analyzes a fully funded social security system under the assumption that agents face temptation issues. Agents are required to save through individually managed Personal Security Accounts without, and with mandatory annuitization. When the analysis is restricted to CRRA preferences our results are congruent with the literature in indicating that the complete elimination of social security is among the reform scenarios that maximize welfare. However, when self control preferences are introduced, and as the intensity of self control becomes progressively more severe the "social security elimination" scenario loses ground very rapidly. In fact, in the case of relatively severe temptation the elimination of social security becomes the least desirable alternative. Under the light of the above findings, any reform proposal regarding the social security system should consider departures from standard preferences to preference specifications suitable for dealing with preference reversals.

1. Introduction

There is an abundance of studies related to the importance of social security and its impact on welfare. The primary reason for this is its dramatically growing scale which has triggered a renewed academic debate regarding the optimal allocation of the available resources. This controversy stems from the huge monetary burden that the mere presence and administration of a social security system entails for the society and the associated budget implications: Old age, disability, unemployment and health insurance policies have evolved into the most expensive items on government budgets.

Most of the studies that seem to emerge as a direct or implicit offspring of this debate focus on the welfare implications of alternative social security schemes in an economy. In the very core of this debate one can clearly identify the dilemma between an "unfunded" (Pay-As-You-Go) versus a "funded" social security system. In an unfunded system, resources are transferred statically from the working population to the concurrent retirees (inter-generational transfers). In contrast, a funded system prescribes a dynamic allocation of resources within the same generation (inter-temporal within the same generation transfers). While the implementation of both systems relies on an external institution (e.g. government), their different logic and mechanics eventually induce entirely different risk-sharing properties as well as savings incentives. Therefore, their welfare implications may significantly diverge because of this difference.

Population aging as a result of the declining population growth rate and decreasing birth rate has challenged enormously the sustainability of a *PAYG* system and called for a minimization of the fiscal burden through tax reforms and benefits restructuring. As a result, there are numerous studies suggesting alternative institutional arrangements that could be more robust to adverse demographic shocks. However, as much as converting an unfunded system to a fully (or partially) funded one may seem a plausible solution, in most cases the transition costs associated with such a reform make it prohibitively costly (DeNardi et al., 1999).

The welfare implications of social security are well identified in the relevant literature.[2] Several studies (e.g. Storesletten et al., 1999) comparing different social security systems typically compare welfare across alternative steady states, each corresponding to a stationary

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* Corresponding author. Tel.: +61 2 6125 6126.
E-mail addresses: cagri.kumru@anu.edu.au (C.S. Kumru), a.thanopoulos@minfin.gr (A.C. Thanopoulos).
[1] Tel.: +30 697 335 1672, +30 210 333 2561.

[2] The interest in the welfare implications of a social security system has been sparked with the seminal work of Diamond (1965). Earlier quantitative models that assessed the welfare implications of the system were developed by Feldstein (1985) and Auerbach and Kotlikoff (1987).

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equilibrium with a different social security system. Focusing only on unfunded social security, Imrohoroglu et al. (1995) emphasize the detrimental effects that such an arrangement has to the overall welfare in a country.

However, all the above studies ignore alternative preference specifications that may be binding in several cases: Imrohoroglu et al. (2003) and Fehr et al. (2008) use time-inconsistent preferences while Kumru and Thanopoulos (2008) and Bucciol (2008) use self-control preferences to highlight that in a context of unfunded social security welfare may be critically affected by the preference specification.[3] In a recent paper, Fehr and Kindermann (2009) study the implications of individual retirement accounts (IRA) on economic aggregates and welfare in the context of a general equilibrium model populated by either rational agents or agents with time-inconsistent preferences.

In this study, we would like to quantitatively assess the welfare implications of the reform of the current *unfunded* social security system into a partially funded or fully privatized one, under the assumption that agents face self-control problems. We proceed by assessing in terms of welfare a hybrid (partially funded) and a fully funded social security system under the alternative hypotheses of self-control or CRRA preferences. The apparatus by means of which we model departures from unfunded social security is a Personal Security Account (PSA). Within that class of "funded" models, we investigate two competing scenarios involving PSAs: one *without* annuitization and an alternative one that prescribes a mandatory annuitization of retirement benefits.[4] More precisely we compare and contrast the implications of five different social security reforms:

- The first reform proposal (*PSA*) postulates the substitution of the current social security system by a two-tier scheme: a universal PAYG-financed basic pension combined with a Personal Security Account that does not require annuitization of benefits at retirement.
- The second reform proposal (*PSAA*) is similar to the first one except that it prescribes a mandatory annuitization of the funds accumulated in PSA accounts.
- The third reform proposal (*PSAwoFT*) postulates the removal of the PAYG-financed basic pension plan existing in the first reform proposal.
- Similarly, the fourth reform proposal (*PSAAwoFT*), suggests the removal of the PAYG-financed basic pension plan existing in the second reform proposal.
- Finally the fifth proposal (*elimination*) suggests the complete removal of the social security system.

Moreover, in order to capture our agents' temptation towards current consumption, our model economies make use of the preference structure pioneered by Strotz (1956) and Phelps and Pollak (1968) and further elaborated by Gul and Pesendorfer (2004) to model self-control issues. Gul and Pesendorfer (2004) identified a particular class of utility functions that provides a time-*consistent* model suitable for addressing the preference reversals that motivated the time inconsistency literature. The key theme here is that self-control preferences assume that agents maximize a utility function that is a 'compromise' between the standard utility (or 'commitment' utility) and a 'temptation' utility. The conflicting ways by which agents derive utility in this setting, is the device through which the trade-off between the temptation to consume on the one hand, and the long-run self interest of the agent on the other is captured. The main benefit is that self-control preferences remain perfectly time-consistent and, contrary to time-inconsistent preferences, allow agents in our model to commit.

With the exception of the aforementioned difference in the specification of preferences, our model specification follows that of Imrohoroglu et al. (2003) and Fuster et al. (2005). Furthermore, our economic environment features uninsurable individual income shocks, borrowing constraints and missing annuity markets.

We aim to contribute to the debate on the reform of social security. Our augmented model allows us to look at the welfare gains or losses due to the reforms from a different angle. In particular, it allows us to assess the welfare-enhancing potential of mandatory savings versus mandatory annuitization of accumulated PSA wealth at retirement. For the sake of comparability of our results, the particular specification of those alternative policies is purposely chosen to match the proposals analyzed in the literature (Storesletten et al., 1999; Fuster et al., 2005), as well as those featuring in the reform recommendations made by the 1997 Advisory Council on Social Security.

It is nevertheless critical to address a question that lies at the very core of our line of research, namely, why models of social security with time inconsistent or "temptation" preferences are relevant in the first place. Several factors weigh-in in favor of the relevance of these models. A first one relates to theoretical completeness: a change in the preference structure enhances our understanding of the mechanics of similar models in the literature by providing an additional channel through which capital accumulation is distorted. An additional factor is the need for comprehensive policy evaluation: an augmented preference structure is essential for providing a comprehensive comparison framework for policy makers in their evaluation of various proposals. Thirdly, empirical relevance: there is sound empirical and experimental evidence that individuals suffer from self-control problems. Frederick et al. (2002) provide an overview of experimental studies documenting that individuals indeed exhibit bias toward immediate gratification. Huang et al. (2007) and Bucciol (forthcoming) study the empirical relevance of self-control preferences using household-level data from the Consumer Expenditure Survey. Their estimates support the presence of temptation.[5] Moreover, in a recent paper Fang and Silverman (2009) empirically identify the existence of time-inconsistency that stems from self-control problems, through the estimation of the structural parameters of a dynamic labor supply model.[6] Finally, the literature documents that the existence of self-control problems affects fundamentally the economic decisions of individuals. Given that, social security programs might play a beneficial role in environments in which individuals suffer from self-control problems: Laibson et al. (1998) show that when individuals have time-inconsistent preferences a fully funded social security system induces higher savings and improves welfare. Furthermore, Imrohoroglu et al. (2003), Kumru and Thanopoulos (2008), and Fehr et al. (2008) show that the presence of agents that are either slightly short-sighted or prone to current consumption changes markedly the welfare implications of the system.

It is worth emphasizing that this paper differs substantially from Kumru and Thanopoulos (2008) and Bucciol (2008), in that the latter two confine their analysis in the implications of one and only type of institutional arrangement with regard to social security, namely a *PAYG* system. While both these studies share the stimulating intuition that the existence of *PAYG* social security can enhance welfare by reducing individuals' self-control costs, their scope for policy impact analysis remains rather limited in that they do not match alternative social security schemes against each other under the presence of self-control. Instead, in this paper we confront *PAYG* social security with various hybrid schemes such as funded and partially funded systems, under the assumption that agents have self-control preferences. In this respect, our work not only represents a significant step forward in

[3] For a detailed introduction to the mechanics of the hyperbolic consumption model and dynamically inconsistent preferences see Angeletos et al. (2001).

[4] When PSA funds are annuitized, agents ("annuitants") receive a series of payments for the duration of their lifetime.

[5] Ameriks et al. (2007) develop a survey instrument to measure self-control problems and apply it to a sample of highly educated adults. They find that self-control problems are smaller in scale for older than for younger individuals.

[6] Similarly, Gruber and Koszegi (2001) recognize that there is strong evidence that preferences related to smoking are time-inconsistent, while Angeletos et al. (2001) show that models featuring time-inconsistent preferences perform better in matching the available consumption and asset allocation data drawn from the Panel Study of Income Dynamics and the Survey of Consumer Finances.