

## The future of social security<sup>☆</sup>

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Received 15 March 2007; received in revised form 31 October 2007; accepted 31 October 2007

Available online 13 November 2007

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### Abstract

We analyze the effect of the projected demographic transition on the political support for social security, and equilibrium outcomes. Embedding a probabilistic-voting setup of electoral competition in the standard OLG model with capital accumulation, we find that intergenerational transfers arise in the absence of altruism, commitment, or trigger strategies. Closed-form solutions predict population ageing to lead to higher social security tax rates, a rising share of pensions in GDP, but eventually lower social security benefits per retiree. The response of equilibrium tax rates to demographic shocks reduces old-age consumption risk. Calibrated to match features of the U.S. economy, the model suggests that, in response to the projected demographic transition, social security tax rates will gradually increase to 16%. Other policies that distort labor supply will become less important; labor supply therefore will rise, in contrast with frequently voiced fears.

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*JEL classification:* E62; H55

*Keywords:* Social security; Probabilistic voting; Markov perfect equilibrium; Saving; Labor supply

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<sup>☆</sup>We thank the editor and an anonymous referee for their valuable suggestions. For useful comments at different stages of this project, we thank Vincenzo Galasso, Piero Gottardi, John Hassler, Hugo Hopenhayn, Enrique Kawamura, Per Krusell, Torsten Persson, Kjetil Storesletten, Harald Uhlig, Jaume Ventura, Fabrizio Zilibotti, and seminar and conference participants at CERGE-EI, CEU, ECARES, Humboldt, IIES, LSE, Maryland, MIT, Oslo, San Andrés, Stockholm School of Economics, and UTDT. We also thank Christina Lönnblad for editorial assistance. Large parts of this paper were written while Gonzalez-Eiras visited the IIES. He thanks the IIES for the hospitality and acknowledges financial support from Fundación Antorchas and Stiftelsen Wennergrenska Samfundet.

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“Your estimated benefits are based on current law. Congress has made changes to the law in the past and can do so at any time.”

(Social Security Statement distributed by the U.S. Social Security Administration, 2007)

## 1. Introduction

Many countries with pay-as-you-go financed social security systems are confronted with a secular decline in population growth rates that puts increasing financial stress on these systems. Projections of social security shortfalls in those countries imply that solvency requires substantial increases in contribution rates or cuts in benefits (or a combination of the two). The questions are: which of these options will be implemented, and what will be the macroeconomic consequences? In this paper, we develop a robust analytical framework to address these questions. Moreover, we apply the framework to generate predictions for the medium-term outlook of the U.S. social security system.

Benefit levels and contribution rates are politically determined and may at any time be altered in the legislative process. In order to predict adjustments of social security taxes and benefits, it is therefore essential to model the determinants of the political support for social security, and the effect of the demographic transition on these determinants. To this purpose, we introduce political choice in Diamond’s (1965) overlapping generations model. We solve for the politico-economic equilibrium and analyze the effect of the projected demographic transition on policies and the allocation.

Households in the model are non-altruistic. As consumers, they take prices and policy as given. As voters, they anticipate the effect of policy on equilibrium outcomes, including future political choices. We assume that voters are not bound by past political decisions. The politico-economic equilibrium therefore features subgame-perfect tax and transfer choices supporting a competitive equilibrium.

Agents hold rational expectations. Voters, in particular, are fully aware of the equilibrium relationship between future state variables and policy choices, and this relationship shapes their preferences over contemporaneous policy choices. We posit that only fundamental state variables affect future policy outcomes, excluding artificial state variables of the type sustaining trigger strategy equilibria. Our underlying assumption is that changes in the *size* of social security programs depend more directly on the economic and demographic environment than through underlying reputation mechanisms, even if the *existence* of these programs may also owe to reputational forces. Focusing on the Markov perfect equilibrium, we aim at identifying fundamental and robust forces that affect the size of social security, without relying on arbitrary assumptions about the parameters of a trigger-type strategy.<sup>1</sup> In fact, the Markov perfect equilibrium we focus on is the *unique* equilibrium arising in the limit of the finite-horizon economy.

We model electoral competition under the assumption of probabilistic voting. The policy platforms of vote-seeking candidates therefore cater to the interests of all voters in society, reflecting both support for social security benefits by the elderly and opposition against them by young tax-payers. However, young voters oppose social security less emphatically than old voters support it, and the politico-economic equilibrium therefore features a structural “bias” in favor of intergenerational transfers. This bias arises because social security taxes do not only generate a cost for workers, but also indirect benefits: By depressing savings, labor income taxes allow to monopolize the supply of capital, and thus, to manipulate the terms of trade with future, unborn generations.<sup>2</sup> This benefit of social security as perceived by tax-paying workers is a robust feature. It persists even if an additional policy instrument is available that depresses savings without transferring resources to the elderly.

<sup>1</sup>The Markov assumption also reinforces our assumption that political choices suffer from a lack of commitment, including commitment to particular trigger-type strategies. For a discussion of Markov perfect equilibrium, see Krusell et al. (1997). Bhaskar (1998) shows that weak informational constraints in overlapping generation games with a strictly dominant action for the old imply that the unique pure strategy equilibrium is in Markov strategies.

<sup>2</sup>In addition to altering the terms of trade, the change of savings induced by higher taxes also translates into future policy changes if policy depends on this state variable. Kotlikoff and Rosenthal (1990) discuss the incentive of young workers to monopolize the supply of capital. They assume commitment and do not model the political process. Cooley and Soares (1999) and Boldrin and Rustichini (2000), among others, stress the role of general equilibrium effects.

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