



ELSEVIER

Contents lists available at ScienceDirect

## Review of Economic Dynamics

www.elsevier.com/locate/red

The dynamics of inequality and social security in general equilibrium<sup>☆</sup>Zheng Song<sup>a,b,\*</sup><sup>a</sup> Chinese University of Hong Kong, Hong Kong, China<sup>b</sup> Fudan University, China

## ARTICLE INFO

## Article history:

Received 23 June 2009

Revised 30 April 2011

Available online 14 May 2011

## JEL classification:

E21

E62

H21

H55

## Keywords:

Inequality

Intra-generational redistribution

Markov perfect equilibrium

Probabilistic voting

Social security

## ABSTRACT

This paper analyzes the dynamic politico-economic equilibrium of a model where repeated voting on social security and the evolution of household characteristics in general equilibrium are mutually affected over time. In particular, we incorporate within-cohort heterogeneity in a two-period Overlapping-Generation model to capture the intra-generational redistributive effect of social security transfers. Political decision-making is represented by a probabilistic voting à la Lindbeck and Weibull (1987). We analytically characterize the Markov perfect equilibrium, in which social security tax rates are shown to be increasing in wealth inequality. A dynamic interaction between inequality and social security leads to larger social security programs. In a model calibrated to the U.S. economy, the dynamic interaction is shown to be quantitatively important: It accounts for more than half of the social security growth in the dynamics. We also perform some normative analysis, showing that the politico-economic equilibrium outcomes can be fundamentally different from the Ramsey allocation.

© 2011 Elsevier Inc. All rights reserved.

## 1. Introduction

Most developed countries have large public pension programs, involving both inter-generational and intra-generational transfers. For instance, social security contributions are roughly proportional to income, while benefits have important lump-sum components. The general equilibrium effects and the welfare implications of such social security programs have been extensively studied in the literature.<sup>1</sup> However, the welfare state is not exogenously imposed, but endogenously determined by policy choices that reflect rich dynamic interactions between political and economic factors. For instance, the evolution of the distribution of household characteristics in general equilibrium may alter the political support for the social security system since households with different characteristics tend to have different preferences over transfers. Despite this, most of the existing literature has either assumed away politico-economic factors or, when considering them, focused on models where the size of social security is decided once and for all. As a result, the feedback of endogenous changes of household

<sup>☆</sup> This paper is based on Chapter 3 of my dissertation at IIES, Stockholm University. I am deeply indebted to my advisor, Fabrizio Zilibotti, for his guidance and numerous discussions. I thank the editor, Matthias Doepke, and an anonymous referee for providing suggestions that improved the paper substantially. I also thank Kaiji Chen, John Hassler, Giovanni Favara, Dirk Niepelt, Jose V. Rodriguez Mora, Kjetil Storesletten and seminar participants at IIES and Oslo for helpful comments. Any remaining errors are mine.

\* Correspondence to: Chinese University of Hong Kong, Hong Kong Special Administrative Region.

E-mail address: zsong@cuhk.edu.hk.

<sup>1</sup> See, among many others, Auerbach and Koltikoff (1987), Imrohroglu et al. (1995) and Storesletten et al. (1999).

characteristics on the decision of social security transfers over time has been ignored altogether (e.g., Tabellini, 2000; Cooley and Soares, 1999; Conesa and Krueger, 1999).<sup>2</sup>

The present paper explores the positive implications and the welfare properties of a rational-choice theory implying interactions between private intertemporal choices and repeated political decisions about social security. To this end, we construct a dynamic general equilibrium model where agents repeatedly vote on the social security system. Our analytical results show that the dynamic interaction between inequality and social security leads to larger social security programs. In a model calibrated to the U.S. economy, the dynamic interaction is shown to be quantitatively important: It accounts for more than half of the social security growth in the dynamics. We also perform some normative analysis, showing that the politico-economic equilibrium outcomes can be fundamentally different from the Ramsey allocation chosen by a benevolent planner with a commitment technology.

In our model, the incumbent government cannot commit to future transfers since they are decided by future elected governments. Instead, transfers are determined in each period by the current constituency, the wealth inequality of which is a key factor. Forward-looking households adjust their private savings when rationally anticipating the equilibrium dynamics of wealth inequality and social security. A main theoretical finding is that this interaction leads to an equilibrium where social security transfers increase over time. The underlying mechanism is twofold. On the one hand, the establishment of a social security increases future wealth inequality since within-cohort transfers discourage the private savings of low-income households more than proportionally. On the other hand, larger wealth inequality makes transfers more desirable in the future. This provides the political support for an increasing size of social security in subsequent periods.

Our workhorse is a standard two-period Overlapping-Generation model. To capture the intra-generational redistributive role of social security, we incorporate within-cohort heterogeneity by assuming young households to be born with different labor productivities. Old households are different in terms of wealth. In other words, there exists multi-dimensional heterogeneity across voters. Each group of voters has its own preferences over transfers. The political decision process is modeled by a repeated probabilistic voting framework.<sup>3</sup> In equilibrium, policymaker candidates respond to electoral uncertainty by proposing a policy platform that maximizes a weighted-average welfare of all groups of voters.

We focus on Markov perfect equilibria, where the size of social security is conditioned on payoff-relevant fundamental elements: the distribution of assets held by old households and the demographic structure. The Markov perfect equilibrium is obtained as one takes the limit of a finite horizon environment.<sup>4</sup> Moreover, under logarithm utility and Cobb–Douglas production technology, the equilibrium can be characterized analytically, making the underlying politico-economic mechanism highly transparent. In particular, we show that the equilibrium social security tax rate is increasing in wealth inequality, and this positive relationship generates growing social security over time. When calibrated to the U.S. economy from 1947 to 1969, the model predicts the initial and steady state social security tax rate of 3.5 percent and 7.2 percent, respectively. The growth of the tax rate is quantitatively close to the data, though the level of tax rate is higher: The average Old-Age and Survivors Insurance (OASI henceforth) contribution rate increases from 2 percent in the 1930s to 4.7 percent in the period from 1947 to 1969. The exercise also suggests that the dynamic interaction between inequality and social security is quantitatively important: It generates a 3.7-percentage-point increase of the tax rate in the dynamics. We then extend the model by incorporating the ageing population in the U.S. The average dependency ratio rises to 19.3 percent from 1970 to 2000, substantially higher than 15.7 percent from 1947 to 1969. Such a change will lead to a further increase in the size of social security. The extended model predicts a tax rate of 9 percent, which is roughly in line with the average OASI contribution rate of 9.8 percent in the 1970 to 2000 period. In addition, more social security benefits make wealth distribution more unequal. The Gini coefficient of wealth in the model economy increases by 3.4 percent. This might explain a significant part of the 10-percent increase in the Gini coefficient of household financial wealth in the Survey of the Financial Characteristics of Consumers (SFCC henceforth) and the Survey of Consumer Finances (SCF henceforth) from the 1960s to the 1980s.

The tractable model allows a comparison between the politico-economic equilibrium outcome and the Ramsey allocation, in which a benevolent planner with a commitment technology maximizes the discounted sum of the welfare of all current and future generations. Under logarithm utility and Cobb–Douglas production technology, the Ramsey solution can also be characterized analytically. We find that the Ramsey solution may feature a decreasing size of social security if the social discount factor is not too small. This sharply contrasts growing transfers in the political equilibrium. The basic intuition is straightforward. The initial inelastic capital stock provides the incentive for the Ramsey planner to impose high taxes for redistributive reasons.<sup>5</sup> However, since she can commit to future policies, low taxation will be adopted for encouraging capital accumulation in periods other than the initial one.

<sup>2</sup> A notable exception is Boldrin and Rustichini (2000), where the interaction between private intertemporal choices and political decisions may lead to a decreasing size of social security.

<sup>3</sup> The probabilistic voting framework is adapted from Lindbeck and Weibull (1987). See Hassler et al. (2005) and Gonzalez-Eiras and Niepelt (2008) for applications of the repeated probabilistic voting in a dynamic political economy.

<sup>4</sup> Previous literature has studied the sustainability and evolution of social security by assuming that voters play trigger strategies (e.g., Boldrin and Rustichini, 2000). Although trigger strategy may provide analytical convenience and have reasonable components, it is hard to provide sharp empirical predictions due to the indeterminacy of equilibria.

<sup>5</sup> Unlike the mechanism for high initial capital tax rates in Chamley (1986) and Judd (1985), the government here makes no attempt to confiscate the initial capital stock due to the pay-as-you-go social security system.

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات