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Is there any gain from social security privatization?

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ABSTRACT

Increasing calls for a social security reform of switching from the pay-as-you-go (PAYG) system to a funded system has been seen in recent decades. This paper examines the effect of this reform on capital accumulation and the welfare of each generation. Three methods are used to finance the pension debt, government debt financing, tax financing, and government asset financing. With government debt or tax financing, the market equilibrium remains unchanged and all generations are as well off in the new system as in the PAYG system. Thus, switching from the PAYG system to a funded system is neutral. With government asset financing, the interest rate will decrease, private capital will increase, but the total output may either increase or decrease. The welfare effect is also ambiguous in general, depending on the rate of return of government assets. With plausible parameters, our simulation shows that the reform will lower the interest rate, increase private capital, and lower government capital in the short run, but raise government capital and increase output in the long run.

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1. Introduction

The pay-as-you-go (PAYG) social security system has been established in many countries for quite some time. Samuelson (1958) showed that, the PAYG system permits a windfall benefit to current retirees, with the social security payment to the current young deferred to the future generation, and an introduction of the PAYG social security system is a Pareto improvement. Recent decades, social security reforms have become a heated debated topic among academics and policy-makers. A prominent suggestion is to switch from the current PAYG social security system to a funded social security system with the establishment of personal social security accounts, often called social security privatization. This paper analyzes the gains from this type of social security reform by taking into consideration various ways to finance the social security debt to the current old generation.

A number of studies have demonstrated the advantages of a switch from the PAYG system to a funded system. Feldstein (1995) used a partial equilibrium framework to examine whether privatizing social security (i.e., a switch from the PAYG system to a funded system) would raise welfare. He shows that a debt-financed transition from the PAYG system to a funded system would raise economic welfare if three conditions are met: (1) the marginal product of capital exceeds the rate of economic growth; (2) the marginal product of capital exceeds the appropriate consumption discount rate; and (3) the rate of economic growth is positive.[2] These conditions are likely to be satisfied. However, he recognized that a majority of the adult population alive at the

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[2] A debt financed transition means that the transition from an unfunded social security system to a funded social security system that does not reduce the benefits of existing retirees would, however, require substituting explicit government debt for the equally large implicit debt of the unfunded social security system.

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time of the privatization might be worse off. Feldstein (1998) provided two alternatives, immediate transition by issuing "recognition bonds" or a gradual transition by collecting taxes. The first method substitutes new government bonds for the existing implicit claims of retirees and current employees. With the second method, employees during the transition period must pay payroll taxes to support the existing retirees and, at the same time, must accumulate assets for their own retirement. With both methods, the first few generations alive during the transition period will be worse off and the future generations will be better off. Kotlikoff (1996) used a general equilibrium model to simulate the effects of social security privatization and showed that a switch to an alternative tax base, such as from a progressive income tax to a consumption tax, may generate significant efficiency gains.

Prior studies have also shown that in order to pay the implicit pension debt in the transition process, some generations have to be worse off to make others better off. Breyer (1989) argued that when the PAYG system is replaced by a funded system, it is generally impossible to compensate the pensioners in the transition generation without making at least one later generation worse off. By assuming agents within a generation are different, Brunner (1996) showed that a Pareto-improving transition to a funded system is not possible because any instrument applied to the financing of pensions in the transition period involves intragenerational redistribution. Murphy and Welch (1998) suggested that one way to complete the transition is to cut benefits instead of raising taxes. Sinn (1997, 2000) argued that there is nothing to be gained from a transition to a funded system in general, but he suggested privatization of the pension system for those not willing to have children. By assuming endogenous fertility, Groezen, Leers, and Meijdam (2003) and Hirazawa and Yakita (2009) examined social security payroll tax in a small open economy with exogenous interest rate and showed that, with a child allowance scheme or a child care market, it is possible to have Pareto improvement by a PAYG payroll tax cut.

Recent years have seen increasing interest in China's social security reforms. Feldstein (1999) proposed that China should move from a PAYG defined benefit system to a funded defined contribution system. In his opinion, in the PAYG system, the rate of return depends on the growth rate of aggregate real wages. According to the World Bank estimation, wages in China will grow at approximately 7% or less per year. However, in the funded system, the rate of return depends on the marginal product of industrial capital, which was estimated at 17% in China (Chow, 1993), or with a conservative estimation of 12%. In this case, $1 saved at age 45 grows up to $7.6 at age 75 in the PAYG system, while $1 will grow up to $29.95 in the funded system.[3] Therefore, the funded system can provide the same level of benefits with a savings rate equal to only one fourth of the rate of tax required in the PAYG system. However, he did not consider the social security payment to the current old generation. Lin (2008) argued that with only about 25% of employees involved in the current PAYG social security system, China should switch to a funded social security system immediately.[4]

This paper examines the effects of a switch from the PAYG system to a funded system by considering the implicit pension debt repayment and by allowing existing generations as well off in the new system as in the PAYG system. An overlapping generations model is utilized. Three methods are used to finance the pension debt to the current old generation: government debt financing, tax financing, and government asset financing. With government debt or tax financing, the market equilibrium remains unchanged, and all the generations are as well off in the new system as in the PAYG system. Thus, the social security reform is neutral. With government asset financing, the interest rate will decrease and private capital stock will increase, but the total output may either increase or decrease, while the welfare effect is ambiguous in general. With plausible parameters, our simulations show that the reform will lower the interest rate, increase private capital, and lower government capital in the short run, but raise government capital and increase the output level in the long run. The paper contributes not only to issues concerning China social security reforms, but also to the theoretical literature on social security reforms in general.

The paper proceeds as follows. Section 2 introduces the model with a PAYG social security system. Section 3 analyzes the effects of switching from the PAYG system to a funded system with various ways of financing social security debt. Section 4 provides concluding remarks.

2. The model

There are many individuals and firms in the economy. Individuals are identical within and across generations. The population of generation $t+1$ in period $t+1$ L_{t+1} is (n is constant): $L_{t+1}=(1+n)L_t$.[5] The government lives forever, running a social security system and managing government capital.

2.1. The firm

The economy produces one good, which can be either consumed or invested. Output is produced by identical competitive firms using a constant-returns-to-scale production technology. There are three inputs in the production: private capital, government capital, and labor. Specifically, the production function is as follows:

$$Y_t = K_t^{\alpha} G_t^{\beta} (A_t L_t)^{1-\alpha-\beta} \tag{2.1}$$

[3] The detailed calculation is as follows: $(1.07)^{30}=7.6122$ and $(1.12)^{30}=29.9599$.

[4] Using the Computable General Equilibrium model Wang, Xu, Wang, and Zhai (2001) found that China's current PAYG system with a notional personal social security account is not sustainable.

[5] The main result of this paper will remain unchanged even if we introduce endogenous fertility. The details are available on request.