

# Privatizing Social Security: A Political-Economy Approach

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*The aging of the population shakes the public finance of pay-as-you-go social security systems. We develop a political-economy framework in which this demographic change leads to the downsizing of the social security system, and, as a consequence, to the emergence of supplemental individual retirement programs. Allowing for a one-shot budget deficit, earmarked to accommodate the cost of the social security reforms, is shown to facilitate the political-economy transition from a national to a private pension system.*

Keywords: Dependency ratio; Median voter; Privatization; Individual saving accounts

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## I. Introduction

The economic viability of national old-age social security systems has been increasingly deteriorating in the wake of aging of the population. Indeed, aging raises the burden of financing the existing pay-as-you-go (PAYG), national pension (old-age social security) systems, because there is a relatively declining number of workers, who must bear the cost of paying pensions, compared to a relatively rising number of retirees. Against this backdrop, proposals have arisen to privatize social security, as a solution to the economic sustainability of the existing systems. This, by and large, means a shift from the current PAYG systems to individual retirement accounts (or fully funded systems).

The increased fragility of national PAYG pension systems, caused by the aging of the population, raises doubts among the young about whether the next generations will continue to honor the implicit intergenerational social contract, or the political norm, according to which, "I pay now for the pension benefits of the old, and the next young generation pays for my pension benefits, when I get old." These doubts are, after all, not unfounded, for there will indeed be more pensioners per each young worker of the next generation, and hence each one of the young workers will have to pay more to honor the implicit social contract. With such doubts, the political power balance may indeed shift toward scaling down the PAYG system, encouraging the establishment of supplemental individual retirement accounts. Such accounts are, by their very nature, fully funded, so that they are not directly affected by the aging of the population.<sup>1</sup> Naturally, the existing old generation opposes any scaling down of the PAYG system, because it stands to lose pension benefits (without enjoying the reduction in the social security contributions). This opposition can, however, be softened, or altogether removed, if the government creates a one-shot budget deficit to support the social security system and allow it not to scale down the pension benefits to the current old, to fully offset the reduction in social security contributions, or even allow it to maintain these benefits intact. (Of course, this deficit will be carried over to the future, with its debt service smoothed over the next several generations.)

In this paper, we develop an analytical model in which a PAYG, old-age security system is designed as a political-economy equilibrium. We then investigate how the aging of the population can shift the equilibrium toward scaling down this fiscal system (thereby encouraging the emergence of individual retirement accounts). We further examine how a one-shot budget deficit, earmarked for a partial privatization of social security, can politically facilitate a scaling down of PAYG systems.<sup>2</sup>

1. Naturally, the aging of the population has some bearing on individual retirement accounts too through the general-equilibrium effects on the return on capital (stemming from the induced change in the capital-labor ratio).
2. In his 2001 testimony to the U.S. Congress, Federal Reserve Board Chairman Alan Greenspan argued on the basis of budget projections (which turned out to be drastically off the mark) that the federal government would pay off all its debt in a few years. If this happened, the government would be forced to invest future surpluses in the financial markets, which might adversely affect corporate governance. To avoid this bad outcome, Greenspan favored tax cuts that would reduce the surpluses. However, a partial privatization of the U.S. Social Security, which would have imposed "transition costs," in which the federal government fulfills its obligations to those who have already paid the social security tax, and at the same time allows individuals to contribute to their pension accounts, could have taken care of the budget surpluses, without any implications for corporate governance. Following Greenspan's testimony, the resistance in the Congress to President George W. Bush's tax cut package collapsed, and the U.S. government headed for a persistent budget deficit, a large part of which is a direct result of the tax cuts.

The organization of the paper is as follows. Section II develops a political-economy framework for determining the social security system. Section III considers the effect of aging on the social security system.

## II. Political-Economy Model of Social Security

Consider a standard overlapping-generations model in which each generation lives for two periods: a working period and a retirement period. There are two types of workers: skilled workers who have high productivity and provide one efficiency unit of labor per unit of labor time, and unskilled workers who provide only  $q < 1$  efficiency units of labor per unit of labor time. Workers have one unit of labor time during their first period of life, but are born without skills and thus with low productivity. Each worker chooses whether to acquire an education and become a skilled worker, or else remain unskilled. After the working period, individuals retire, with their consumption funded by private savings and the social security pension, discussed below.

There is a continuum of individuals, characterized by an innate ability parameter,  $e$ , which is the time needed to acquire skill. By investing  $e$  units of labor time in education, a worker becomes skilled, after which the remaining  $(1 - e)$  units of labor time provide an equal amount of effective labor in the balance of the first period. There are also pecuniary costs of acquiring skills,  $\gamma$ , which are not tax deductible.<sup>3</sup> The cumulative distribution function of innate ability is denoted by  $G(\cdot)$  with the support being the interval  $[0, 1]$ . The density function is denoted by  $g = G'$ .

If an individual with an innate ability level (henceforth an  $e$ -individual) acquires skill, then his or her income is  $(1 - \tau)w(1 - e) - \gamma$ , whereas if the individual remains unskilled then the income is  $(1 - \tau)qw$ , where  $w$  is the wage rate per efficiency unit of labor and  $\tau$  is the social security contribution (tax) rate. There exists a cutoff level,  $e^*$ , of the education-cost parameter,  $e^*$ , such that those with education-cost parameter below  $e^*$  will invest in education and become skilled, whereas everyone else remains unskilled. The cutoff level is determined by an equality between the return on education and the cost of education (including foregone income):

$$e^* = 1 - q - \gamma / [(1 - \tau)w]. \quad (1)$$

We assume a linear production function in which output,  $Y$ , is produced using labor,  $L$ , and capital,  $K$ :

$$Y = wL + (1 + r)K. \quad (2)$$

The wage rate,  $w$ , and the gross (before depreciation) rental price of capital,  $1 + r$ , are determined by the marginal productivity conditions for factor prices:

3. This is a realistic assumption. Unlike corporations for which depreciation of capital is deductible, for individuals the pecuniary cost of investment in human capital is not.

$$w = \partial Y / \partial L \text{ and } 1 + r = \partial Y / \partial K.$$

These conditions are already substituted into the production function. For simplicity, we assume that capital fully depreciates at the end of the production process.

We assume that the population grows at a rate of  $n$ . The labor supply of each individual is assumed to be fixed, so that the social security tax does not distort the individual labor-supply decisions, at the margin. The aggregate labor supply does, however, depend on the income tax rate, as this affects the cutoff ability,  $e^*$ , and thus the mix of skilled and unskilled individuals in the economy. This distortion keeps the tax rate from being driven up to 100 percent. At the current period, the aggregate labor supply is given by

$$\begin{aligned} L &= \left\{ \int_0^{e^*} (1 - e) dG + q [1 - G(e^*)] \right\} N_0 (1 + n) \\ &= l(e^*) N_0 (1 + n), \end{aligned} \quad (3)$$

where  $N_0(1 + n)$  is the size of the working-age population at present ( $N_0$  is the number of young individuals born in the preceding period), and  $l(e^*) = \int_0^{e^*} (1 - e) dG + q [1 - G(e^*)]$  is the average labor supply (per worker) in the current period.

There is initially a PAYG, old-age social security system by which the taxes collected from the young (working) population are earmarked to finance a pension benefit to the old (retired) population.<sup>4</sup> Thus, the benefit ( $b_t$ ), paid to each old individual at present, must satisfy the following PAYG budget constraint:

$$b = \tau w l(e^*) (1 + n), \quad (4)$$

where  $\tau$  is the social security tax at present.

Votes are repeated every period. In each period, the benefit of the social security system accrues only to the old, whereas the burden (the social security taxes) is borne by the young. Then, one may wonder why would not the young, who outnumber the old with a growing population, drive the tax and the benefit down to zero in a political-economy equilibrium. We appeal to a sort of an implicit intergenerational social contract that goes like this: "I, the young, pay now for the pension benefits of the old; and you, the young of the next generation, will pay for my pension benefit, when I grow old and retire." This implicit intergenerational contract could be an outcome of an intergenerational game, with trigger strategies, as shown in Cooley and Soares (1999a, b) and Bohn (1999).<sup>5</sup> The young believe that if they do not pay the old a pension benefit, then the next young generation will punish them by not

4. This specification put explicitly the benefit,  $b$ , as an old-age social security benefit. In contrast, in an earlier work (e.g., Razin, Sadka, and Swagel [2002a, b]), the benefit  $b$  was uniformly paid in cash or in kind to all young and old alike. It was intended to capture intra-generational redistributive features of a welfare state reached by some social consensus.

5. Cooley and Soares (1999a, b) and Bohn (1999) have used explicit game-theoretic reasoning to address the issue of the survivability of the PAYG social security system. This literature demonstrates the existence of an equilibrium in an overlapping-generations model with social security as a sequential equilibrium in an infinitely repeated voting game. The critical support mechanism is provided by trigger strategies. As put by Bohn (1999):

providing for their pensions. With such a contract in place, the young at present are willing to politically support a social security tax,  $\tau$ , which is earmarked to pay the current old a pension benefit of  $b$ , because they expect the young generation in the next period to honor the implicit social contract and pay them a benefit  $\alpha b$ . The parameter  $\alpha$  is assumed to depend negatively on the share of the old in the population. If the current young will each continue to bring  $n$  children, then the share of the old will not change in the next period and  $\alpha$  is expected to be one. But if fertility falls and the share of the old in the next period rises relative to the present, then  $\alpha$  is expected to fall below one. This is because the young believe that if fertility falls in the future, the next young generation will either find it harder or will be plainly reluctant to continue to support the old (the current young) at the current level.

Because factor prices are constant over time, current saving decisions will not affect the rate of return on capital that the current young will earn on their savings. Hence, the dynamics in this model are redundant. For any social security tax rate,  $\tau$ , equations (1) and (4) determine the functions  $e^* = e^*(\tau)$  and  $b = b(\tau)$ . Denote by  $W(e, \tau, \alpha)$  the lifetime income of a young  $e$ -individual:

$$W(e, \tau, \alpha) = \begin{cases} (1 - \tau)w(1 - e) - \gamma + \alpha b(\tau)/(1 + r), & \text{for } e \leq e^*(\tau), \\ (1 - \tau)wq + \alpha b(\tau)/(1 + r), & \text{for } e \geq e^*(\tau). \end{cases} \quad (5)$$

In each period, the political-economy equilibrium for the social security tax,  $\tau$  (and the associated pension benefit,  $b$ ), is determined by majority voting among the young and old individuals who are alive in this period. The objective of the old is quite clear: so long as raising the social security tax rate,  $\tau$ , generates more revenues, and consequently, a higher pension benefit,  $b$ , they will vote for it. However, voting of the young is less clear-cut. Because a young individual pays a tax bill of  $\tau w(1 - e)$  or  $\tau wq$ , depending on his or her skill level, and receives a benefit of  $\alpha b/(1 + r)$ , in present value terms, he or she must weigh the tax bill against the benefit. The individual votes for raising the tax rate, if  $\partial W/\partial \tau > 0$ , and for lowering it, if  $\partial W/\partial \tau < 0$ . Note that

$$\partial^2 W(e, \tau, \alpha)/\partial e \partial \tau = \begin{cases} w, & \text{for } e < e^*(\tau), \\ 0, & \text{for } e > e^*(\tau). \end{cases} \quad (6)$$

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The failure of any cohort to adhere to the proposed equilibrium triggers a negative change in voters' expectations about future benefits that destroys social security. Since survival and collapse are discrete alternatives, trigger strategy models provide a natural definition of what is meant by social security being viable.

To support social security as a sequential equilibrium, there is a very simple condition that must be fulfilled. For the median voter, the present value of future benefits exceeds the value of social security contributions until retirement. This condition is easily satisfied in our overlapping-generations model.

Therefore, if  $\partial W/\partial\tau > 0$  for some  $e_0$ , then  $\partial W/\partial\tau > 0$  for all  $e > e_0$ ; and similarly, if  $\partial W/\partial\tau < 0$  for some  $e_0$ , then  $\partial W/\partial\tau < 0$  for all  $e < e_0$ . This implies that if an increase in the social security tax rate benefits a particular young (working) individual (because the increased pension benefit outweighs the increase in the tax bill), then all young individuals who are less able (that is, those who have a higher cost-of-education parameter,  $e$ ), must also gain from this tax increase. Similarly, if a social security tax increase hurts a certain young individual (because the increased pension benefit does not fully compensate for the tax hike), then it must also hurt all young individuals who are more able.

As was already pointed out, the old always opt for a higher social security tax. But as long as  $n > 0$ , the old are outnumbered by the young. To reach an equilibrium, the bottom end of the skill distribution of the young population joins forces with the old to form a pro-tax coalition of 50 percent of the population, whereas the top end of the skill distribution of the young population forms a counter, anti-tax coalition of equal size. In determining the outcome of majority voting, the decisive voter must be a young individual, with an education-cost index denoted by  $e_M$ , such that the young who have an education-cost index below  $e_M$  (namely, the anti-tax coalition) form 50 percent of the total population. The political-economy equilibrium tax rate maximizes the lifetime income of this median voter.

Formally,  $e_M$  is defined as follows. There are  $N_0(1+n)G(e_M)$  young individuals with cost-of-education parameter  $e \leq e_M$  (more able than the median voter), and  $N_0(1+n)[1-G(e_M)]$  young individuals with cost-of-education parameter  $e \geq e_M$  (less able than the median voter). There are also  $N_0$  retired individuals at present who always join the pro-tax coalition. Hence,  $e_M$  is defined implicitly by

$$N_0(1+n)G(e_M) = N_0(1+n)[1-G(e_M)] + N_0.$$

Dividing this equation by  $N_0$  and rearranging terms yield the cost-of-education parameter for the median voter:

$$e_M = G^{-1}\left[\frac{2+n}{2(1+n)}\right]. \quad (7)$$

As noted, the political equilibrium tax rate,  $\tau$ , denoted by  $\tau_0(e_M, \alpha)$ , maximizes the lifetime income of the median voter:

$$\tau_0(e_M, \alpha) = \arg \max_{\tau} W(e_M, \tau, \alpha). \quad (8)$$

This equilibrium tax rate is implicitly defined by the first-order condition:

$$\frac{\partial W[e_M, \tau_0(e_M, \alpha), \alpha]}{\partial \tau} \equiv B[e_M, \tau_0(e_M, \alpha), \alpha] = 0, \quad (9)$$

and the second-order condition is

$$\frac{\partial^2 W[e_M, \tau_0(e_M, \alpha), \alpha]}{\partial \tau^2} = B_\tau[e_M, \tau_0(e_M, \alpha), \alpha] \leq 0, \quad (10)$$

where  $B_\tau$  is the partial derivative of  $B$  with respect to its second argument.

### III. Social Security under Strain: Aging Population

We now examine how aging affects the political-economy equilibrium of social security. We first continue to maintain in Section III.A the strict PAYG feature of social security assumed so far. In Section III.B, we relax this feature.

#### A. Strict Balanced-Budget Rules

In a PAYG system, the burden of financing the pension benefits to the old falls on fewer young shoulders, when population ages. If the fertility of the current young falls below the fertility rate ( $n$ ) of their parents, then the share of the old in the next period will rise. The current young expect the next young generation to reduce the benefit it pays to the old (current young) generation. That is, the current young generation perceives a smaller  $\alpha$ .

To find the effect of aging on social security, we investigate the effect of a decline in  $\alpha$  on the equilibrium social security tax rate,  $\tau_0(e_M, \alpha)$ . Differentiate equation (9) totally with respect to  $\alpha$  to conclude that

$$\frac{\partial \tau_0(e_M, \alpha)}{\partial \alpha} = -\frac{B_\alpha[e_M, \tau_0(e_M, \alpha), \alpha]}{B_\tau[e_M, \tau_0(e_M, \alpha), \alpha]}, \quad (11)$$

where  $B_\alpha$  is the partial derivative of  $B$  with respect to its third argument. Because  $-B_\tau$  is non-negative (see the second-order condition [10]), it follows that the sign of  $\partial \tau_0 / \partial \alpha$  is the same as the sign of  $B_\alpha$ . It also follows from equation (9) that  $B_\alpha = \partial^2 W / \partial \alpha \partial \tau$ . Employing equation (5), we find that

$$B_\alpha[e_M, \tau_0(e_M, \alpha), \alpha] = \frac{\partial^2 W[e_M, \tau_0(e_M, \alpha), \alpha]}{\partial \alpha \partial \tau} = \frac{1}{1+r} \frac{db[\tau_0(e_M, \alpha)]}{d\tau}. \quad (12)$$

Naturally, no one will vote for raising the social security tax if  $db/d\tau < 0$ , because in such a case, the pension benefit falls when the social security tax is raised. Put differently, a political-economy equilibrium will never be located on the “wrong” side of the Laffer curve, where a tax rate hike lowers revenue. This can also be seen formally. From equation (5),

$$B(e, \tau, \alpha) = \frac{\partial W(e, \tau, \alpha)}{\partial \tau} = \begin{cases} -w(1-e) + \frac{\alpha}{1+r} \frac{db(\tau)}{d\tau}, & \text{for } e \leq e^*(\tau), \\ -wq + \frac{\alpha}{1+r} \frac{db(\tau)}{d\tau}, & \text{for } e \geq e^*(\tau), \end{cases} \quad (13)$$

so that, when the lifetime income of the median voter is maximized, that is, when  $B = 0$  (see equation [9]), we have

$$\frac{db[\tau_0(e_M, \alpha)]}{d\tau} = \begin{cases} w(1 - e_M)(1 + r)/\alpha & \text{if } e_M \leq e^*(\tau) \\ wq(1 + r)/\alpha & \text{if } e_M \geq e^*(\tau) \end{cases} \geq 0. \quad (14)$$

Thus, it follows from equations (12) and (14) that  $B_\alpha[e_M, \tau_0(e_M, \alpha), \alpha] \geq 0$ , and hence, from equation (11), that

$$\frac{\partial \tau_0(e_M, \alpha)}{\partial \alpha} > 0. \quad (15)$$

We conclude that when the young population expects reduced social security benefits because of the aging of the populations (that is, when  $\alpha$  falls), the public indeed votes for scaling down the social security system already present (that is, for lowering  $\tau$  and  $b$ ). As a result, the young resort to supplemental old-age savings, such as individual retirement accounts. Naturally, the old are worse off as a result of reducing  $b$ . But they are outvoted by the young, whose inclination to lower  $\tau$  has grown stronger, following the reduction in the social security benefits that they will get.

## B. Reform-Earmarked Budget Deficit

The old, naturally, continue to oppose the (partial) transition from a PAYG, old-age social security system to individual retirement accounts, because they lose some of their pension benefits. They also have a strong moral claim that they contributed their fair share to the social security system when they were young, but they receive at retirement less than what they paid when they were young. Their opposition, strengthened perhaps by being morally justified, can be accommodated, in part or in full, if the government is allowed to make a *one-shot, debt-financed* transfer to the social security system, to allow the system to pay pension benefits in excess of the social security tax revenues. This deficit is carried forward to the future, and its debt service is smoothed over the next few generations, so that its future tax implications for the current young generation are not significant. Such a reform-earmarked budget deficit may indeed be considered in the expected revision of the Stability and Growth Pact in the European Union (EU).

For simplicity, suppose that the government makes a transfer at the exact amount that is required to keep the pension benefits of the current old intact, despite the reduction in the social security tax rate. Specifically, when  $\tau$  falls, then the term  $b$  in equation (4), which is financed by this  $\tau$ , falls as well. But we assume that the government compensates the old generation, to maintain the total pension benefits intact. Therefore, despite the fall in  $b$ , the old are indifferent to the reduction in  $\tau$  (and, consequently, the reduction in  $b$ ). Thus, the outcome of the majority voting is now effectively determined by the young only. The median voter is now a median among the young population only. This median voter has a lower cost-of-education index than before; that is,  $e_M$  will fall.



To find the effect of the fall in  $e_M$  on the political-economy equilibrium social security tax rate,  $\tau_0(e_M, \alpha)$ , we follow the same procedure as in the preceding section, and conclude that

$$\frac{\partial \tau_0}{\partial e_M} = - \frac{B_{e_M}[e_M, \tau_0(e_M, \alpha), \alpha]}{B_\tau[e_M, \tau_0(e_M, \alpha), \alpha]}, \quad (16)$$

where, as before, the sign of  $\partial \tau / \partial e_M$  is the same as the sign of  $B_{e_M}$ , because  $B_\tau \leq 0$ . Note that  $B_{e_M} = \partial^2 W / \partial e_M \partial \tau$  (see equation [9]), so that it follows from equation (5) that

$$B_{e_M}[e_M, \tau_0(e_M, \alpha), \alpha] = \begin{cases} w, & \text{for } e_M < e^*(\tau), \\ 0, & \text{for } e_M > e^*(\tau). \end{cases} \quad (17)$$

Thus, we conclude that  $\partial \tau / \partial e_M$  is non-negative: it is positive when the median voter is a skilled individual (that is, when  $e_M < e^*$ ), and zero when the median voter is an unskilled individual (that is, when  $e_M > e^*$ ). Hence, a decline in  $e_M$  decreases (or leaves intact) the social security tax  $\tau_0(e_M, \alpha)$  and the associated benefit  $b$ .

The rationale for this result is straightforward. All unskilled people have the same lifetime income, regardless of their cost-of-education parameter,  $e$ . Therefore, the attitude toward the  $(\tau, b)$  pair is the same for all of them. Hence, the change in the median voter has no consequence on the outcome of the majority voting, when this median voter is an unskilled individual. For skilled individuals, lifetime income increases when the education-cost parameter,  $e$ , declines. Because the social security system is progressive with respect to the cost-of-education parameter, the net benefit from it (that is, the present value of the expected pension benefit minus the social security tax) declines as lifetime income increases (that is, as  $e$  falls). Therefore, a decline in the cost-of-education parameter of the median voter,  $e_M$ , lowers the political-economy equilibrium social security tax and pension benefit.

## IV. Conclusion

Making the fiscal constraints, of the sort previously imposed by the Stability and Growth Pact in the EU, more flexible may facilitate the political-economy transition from a national PAYG, old-age social security system to a fully funded private pension system. Such a transition will of course improve the viability of the national system during and after the transition. But this comes at the cost of a lesser degree of income redistribution, an inherent feature of a national system.

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## Comment

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The paper by Assaf Razin and Efraim Sadka touches on a number of fundamental issues regarding the current situation of social security programs throughout the world. Increasingly, we find the economic situations of these programs to be precarious. And proposals and counterproposals to more soundly underpin these programs flood the market for ideas—yet seldom is policy changed.

This paper contributes to our "positive" understanding of social security by analyzing an overlapping-generations model of social security with intergenerational as well as intra-generational features. The latter form of inequality, that is, inequality within a generation, is introduced through individuals' exogenous, heterogeneous differences in innate ability. The authors demonstrate with their model that a political, median voter equilibrium exists where the non-working old and the working poor maintain a pay-as-you-go (PAYG) social security regime. Such an intergenerational transfer scheme is supported by an implicit contract between generations that makes PAYG feasible. According to these authors, such an implicit contract has a moral dimension that should be incorporated into the positive analysis of social security.

The authors then consider the important demographic facing most social security systems: namely, population growth declines will lower the perceived benefit to the young from a PAYG social security regime. As such, the coalition of poor young workers with the existing non-working elderly will begin to fray as intergenerational redistribution exceeds the former's desire to engineer intra-generational redistribution. It follows that a population growth decline will facilitate a move toward a more privatized social security regime. This will, of course, be opposed by the current old.

Razin and Sadka argue, however, that in the face of a permanent decline in the population growth rate the transition to a privatized social security regime may be enhanced by a one-time transfer to the current old financed by a deficit. In essence, the more productive, current young can buy off the current old. From the authors'

perspective, this will maintain the social contract across generations as well as the moral dimension whereby the old are not penalized by declining fertility.

While the paper is helpful in thinking about the positive equilibrium dynamics of social security, several issues remain that are worth pondering. First, what is the role of the capital stock in the model? This turns out to be important, since capital is a source of untaxed income in the model (only labor income is taxed) that is skewed toward those of higher income and is also more concentrated in the hands of the elderly. Second, what happens if there is an exogenous rise in income inequality within a generation? Likely, following the seminar piece by Meltzer and Richard (1981), rising inequality within a generation will drive a larger role for social security (to achieve redistribution both across and within generations).

Third, how important is the model's neglect of general equilibrium effects on wages and interest rates? In the model, factor prices are presumably set in international markets (and so are assumed to be fixed from the standpoint of the domestic economy), but such an assumption should presumably be further investigated. For instance, what if voters could consider allowing a mass immigration of young foreign workers of low ability to help finance social security in the face of a population decline? It turns out that with fixed factor prices, such immigration would actually find favor with poorer young citizens. The reason is that if these foreign workers were given voting rights, they would vote to keep the redistributive PAYG system that would align their interests with the existing poorer young citizens. Such a coalition is unlikely to hold if lower wages resulted from an increase in the supply of labor of those with less innate ability.

Finally, the mechanism identified by Razin and Sadka for financing the transition from a PAYG system to a self-financed privatized social security system when a country is faced with a permanent decline in its population growth rate is a one-time transfer to the current old financed in perpetuity by taxes on future generations. Inherently, this sustains the social contract across generations and satisfies a sense of moral fairness whereby the current old are not adversely affected by the change in the social security system. Nevertheless, in reality, each and every generation believes it has faced exceptional distress and that it is deserving of one-time transfers. Hence, the political-economy reality is that there is no such thing as a one-time transfer, and that a system that can allow one one-time transfer can always allow another one-time transfer, *ad infinitum*.

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## Comment

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### I. Introduction

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Assaf Razin and Efraim Sadka provide an elegant paper, which focuses on how a political outcome of the social security program responds to population aging. The paper analyzes the political process in which two generations, the young and the old, vote on income transfers between the generations (the pay-as-you-go [PAYG] social security program). The outcomes of the voting are, first, that the population aging downsizes the social security program, and second, that a one-shot, reform-earmarked deficit will facilitate the downsizing.

The population aging has two offsetting effects on the size of the social security program. A factor that enlarges the program is that the population aging increases the share of the elderly, who support the program. On the other hand, a factor that shrinks it is that the young generation anticipates the PAYG social security program will be less profitable. In an earlier paper, Razin, Sadka, and Swagel (2002) discussed the relative importance of these effects, and found that the latter effect is likely to dominate. In the present paper, the authors employ a much simpler model, which features only the latter effect.

I think that the political-economy analysis, which the authors take, is a very promising approach to understanding the evolution of the social security program, because the program can be treated as an endogenous variable that is determined by a political process. Traditional economic analysis can only discuss the normative size of the program, which is not sure to be realized.

The political-economy approach, however, is still evolving. In this comment, therefore, I would like to address three points that should be elaborated further in future work. I will then discuss the policy implications for the Japanese public pension program.

### II. Issues in the Political-Economy Approach

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The first point concerns the conflicting nature of agents as voters/savers in the model.

If the median voter is a person who receives transfers from the rich, income redistribution policy becomes a natural outcome of a voting game. Constructing the social security program as a voting equilibrium is more challenging, because the median voter is a worker who contributes to the program. The model must explain why the young agree to give money to the old. The authors employ the brilliant idea that the PAYG system arises as an outcome of successive intergenerational games, where the young anticipate that they will receive benefits from the next generation.

The young are then assumed to correctly recognize the future social security benefit. Since this means they forecast the future rationally, they must behave as

rational life-cycle savers so that they accumulate enough assets to finance their consumption after retirement. If so, the model faces a difficulty in maintaining internal consistency, because it loses a sound basis that justifies a program of income transfer from the young to the old.

The social security program may be justified by reasons that make it difficult for people to prepare for retirement. In the Japanese experience, rapid economic growth during the postwar period rendered the accumulated assets of the elderly insufficient. In the United States, the Great Depression played an important role in the birth of the Social Security program. When such a kind of negative shock on the old is the reason for the launch of the PAYG system, predictions based on a perfect-foresight steady state might not be a good approximation to the reality.

The second point is that the political support for the social security program depends crucially on the design of the benefit.

The authors assume that the social security benefit is a fixed amount, while the social security tax is proportional to wages. Due to this setting, the social security program contains an intra-generational income transfer from the poor to the rich. Given this type of income redistribution, the median voter is more likely to support the social security program, because he/she is a poor worker who benefits from the program.

An equal amount to every retiree is not the only benefit rule. We can consider a variety of benefit rules. Many countries' systems, including the Japanese one, indeed have an earnings-related portion of the benefit. The Japanese public pension for employees has two tiers of benefits: the first is a constant benefit, and the second is earnings-related. For average Japanese employees, the earnings-related portion amounts to roughly double the fixed-amount portion.

If the benefit is proportional to wages, the social security program does not accomplish intra-generational income redistribution. In such a case, the young decide whether to support the program by simply comparing the internal rate of return of the PAYG system (the economic growth rate) with that of private savings (the interest rate). This action makes it more difficult for the social security system to survive as a political equilibrium.

What kind of outcome will emerge as a voting equilibrium depends crucially on what kind of agenda is set on a voting slip. When a tax policy is incorporated in the voting game, the political outcome may differ greatly from the paper's prediction, because the intra-generational income transfer and the mandatory saving plan can be separated. Since the PAYG system has some efficiency costs in a dynamically efficient world, a better choice may be that the tax policy engages in income redistribution.

Third, it seems that the political process of deficit financing should be more elaborately formulated.

The future generations are not active players in the political process behind budget deficits, but are involved in the political process of social security (the paper assumes that the young have an option to adopt a trigger strategy in the voting model of the social security program). This asymmetric setting seems odd, first because both are important policy agendas, and second because the economic effects of social security are functionally equivalent to those of budget deficits. When the government runs a budget deficit earmarked to the pension benefit, some part of the benefit will

be financed by a tax increase in future periods. Since future generations are unhappy with this policy, they may engage in a trigger strategy, which will eventually cause the social security program to collapse. When future generations can influence the political process, the outcome may be altered. Thus, a more comprehensive approach to agenda setting in the voting process is called for.

### III. Implications for the Japanese Public Pension Program

This paper provides important policy implications for the Japanese public pension program. Since Japan is rapidly aging, the public pension program faces financial difficulty. In June 2004, the Japanese Diet passed pension reform legislation that will cut future benefits and contributions. Since an immediate cut of benefits was politically unachievable, the government plans to cut the benefits gradually. While the Reform Act decided that subsidizations from the government budget would be increased, the financing of the increased subsidization has not yet been finalized. A hike in the value-added tax rate is one option, but a tax increase is obviously very risky for politicians. If a satisfactory tax reform is not implemented, deficit financing may be selected. The contribution rate for the pension program is scheduled to be increased gradually, from 13.58 percent now to 18.30 percent in 2017. Since many enrollees currently refuse to pay premiums, however, a serious concern is whether people will be willing to pay the increase. The predictions of the authors' paper accord well with these aspects of the Japanese experience.

The paper's insights also help us to formulate further reform that we must implement. The plan of increased subsidization raises another important policy problem. A massive amount of general tax revenues will be used for not only the poor elderly but also the rich elderly, because the first tier is currently designed as a universal benefit. A redesign of benefit rules is an important issue to be addressed. One idea behind the reform is that the subsidized part should be means-tested. Another idea is to transform benefits to an earnings-related benefit with a minimum guarantee. Only the minimum guarantee portion will be financed by general tax revenues. If this idea is implemented, the intra-generational income transfer of the public pension will be weakened. According to the paper's analysis, this will lead to weaker political support for the public pension.

We thus face a choice. One option is that the public pension program should not engage in intra-generational income redistribution and that we should let it be scaled down. The other is that we should enlarge the fixed-amount portion of the benefit to retain political support for the public pension program.

This paper gives us important insights into the future path of the Japanese public pension program. Accordingly, we must take the message of this paper seriously.

#### Reference

Razin, Assaf, Efraim Sadka, and Phillip Swagel, "The Aging Population and the Size of the Welfare State," *Journal of Political Economy*, 110 (4), 2002, pp. 900–918.

## General Discussion

Assaf Razin responded to the queries raised by Gregory D. Hess on capital accumulation and capital income taxes to finance the welfare state. He explained that a linear production function with constant factor prices was adopted simply to avoid dynamic complications in his model without losing sight of the main political-economy mechanism. Introduction of capital income taxes would change the coalition behind the redistribution, because rich older people would oppose raising capital income taxes. In response to Yasushi Iwamoto, Razin noted that the model did not endogenize the intertemporal voting process and left exogenous the rationale for the existence of a pay-as-you-go (PAYG) system. He admitted that the trigger strategy game-theoretic mechanism could be incorporated in the analysis, but believed that the paper's results would not qualitatively change and would hold up in such a game.

Following Razin's response to the two discussants, other participants raised several questions and points. Regarding the implications of the model for Japan's situation, Akira Otani (Bank of Japan) suggested that Japan's pension problem could be viewed as a typical example of rent seeking, given the strong political power of the older generation as pension beneficiaries. Kazumasa Iwata (Bank of Japan) expressed his concern that Japanese people, especially the younger generation, tend to refuse to pay their public pension contribution, which makes the problem of financing the social security system more severe. As a possible solution to this problem, he introduced the ongoing discussion of taxation of social security, with a warning that it might offset the transfer mechanism of social security from the younger to the older generation. Etsuro Shioji (Yokohama National University) suggested that Japan's problems could be overcome by admitting a large number of immigrants. Keimei Kaizuka (Chuo University) clarified the definition of privatization in the model, and then mentioned Paul Samuelson's view of a choice between a PAYG and funded-type pension system. According to this view, he explained, when the population growth rate is low, a funded-type pension system would be better, and this might apply to Japan's current situation.

In response to Otani, Razin doubted that the older generation had significant political power in Japan. In response to Shioji's migration solution, Razin mentioned his theoretical paper that addresses migration.<sup>6</sup> This paper showed that even unskilled migration into an aging welfare state with a PAYG system could generate benefits to the native-born population, even though the immigrants receive over their lifetime net benefits from the welfare state.

With respect to the model properties, Hiroshi Fujiki (Bank of Japan) asked whether the results based on the paper's assumption of constant factor prices would be the same under a small open-economy model. Similarly, regarding how to capture aging in the model, Simon Price (Bank of England) claimed an aspect of the pension problem was not only declining birth rates, but also increasing life expectancies. He then asked whether a model could be constructed to incorporate probabilities of

6. See Assaf Razin and Efraim Sadka, "Migration and Pension with International Capital Mobility," *Journal of Public Economics*, 74 (1), 1999, pp. 141–150. Also Assaf Razin and Efraim Sadka, *The Decline of the Welfare State: Demography and Globalization*, Cambridge, Massachusetts: MIT Press (forthcoming).

retirement or death. Addressing similar claims about the distinction between aging and population decline, Iwata questioned whether the model was consistent in terms of the optimal population growth, which was derived from the so-called “golden rule” equating the rate of population growth with that of return on capital. He insisted that a decreasing population would be desirable because per capita consumption could increase, but not desirable because it could lead to higher capital intensity and lower return on capital, which would lower the economic growth rate. Furthermore, Iwata pointed out the possibility of a decreasing population stimulating labor productivity growth, to offset a decreased labor supply in efficiency units.

Addressing comments on his model from Fujiki, Price, and Iwata, Razin noted that the model was stylized to isolate a particular mechanism, and the results could change when considering other mechanisms such as endogenous factor prices or increased life expectancies. Therefore, he called for necessary further analysis to derive policy implications from the model.

The chairperson of the session, Nobuo Inaba (Bank of Japan), pointed out that the downsizing of the public pension system could substantially reduce the buffer role of the public pension against uncertain life expectancies. He closed the session by emphasizing the importance of improving the environment to facilitate effective functioning of private financial institutions in this area.