Abstract

Pay-as-you-go funding is a key feature of most social security programs and expected shortfalls in funding are nearly universal as well. If parents love their children, why do they support social security programs that are actuarially unsustainable in their present form? This paper develops an overlapping generations model, incorporating elements of Tabellini’s (2000) positive theory of social security and Bénabou and Ok’s (2001) analysis of income mobility, to show why a majority of rational voters who care about their descendants can insist on the preservation of current benefits for themselves but accept social security’s future retrenchment. Implications of this explanation are tested using a 2001 Eurobarometer survey on pensions and comparative intergenerational mobility data (Comi 2004).
CONFLICT BETWEEN ALTRUISTIC GENERATIONS: SOCIAL SECURITY
AND THE POLITICS OF AGING SOCIETIES

1 Introduction

All democratic societies are characterized by right-skewed income distributions. In these societies, a majority of voters have below-average incomes and in each, accordingly, a potential voting majority favors redistribution. There is an enormous literature examining how this presumed majority interest is advanced or constrained by labor unions, global competition, electoral rules, and cross-cutting cleavages.

Most public pension programs, however, redistribute not only cross-sectionally, transferring from higher income to lower income retirees. There is also a pervasive pattern of intergenerational redistribution from workers to retirees. The question this kind of redistributive policy raises, therefore, is not why a natural majority is thwarted, a common theme in the political economy literature. Social security programs are very popular. The question is how the arrangement is politically sustained when the necessary voting majority includes support from those below the normal retirement age. An obvious answer is that workers anticipate benefitting from the same lopsided arrangement when they retire. But given the typical benefit structure, nearly universal pay-as-you-go (PAYG) financing, and demographic trends, this intergenerational redistribution is for all practical purposes irrevocable (Mulligan and Sala-i-Martin 1999a). Workers will never completely recoup their contributions (e.g., Gokhale 2007).

To many observers, the best explanation lies with the disproportionate political capacity of the elderly to raid the coffers of their descendants (e.g., Grossman and Helpman 1998; Mulligan and Sala-i-Martin 2004). Since conflict is endemic to politics, this explanation has a natural appeal. If one believes that parents are generally altruistic toward their children, however, the puzzle of intergenerational transfers cannot be
dispatched so easily. The political warfare model, in truth, begins to look unnatural. Indeed given altruism, the very fact that the basic financial structure of social security is consistent with a model of intergenerational political conflict is puzzling.

Of course, neither actuarial tables nor planted axioms about altruism substitute for an explicit consideration of the politics sustaining social security programs. Ultimately, social security is subject to the same political constraints as any other program. Whether a democratic majority supports it depends on the economic and political conditions voters face. The willingness of altruistic parents to support current programs and thereby accept irrevocable transfers from their progeny, I will argue, is rooted in rational but nonetheless overly optimistic expectations about what their children’s economic situation will be when expected financial challenges to these programs occur and when the debt associated with the current financial structure comes due. With no lack of moral consistency, one generation may politically support a program for itself that must be scaled back for its children.

I develop an overlapping generations model involving three generations, two of which are old enough to vote on a uniform income tax determining the next period’s level of social security spending, which is funded on a PAYG basis.\(^1\) In this model, anchored in work by Tabellini (2000) and Bénabou and Ok (2001), altruism between generations rules out pure exploitation. What confounds the ordinary impact of parental altruism, however, is not only naked self-interest but parents’ expectations about the future value of the income producing endowment their children inherit. The evolution of these endowments is modeled as an increasing concave stochastic function of current productivity (the fuller explanation is in section 4). Under this assumption and a few others, the model implies that a majority of voters can rationally expect their children and grandchildren to have above-average incomes even after adjusting for economic growth. These parent-voters will then oppose the

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\(^1\)For an application of the model to the U.S. social security program, see Grafstein (2009).

long-term redistribution characterizing, to varying degrees, all the social security programs
the paper will examine. Those who currently benefit from social security’s progressivity
may accept its future retrenchment precisely because they believe their descendants are
more likely to be hurt by the program’s redistributive character. For empirically reasonable
parameter estimates, the implication is valid for modern democracies. By the same token,
redistributive social security programs maintain support from altruistic poorer voters whose
(grand)children will pay relatively less for the benefits their retired parents will enjoy.

The model identifies specific forces affecting the individual’s time-varying support for
social security programs. These forces are embodied in three empirical hypotheses. One,
the higher individuals’ incomes are, the less likely they are to support intra-generational
redistribution through social security. Yet two, the greater the degree of income mobility
in a country, the less likely are its citizens with below mean income to support such
redistribution. Three, since older voters derive relatively lower marginal utility from taxes
supporting social security programs, there is a tipping point at which higher age reduces
support for these programs.

While the model is straightforward in its implications, complications emerge when it is
tested in a cross-country setting. Despite the structural parallels already noted, social
security programs vary in many respects, and the institutional contexts in which
democratic voters make choices about welfare spending vary enormously as well. The need
for comparable data on intergenerational mobility suggests looking to Europe to examine
the political basis of the typical social security system. I test the preceding hypotheses
using a 2001 Eurobarometer survey on pensions (Christensen 2006). Consistent with the
model, the subsample is limited to democratic countries for which comparable income
mobility data are available, although with suitable modification the model applies to any
regime sensitive to popular opinion.
2 Why Social Security Programs Are Politically Sustainable

Why do public social security programs typically entail net permanent losses for younger relative to older generations? One possible explanation appeals to the bounded rationality of older voters whose contradictory and uninformed beliefs compartmentalize their concern for their children and their concern for their own pocketbooks (e.g., Kotlikoff and Burns 2004, xiii; Retirement Confidence Survey 2006). While this kind of open-ended explanation is difficult to refute, the size of the current financial tax burden for most workers means the economic ramifications of these programs would be hard for the public to ignore (Tabellini 2000, 523-24). Evidence from the U.S. suggests that the public, and the elderly in particular, are relatively well informed about social security (e.g., Jacobs and Shapiro 1998; Campbell 2003). In any case, we will see that individuals behave as if they were rationally influenced by their age, the relation of their personal income to the mean, and differences in income mobility.

Given the size of the intergenerational transfer, a simpler and more promising approach is to deny the existence of the general puzzle by denying the importance of altruism in intergenerational politics. According to Mulligan and Sala-i-Martin’s (1999b) "gerontocracy" model, for example, the elderly have the advantage in distributional conflicts between the generations because their lower productivity translates into lower opportunity costs of leisure activity, which can be directed toward lobbying and voting. As a result, organizations of the elderly enjoy a competitive advantage when promoting social security programs whose retirement incentives only strengthen that advantage.

Despite its many strengths, the gerontocracy model is incomplete. For example, spending on youth in general has also increased out of proportion to demographics. Yet Mulligan and Sala-i-Martin (1999b, 5) attribute this increase to the preferences of the
middle aged, presumably a reflection of parental altruism. More surprising from the perspective of a conflict model, surveys consistently indicate that the young "victims" of social security programs also favor them (e.g., Slavov 2006). While survey responses cannot be equated with concrete political decisions, there is little direct evidence for pure intergenerational conflict.

A different approach explains the intergenerational "cooperation" supporting an unfunded social security program by showing support to be the equilibrium of a repeated noncooperative game between overlapping generations that vote on its continuation each period. Bohn (2003), for example, argues in a general equilibrium, majority rule setting that social security benefit structures can be politically sustainable on a PAYG basis since voters of median age or higher will support the necessary tax increases (see also Cooley and Soares 1999; Galasso 2006). To reach this result, he assumes that in calculating the program’s future net benefits voters treat their previous contributions as sunk costs. Even though the median voter is below retirement age, her support for the program is sustained each period by "trigger strategies" entailing the destruction of the program if any cohort of retirees fails to receive the appropriate benefit.

Modeling social security as a repeated noncooperative game is an attempt to show how an implicit intergenerational compact can be sustained in the absence of altruism. "Altruism is almost too powerful to be interesting: social security is obviously viable if the young are eager to make transfers to the old" (Bohn 2005, 49). For purposes of the analysis here, the key problem with this substitute explanation is that altruism does not disappear with age. Voters rationally ignore their own sunk costs at each decision point, but the

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2The attempt to substitute trigger strategies for intergenerational altruism can be questioned on formal grounds: the multiplicity of the resulting equilibria (Galasso and Profeta 2002, 12), the extent to which these strategies are contingent on the predicted reactions of future generations, and the fact that these particular solutions are not renegotiation proof (Tabellini 2000, 524; Fudenberg and Tirole 1991, 174-82;
empirical puzzle is that voters also ignore the new "sunk costs" they impose on their descendants.³

In sum, models of intergenerational conflict seem unable to replace tout court models recognizing intergenerational altruism. Nevertheless, conflict models are not entirely without merit. The scale of the intergenerational redistribution projected for most social security programs outstrips what might reasonably be anticipated as the effect of long-term economic growth. So why have not altruistic parents living in democracies intervened? Their failure to do so presents a political puzzle.

### 3 Income Mobility and Redistribution

In country after country, social security programs are characterized by substantial intergenerational transfers. Due to demographics and the limits of economic growth, these transfers cannot be duplicated for subsequent beneficiaries. This demands an explanation. Of course, the existence of social security programs per se is not particularly puzzling. Risk-averse individuals planning ahead to retirement will want to insure themselves against bad wage histories and uncertainty about individual longevity. But these concerns lead to intracohort redistribution. The puzzle is the degree of redistribution across generations.

An important building block of my explanation for the political dynamics of social security is a modified version of Bénabou and Ok’s (2001) Prospect of Upward Mobility (POUM) model of voting on redistribution. Bénabou and Ok posit a fairly standard income mobility process in which expected future income is a positive function of current income

³There is a qualification to this claim about own sunk costs: in the same way voters are held hostage to the threat of retribution by succeeding generations, there might be an equilibrium in which voters break the compact if the sunk costs they inherit are too large. In this equilibrium, the middle generation plays a complicated strategy against both its predecessors and its descendants.
but increases at a decreasing rate, a process somewhat analogous to regression to the mean. Given this and a few more technical assumptions, they show, somewhat paradoxically, that a majority of altruistic voters may oppose long-term redistribution because they rationally expect to have above-average incomes. For parallel reasons, voters who currently benefit from the progressivity of social security will be willing to accept its future restriction because they expect their descendants to be hurt by the program’s redistributive character.

A simple application to Italian income data and its income mobility process will help illustrate how the voters’ calculations might work in practice. Based on 1977-2002 data, Piraino (2006) summarizes the Italian case using a four-class transition matrix

$$M = \begin{bmatrix} .201 & .514 & .199 & .086 \\ .116 & .474 & .293 & .117 \\ .118 & .351 & .270 & .261 \\ .028 & .112 & .381 & .480 \end{bmatrix}$$

where, reading from the top down, the first column of $M$ defines the respective probabilities that sons of Low, Low-Middle, High-Middle, and High income fathers will enter the lowest class next period, the second column defines the transition probabilities to the Low-Middle class, the third column defines the transition probabilities to the High-Middle upper class, and the fourth column defines the transition probabilities to the High income class. Notice that the sons of fathers in the lowest class have a small chance of entering next generation’s upper class directly, while the sons of fathers in the upper class face a negligible risk of entering the lowest class directly.

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4Low means income lower than two-thirds of the median, Low-Middle means incomes from two-thirds of the median to the median, High-Middle means incomes between the median and 150% of the median, and High includes all incomes above 150% of the median. In a published version, Piraino (2007) presents these data in a form that is somewhat less useful for my purposes.
In 2002, mean Italian income was €14,631, and the first, second, and third income quartiles were capped at €8477, €12,810, and €17,969 respectively (Clementi, Gallegati, and Kaniadakas 2008).\textsuperscript{5} Clearly a majority of the population had below average income. Yet even equating the Low-Middle with the bottom quartile’s income and the income of the top quartile with the third quartile’s income, the expected income for the sons of current Low-Middle class fathers was €18,749. In other words, in 2002 a majority of the Italian population could have rationally expected their children to have above-average income, although a majority could have rationally supported contemporaneous redistribution. If their calculations were risk neutral, then, they would have rejected a future policy of redistributive taxation, say to finance social security.

Looking longer term, suppose that in 2002 Italian incomes had in fact converged to the unique income distribution \( \{.10, .35, .30, .25\} \) that is invariant to these transitions.\textsuperscript{6} Assuming a modest €20,000 for the top quartile, a majority would continue to oppose long-term redistribution while favoring it for 2002.

Of course, the typical voter is not risk neutral and social security represents an important form of insurance. Consider, for example, the situation of a voter who is considering laissez-faire versus complete redistribution insuring her descendants against any idiosyncratic income risk. Assume she has the standard utility function

\[
U(y_t) = \frac{y_t^{1-\gamma} - 1}{1 - \gamma}, \quad \gamma > 0,
\]

where \( y_t \) is her income at time \( t \) and \( \gamma \) measures her degree of relative risk aversion or, more intuitively, the concavity of the function.\textsuperscript{7} In Bénabou and Ok’s (2001) analysis of U.S. data, the maximum degree of risk aversion consistent with majority opposition to

\textsuperscript{5}The maximum income in the sample was €245,388.

\textsuperscript{6}In other words, \([.10 .35 .30 .25]\cdot M = [.10 .35 .30 .25]. \) The 2002 median income individual, then, was somewhat poorer than the stationary median.

\textsuperscript{7}That is, \( \gamma = -y_t U''(y_t)/U'(y_t) > 0. \) When \( \gamma = 1, \) by l’Hôpital’s rule, \( U(y_t) = \ln(y_t). \)
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redistribution is \( \gamma = 0.35 \), which is distinctly below typical empirical estimates of the parameter. For the Italian data, after again assigning just \( \text{\euro}20,000 \) to the High income class the maximum risk aversion parameter equals 1.7, which is within standard estimates. Means testing redistribution to target it to the lowest class would increase this parameter still further.

4 Intergenerational Altruism and Support for Social Security

The preceding section illustrated the hypothetical impact of the POUM process for the Italian case. This section develops a more general political-economic model of a social security program consistent with two stylized facts: the program is supported by a majority of voters in the short run yet the benefits it provides may be reduced or eliminated by voters who are altruistic toward their parents and/or children. The model is based on Tabellini (2000), but modified to introduce POUM calculations.

In each country \( j \) three generations coexist: dependent children, working parents, and retired parents. Each child has one parent and lives for three periods. The country’s net rate of population growth is \( n_j \), so for each parent there are \( 1 + n_j \) children (for the sake of notational simplicity, from here on I will suppress the country subscript unless needed). The consumption good is jointly consumed by each dependent child and working parent. With \( i \) indexing families, children from generation \( t \) inherit productive endowments from their generation \( t-1 \) parents, so \( e_i^{it} = e_i^{it-1} \). The distribution of \( e_i^t, |e_i| < 1 \), is given by the known function \( G_j(\cdot) \) having a 0 mean and negative median. The utility of each \( t-1 \) generation working parent in the \( i^{th} \) family is described by

\[
P_i^t = \frac{\alpha}{1 + n} R_i^t + U(c_i^t) + E_i^t \left[ R_i^{t+1} + (1 + n) \delta P_{i+1}^t \right],
\]  

(1)
where $\alpha$, $0 < \alpha < 1$, measures the worker’s altruism regarding the retired parent’s time $t$ utility $R_t^i$; $c_t^i$ is the worker’s (and dependent’s) consumption at time $t$; utility from household consumption, $U(\cdot)$, is a strictly increasing concave function with constant relative risk aversion as in the Italian example; $E_t^i$ is mathematical expectation given $i$’s information at time $t$ (including $e_t^{it}$); and $\delta$, $0 < \delta < 1$, measures the worker’s altruism toward each child as a future worker and, indirectly, as a future retiree. I do not discount $R_{t+1}^i$ since it represents the worker’s own future utility, although it would be straightforward to incorporate a time preference. The worker’s budget constraint is

$$(1 - \tau_t)w(1 + e_t^{it}) + \frac{b_t^i}{1 + n} \geq c_t^i + s_t^i + k_t^i,$$

where for simplicity the "base" market wage $w$ is assumed to be constant; $\tau_t$, $0 \leq \tau_t \leq 1$, is a proportional income tax dedicated to funding contemporaneous social security benefits; $b_t^i$ is the bequest from $i$’s parent divided equally among the $1 + n$ children; $c_t^i \geq 0$ is worker $i$’s consumption at time $t$; $s_t^i$ is $i$’s savings, which can be positive or negative; and $k_t^i \geq 0$ is a gift to $i$’s retired parent. There are no outside assets and output is not storable, so the sum of savings must equal 0. The wage is multiplied by $1 + e_t^{it}$ to produce a simple interpretation of the impact of above-mean ($e_t^{it} > 0$) and below-mean ($e_t^{it-1} < 0$) endowments on the effective wage, which therefore is defined on $(0, 2w)$.

At time $t$ the utility of each $t-2$ generation retiree in the $i^{th}$ family is described by

$$R_t^i = d_t^i + \delta(1 + n)P_t^i,$$

where $d_t^i$ is the retirees’ period $t$ consumption and $\delta$ continues to measure the retired parent’s altruism toward her children. The retiree’s budget constraint is

$$g_t + I_{t-1}s_{t-1}^i + k_t^i(1 + n) \geq A + d_t^i + b_t^i,$$

where $g_t$ is a lump-sum retirement benefit from the government; $I_{t-1}$ is the gross rate of
return on savings $s_{t-1}$; $k^t_t(1 + n)$ is the sum of gifts from the retiree’s children; and $A > 0$ is an endowment.\footnote{One can think of $A$ as an income floor in the absence of gifts or income from savings. It thereby prevents negative consumption by retirees under these circumstances.} Because endowments are unequally distributed and there is a uniform social security benefit, the program is redistributive.

The impact of children’s endowments on their individual earning capacity as workers cannot be fully predicted a period earlier. This timing reflects the financial uncertainties voters typically confront. In particular, childhood endowments are governed by a concave stochastic transition function $f$:

$$e^t_{t+1} = f(e^t_t, e^t_{t+1}),$$

where $e^t_{t+1}$ is an identically distributed random shock whose realization is the same for all generation $t$ children in $i$, $f$ is normalized to produce mean income of 0, which controls for the impact of per capita productivity growth, and a worker’s expected endowment is a positive function of childhood endowment.\footnote{Technically, for the endowment pair $e^t_i, e^t_{i+1}$ and shock $e^t_{i+1}$, $\text{prob}(e^t_{i+1} | f(e^t_i, e^t_{i+1}) \leq e^t_{i+1})$ is decreasing in $e^t_i$ (see Bénabou and Ok 2001, 455 and 450-51).} When $f(\cdot, \cdot)$ is specified as an autoregressive loglinear function it becomes a standard way to characterize income mobility (e.g., Corak 2004).

From (1) - (4), optimal gifts and bequests satisfy $U''(c^i_t) \leq 1/\delta$ and $U'(c^i_t) \geq \alpha$. In light of empirical findings suggesting limited parental financial altruism (see Gokhale, Kotlikoff, and Sabelhaus 1996; Auerbach et al. 2001), I echo Tabellini’s (2000) assumption that there are no acts of private altruism by assuming that these inequalities are strict for all feasible income: $U'(0) < 1/\delta$ and $U'(w[1 + e^{it-1}_t]) > \alpha$, where $e^{it-1}_t$ is the maximum (supremum) value of $e^{it-1}_t$ (for ). Finally, the government budget is balanced each period, so with mean endowment 0, $g_t = \tau_t(1 + n)w$. 

\begin{align*}
8 & \text{One can think of } A \text{ as an income floor in the absence of gifts or income from savings. It thereby prevents negative consumption by retirees under these circumstances.} \\
9 & \text{Technically, for the endowment pair } e^t_i, e^t_{i+1} \text{ and shock } e^t_{i+1}, \text{ prob}(e^t_{i+1} | f(e^t_i, e^t_{i+1}) \leq e^t_{i+1}) \text{ is decreasing in } e^t_i \text{ (see Bénabou and Ok 2001, 455 and 450-51).}
\end{align*}
To determine the additional equilibrium conditions, note that optimal savings are given by

$$U'(c^i_t) \frac{\partial c^i_t}{\partial s^i_t} + \frac{\partial R^i_{t+1}}{\partial s^i_t} = 0,$$

and therefore

$$U'(c^i_t) = \frac{\partial d^i_{t+1}}{\partial s^i_t} = I_t.$$  

In equilibrium, then, marginal utilities from consumption and savings must be equal, aggregate savings are 0, and, since the retiree’s utility function is linear in consumption, her marginal utility from savings equals $I_t$.\(^{10}\) Since $U(\cdot)$ is identical across individuals, all workers must have the same consumption for these conditions to hold. This restriction is only satisfied when $c_t = (1 - \tau_t)w_t$, which means that loans from workers with positive endowments (who will receive the market interest rate $I_t$) increases the consumption of workers with negative endowments. The equilibrium conditions are then:

$$c^i_t = (1 - \tau_t)w_t,$$

$$s^i_t = (1 - \tau_t)e^{it-1}w_t,$$

$$d^i_t = A + \tau_t(1 + n)w_t + I_{t-1}(1 - \tau_{t-1})e^{it-2}w_{t-1}.$$

The first-order condition for optimal savings implies

$$I_t = U'(c^i_t) = U''[(1 - \tau_t)w_t].$$

Substituting these conditions into the utility functions of workers and retirees yields

\(^{10}\)For the retiree’s Lagrangian, the costate is $\lambda[d^i_t - A + g_t + I_{t-1}s^i_{t-1}]$, so $\partial R_t/\partial d^i_t = 1 - \lambda = 0$, and $\lambda = 1$. Therefore increases in consumption are one-for-one with increases in income.
respectively:

\[ P_t^i = \frac{1}{1 - \alpha \delta} \left\{ \frac{\alpha}{1 + n} \left[ A + I_{t-1}(1 - \tau_{t-1}) e_t^{it-2} w \right] + U[(1 - \tau_t)w] \right\} \\
+ I_t(1 - \tau_t)e_t^{it-1} w + \alpha \tau_t w + A + (1 + n)E_t[\tau_{t+1}w + 2\delta P_{t+1}^i] \right\}, \]

\[ R_t^i = A + \tau_t(1 + n)w + I_{t-1}(1 - \tau_{t-1}) e_t^{it-2} w + \delta (1 + n) P_t^i. \]  

The first term in square brackets in (6a) represents the retired parent’s assets plus after-tax (re)payments on loans; the second term represents the worker’s utility from consumption; the third term represents her own after-tax loan (re)payments; the fourth term represents her tax payments adjusted by her altruism toward her retired parent; the fifth term represents her fixed income and expected retirement benefits; and the last term represents the same calculation applied to her children. Equation (6b) has a parallel interpretation.

To keep the model tractable, I follow standard practice by assuming that workers and retirees vote directly on the tax. Since the annual social security budget is in balance, a vote on taxes is indirectly a vote on the size of the social security benefit itself. In particular, votes in period \( t \) determine the period \( t + 1 \) tax burden of workers’ children and the benefits these workers receive when they retire. The delay in implementation reflects the common understanding that significant changes in the social security program will be implemented with sufficient time for workers to adjust their retirement plans, which Galasso (2006, 55 and 192) interprets as a divide-and-conquer strategy across age groups. This approach reduces the choice to one policy dimension, the selection of the tax level, instead of including the timing of the tax or the retirement age as additional dimensions.

For the analysis of simple two-party majority-rule representative democracies, it is common to treat the position of the median voter as decisive in determining the tax level insofar as the Median Voter Theorem instructs parties to converge to her position.
Translating different electoral rules such as proportional representation (PR) into a model of direct democracy may seem more complicated. However, Boix (2003, 189) argues that the median voter prevails in both plurality and PR systems.

The key issue, then, is how the median voters’ utility functions respond to future tax increases. Differentiating $P_i^t$ and $R_i^t$ with respect to $\tau_{t+1}$ yields:

$$\frac{\partial P_i^t}{\partial \tau_{t+1}} = \frac{1 + n}{1 - \alpha \delta} \left[ w + 2\delta \frac{\partial P_i^{t+1}}{\partial \tau_{t+1}} \right],$$

(7a)

$$\frac{\partial R_i^t}{\partial \tau_{t+1}} = (1 + n)\delta \frac{\partial P_i^{t+1}}{\partial \tau_{t+1}}.$$  

(7b)

Using the equilibrium conditions, the law of iterated expectations to substitute for $P_{t+1}^i$ and $P_{t+2}^i$, and differentiation yields:

$$\frac{\partial P_i^t}{\partial \tau_{t+1}} = \frac{1 + n}{1 - \alpha \delta} w \left\{ 1 - 2\delta (1 - \alpha + E_t I_{t+1}) 
- 2\delta \left[ \left[ 1 + \frac{2\alpha \delta}{1 - \alpha \delta} \right] \left[ 1 - (1 - \tau_{t+1})\gamma \right] - E_t I_{t+1} i_{t+1} \right] \right\},$$

(8)

where $\gamma$ is the coefficient of relative risk aversion (see note 7). I assume $\gamma < 1$ (Galasso 2006, 224 estimates $\gamma = 0.75$). Observe that, after rescaling, the retiree’s utility response to tax increases is identical to her children’s. Therefore, the optimal tax rates within a family are identical. When the degree of altruism is relatively modest, a supposition with empirical support, I can assume that $(1 + n)\delta < 1$. *Ceteris paribus*, the elderly receive numerically lower marginal utility from the social security tax than do workers. If the majority of voters expect their (grand)children to have above-average endowments, the increasing opposition of retirees is moderated by a factor of $(1 + n)\delta$.

Note that each new period produces a decision problem structurally identical to the one characterized here. Under PAYG, binding tax decisions are made only for one period. As voters, workers and retirees are concerned with the expected endowment of her children and grandchildren relative to the expected endowment of their cohort. Their strategic
concern, then, is unaffected by expected endowment of the decisive median voter.

Equation (8) implies that each voter’s expected utility decreases monotonically as her expected endowment increases. But in terms of utility levels, if her (grand)child’s expected endowment is below average \((E_t e_{t+1}^i < 0)\) and small enough, she will support more spending on social security. When that expected endowment is sufficiently above average, she will vote for less spending. Since these responses are linear in expected endowment, the resulting preferences are single-peaked and the second-order conditions for a voting optimum are satisfied (Tabellini 2000, 530). In other words, in the simple majority rule voting game played by an electorate consisting of workers and retirees, all of whom vote for one of two opportunistic candidates proposing alternative tax rates, there is an equilibrium determined by the median voter’s preference.

On the other hand, the increased turnout associated with PR (Franklin 2002) tends to shift the income distribution of voters downward and therefore lowers the income of the median voter relative to the population (Franzese 2002, 71-75). To the extent the expected median income becomes lower relative to the mean, this shift broadens the coalition voting against a positive or a higher tax, since the opposition coalition is formed from the top of the endowment distribution down. This shift, of course, is reflected in the cumulative distribution function of time \(t + 1\) endowments, \(G(e_{t+1}^i)\).

Designating expected endowment of the children and grandchildren of the median voters by \(E_t e_{t+1}^i\), the number of retirees by \(N^R\), and noting there are \(1 + n\) as many workers as retirees, the definition of the median requires

\[
(1 + n)G[f^{-1}[E_t(e_{t+1}^m)]] + G[f^{-1} o f^{-1}[E_t(e_{t+1}^m)]] = 1 + \frac{n}{2},
\]

where \(f^{-1}(\cdot)\), the inverse of the transition function, produces the endowment of the worker who is a median voter and a second application of \(f^{-1}(\cdot)\) produces the endowment of a
By using equation (8) and the economic equilibrium condition $I_{t+1} = U'(e_{t+1})$ and by setting (7a) or (7b) to 0, $E_t(e_{t+1}^m)$ can be associated with equilibrium consumption $c_{t+1}^*$ such that

$$E_t(e_{t+1}^m) = \frac{E_t[w\{1 - 2\delta[1 - \alpha + U'(c_{t+1}^*)]\}]}{2\delta E_t[wU'(c_{t+1}^*)\{1 + \frac{2\alpha\delta}{1 - \alpha\delta}[1 - (1 - \tau_{t+1})\gamma]\}].}$$

(10)

Although $I_{t+1} = U'(e_{t+1}^*) > \alpha$, for plausible values of $I_{t+1}$ and a sufficiently low degree of altruism toward children ($\delta < 0.5$), $1 - 2\delta(1 - \alpha + U'(e_{t+1}^*)) > 0$. Thus the numerator is positive. Also, by assumption, $\gamma < 1$, so the denominator is positive as well. Then applying the implicit function theorem to (10), $\partial \tau_{t+1}/\partial E_t(e_{t+1}^m) < 0$ (with an interior optimum).\textsuperscript{12}

In addition, using the chain rule:

$$\partial c_{t+1}^*/\partial E_t(e_{t+1}^m) = (\partial c_{t+1}^*/\partial \tau_{t+1})[\partial \tau_{t+1}/\partial E_t(e_{t+1}^m)].$$

By equation (5) this last expression equals

$$-w[\partial \tau_{t+1}/\partial E_t(e_{t+1}^m)] > 0,$$

implying

$$\partial E_t(e_{t+1}^m)/\partial c_{t+1}^* > 0.$$

By definition $G_j(\cdot)$ is also strictly increasing, so $c_{t+1}^*$ is unique. Finally, since the equilibrium conditions require

$$c_{t+1}^* = (1 - \tau_{t+1})w,$$

\textsuperscript{11}Equation (9) follows from the definition of the median:

$$(1 + n)NRG[f^{-1}[E_t(e_{t+1}^m)]] + NRG[f^{-1} \circ f^{-1}[E_t(e_{t+1}^m)]] = (1 + n)NR\{1 - G[f^{-1}[E_t(e_{t+1}^m)]]\}$$

$+NR\{1 - G[f^{-1} \circ f^{-1}[E_t(e_{t+1}^m)]]\}.$

\textsuperscript{12}The derivative is with respect to the endowment at the point that happens to be the expected median; the derivative with respect to equilibrium consumption has a similar interpretation.
the equilibrium tax rate is defined by

$$\tau^*_t = 1 - \frac{c^*_t + 1}{w}.$$ (11)

Thus the Social Security program survives when the optimal tax creates a wedge between the wage and equilibrium consumption of a median voter’s children or grandchildren, that is, when $c^*_t + 1 < w$.$^{13}$ To determine whether this condition is in fact satisfied, define $E_t(e^w_t + 1)$ as the result of substituting $w$ for $c^*_t + 1$ in the right-hand-side of equation (10). Using equations (9) - (11) and the fact that $\partial G/\partial c^*_t + 1 > 0$, there is a positive tax when this level of tax-free consumption pushes the left-hand side of equation (9) beyond the voting equilibrium, that is, when

$$(1 + n)G[f^{-1}[E_t(e^w_t + 1)] + G[f^{-1} \circ f^{-1}[E_t(e^w_t + 1)]]] > 1 + \frac{n}{2}.$$ "

Whether a social security program is politically sustainable, in short, depends on the expected distribution of endowments.$^{14}$ However, even when the tax is positive the logic of the POUM hypothesis puts downward pressure on the actual rate. Specifically, since $\partial \tau^*_t + 1/\partial E_t(e^m_t + 1) < 0$, social security taxes decline when the expected endowment of descendants of the median voter increases. Whether this implies ever declining social security taxes and eventually a corner solution dictating $\tau^*_t + 1 = 0$ for some $j$ depends on technical features of the income transition process (Bénabou and Ok 2001). Because of differences in their underlying economies and intra-generational redistribution policies, some countries, independent of social security policy, have more concave income transition

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$^{13}$As anticipated in the discussion of altruism and economic growth, the optimal tax is increasing in the base market wage.

$^{14}$Tabellini’s (2000) model implies that higher inequality is associated with higher Social Security taxes, an implication also supported by cross-country regressions. This implication is reaffirmed here: greater inequality is associated with a relatively smaller expected median endowment and, from equation (8), a smaller expected endowment is associated with support for higher payroll taxes.
functions than others.\(^\text{15}\)

Tabellini’s (2000) model implies that the social security tax is lower the higher the proportion of workers to retirees in society.\(^\text{16}\) In the adaptation developed here, there is no relation (applying the implicit function theorem to \([8]\) shows \(\partial E_i^t c_{i+1}^t / \partial n = 0\)). The intuition behind this different result is that voters in the same family are considering the expected endowments of the same descendants, either children or grandchildren. The divergence in interest between workers and their children has already been noted, but it does not materialize in the voting booth since dependent children do not vote. What drives this result’s divergence from Tabellini (2000), then, is the timing of the tax combined with the demographic structure of the model.

However, this difference between the models should not obscure another crucial connection between social security and demographic structure. From equations \((7b)\) and \((8)\), ceteris paribus fertility amplifies the social security tax’s impact on the voter’s (grand)children. Specifically, those societies in which social security is implicitly being retrenched should be pushed further in that direction by lower birthrates.

The actual impact, of course, is determined by the net effect of fertility rates and increasing longevity. Within the model, the situation in which fertility does not offset longevity can be represented by \(-1 \leq n_j < 0\). True, at the limit—\((1 + n_j)^t\) as \(t \to \infty\)—this

\(^{15}\)Strictly speaking, I mean country \(j\)’s transition function is more concave in expectation (\(\triangleright\)) than is country \(k\)’s, i.e., \(E_i(f_j(e_i^t)) \triangleright E_i(f_k(e_i^t))\), when for identical parental income distributions the expectation that a child will have below-mean income is lower in \(j\) than in \(k\) (see Bénabou and Ok 2001, 462).

\(^{16}\)While Tabellini (2000) reports cross-country regressions consistent with this implication, the dependent variables are, for example, percent of GNP or percent of government expenditures spent on social security; the relevant explanatory variable is percent of population over 65. Numerous hypotheses about social security are also consistent with these results, including the assumption of equal concern for everyone and the assumption that there is a link between longevity and economic growth (which leads to a change in the base wage).
kind of society disappears. However odd, disappearance in fact is the projection for countries like Italy should its current population trend continue. One way to describe the implication of this demographic trend for social security is that maintaining the existing program in countries like Italy represents a much more substantial challenge than in countries like the U.S. (e.g., Galasso 2006).

Tabellini’s (2000) model also implies that higher inequality is associated with higher social security taxes, an implication supported by cross-country regressions. This implication is reaffirmed here: greater inequality is associated with a relatively smaller expected median endowment and, from (6), a smaller expected endowment is associated with support for higher payroll taxes. The behavior of the median voter with respect to inequality, of course, is critical to understanding the kind of program the majority sustains. Individual behavior in light of inequality, however, is relative to the mean: the greater the degree of inequality, the greater the support for redistribution by those with (expected) endowments below the mean.

More important, the converse is also true. A larger expected children’s endowment is associated with support for lower payroll taxes and therefore lower benefits. At first sight, the median voter should still support any redistributive payroll tax since median income is consistently below mean income. Yet, as illustrated by Bénabou and Ok’s (2001) analysis of U.S. data, the median endowment can remain perpetually below the mean while, due to income dynamics, the median and expected mean reverse their relative positions. In that case, median voters will support social security reductions for their descendants, altruism notwithstanding. To state this conclusion more precisely, the following statements are mutually consistent: (i) knowing what they know at time $t$, time $t$ median workers would have voted at time $t - 1$ for the actual time $t$ social security tax, (ii) time $t$ median retirees did in fact vote for it, and (iii) if the endowment of the time $t + 1$ median workers were identical to the endowment of workers at time $t$, time $t$ median workers and retirees would
vote to extend the time $t$ tax to time $t+1$, but (iv) based on expectations about endowments, time $t$ median workers and retirees vote to reduce or eliminate the time $t+1$ tax. In short, altruistic voters who support social security for themselves may prefer to trim or eliminate it for their children or grandchildren. Moreover, the endowment structure implies that all of the preceding statements about median voters will apply to voters whose endowments lie within some finite interval below the median endowment.

When taxes decline, each new retiree has paid higher taxes in support of her parent’s generation than the taxes now supporting her. Strictly speaking, within the model these declining social security taxes do not imply that the new retiree experiences a negative net lifetime return on social security taxes paid. The qualifier is necessary since, theoretically, population and productivity growth could offset the impact of declining tax rates. But this theoretical possibility is not a serious empirical restriction: for the countries studied the positive impact of growth has been trumped by the increasing longevity of retirees.\textsuperscript{17}

Even though net benefits decline with declining tax rates, the interests of workers and their children do not diverge in the voting booth since dependent children do not vote and the workers and retirees who do vote cannot know the actual endowments their (grand)children will bring to the workplace. So voters with below-average incomes can still support future reductions in net social security benefits to the extent they expect their descendants to have above-average incomes. True, those who already enjoy above-average incomes will also be inclined to oppose redistribution. However, the income mobility process is characterized by an increasing concave function. Expected decreases in income for those at the upper end are relatively larger than expected increases for those at the lower end.

\textsuperscript{17}For reasons already discussed, within the model this net empirical effect on benefits can be represented by $n < 0$. Net benefits also decline because PAYG financing makes each subsequent generation pay for the windfall experienced by the first generation of retirees.
Finally, note the crucial role played by altruism in generating these results. For the limiting case of no altruism—when $\alpha = \delta = 0$—equation (8) says that workers’ utility increases with increases in taxes on their children, while equation (7b) says that retirees are indifferent to taxes that will not change their own benefits.

5 Empirical Analysis

The POUM-based model explains why the financial structure associated with so many social security programs has been politically acceptable despite the fact that for most countries a future retrenchment of their programs is a foregone conclusion. Beyond this aggregate-level result, however, it is important to determine whether, on the margin, individuals take into account the kinds of forces identified by the POUM-based model: relative income, age, and mobility. Unfortunately, current data do not tell us how individuals would assess a fully articulated set of reform proposals, let alone how they would have voted for them. Moreover, many considerations factor into any individual’s decision, not least of which are the decision maker’s degree of risk aversion and how her discount rate interacts with the projected time when descendants’ incomes exceed the mean. Accordingly, I frame the appropriate inferences about expressed support for social security as a redistributive program in terms of relative probabilities.

The political sustainability of social security programs is also affected by cross-country differences. Unfortunately, the simplifications of the model do not allow explicit incorporation of these cross-country variations. Rather, the model and empirical analysis focus on the tail end of the political-economic process, the factors affecting the respondent’s specific decision problem. The model embeds individuals in a closed political economy yielding general equilibrium outcomes.\(^\text{18}\) Nevertheless, the resulting model is

\(^\text{18}\)Strictly speaking, these would be general equilibrium results if fertility decisions were endogenized and the model were supplemented with a labor market to generate the wage. Or the wage could be treated as
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structural in the sense that it is rooted in the individual’s fundamental preferences and opportunities. As a result, the structure of the individual’s decisions about social security can be assumed to be invariant to macro-level forces influencing the decision’s outcome so long as their impact is channeled through endowments or wages.

That said, only a more general model can fully explain the level of support for redistributive social security programs and thereby predict their political future. Unfortunately, available data are insufficient to estimate the key political parameters of such a model. But these individual-level data are sufficient to confirm whether POUM-based forces affect individual support as hypothesized.\(^{19}\)

While the distribution of endowments is a key driver in the model, they are unobservable. Fortunately, endowments are positively associated with income and income is observable. The resulting distribution of income has implications for political behavior since social security in the model, as in practice, is redistributive: the tax burden is a positive function of endowment but, in the model, benefits are distributed in equal lump-sum amounts. Accordingly:

**Hypothesis 1**: The higher individuals’ incomes, the less likely are they to support social security redistribution.

But:

**Hypothesis 2**: The greater the degree of income mobility the less likely are individuals

\(^{19}\)The following, then, represents a reduced form, not structural, estimation of equation (8), the model’s first-order condition for workers and, rescaled, the first-order condition for retirees. Ultimately the key issue is whether the reduced form is identified. Although relevant structural parameters are missing, there is good reason to believe that the reduced form estimators are consistent: (i) if there is causation in this case the causal direction is unambiguous, and (ii) in light of the model’s equilibrium conditions (5), the key regressors in the estimation are indeed associated with the first-order conditions.
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with below mean income to support social security.\textsuperscript{20}

\textit{Hypothesis 3}: Since retirees derive numerically lower marginal utility from taxes than workers do, \textit{ceteris paribus} there is a tipping point at which higher age is associated with a relative reduction in support for social security.

Intuition suggests that surveyed support for a particular way of organizing a current social security program should be associated with support for the same organization in the future. What makes any inference of this kind tricky, however, is the model’s demonstration that support for current benefits does not imply support for the same level of future benefits. This is the altruism puzzle. In principle, then, elicited support for one kind of pension scheme could disguise support for a very different scheme for the future.

Fortunately, one of the questions in the 2001 Eurobarometer survey on pensions addresses the basic redistributive dimension of social security:

Q. 62.7 (V389): "A good pension system should contribute to greater equality in income and living conditions among the elderly." The coding is: Strongly disagree, 1; Slightly Disagree, 2; Slightly Agree, 3; Strongly Agree, 4.\textsuperscript{21}

This question allows us to determine whether the key factors identified by the model—mobility and relative economic position—affect views on distributive principles in

\textsuperscript{20}Income is positively associated with support for social insurance (e.g., Moene and Wallerstein 2003). But it is important to distinguish redistributive insurance protecting current high income against future losses and redistributive insurance when predicting (children’s) income in the future.

\textsuperscript{21}There are two other plausible questions. Q. 62.6 (V388): "Older people who have wealth or sufficient income from other sources should not receive a pension from the state." and Q. 62.10 (V392): "The amount of one’s pension should be strictly based on the amount of contributions one has paid into the pension scheme." A factor analysis of responses to the three questions suggests there is at most one underlying factor with two components (the third question makes almost no statistical contribution). But all three components are only weakly related. In particular, the respective "uniqueness" values are 0.70, 0.91, and 1.0. Similarly Cronbach’s alpha is 0.28, 0.18 with all three questions.
the appropriate way. Obviously, the question is posed normatively, which generally suggests (anticipated) stability in responses over time. Moreover, normative responses are not detached from material interests. Accordingly, in interpreting responses to this question I treat the model as implying that lower income respondents experiencing higher mobility will tend to respond at the margin less favorably toward redistributive principles than lower income individuals with worse prospects. Of course, these effects at the margin do not imply an explanation for the level of support for social security principles. Here the pure insurance function of social security is surely very important.

I test the three hypotheses using a two-level hierarchical ordered logit model. The level-one variable measuring support for redistributive social security is regressed on the set of variables listed below.\footnote{The estimation model, which does not include a random coefficient on the \textit{BelowMean} variable described below, but retains a level-two additive disturbance term, gives qualitatively identical results to one with a random coefficient, but provides a substantially better fit. The obvious explanation for the better fit is the small number of level-two observations. Since maximum likelihood estimation has dubious small sample properties I use penalized quasi-likelihood (Breslow and Clayton 1993) yielding generalized least squares estimates of level-two coefficients and approximate maximum likelihood estimates of the (co)variance parameters. This is not a perfect solution, but Breslow (2004) indicates that potential biases are limited when cluster sizes are large. Nonetheless, robust standard errors and bootstrapped standard errors are slightly higher (although see footnote 27).}

The level one exogenous variables are: \textit{Income} (D.29), after-tax household income in quartiles coded 1-4 and centered around its mean; \textit{BelowMean}, coded 1 if income is below the national mean income, 0 if not;\footnote{Mean household income is relative to pre-tax values provided by the Luxembourg Income Study 2000 (Portugal data are from Rodrigues, Albuquerque, and Fernandes 2004). For each country, all incomes below the lower bound of one of the twelve Eurobarometer income categories can be classified as below the mean. If the highest pure below-mean income is category \(n\), \(n < 12\), this procedure misclassifies some number of households in category \(n + 1\). The choice of which category to use as the cut point was} \textit{Age} (D.11); \textit{Age}^2; \textit{Male} (D.10), to control for social
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security’s negative actuarial impact on men relative to women, coded 1 if male, 0 if female; and Ideology (D.1.1), to control for independent regard for government programs, coded 1-10 Left-Right and centered around its mean. The level two variable is Immobility, a measure reflecting each country’s pre-tax income mobility based on parent-child income elasticities. The country units are Belgium, France, Germany, Ireland, Italy, Portugal, and Spain. The mixture of the two models produces ImmobilBlw, which is formed by the interaction of BelowMean with Immobility. The model assumes that the coefficients $\beta_{ij}$ on the level-one intercept and variable BelowMean are given by $\beta_{ij} = \gamma_{0j} + \gamma_{1j}Immobility_j$, where $i$ and $j$ designate individuals and countries respectively. The cut points are pragmatic depending on the relation between the mean and the category bounds. As a practical matter, the empirical analysis reveals little difference between using the two categories.

24 Income and Ideology, have significant missing data in the form of "refusal to answer" or "don’t knows." This problem was addressed using the Amelia II missing data imputation program developed by James Honaker, Gary King, and Matthew Blackwell. The extensiveness of the missing data suggested the use of a ridge prior to induce convergence.

25 The Immobility measure averages Comi’s (2004) estimates of father-son and father-daughter income elasticities. Since smaller elasticities imply higher mobility and this variable is interacted with BelowMean, the "immobility" interpretation is the most straightforward approach. I use estimates that reflect earnings averaged over multiple years to reduce selection bias due to variable unemployment rates across countries and the association between unemployment and level of earnings. Only countries with statistically significant mobility estimates for sons and daughters are included. Theoretically, these exclusions are awkward because 0 values have a direct substantive interpretation as instances of very high mobility. In the actual cases, however, the estimated values were negative, suggesting counterintuitively that parental income is a burden in those countries. Finally, mobility rates do not incorporate parents’ private information about future prospects. Yet familial clues about the impact of effort on success may be self-sustaining (Piketty 1995). If so, the family income control attenuates this problem.

26 The financial structure of social security varies across the sampled countries (see Feldstein and Siebert 2002). All have at least one component financed by PAYG, but its relative weight varies. By the same token, the possibility of labor and capital mobility imposes pressures toward consistency (Feldstein and Siebert 2002, 85-108).
designated by \( c_k, k = 1, 2, 3 \), with \( c_1 = 0 \).

The resulting model is:

\[
Pr(SocSec_{ij} > k) = \logit^{-1}(b_{0j} + b_{1j}Income_{ij} + b_{2j}BelowMean_{ij} + b_{3j}Immobility_{ij} + b_{4j}ImmobilBlw_{ij} \\
+ b_{5j}Age_{ij} + b_{6j}Age_{ij}^2 + + b_{7j}Male_{ij} + b_{8j}Ideology_{ij} - \delta_k).
\]

Regression results for the model are presented in Table 1.
<table>
<thead>
<tr>
<th></th>
<th>Coef.</th>
<th>Std. Err.</th>
<th>P &gt;</th>
<th>95% Conf. Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>-2.0**</td>
<td>0.063</td>
<td>0.001</td>
<td>-1.388 - 1.085</td>
</tr>
<tr>
<td>BelowMean</td>
<td>0.62</td>
<td>0.274†</td>
<td>0.03</td>
<td>-3.171 - 1.082</td>
</tr>
<tr>
<td>Immobility</td>
<td>-7.45</td>
<td>3.00†</td>
<td>0.05</td>
<td>-1.29X10^6 - 2.286</td>
</tr>
<tr>
<td>ImmobilBlw</td>
<td>3.31</td>
<td>1.64†</td>
<td>0.04</td>
<td>-0.906 - 0.001</td>
</tr>
<tr>
<td>Age</td>
<td>0.028**</td>
<td>0.010</td>
<td>0.007</td>
<td>0.954 - 0.992</td>
</tr>
<tr>
<td>Age^2</td>
<td>-0.00028**</td>
<td>0.00010</td>
<td>0.01</td>
<td>-0.0001 - 0.0001</td>
</tr>
<tr>
<td>Male</td>
<td>-0.03</td>
<td>0.062</td>
<td>0.664</td>
<td>-1.161 0.909</td>
</tr>
<tr>
<td>Ideology</td>
<td>-0.06**</td>
<td>0.017</td>
<td>0.000</td>
<td>-1.098 - 1.029</td>
</tr>
<tr>
<td>Constant</td>
<td>-4.46**</td>
<td>0.484</td>
<td>0.000</td>
<td>0.004 0.034</td>
</tr>
<tr>
<td>c_2</td>
<td>-1.61**</td>
<td>0.098</td>
<td>0.000</td>
<td>-6.084 - 4.146</td>
</tr>
<tr>
<td>c_3</td>
<td>-4.37**</td>
<td>0.111</td>
<td>0.000</td>
<td>-98.299 - 63.631</td>
</tr>
</tbody>
</table>

pseudo-R^2 = 0.02; N = 3953; * p < 0.05 ** p < 0.01; † see footnote 27 for a discussion of statistical significance
Before unpacking the full quantitative implications of Table 1, it is worth noting that the qualitative results are broadly consistent with the three hypotheses.\textsuperscript{27} Thus regarding Hypothesis 1, income is negatively associated with support for redistribution. Regarding Hypothesis 2, in a society with complete mobility ($Immobility = 0$), those with below-mean incomes are less likely to support redistributive social security programs. Conversely, to the extent societies are immobile ($Immobility > 0$) those with below-mean incomes are more likely to support redistribution. The statistically significant negative coefficient on $Age^2$ is consistent with Hypothesis 3: there is a point at which the probability of supporting redistribution declines with age.

I simulate first differences to estimate the quantitative implications of the model. Table 2 reports the results of increasing each of the key variables from its mean to one standard deviation above, holding all other variables at their means (or age by 10 year increments from base ages of 40 and 65). The percent change in probability represents the change from the base probability with all variables at their means.

\textsuperscript{27}Standard $t$-tests for statistical significance and marginal effects calculations are inappropriate for interactions in the context of logistic regression (Ai and Norton 2003). A likelihood ratio test in which the restricted model does not contain the interaction term yields $\chi^2(1) = 3.50$ with $Prob > \chi^2(1) = 0.06$. This is a reasonably strong rejection of the null of no difference given the multicollinearities associated with interactions.
Table 2: First Differences

<table>
<thead>
<tr>
<th>Change in Probability of Support for Redistribution</th>
<th>95% Confidence Interval</th>
<th>% Change in Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Income↑</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pr(SocSec = 1)</td>
<td>0.005</td>
<td>0.002</td>
</tr>
<tr>
<td>Pr(SocSec = 2)</td>
<td>0.02</td>
<td>0.007</td>
</tr>
<tr>
<td>Pr(SocSec = 3)</td>
<td>0.03</td>
<td>0.014</td>
</tr>
<tr>
<td>Pr(SocSec = 4)</td>
<td>- 0.05</td>
<td>- 0.080</td>
</tr>
<tr>
<td><strong>BelowMean↑</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pr(SocSec = 1)</td>
<td>0.015</td>
<td>0.0002</td>
</tr>
<tr>
<td>Pr(SocSec = 2)</td>
<td>0.05</td>
<td>0.001</td>
</tr>
<tr>
<td>Pr(SocSec = 3)</td>
<td>0.06</td>
<td>0.002</td>
</tr>
<tr>
<td>Pr(SocSec = 4)</td>
<td>- 0.12</td>
<td>- 0.225</td>
</tr>
<tr>
<td><strong>Immobility↓</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pr(SocSec = 1)</td>
<td>0.004</td>
<td>- 0.003</td>
</tr>
<tr>
<td>Pr(SocSec = 2)</td>
<td>0.01</td>
<td>- 0.007</td>
</tr>
<tr>
<td>Pr(SocSec = 3)</td>
<td>0.02</td>
<td>- 0.002</td>
</tr>
<tr>
<td>Pr(SocSec = 4)</td>
<td>- 0.03</td>
<td>- 0.069</td>
</tr>
<tr>
<td><strong>Age + Age^2 (40-50)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pr(SocSec = 1)</td>
<td>- 0.0005</td>
<td>- 0.0013</td>
</tr>
<tr>
<td>Pr(SocSec = 2)</td>
<td>- 0.002</td>
<td>- 0.0041</td>
</tr>
<tr>
<td>Pr(SocSec = 3)</td>
<td>- 0.005</td>
<td>- 0.0111</td>
</tr>
<tr>
<td>Pr(SocSec = 4)</td>
<td>0.007</td>
<td>0.0028</td>
</tr>
<tr>
<td><strong>Age + Age^2 (65-75)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pr(SocSec = 1)</td>
<td>0.002</td>
<td>0.0002</td>
</tr>
<tr>
<td>Pr(SocSec = 2)</td>
<td>0.007</td>
<td>0.0007</td>
</tr>
<tr>
<td>Pr(SocSec = 3)</td>
<td>0.02</td>
<td>0.002</td>
</tr>
<tr>
<td>Pr(SocSec = 4)</td>
<td>- 0.03</td>
<td>- 0.046</td>
</tr>
</tbody>
</table>
A one standard deviation increase in *Income* from its mean strongly shifts preferences against redistribution. Although the shift is not perfectly monotonic, the probability of strongly opposing redistribution increases by 25% and in the next strongest category by 29%. The probability of offering the strongest support for redistribution declines by 13%. *BelowMean* $\uparrow$ shifts a typical above-mean income individual in a perfectly mobile society (*Immobility* = 0) to below mean. As predicted this simulated change pushes respondents strongly toward opposition to redistribution: those at the bottom half of the income ladder are now more likely to see redistribution as a break on expected success. For those in the upper half, by contrast, mobility is less likely to work in their favor.

*Immobility* $\downarrow$ shifts a typical below-mean individual from a society with mean mobility to a society whose mobility is one standard deviation above the mean. This interaction variable is statistically significant with a one-tailed test and the substantive results are consistent with theoretical predictions. Indeed the percentage changes are fairly strong, particularly for those categories reflecting explicit opposition to redistribution.

Finally, although given data limitations make it is impossible to separate out cohort from life-cycle effects, the *Age* variable behaves as theoretically expected.\(^{28}\) While aging from 40 to 50 *ceteris paribus* has a very small and statistically insignificant impact on redistributive preferences, aging from 65 to 75 is associated with a fairly strong and statistically significant increase in *opposition* to redistribution.

It is instructive to disaggregate the sample by age. Although income and mobility have the same qualitative impact on respondents over age 50, in this subsample the interaction of *BelowMean* and *Immobility* suffers a substantial decrease in statistical significance in comparison to the subsample comprised of those 50 and under. This statistical weakening may reflect the fact that insofar mobility influences redistribution

\(^{28}\)If anything, cohort effects should work against Hypothesis 3 since those who were 65-75 in 2001 lived through the Great Depression.
preferences per the model, its importance is two generations removed for those over 50. Of course, a narrower self-interest interpretation is that mobility prospects are simply irrelevant to people over 50. But the same statistical weakening affects respondents under 30. The statistically core group seems to be those between 30 and 50, namely, those most likely to have dependents whose mobility prospects are at stake.

In sum, the data provide consistent support for the three hypotheses, which are designed to capture the kinds of POUM forces affecting the intergenerational politics of social security. Although income per se drives respondent preferences in a rationally self-interested fashion, we see that the prospects for mobility temper their calculations.

6 Conclusion

The great social insurance programs initiated in western industrial nations in the late nineteenth century and brought to maturity in the twentieth were designed to pool risk and thereby attenuate the impact of individual misfortune. Yet the shifting of risk went even further. Typically, much of the financial burden of these programs was imposed on later generations. This shift has been politically reaffirmed for many decades, along with the program retrenchment it now requires. How is this possible if parents genuinely care for their children?

The same period in which social insurance programs developed also witnessed an extraordinary increase in public spending on education and public health and a general decline in the impact of social caste. While broadly part of the same political movement, this rise in social and economic mobility may have had an unintended impact on social insurance. For rising mobility increases the likelihood that key insurance programs of the welfare state will impose net losses on a majority of the next generation. This rational expectation of above-average financial outcomes may in fact have motivated support for
both current programs and their future retrenchment.

This paper presents a model of this phenomenon applied to public pension programs. Several testable hypotheses emerge from this model. One, those with higher incomes will be less inclined to support redistribution through social security. Two, the greater the degree of income mobility, the more likely are those with below-average incomes to reduce their support. Three, the elderly will exhibit relatively lower support for redistribution through social security, an implication foreign to models of intergenerational political conflict.

An analysis of data from a 2001 survey of European attitudes toward pension programs provides consistent support for these hypotheses. In other words, in expectation the Lake Wobegon effect extends far beyond Minnesota.
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