GERONTOCRACY, RETIREMENT,
AND SOCIAL SECURITY

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ABSTRACT

Why are the old politically successful? We build a simple interest group model in which political pressure is time-intensive, showing that in the political competitive equilibrium each group lobbies for government policies that lower their *own* value of time but that the old do so to a greater extent and as a result are net gainers from the political process. What distinguishes the elderly from other political groups (and what makes them more successful) is that they have *lower labor productivity* and/or that we are all likely to become elderly at some point, while we are relatively unlikely to change gender, race, sexual orientation, or even occupation. The model has a variety of implications for the design of social security programs, which we test using data from the Social Security Administration. For example, the model predicts that social security programs with retirement incentives are larger and that the old are more "single-minded" in their politics, implications which we verify using cross-country government finance data and cross-country political participation surveys. Finally, we show that the forced savings programs intended to "reform" the social security system may increase the amount of intergenerational redistribution. As a model for evaluating policy reforms, ours has the attractive feature that reforms must be time consistent from a *political* point of view rather than a public interest point of view.

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I. A Look at Government Spending on the Elderly

I.A. Spending on the Elderly Dominates Government Budgets

Spending on the elderly dominates government budgets in the United States and other countries. The first two columns of Table 1 list the 12 largest federal programs in 1996 expressed as a percentage of fiscal year spending and as a percentage of GDP, respectively. The largest program is, by far, social security:[1] the elderly receive public pensions from this one program totaling 22.4% of federal outlays and almost 5% of GDP. The second largest program is National Defense, which takes 17% of total spending and 3.6% of GDP. Interest payments on government debt are the third largest category and represent 15.5% of total spending and 3.2% of GDP. Medicare is the fourth largest category and, together with Federal Employee Retirement and Social Security add to a total of 39.0% of the budget and 8.1% of GDP. Thus, three of the top six 1996 Federal government programs are almost exclusively for the elderly.

Furthermore, four more top federal programs are disproportionately, although not exclusively, enjoyed by the elderly - Medicaid and other Health, Veteran's Benefits, Food Stamps, and Housing Assistance. According to the U.S. House Ways and Means Committee (1996), citizens aged 65+ are 12% of Medicaid recipients, which is proportional to their representation in the overall population. However, they receive more than 31% of Medicaid expenditures. Roughly one third of Food Stamp and Housing Assistance beneficiaries and one half of Veterans beneficiaries are also Social Security and Medicare beneficiaries. If we add the expenditures on Social Security, Medicare, Federal Employee Retirement with one third of "other health", Food Stamps, and Housing Assistance and one half of Veteran's Benefits, we see that nearly 50% of the federal budget is used to either pay or subsidize services mainly used by the elderly (almost 10% of GDP).

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[1] The numbers for Social Security include Old Age Insurance as well as Disability Insurance. Old Age Insurance is 87% of the Social Security spending. We include both in a single category because most of the beneficiaries of the Disability Insurance are older people.

Table 1: Top Federal Programs in the U.S.	1996[a]		1950[b]	
	% of:		% of:	
	outlays	GDP	outlays	GDP
(1) Social Security	22.4	4.7	1.8	0.3
(2) Defense	17.0	3.6	32.2	5.2
(3) Interest on Debt	15.5	3.2	11.3	1.8
(4) Medicare	11.2	2.3	0	0
(5) Medicaid and other Health	7.7	1.6	0.6	0.1
(6) Federal Employee Retirement	5.4	1.1	4.8	0.8
(7) Transportation (highways, air traffic,...)	2.5	0.5	2.3	0.4
(8) Veteran's Benefits	2.4	0.5	20.8	3.3
(9) Food Stamps	1.7	0.4	0	0
(10) Unemployment Assistance	1.6	0.3	4.7	0.8
(11) Housing Assistance	1.6	0.3	0.0	0.0
(12) Supplemental Security Income	1.5	0.3	0	0
for elderly=(1)+(4)+[(5)+(9)+(11)]/3+(6)+(8)α[c]	43.8	9.1	7.9	1.3

Source: Office of Management and Budget (1997).

[a]1996 Total Federal Outlays=1.56 trillion (20.8% of GDP), GDP=7.48 trillion

[b]1950 Total Federal Outlays=0.042 trillion (16.0% of GDP), GDP=0.27 trillion

[c]α is the fraction of veterans who are in retirement age in respective years (see text).

Public expenditure on the elderly has grown dramatically since WWII. Columns 3 and 4 of Table 1 display the size of the same 12 programs in 1950. Back then, social security represented only 1.8% of total spending and a 0.3% of GDP. If we add the numbers on Social Security, Medicare, and Federal Employee Retirement with one third of "other health", Food Stamps, and Housing Assistance and 5% of Veteran's Benefits for 1950, the payments or subsidies to services used by the elderly was only 7.9% of federal spending (1.3% of GDP).[2]

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[2]We include only 5% of 1950 veteran's benefits because, according to the U.S. Census Bureau (1975, Series Y 943-956), only 4.4% of veterans were aged 60+. As a result, we understate the growth of veteran's payments going to those aged 65+ because those payments have grown more rapidly than the fraction of veteran's over age 65+ (U.S. Census Bureau, various issues, and House Committee 1996, Table 16-2).

The pattern is found for the sum of Federal, State, and Local government spending (net of intergovernmental transfers). The solid line in Figure 1 shows that the fraction of GNP spent by government at all levels on the elderly has more than quadrupled over the period 1952-96. We compute total spending on the elderly as the sum of Federal retirement expenditure, Medicare, state and local government employee retirement, one third of other medical spending at all levels, and one third of health and housing expenditures at all levels.

The dashed line in Figure 1 shows how spending on "youth" (we define "youth" to be those aged 24 and under and spending on them to be education and training spending at all levels) has also grown relative to GNP. However, there are four reasons why we find spending on the elderly to be extraordinary. First, the levels of spending are very different: more than $21,000 per person aged 65+ were spent in 1996 by all levels of governments vs. less than $4000 per person aged 0-24. Second, elderly spending has grown more rapidly. Third, spending "on youth" probably benefits the middle aged since the youth are dependent on them. If this is true, the appropriate metric of spending on those other than the elderly is total spending minus elderly spending, which has fallen as a fraction of government spending and unchanged as a fraction of GNP (government spending at all levels was 23 and 31% of GNP in 1950 and 1996, respectively; OMB 1997). Fourth, most spending on youth is at the state and local rather than Federal levels. Because it is easier for taxpayers to move across localities than across countries, perhaps youth spending is more like something all residents want rather than one group taking from another by force - which is how we model spending on the elderly.
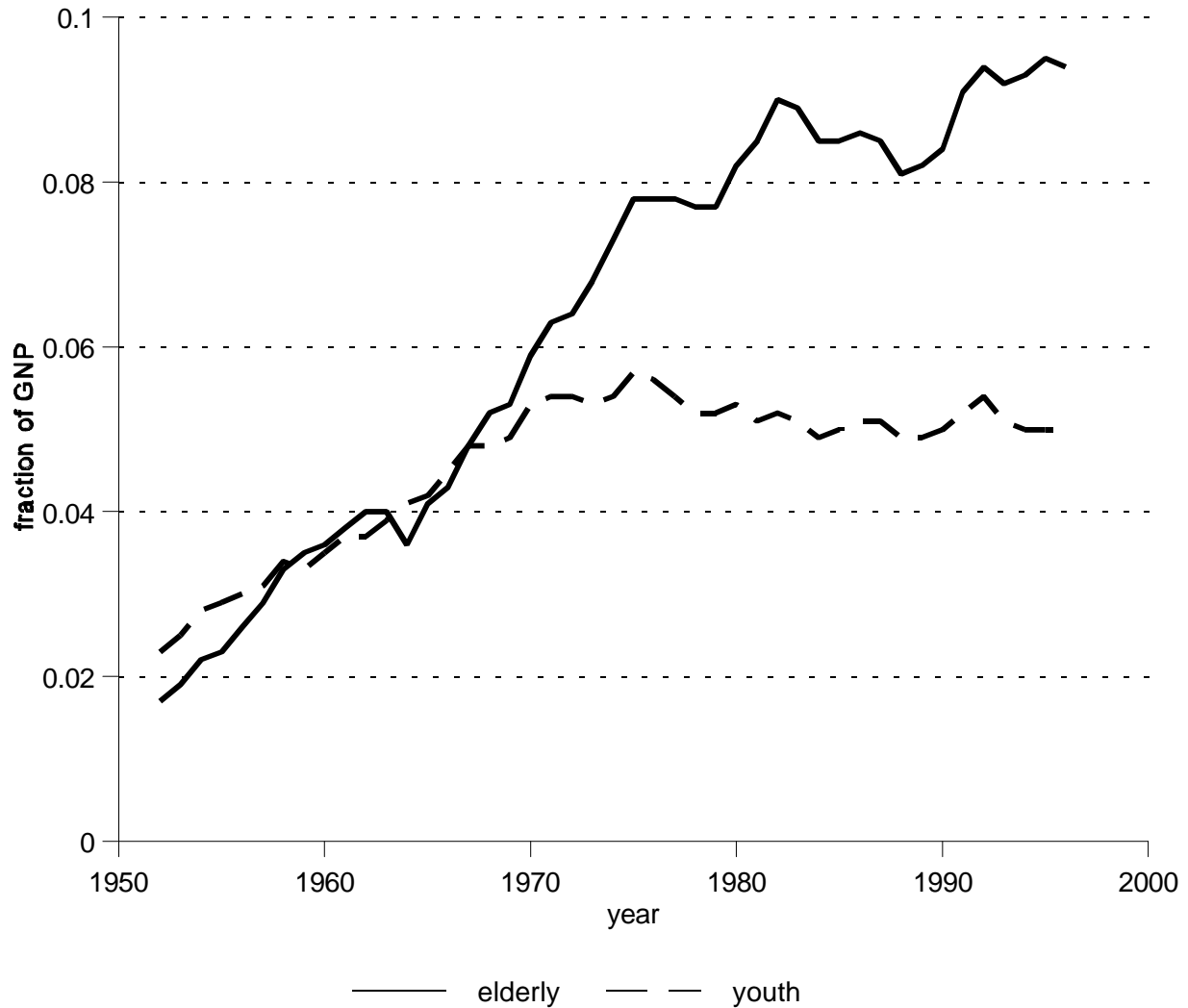
Figure 1 U.S. Government Spending (all levels) on Youth and Elderly

American government expenditures on the elderly are not representative of expenditures by the governments of other developed countries; the foreign old age public pension programs are substantially larger fractions of GDP. To name a few, Italy (13%), Sweden (16%), and Belgium (20%). Some less developed countries also have large SS budgets (Brazil's is 7% of GDP). Even larger shares are computed when medical and other old age subsidies are added to public pensions.

Substantial American government spending on the old is not entirely new. Programs at the state level were common before WWII, although they were not as large as Social Security eventually became (Costa 1998, p. 167). Pensions for Union Army veterans were very generous and, by the end of the 19th century, often

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replaced all of an unskilled laborer's salary (Costa p. 161) - as compared with typical Social Security replacement rates of 30% early in the program and 40-50% rates later in the program (House Committee 1996, Table 1-14). Union Army Pensions consumed 43% of the federal budget in 1893 (Costa p. 162) and 1.2% of GNP for beneficiaries who were only 1.5% of the population (Census Bureau series HS Y-457, A-7, and F-1).

I.B. Spending growth cannot be explained by demographics

The government spending on the elderly (hereafter "SS") cannot be accounted for by demographics.[3] To see this, notice that if demographics were changing while political influence per beneficiary were held constant, one would expect the fraction of GDP devoted to government programs for the elderly to increase with their fraction in the population. However, the effect should be *less than one-for-one* because the deadweight losses associated with SS taxes presumably increase at an increasing rate. It is interesting that in 1950 the number of citizens aged 65+ was 12.4 million (8.1% of the population) while in 1996, they were 33.9 million (12.8% of the population). The population share of the 65+ has therefore grown by a factor of 1.6. Without changing political influence, therefore, the fraction of SS would have increased by less than a factor of 1.6. However, Table 1 shows that the share of SS (narrowly defined) in GDP (Row 1) has grown by a factor of 15.6 while the share of all federal programs devoted to the retired (last row) has grown by a factor of 7. Figure 1 shows that government spending at all levels has grown by more than a factor of 5. Hence, the fraction of GDP devoted to the elderly through public programs has grown more than one would have predicted by the evolution of the demographics. We interpret this as an increase in the political power enjoyed by those citizens (see also Preston 1984 and, for an earlier period, Lindert 1994), which needs to be explained by a good positive theory of SS.[4] Compare Union Army pensions with modern elderly programs. The former consumed 1.2% of GNP for beneficiaries who were 1.5% of the population - a ratio of 0.80 - while the latter consume 9.4% of GNP for beneficiaries who are 12.7% of the population - a ratio of 0.74. The order-of-magnitude demographic changes

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[3]Whenever possible, our study defines "Social Security" to be government transfers to the elderly which, in the U.S., includes old age public pension payments, some disability, Medicare, some Medicaid, some Veteran's benefits, some Food Stamps and some housing assistance. Another measure - the "generational accounting" of Auerbach et al (1992) - is superior in many respects, but would be very difficult to construct for many countries and many time periods. As we occasionally note in the paper, data availability has sometimes required us to utilize definitions of "SS" that are inferior to either of these.

[4]Since the share of the population under age 25 fell somewhat, Figure 1 also shows that spending on youth cannot be accounted for by demographics. Does this mean that we also need a theory of the political power of youth? Perhaps not, since spending on youth may primarily benefit the middle aged at the expense of the old. And, as noted in the text, the level and growth of spending on the elderly is much greater.

over the century may not have produced an important change in government spending per elderly beneficiary.

Turner (1984), on the other hand, reports some results suggesting an inverse relationship between the fraction of the population over age 65 and OASI benefits per beneficiary. Other specifications suggest the opposite.[5] His analysis is for the period 1947-77 and holds constant a number of other variables including the national employment rate, participation rate, and the share of the population under age 16. Parsons (1982) found no cross-state relationship between the fraction of the population over age 65 and 1930's state old age assistance benefits per beneficiary.

1.C. Some Internationally and Historically Common Design Features

It is interesting to notice that, despite a large cross-country variation in the size of social security programs, there are certain design features that are fairly common across countries. We think that a good positive theory of social security ought to explain these common features. To investigate how different countries design their social security programs, we use the publication *Social Security Programs throughout the World*, published by the U.S. Social Security Administration (various issues). This publication reports the "main" rules and regulations governing the SS programs of 144 countries for a number of years. In this paper we use the data for 1995 and for those 89 countries with government finance data reported by the International Monetary Fund to establish a number of interesting regularities on the way SS programs are designed (see also Sala-i-Martin (1996)). Some of the summary statistics are displayed in Table 2.

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[5]We have unsuccessfully attempted to replicate Turner's study. Our replications never suggest an inverse relationship.

Table 2:	
Social Security Program Design in a Cross-Section of 89 Countries, 1995	
Design Feature	**%Countries**
Social Security Benefits Induce Retirement	75%
of which: *- retirement required (no DRC)*	- 48%
- retirement required (unfair DRC)	- 12%
- tax incentives for retirement (no DRC)	- 10%
- tax incentives for retirement (unfair DRC)	- 3%
- current retirees covered by previous law inducing retirement	- 3%
Social Security Benefits Do Not Induce Retirement	25%
of which: *- benefits paid at fixed age regardless of labor force status*	- 22%
- "fair" credits paid to those delaying retirement	- 3%
- current retirees covered by previous law not inducing retirement	- 0%
Financed with Payroll Taxes	96%
Employers and employee share the tax	90%
Some Earnings exempt from payroll tax	32%
Payroll tax is capped	49%
Benefits increasing with taxes paid	85%
of which: *- proportional to taxes paid*	- 14%
- otherwise increasing with taxes paid	- 72%
Benefits largely independent of asset income	89%
of which: *- small means-tested portion of program*	- 10%
- entire benefit independent of asset income	- 78%
Pay-as-you-go	98%
of which: *- the entire old age system is "pay-as-you-go"*	- 83%
- a substantial part of the old age system is "fully funded"	- 15%

Notes: (1) Constructed from 89 individual country data provided in *Social Security Programs Throughout the World 1995*.

(2) 16 countries had missing data regarding the inducement of retirement.

(3) "DRC" = delayed retirement credit

Table 2's first row shows that the overwhelming majority of the programs throughout the world *induce*

retirement in one way or another. Of the 73 countries for which this information was available, 55 (75%) induce the elderly to retire in order to collect their pensions. When considering the retirement incentives implicit in benefit formulas, four criteria are considered. First, we consider whether benefits in a given year at or after the earliest retirement age decline with labor income - a policy known as a "retirement" or "earnings" test. Second, for those countries with a retirement or earnings test, we consider whether benefits lost due to the test were credited towards benefits received after full retirement - a policy know as a "delayed retirement credit" (DRC). If there is a delayed retirement credit, we judged whether it was actuarially fair (namely, whether it was close to or greater than 8% per year).[6] Countries with fair DRC's we judged not to induce retirement regardless of their use of a retirement or earnings test. Third, in countries with substantial and recent reforms, we attempt to assess whether retirees after the reform are covered by current formulas or formulas from previous laws. Two countries, Berundi and Peru, had prereform formulas inducing retirement and their reforms have formulas which do not induce retirement, but have not retired many people under the new formulas. Fourth, we classify the Netherlands as inducing retirement because, according to Kapteyn and de Vos (1997), the "unemployment" portion of SS is used as an old age pension. We suspect there may be other countries satisfying the final two criteria for induced retirement (eg., Chile, Iceland, Singapore), but we do not tabulate them as such in Table 2.

While, according to these three criteria, Table 2 shows 75% of countries inducing retirement, we believe we have understated the prevalence of retirement inducing government policy. For instance, governments (like the Swiss) may require employers to provide pensions that induce retirement. Or union rules applying to all or a substantial fraction of the labor force may mandate retirement (eg., Sweden - see Palme and Svensson 1997, p. 18). Gruber and Wise (1997) emphasize how European "disability" and "unemployment" programs are often induced retirement programs in disguise. Or formulas for crediting the earnings of those near retirement age toward future SS benefits may also act as an implicit tax on work by the elderly (Palme and Svensson 1997 suggest this is the case for Sweden). Government policies for providing health insurance may also induce retirement (Rust and Phelan 1997). A more detailed study might therefore show that 85 or 90% of governments induce retirement with SS and other policies.

44 of the 73 (60%) countries with available data do not pay any SS benefits to somebody employed and

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[6]For countries whose SS systems looked like retirement savings accounts ("Provident Fund" systems), we judged whether the rate of return paid on the fund was comparable to a market return. Countries with both a retirement test and, in our judgement, "unfair" returns are: Nepal, Sri Lanka, Tanzania, and Zambia. India has a Provident Fund which may pay a fair return, but it is only part of its SS system. Only Malaysia has a Provident Fund with a retirement test but paying apparently fair returns (and thereby not inducing retirement). Other Provident Funds do not have a retirement or earnings test and hence were judged not to induce retirement regardless of the fairness of the return.

do not fairly credit the benefits lost due to employment to future retirement years. Among these, 35 countries pay no DRC at all. Nine countries pay SS benefits to elderly workers, but the benefit is reduced according to the amount of the beneficiaries earnings and not fairly credited towards future years. The 1995 United States formulas for those aged 65-69 is one of these nine countries, although current law *plans* to pay actuarially fair credits in the next ten years or so. For 1995 U.S. retirees, a 33% marginal tax rate is levied on the public pension of someone aged 65-69 earning more than$12,500. If he is ineligible for any old age pension or chooses not to collect one, then he earns some credit for later years when he does retire, but those credits are actuarially unfair enough that the U.S. earnings test is still an implicit tax on work (Myers 1993, pp. 98-99).[7] The interesting fact is that the same person can make millions of dollars in the stock market and no taxes on his pension are imposed. He loses (part of) his pension only if he works![8] This kind of regulation is so overwhelmingly common across countries that we feel it ought to be part of any satisfactory theory of SS. Hence, a simple look at social security regulations around the world seems to indicate that the elderly are being discouraged from working.

This finding from Table 2 is important enough to reiterate with some examples of countries taxing the labor income of the elderly at 100% rates (a dollar of pension is lost per dollar earned). As of 1995, elderly Spaniards and Belgians are not allowed to collect their government pension if they earn any labor income at all (Boldrin et al 1997 p. 16, SSA 1997 p. 330, Pestieau and Stijns 1997, p. 9) and those benefits are typically close to or more than what the pensioner would have earned after taxes if he had kept working (Boldrin et al 1997). France allows pensioners to receive labor income, but not from their preretirement occupation (Blanchet and Pele 1997, p. 9, SSA 1997, p. 130). No Austrian under age 65 earning more than 3740 schillings/month may collect a public pension (= $349/month, SSA 1997 p. 21). Furthermore, the size of the public pension benefits in these and other countries are nearly the size of the average worker's earnings (Gruber and Wise 1997) - and therefore the range of income to which the 100% implicit tax applies is very large.

The second row in Table 2 shows that the majority of SS programs are financed with special payroll taxes: 96% of the countries do. In practice, this also means that for all these countries, the SS program has its own program. For some reason, most SS countries in the world are not financed through the regular budget but,

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[7]There is substantial amount of evidence in the labor literature showing that SS regulations induce retirement (for micro studies see Pechman, Aaron and Taussig (1968), Boskin (1986), Boskin and Shoven (1987), Kotlikoff and Wise (1987) and the extensive survey on empirical results in Atkinson (1987). For cross-country studies, see Gruber and Wise (1997) and Modigliani and Sterling (1983).)

[8]Beginning in 1984 (Myers 1993, p. 147), some U.S. SS benefits are taxable for those in roughly the top decile of personal taxable income distribution. This provision produces a system similar to one where benefits are not taxable but are subject to a slight asset income test.

instead, through a special tax, which is usually a payroll tax.

The payroll tax is split between "employer" and "employee," although nearly all those countries with a payroll tax require some contribution by both parties. We use the data on the share paid by firms as an explanatory variable in the determination of the size of the SS program (see section VI). The fourth and fifth rows show that only 32% of the countries have exemptions in the SS tax while 49% have some kind of cap.

Row 6 shows that in 85% of the countries, the SS benefits are increasing with amount of years worked (and amount of taxes paid). Some countries pay benefits in proportion to lifetime taxes paid while others have more complicated formulas.[9] The seventh row suggests that in 89% of the countries, asset income is largely irrelevant for computing benefits (a few of them means-test a small portion of the old age benefit). This suggests that most programs are not designed as antipoverty programs (see Mulligan and Sala-i-Martin 1999a and b for a more careful analysis of this point). Finally, the last row of the Table shows that the overwhelming majority of the programs (98%) have pay-as-you-go (PAYG) features. Of these, a fraction have full-funded much, but not all, of their program.[10]

At least in the U.S., government spending on the elderly has historically taxed labor income more than asset income (if asset income were taxed at all). "The 1935 report of the Committee on Economic Security appointed by President Franklin D. Roosevelt recommended that no benefits be paid before a person had 'retired from gainful em-ployment.'" (House Committee 1996 p. 31) Before 1950, U.S. Social Security mandated retirement (ie, monthly earnings less than $15) for SS beneficiaries but did not have asset income tests. Although relaxed slightly, earnings limits were still effectively a "retirement mandate" until 1972 (U.S. Ways and Means Committee 1996, Section 1, page 31; Myers 1993 pp. 271-4). Prior to the 1970s, state administered old age assistance programs typically (implicitly) taxed earnings at a 100 percent rate, although they also had asset income tests (Myers 1993 pp. 827). Union army pensions did not have an asset income test (Costa 1998 p. 198). Nor did the Union Army pension have explicit earnings and employment tests, although nonemployment was probably "viewed by employees of the Pension Bureau as evidence of an inability to perform manual labor", and such evidence was required to obtain a pension (Costa 1998 p. 44).

The main lesson from cross-country and historical comparisons of programs for the elderly is that SS

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[9]The link between benefits and taxes paid can be imperfect in these countries because low earnings workers may enjoy proportionally more benefits, because governments revise benefit formulas and coverage rules, and other reasons.

[10]A fully-funded system can continually pay retirees according to their lifetime taxes plus interest without raising tax rates. A pay-as-you go system pays retirees according to the labor income taxes levied on the young, which typically means returns a less than "fair" unless labor income tax rates increase over time.

programs appear to be strongly related to *labor markets* - "contributions" are a function of labor income, while benefits are a function of labor income and labor force status. A good theory of SS ought to explain why the elderly are either forced or induced to stop working before they can collect their pensions, why these pensions are almost always financed with payroll taxes, and why they are not related to how rich the recipient is.

This paper provides such an explanation. Intuitively, our main point is that redistribution requires political, moral, and social pressure and that this pressure is related to an allocation of time by program beneficiaries. In particular, we argue that an interest group's political influence depends on the amount of non-working time enjoyed by its members. Besides the obvious reason (citizens who do not work have more time to spend on political activities), one important reason for this is that a group of citizens without jobs is probably more "homogeneous" in its political concerns than a group of citizens with jobs. Those with jobs are likely to be from different occupations and industries, each with its own unique political concerns. Each political group faces a free riding problem since none of its individual members has sufficient incentives to allocate his time to best serve the interests of his group. In an attempt to overcome this free riding problem, political groups may want to impose a "tax" on the labor income of its own members in order to induce them to "retire" so that they can spend some additional leisure time lobbying for the group. We show that the political group with a lower wage has larger incentives to impose retirement-inducing taxes on its members.

An additional ingredient of our theory is the fact that political institutions (such as social security) may be persistent so the policies and laws enacted today may still be in place in a few years. In the meantime, however, people may switch from one political group to the next. We show that the group whose members have a lower probability of switching to competing groups will have a better chance of winning the political process. And what distinguishes the elderly from most other groups is that, while it is very likely that today's young are old in the future, it is not likely that the old ever become young. Hence, the old will impose on themselves a larger retirement-inducing tax, they will retire more, lobby more and will extract transfers from the young. What makes the elderly more successful than other groups with lower wages (like women or blacks) is that the young eventually become old, while most men do not become women (although some might), most whites do not become black (although some might). Hence, transfers to these particular groups are opposed more strongly than transfers to the elderly.

II. Our Economic Approach to Gerontocracy and Social Security

In this paper we take a political-economy approach to explain the existence and success of social security alongside the great political success of the elderly: gerontocracy and social security go hand and hand. In case there were still any doubt about it, we point out that several researchers have found that political forces sustained

and expanded government spending for the elderly. Costa's (1998, Chapter 8), Holtzman's (1963), and Pratt's (1976) historical accounts, for example, suggest that well-organized pressure groups were essential for the emergence and growth of American Social Security as well as earlier state old-age assistance and Army pension programs. In fact, those groups include the Grand Army of the Republic and the Townsends, and are among the more famous political pressure groups in American history.

But why are the elderly so successful in the political sector? It can be argued that the elderly "deserve" help from the government. However, many groups "deserve" help and subsidies yet governments do not always subsidize them. What do the elderly have that poor single mothers, blacks and other minorities, poor women, poor men or other groups that (in principle) deserve help do not have? Political theories based on the median voter are not likely to explain the political success of minorities like the elderly (see Mulligan and Sala-i-Martin (1999a).) On the other hand, versions of interest group models of Becker (1983, 1985), and Peltzman (1980) do not really answer why one minority might have more influence than another (see Mulligan and Sala-i-Martin (1999a)). We explain the success of the elderly, and hence social security, by looking at the links between time allocation and political activity.

II.A. AARP: The "R" Does not Stand for "Old"

Fortune magazine recently conducted a poll of 329 Washington "insiders", "including members of Congress, their staffs, and senior White House officials" (December 8, 1997, p. 146). Respondents were asked to rank the clout in Washington of 120 interest groups, labor unions, and trade associations and to assess the importance of a list of lobbying techniques.[11] The American Association of Retired Persons ranked most powerful. Two of the three top rated lobbying techniques were "having *active* allies in a Congressman's district" and "mobilizing *grassroots* action, such as phone calls and letters" (p. 146, italics added). A successful group has "large numbers of geographically dispersed and politically *active* members who focus their energies on a *narrow range of issues*" (p. 146, italics added). Three of the worst four techniques involved expenditures of *money* rather than time.[12]

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[11]Each list presented to the respondents was chosen by a panel of experts which included "members of Congress, professional lobbyists, academics, congressional staff, and pollsters" (p. 158).

[12]"Buying TV, radio, and print ads to promote your cause," "spending lots of money on issue-oriented ads for or against a Congressman," "retain high-priced, gun-for-hire lobbyists."

The AARP is only one example of an interest group of *retirees* lobbying for public pensions.[13] In many European countries, labor unions are important lobbyists for public pensions, and those unions are heavily influenced by retirees. American unions have also served (and continue to serve) this purpose, although to a lesser extent. They have lobbied for increases in public SS benefits (Clague et al 1971, p. 5), benefit formulas encouraging early retirement (p. 113), and public health benefits (p. 20). American unions have also encouraged national and union political activity by their retired members, and that activity has influenced pension policy (Clague et al. pp. 39, 124; Deaton 1989 p. 148).

It is sometimes claimed that retiree lobbies were not important in the establishment of SS in the U.S. However, the Townsends were an extremely large lobby in the 1930s including 1.5 million Americans aged 60 and over - 10% of the nation's population in that age group! - most of whom were probably retired or not working much.[14] The Townsends lobbied for very generous pensions *mandating retirement* (Amenta and Zylan 1991, p. 253). Although Social Security was not as generous as proposed by the Townsends, it included the retirement mandate (with the exception of the $15/month exemption) and some historians believe that the political pressure applied by the Townsends had an important influence on Social Security legislation. Furthermore, Townsend historians and Francis Townsend himself (the founder of the Townsend lobby) recognize that *retirement* was crucial for the political success of public pensions. Francis Townsend and his followers wrote how a public pension would provide elderly with "time to enjoy life and gain the full advantage from recreation, political, and civil life...." (quoted by Putnam 1970, p. 53, original reference to the 1934 *Palo Alto Sun* unavailable) and, in turn, leisure time helped supply the volunteers crucial for a successful lobby (Townsend 1943, pp. 142-7, 151).[15]

We should say at the outset that in this paper we do not solve (and we do not attempt to solve) the "voter's paradox". We do not explain why people vote or engage in political activities. We take it as given that they do, and we try to understand how the pressure groups will try to induce them to participate more for the benefit of the whole group.

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[13]Although, proof of retirement is not required for AARP membership, AARP attracts members with vacation travel discounts and emphasizes volunteerism (http://www.aarp.org/) - which are disproportionately attractive to the retired.

[14]Holtzman (1963 pp. 48-9). Member counts and characteristics may have been exaggerated, but Putnam's (1970 pp. 102-103) 1936 photograph of a 15,000 member Townsend club meeting in the Rose Bowl makes two things clear - there were a lot of members and they were old. See Cantril (1941, pp. 192-93) and Amenta & Zylan (1991) for empirical evidence that the old and the retired were much more likely to support the Townsend lobby.

[15]See also Amenta & Zylan (1991, p. 256).

II.B. The Importance of "Time" in the Political Process

In order to show our point more clearly, we start with a simple version of the Becker (1983) model of pressure groups with one important amendment: *some of the resources needed to apply political pressure are time-intensive.* In this section we propose that if the old and the young are identical in every respect except one (*either* their time horizon or their value of time), then the political equilibrium involves the endogenous creation of a SS program financed with labor income taxes and with mandatory retirement or retirement-inducing taxes.

Imagine that there is an equal number of identical young and identical old indexed by i ($i = y, o$). People divide their time between work and "leisure activities". Leisure activities, which we denote by l, include participation in political activities and lobbying. We assume that political activities are a fixed (and perhaps very small!) fraction of leisure activities which is independent of the tax rates.[16] Since free-riding is an important part of our analysis, our notation distinguishes the leisure of an individual group i member, l_i, from his group's average leisure $\bar{l}_i$.

Following Becker (1983,1985), we consider a "political pressure function" which allows each of the groups to get a lump sum transfer from the other group. Unlike Becker, we assume that the size of the transfer is an increasing function of the relative *time* devoted to lobbying and to other political activities. Define $f(\bar{l}_o, \bar{l}_y)$ to be the fraction of potential GNP transferred from the young to the old ($f<0$ means transfers from the old to the young), with $f_1 > 0, f_2 < 0$. We assume that if the two groups devote equal effort to lobbying, no transfers are made so $f(\bar{l}, \bar{l}) = 0$. We also assume that the function f is "symmetric" in the sense that $f(a,b) = -f(b,a)$. The symmetry of the pressure function means that the "political technology" favors neither the old nor the young.

In the absence of social security taxes and transfers, the two groups choose the same amount of work and leisure. Since when $l_y = l_o = \bar{l}$ there are no transfers ($f(\cdot)=0$), it follows that we are giving the two groups the *same fundamental political power*. And we do so because we want to show that a social security scheme with a higher political power for the elderly may arise, even if the *old and the young have the same underlying fundamental political power.*

The most straightforward interpretation of the pressure function is that each cohort cares only about itself, with l_o and l_y related to resources devoted by each group to battle with the other. We maintain this metaphor throughout our presentation of the mathematical model, but four other interpretations are also highly relevant.

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[16] What is crucial for our results, however, is that political activities not be an "inferior" good with respect to the composite leisure good and that citizens do not take into account the effects of their political activity on other citizens.

The Single-Minded Leisure Class

The hypothesis embodied by our pressure function $f(\cdot)$ that a group with more leisure is more likely to be politically successful has a different, but equally relevant, interpretation. Suppose that every citizen has a fixed amount of political resources (which might be time or goods), which he must allocate among different "issues". The "issue" that acquires the most aggregate political resources is the politically most successful. Especially in a specialized modern economy, workers will naturally tend to focus on issues that subsidize their industry or occupation relative to others and may prefer to have such a regulation or subsidy rather than a monetary government transfer. Furthermore, the political activities of members of different industries and different occupations may, to some degree, cancel each other out. Nonworkers, on the other hand, do not have such special interests and are united (ie, "single-minded") in their political action - all they want are monetary transfers and perhaps medical care. Under this interpretation, *the inclusion of l_o and l_y in the pressure function thereby represents the amount of "political single-mindedness" in each group, and our assumption that single-mindedness facilitates political success.*[17] Our presumption that single-mindedness facilitates political success is consistent with common sense, consistent with the Fortune Magazine study of successful lobbies (p. 146), and can be derived from a model of probabilistic voting such as that of Coughlin, Mueller, and Murrell (1990).

We believe that this alternative interpretation of the effect of "leisure" on political power is more relevant than the straightforward "time-to-do-politics"interpretation. A number of other authors have also emphasized single-mindedness and its effect on government spending, including Peltzman (1980), Lehner and Widmaier (1983), Berry (1984), and Murrell (1984). We contribute to this discussion by suggesting why single-mindedness might be more prevalent for the old than for others and how the single-mindedness affects the design of policy.

Segregation and Reduced Costs of Political Organization

Leisure may also help an age group segregate in time and space, segregation which reduces costs of political organization. For example, a retired group can live together on the outskirts of a metropolitan area (they don't care about commuting costs) or congregate in regions such as Florida and Arizona or times of the day where leisure activities are most convenient. Pratt (1976, chapter 4) argues that areas and times for congregation of group members has been one of the strengths of the senior movement.

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[17]A corollary to our proposition that the young and old lobbies (two nonoccupational lobbies) are more powerful when their members work less is that occupational, industrial, or other job-related lobbies are more powerful when their members work *more*. Mulligan and Sala-i-Martin [1999c] derive and test this corollary.

<u>Endogenous Political Preferences</u>

A substantial number of young voters who favor social security, it would seem, is inconsistent with the model. However, the work of Becker (1996) and Becker and Murphy (1993) suggests another interpretation of the same function. l_o represents efforts - such as political advertising and moral persuasion - by some old to influence the young and other old to "favor" or "prefer" old age policies (or oppose policies for the young) while l_y represents efforts by some young to influence the old and other young to favor policies for the young (or oppose old age policies). In this sense, what we call "time to lobby" in the model should not be understood strictly as time "doing politics" (like voting, attending meetings, sending letters to senators, etc) but, instead, in a more general way as time to persuade other citizens not to oppose certain policies (time making one's children and neighbors feel sorry for oneself). And it should be the case that work is a substitute for this kind of activity.

We expect citizens to be especially vulnerable to political advertising because any one citizen has very little incentive to understand policy "correctly" because his vote and other political activity is very unlikely to effect policy.[18] Examples of such preference formation would be arguments that the elderly deserve respect or other special treatment, or that the elderly deserve transfers from the young because they too paid taxes when young.[19]

Under this interpretation, the success of the elderly in the political process will show up not only in large transfers from the young, but also in some political support on the part of the young. For example, political polls may show that a substantial fraction of the young "approve" having their wage taxed if the proceeds go to finance social security.

<u>Monopoly Capitalism</u>

There is also a neo-Marxist interpretation of the pressure function in which a group's leisure is an important determinant of its political influence. It has long been suggested that government transfers occur in order to pacify beneficiaries who are, say, upset because they do not have jobs and this argument has been applied to Social Security (eg., Piven and Cloward 1971, Olson 1982; Pampel and Williamson 1989 survey this literature on their pp. 29-34). Explaining induced retirement is a little more difficult under this interpretation, since our group-maximizing model then literally means that the old induce retirement, in order to make themselves upset, in order to get money from the government, in order that they might be happy.

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[18]This argument is developed more extensively by Becker and Mulligan (1999).

[19]We attribute this view of political advertising of "preference formation" to Gary Becker, although others such as Romer (1996) have also emphasized the role of preference formation in the political sector.

II.C. The model

II.C.1. Political Equilibrium Defined

Consider the standard overlapping generations model, with each generation represented by an "interest group" which tries to extract rents from the other group alive at the time. In order to change the political effort of each of its members, an interest group may tax its members with a labor income tax and distribute the proceeds to them in a lump sum fashion. Our version of the model can be formulated as three stages taking place during each "period":

<u>Stage 1</u> Each interest group chooses labor income tax rates for its members, taking into account the effect of taxes on the political participation and utility of its members and on decisions by interest groups representing its members in the future. Each interest group takes the actions of nonmembers and its own past actions as given.

<u>Stage 2</u> Each cohort of individuals chooses current consumption and leisure, taking current and future prices, tax rates, and subsidies as given.

<u>Stage 3</u> Given the amount of redistribution in the previous period, a period's aggregation of leisure by interest group determines the pattern of lump sum taxes and subsidies across interest groups for that period. Holding constant the behavior of interest groups at each date, transfers across groups tend to persist over time.

Promises are limited in our model of pay-as-you-go social security. In particular, the old cannot promise the young that the young will be able to tax the next generation just as heavily when they are old, although a social security program implemented today may increase the ability of the young to increase social security in future periods. This means that taxes paid by the old in their youth are a very imperfect guarantee - or perhaps no guarantee at all - that they will receive benefits; the old will receive mainly what they fight for as old people. Similarly, the old age subsidies of the currently young depend mainly on the political pressure that they will be able to apply when old. We believe that there is an important degree of realism in our assumption - it explains why, despite the alleged purposes of SS and the precise benefit formulas used, benefit formulas change over time

and ultimately benefits are only weakly related to taxes paid.[20,21] However, we recognize that some of the political rhetoric has tried to enforce such promises by suggesting that tax payments of the young are "saved" for their old age.[22] We also realize that, according to the Folk Theorem, there are many equilibria in infinite horizon games without enforceable promises, some of which are similar to those which obtain when promises are perfectly enforceable (Fudenberg and Tirole 1991, Chapter 5 and Kotlikoff et al 1988 for an application to intergenerational transfers). We do not investigate the possibility that such equilibria may exist in our model.

We allow government programs to be "persistent." Thus a social security program today will make it easier for tomorrow's old to tax tomorrow's young. On the other hand, future social security benefits are not guaranteed because enough pressure by the future young could eliminate the program or even create a transfer from old to young. The persistence of government programs has been commented on and analyzed in both popular discourse and in the academic literatures.[23] Since the unborn do not apply political pressure, it seems that all political participants would agree that more persistence of social security is better than less. Although the young cannot commit themselves to fight hard as old people and cannot prevent the unborn from fighting back after they are born, today's young and old would do what they can to build persistence into a social security program. We capture the persistence of government policy with the parameter $\rho > 0$.

We now solve the three stages of the model.

Stage 3

In stage 3, the aggregate leisure choices for each of the two living interest groups in any period, $\bar{l}_y$ and $\bar{l}_o$, determine intergroup taxes and subsidies for that period f_t according to the function $f(\bar{l}_o, \bar{l}_y)$:

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[20]The House Ways and Means Committee (1996, Section 1, page 112) reports that an average earner retiring at age 65 in 1940 recovered in five months his lifetime OASI contributions with interest. Those retiring in 1960 recovered them in two years, those in 1980 in four years, those in 1996 in 28 years. We point out that the 1996 figure assumes that benefits formulas remain fixed (a historically counterfactual assumption). We suspect that 1996 would also be overwhelming if the computations had included Medicare taxes and benefits.

[21]Mulligan (1997) reports on a group that still receives SS benefits without paying taxes and how commitments made by the Social Security Administration were repealed by later legislation.

[22]See Romer (1996) for one argument that this rhetoric is crucial for the political viability of social security. However, we suggest in section II.C that such rhetoric could be an outcome of our interest group model with unenforceable promises. See also Friedman (1963).

[23]For some academic studies, see Romer (1996) and Wilensky (1975).

$$f_t = f\left(\bar{l}_o, \bar{l}_y\right) + \rho f_{t-1} \;, \quad \rho \in [0, 1]$$

In other words, the transfers that the old will get today are the sum of what they fight for today plus what was decided in fights in the past (which is captured by the persistence term ρf_{t-1}). We assume that f has the properties introduced above. When positive, f_t is a lump sum tax for the date t young and a lump sum transfer for the date t old.

f_t is a fraction of potential GNP, which we denote $\bar{w}$. We assume that $\bar{w}$ is a homogeneous function of w_o and w_y, the labor productivities of both groups alive at the time.

Without loss of generality, the analysis can combine Stages 1 and 2. In other words, we begin by assuming that each interest group is able to dictate the actions of each of its members, and choose those actions in order to maximize member utility. We then return to the very important question of how interest groups coordinate their members' actions.

Stages 1 and 2

In stages 1 and 2, the old interest group chooses consumption $\bar{c}_o$ and leisure $\bar{l}_o$ for its members, taking as given the wealth of its members a, the activities of the currently young $\bar{l}_y$, and the effect ρf_{t-1} of past policy on current policy:

Old Group Program

$$v(\bar{w}\rho f_{t-1} + a\,;\, w_o, \bar{l}_y) \equiv \max_{\bar{c}_o, \bar{l}_o} u_o(\bar{c}_o, \bar{l}_o)$$

(1)

$$\text{s.t.} \quad \bar{c}_o = w_o(1 - \bar{l}_o) + \bar{w}\left[f\left(\bar{l}_o, \bar{l}_y\right) + \rho f_{t-1}\right] + a$$

The term $\bar{w}\left[f(\bar{l}_0, \bar{l}_y) + \rho f_{t-1}\right]$ is the lump sum transfer to the old from the young, which is the end result of the political competition. We denote consumption and leisure with bars to emphasize that it is the group making decisions for *all* of its members. We also denote the value of the old group program with the function v, because v is relevant for decisions made by the young lobbies in anticipation of the aging of their members. v depends on the legacy left by the lobby representing its members as young people, namely the assets accumulated a plus the remnants of past policy $\bar{w}\rho f_{t-1}$.

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In stages 1 and 2, the young interest group chooses consumption $\bar{c}_y$ and leisure $\bar{l}_y$ for its members, taking as given remnants of past policy $\bar{w}\rho f_{t-1}$, the activities of the currently old $\bar{l}_o$, and the activities of the future young $\bar{l}_y'$. The young lobby's program is:

<u>Young Group Program</u>

$$\max_{\bar{c}_y, \bar{l}_y, \bar{a}'} u_y(\bar{c}_y, \bar{l}_y) + \beta v(\bar{w}'\rho f_t + \bar{a}'; w_o', \bar{l}_y')$$

$$\text{s.t.} \quad \bar{c}_y + R\bar{a}' = w_y(1 - \bar{l}_y) - \bar{w}f_t \qquad (2)$$

$$f_t = f\left(\bar{l}_o, \bar{l}_y\right) + \rho f_{t-1}$$

Primes (') denote future values of the relevant variable. a' is assets the young plan to have available for consumption in their old age. The young finance consumption and savings out of their labor income, net of lump sum taxes paid to the old. We assume that borrowing and lending occurs at rate of interest r ($R \equiv (1+r)^{-1}$), and that r is independent of the policies chosen by the young and old lobbies. One interpretation of this is that the old and young populate a small open economy and the borrowing and lending occurs with agents living more than two periods (eg., Barro-dynasties). Another interpretation is that there is a storage technology paying a fixed rate of return, although this adds a constraint that storage must be nonnegative - a constraint which may or may not be binding in the equilibria we study, depending on the values of the parameters. Our Proposition 8 analyzes the case that a "borrowing constraint" is binding.

<u>Definition</u> For given $a, \bar{l}_y', w_o, w_y, w_o', f_{t-1}$, a **political equilibrium** is a vector $Y = \left(\bar{c}_o, \bar{l}_o, \bar{c}_y, \bar{l}_y, a', \bar{c}_o', \bar{l}_o'\right)$ such that:

   (a) $\bar{c}_o$ and $\bar{l}_o$ solve the program (1), given $\bar{l}_y, a, w_o, f_{t-1}$

   (b) $\bar{c}_y, \bar{l}_y, a'$ solve the program (2), given $\bar{l}_o, \bar{l}_y', w_y, w_o', f_{t-1}$

   (c) $\bar{c}_o'$ and $\bar{l}_o'$ solve the program (1), given $\bar{l}_y', a', w_o', f_t = f(\bar{l}_o, \bar{l}_y) + \rho f_{t-1}$

We assume a political equilibrium exists. For some purposes, it is useful to consider a balance growth equilibrium in which $\bar{l}_o$ and $\bar{l}_y$ are constant over time:

<u>Definition</u> For given g, β, R, ρ, a **balanced growth political equilibrium** is a vector $Z = \left(\bar{c}_o, \bar{l}_o, \bar{c}_y, \bar{l}_y, a, f_{t-1}\right)$ such that:

(a) $\quad f_{t-1} = \dfrac{f(\bar{l}_o , \bar{l}_y)}{1 - \rho}$

(b) $\quad$ For any $w > 0$, $\left(c_o, \bar{l}_o, \bar{c}_y, \bar{l}_y, a(1 + g), \bar{c}_o(1 + g), \bar{l}_o\right)$ is a political equilibrium given $a, \bar{l}_y, w, w(1 + g), w(1 + g), f_{t-1}$

Clearly a balanced growth equilibrium need not exist for any utility function. We verify its existence in a special case below.

II.C.2. Fiscal Policy Coordinating Group Activities

The old group program can be shown graphically, as it is in Figure 2. For the moment, ignore the straight solid line and the straight dotted line. The solid curve graphs the old group budget constraint (1). With leisure equal to one, the old consume only their wealth a and the social security $\bar{w}\left[f(1 , \bar{l}_y) + \rho f_{t-1}\right]$ they are able to obtain when none of their members are working. The group constraint is nonconvex because the pressure function f is either linear or strictly concave.

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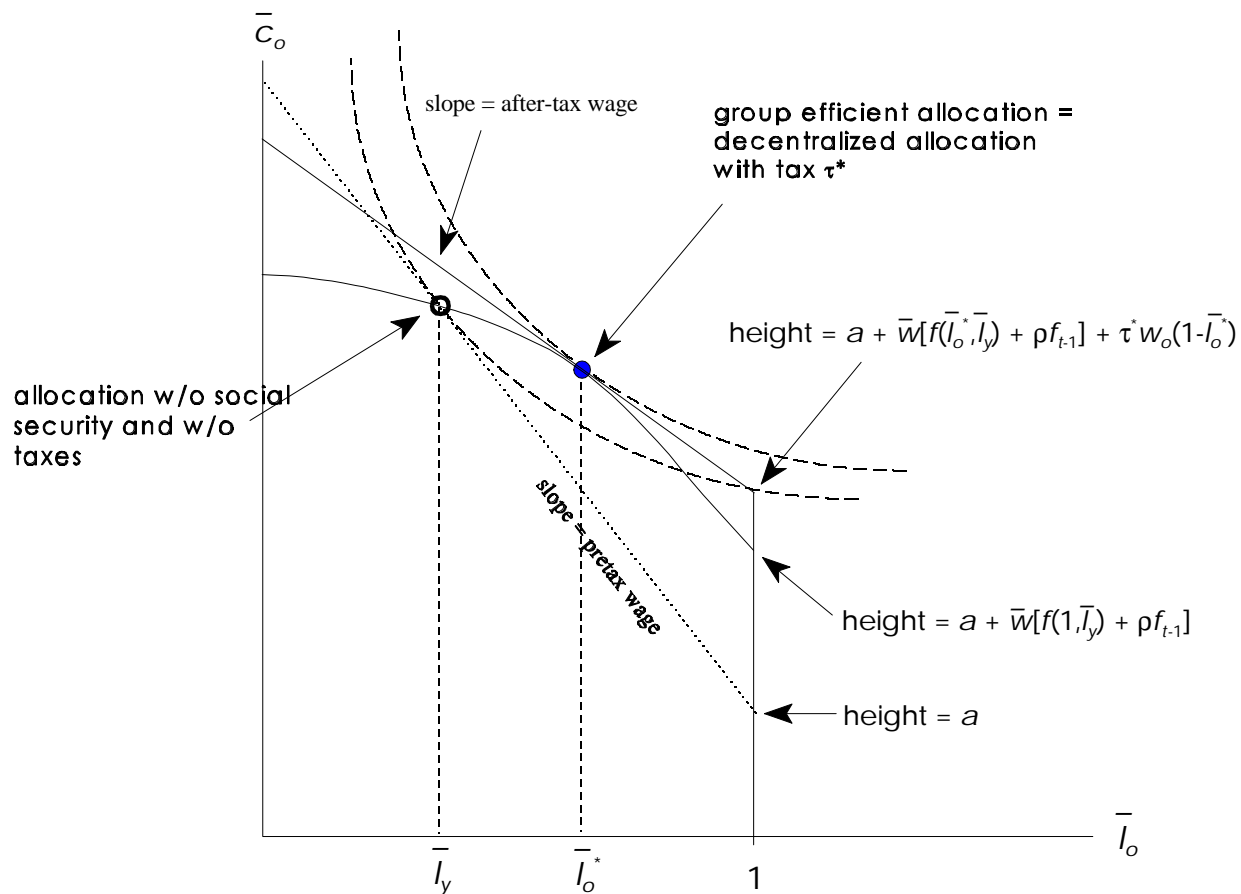
Figure 2 Old Group Consumption-Leisure Allocations

A representative old person's indifference curves are drawn as dashed curves. Assuming that the optimal group allocation is interior, it appears graphically a point of tangency between an indifference curve and the group budget constraint - see the solid dot in Figure 2. The first order condition is algebraically expressed as:

$$\frac{\partial u_o / \partial l}{\partial u_o / \partial c} = w_o - \bar{w} \frac{\partial f}{\partial l_o}$$

Now suppose that each member is free to choose how much to work. Without any distortionary labor income taxes or subsidies, the budget constraint facing an individual old person has the same form as (1), except that an individual member takes the actions of others $(\bar{l}_o, \bar{l}_y)$ as given:

$$c_o = w_o(1 - l_o) + \bar{w}\left[f\left(\bar{l}_o, \bar{l}_y\right) + \rho f_{t-1}\right] + a$$

This is shown as a dotted line in the Figure. As is very familiar from the theory of labor supply, the individual's desired labor supply (if interior) equates his marginal rate of substitution to the wage w_o. Notice that, at the group-optimal allocation, a member's marginal rate of substitution is *not* equal to his wage, and thus it is unrealistic to suppose that he would willingly accept the amount of work requested of him by the interest group - holding constant the amount worked by the other members of his group, he would prefer to work more.

However, the group-optimal allocation can be implemented in a decentralized way by levying a flat-rate tax on labor income and rebating the proceeds of the tax to its members in a lump sum fashion. Old group revenue associated with the payroll tax is $\tau_o (1 - \bar{l}_o) w_o$, where τ_o is the labor income tax rate.

When we add the within-group taxes and transfers to the cross-group taxes and transfers, an old person's budget constraint is:

$$c_o = a + \bar{w}\left[f\left(\bar{l}_o, \bar{l}_y\right) + \rho f_{t-1}\right] + (1 - \tau_o)w_o(1 - l_o) + \tau_o w_o(1 - \bar{l}_o) \qquad (3)$$

where τ_o is the rate of labor income taxation levied by the old group on its members. One such budget constraint is shown in Figure 2 as a straight solid line.

Equation (3) assumes that, given the lump sum taxes and transfers across groups, no labor taxes paid by the old are enjoyed by the young.

We have described interest groups as levying their own taxes while in fact the AARP and other interest groups do not levy labor income taxes on their members. In order to prevent members from leaving the group in order to avoid the taxes, groups may use the power of the government to enforce these taxes. Hence, it would appear that the government collects the labor income taxes and pays out the revenue, when in fact the government does so under the direction of (or with the permission of) an interest group. With the government administering cross-group and within-group taxes and transfers, it may (without loss of generality) cancel out bidirectional taxes and transfers. For example, the old may in equilibrium receive lump sum transfers from the young, pay labor income taxes to the government on behalf of its own group, and receive lump sum transfers from the government on behalf of its own group, netting out as a single subsidy from the government which is a declining function of labor income.

The optimal tax rate equates the slope of the individual's budget constraint to the slope of the group

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budget constraint at the group optimal allocation:

$$\tau_o = \frac{\bar{w}}{w_o} \frac{\partial f}{\partial l_o} > 0 \tag{4}$$

The tax rate is positive because individual members do not account for the fact that, by cutting back on their work, they help the group.

<u>Proposition 1</u>   A political equilibrium involves a positive rate of labor income taxation for the old, which may be explicit or implicit.

<u>Proof</u>   See above.

Proposition 1 is one of the important results of our model - that intergenerational political competition distorts elderly labor supply even when (as in our model) lump sum taxes are subsidies are available.

Assuming the optimal allocation is interior, the young lobby has two first order conditions: one determining the optimal mix of current activity between consumption and leisure and the other determining the optimal savings. The savings first order condition for the young lobby is:[24]

$$\frac{\partial u_y/\partial c}{\partial u_o'/\partial c} = \frac{\beta}{R} \tag{5}$$

where $\partial u_o'/\partial c$ is the marginal utility of consumption of the future old (ie, the future marginal utility of consumption of the current young).

The intratemporal condition is algebraically expressed as:

$$\frac{\partial u_y/\partial l}{\partial u_y/\partial c} = w_y + \left(1 - \rho R \frac{\bar{w}'}{\bar{w}} \right) \bar{w} \frac{\partial f}{\partial l_y} \tag{6}$$

<u>Assumption 1</u> $\rho R \frac{\bar{w}'}{\bar{w}} < 1$.

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[24]Here we utilize the envelope theorem as applied to the program (1).

If either $\rho \ll 1$ or the interest rate exceeds the rate of economic growth, then Assumption 1 is satisfied. Assumption 1 implies that the marginal rate of transformation between consumption and leisure for the young group is less than w_y.

Notice from program (2) that the young lobby has two considerations that the old lobby does not:

(i)   the effect of its choices on future policy,

(ii)   the effect of its choices on the activities of the lobby representing its members in their old age.

Effects (i) and (ii) are seen in program (2) as the terms $\bar{w}' \rho f_t$ and a', respectively, in the value function v. Accounting for (i) means that the young lobby calculates how, by fighting against SS today, an increase in $\bar{l}_y$ decreases SS in the future. This calculation appears in the first order condition (6) as the term $\rho R \bar{w}' (\partial f / \partial l_y)$. Accounting for (ii) means that the young lobby calculates how an increase in $\bar{l}_y$ decreases savings, decreases old age leisure (or, if leisure is an inferior good, increases old age leisure), and decreases the future size of the SS program. As seen in the program (1), the value function v embodies the anticipation of the young lobby that there will be a lobby representing its members in their old age and will be discouraging them from working in order to enhance group interests.

Now suppose that each young person is free to choose how much to work. Without any distortionary taxes or subsidies, the intertemporal budget constraint facing an individual young person has the same form as that implied by combining (1) and (2), except that an individual member takes the actions of others $(\bar{l}_o, \bar{l}_y, \bar{l}'_o, \bar{l}'_y)$ - and hence (f_t, f_{t+1}) - as given:

$$c_y + R c_o' = w_y (1 - l_y) - \bar{w} f_t + R \left[w_o' (1 - l_o') + \bar{w}' f_{t+1} \right]$$

As is very familiar from the theory of labor supply, the young individual's desired labor supply (if interior) equates his young intratemporal marginal rate of substitution to the wage w_y. Notice that, at the group-optimal allocation, a young member's marginal rate of substitution is *not* equal to his wage, and thus it is unrealistic to suppose that he would willingly accept the amount of work requested of him by the interest group - holding constant the amount worked by the other members of his group, he would prefer to work more.

However, the young group-optimal allocation can be implemented in a decentralized way by levying a flat-rate tax on labor income and a flat rate savings tax and rebating the proceeds of the taxes to its members in a lump sum fashion. Young group revenue associated with the payroll tax is $\tau_y (1 - \bar{l}_y) w_y$, where τ_y is the young labor income tax rate. Young group revenue associated with the savings tax is $\sigma R \bar{a}'$, where σ is the savings tax rate.

When we add the within-group taxes and transfers to the cross-group taxes and transfers, a young person's intertemporal budget constraint is:

$$c_y + (1 + \sigma)Rc_o' = (1 - \tau_y)w_y(1 - l_y) - \sigma R\bar{a}' + \tau_y w_y(1 - \bar{l}_y) - \bar{w}f_t +$$
$$(1 + \sigma)R\left[(1 - \tau_o')w_o'(1 - l_o') + \tau_o' w_o'(1 - \bar{l}_o') + \bar{w}'f_{t+1}\right]$$

We assume that, given the lump sum taxes and transfers across groups, no labor or savings taxes paid by the young are enjoyed by the old. Of course, bidirectional taxes and transfers may be canceled out. For example, the young may in equilibrium pay lump sum taxes to the old, pay labor income taxes to its own group, and receive lump sum transfers from its own group which might net out to a single labor income tax paid to the old.

The optimal young labor income tax rate equates the slope of the young individual's budget constraint to the slope of the group budget constraint at the group optimal allocation:

$$\tau_y = -\frac{\bar{w}}{w_y}\left(1 - \rho R\frac{\bar{w}'}{\bar{w}}\right)\frac{\partial f}{\partial l_y} > 0 \tag{7}$$

The tax rate is positive because individual members do not account for the fact that, by cutting back on their work, they help the group.

<u>Proposition 2</u>   If Assumption 1 holds, the political equilibrium involves a positive rate of labor income taxation for the young, which may be explicit or implicit.

<u>Proof</u>   See above.

A second important result is that intergenerational political competition discourages work by the young, even when lump sum taxes and transfers are feasible.

<u>Proposition 3</u>   A political equilibrium involves neither savings taxes nor savings subsidies.

<u>Proof</u>   *The optimal savings tax rate is zero*, because the group first order condition (5) is the same as the first order condition for a individual young person making his savings decision in the absence of savings taxes.

A third important result is that intergenerational political competition neither taxes nor subsidizes retirement savings. Propositions 1 - 3 show how our model explains the use of labor income taxes to finance intergenerational transfers even when lump sum taxes are available, the use of intergenerational subsidies that implicitly tax the labor income of the beneficiary even when lump sum subsidies are available, and why those taxes and subsidies neither (explicitly or implicitly) tax nor subsidize retirement savings.

Intuitively, there are only two ways in which young individual and group interest depart. The first is that, in the absence of young labor income taxes, a young individual works too much during youth. Here the group and individual incentives can be aligned with an optimally chosen τ_y. The second departure is that, in the absence of old labor income taxes, a young individual will plan to work too much during old age. Here the group and individual incentives can be aligned with the expectation of an optimally chosen $\tau_o{}'$. The expectation is quite rational since there will be an old lobby in the future solving a program of the form (1). Given that current and future lobbies are choosing optimal labor income tax rates, the individual and group incentives to save are the same; no savings tax or subsidy is needed.

Since the only private sources of old age income are earnings and retirement savings, taxing savings in addition to (implicitly) taxing labor income is essentially the same as means-testing old age benefits. Another interpretation of Proposition 3 is that old age benefits are not means-tested because doing so would excessively discourage old age leisure and excessively encourage leisure during youth. This is a very important prediction of our model because means-testing is advocated by much of the rhetoric about SS and inconsistent with how most countries pay old age subsidies in practice.

II.C.3. Tax Rate Comparative Statics

<u>Assumption 2</u>   The pressure function takes the linear form $f(\bar{l}_o, \bar{l}_y) = \phi\, \bar{w}\, (\bar{l}_o - \bar{l}_y)$, where $\phi < 1$ is a constant and $\bar{w}$ is a homogeneous function of w_o and w_y.

<u>Proposition 4</u>   If Assumption 2 holds, then more policy persistence ρ increases τ_o/τ_y.
<u>Proof</u>   Use the linear pressure function to evaluate (4) and (7) and divide.

<u>Proposition 5</u>   If Assumption 1-2 hold, then more economic growth (ie, higher w_y/w_o and $\bar{w}'/\bar{w}$) increases τ_o/τ_y.
<u>Proof</u>   Use the linear pressure function to evaluate (4) and (7) and divide. Use Assumption 1 if $\tau_o = 1$.

As we see from equations (4) and (7), a group's optimal tax rate decreases with its members' relative

wage (either w_o or w_y) and increases with its marginal political product (either $\partial f / \partial l_o$ or $-\partial f / \partial l_y$). τ_y also decreases with ρ. Holding constant the marginal political products, higher g or ρ thereby increases τ_o/τ_y. However, since the marginal political product is a function of l_o and l_y, it is possible that an increase in either g or ρ would change the marginal political products enough that the net effect of more g or ρ is to decrease τ_o/τ_y. Assumption 2 rules out effects of g or ρ on the marginal political products, and hence is sufficient to guarantee that the second effect does not dominate the first.

<u>Assumption 3</u> $\rho > 0$ and $w_y \geq w_o$

<u>Proposition 6</u>   If Assumptions 2 and 3 hold, then $\tau_o > \tau_y$.

<u>Proof</u>   Use the linear pressure function to evaluate (4) and (7) and divide:

$$\frac{\tau_y}{\tau_o} = \frac{w_o}{w_y}\left(1 - \rho R \frac{\bar{w}'}{\bar{w}} \right) < 1$$

Hence the persistence of policy and/or the higher value of time of the young limit τ_y - the rate at the young lobby is willing to encourage leisure by its members - to be strictly less than τ_o. Proposition 6 accords with the cross-country and historical evidence on SS - that the old are presented with less incentive to work than are the young.

Notice how the tax rates are inversely related to the pretax wage rate. Intuitively, the costs in terms of labor income of taxing (ie, discouraging work by) your own group are proportional to wages. The benefits, on the other hand, are less than proportional to own wages (you steal from people who aren't necessarily like you). So when a group decides whether it is willing to forego labor income, internalize the political activity free-rider problem, and increase social security income, it balances the costs with the benefits. At a given tax rate, the old have relatively low costs and high benefits. So the old can go to a higher tax rate to get the same marginal loss of labor income. To put it another way, the political productivity of leisure is assumed to be unrelated to labor productivity. Interest groups therefore wish to tax *work* rather than *earnings*. Since work is a smaller fraction of earnings for productive people, the group-optimal tax rate is a declining function of member labor productivity.

Since the pretax wage of the elderly is smaller than that of the young, $w_o < w_y$, the political equilibrium tax rate for the old tends to be larger ($\tau_o > \tau_y$). This in turn encourages the old to take more leisure and exert more political influence. If $\bar{l}_o > \bar{l}_y$, the outcome of the political game will be a transfer from the young to the old. In other words, the political outcome of the game can be the introduction of a social security scheme where the old will be induced to retire through more heavy labor taxes and will enjoy a transfer from the young. We prove this

result in the next section with some restrictions on the form of the utility function.

II.C.4. Gerontocracy and Retirement as an Outcome of Political Competition

There are a number of reasons why retirement (namely, $l_o' > l_y$) is consistent with a life cycle model of savings and labor supply.[25] First, it may be the case that $R w_o' < w_y$ so that work is more profitable (in present value terms) during youth. Second, it may be that $\beta > 1$ so that, even if work were equally profitable in youth and old age, people prefer to consume and take leisure at the end of their life. Third, it may be that work is more painful (or leisure more desirable) during old age. And even without retirement (ie, $l_o' \leq l_y$) it could be the case that the old work less than the young because cohorts have different lifetime wealth.

In order to focus the analysis on how time-intensive political competition might contribute a theory of retirement, we rule out these other effects with Assumption 4:

<u>Assumption 4</u>   The utility function is logarithmic and independent of age ($u_i(c, l) = \log c + \gamma \log l$), the interest rate equals the rate of time preference ($\beta = R$), wages are constant throughout the life cycle ($w_o' = w_y$), but are at least as high for later born cohorts ($w_o \leq w_y$). Wages grow at a constant rate $g \geq 0$ from cohort to cohort.

<u>Assumption 5</u>   If $x < y$, then $\frac{\partial f}{\partial x}(x,y) > \left[\frac{1}{1+g} - \rho R\right] \left|\frac{\partial f}{\partial y}(x,y)\right|$.

Assumption 5 is a weak restriction on the second derivatives of the pressure function. For example, it is satisfied when $\rho R(1+g) \doteq 1$ or when the pressure function is separable.

<u>Lemma</u>   If Assumption 4 holds, then there exists a balanced growth political equilibrium with constant leisure and a constant fraction of potential GNP transferred across generations. The leisure of old relative to young depends only on their relative tax rates which, if $l_o < 1$, can be computed according to:

$$\frac{l_o}{l_y} = \frac{1 - \tau_y}{1 - \tau_o}$$

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[25]See Weiss (1972) for a careful analysis of some of these possibilities.

<u>Proof</u>   (i) Assume $l_o = 1$. With f, τ_y, and τ_o constant over time, the same pair (l_y, l_o) solves each individual's lifetime allocation problem regardless of his year of birth. Consumption is constant over the life cycle and grows at rate g with year of birth.

        (ii) With all individuals choosing the same pair (l_y, l_o) regardless of year of birth, there exists an f_{t-1} such that f_t is constant over time.

        (iii) With all individuals choosing the same pair (l_y, l_o) regardless of year of birth, and wage growing at constant rate g with year of birth, (4) and (7) imply that τ_y and τ_o are constant over time.

        (iv) The formula for l_o/l_y follows from the consumers intertemporal first order condition and the constancy of l_o over time.

        (v) The result is trivial if $l_o = 1$, since the definition of equilibrium requires $l_y < 1$.

<u>Proposition 7</u>   If Assumptions 3-5 hold, then a balanced growth political equilibrium has gerontocracy, retirement and social security:

$$\tau_o > \tau_y \ , \quad l_y < l_o' = l_o \ , \quad f > 0$$

<u>Proof</u>   (i) Assume an interior solution for l_o and suppose $l_o < l_y$. From the Lemma and the symmetry of f, $l_o < l_y$ occurs if and only if $\tau_o < \tau_y$ and if and only if $f < 0$.

        (ii) From Assumption 5 we have $\dfrac{\partial f}{\partial l_o} > \left[\dfrac{1}{1+g} - \rho R\right]\left|\dfrac{\partial f}{\partial l_y}\right|$

        (iii) From (4) and (7) we have $\tau_o > \tau_y$, which is a contradiction.

<u>Corollary</u>   If Assumptions 3-5 hold, then economic growth g and policy persistence ρ increase balanced growth gerontocracy, retirement, and social security in the neighborhood of $g = \rho = 0$.

<u>Proof</u>   (i) If $g = \rho = 0$, then from (4) and (7) a balanced growth equilibrium must have $l_o = l_y < 1$, $\tau_o = \tau_y$, and $f = 0$ (no gerontocracy, retirement, or SS).

        (ii) Increasing ρ means that Proposition 7 applies - an increase in gerontocracy, retirement, and SS as compared to the equilibrium with $g = \rho = 0$.

        (iii) Increasing g increases τ_o but not τ_y. From the Lemma, $l_o > l_y$ and $f > 0$ - an increase in gerontocracy, retirement, and SS as compared to the equilibrium with $g = \rho = 0$.

It is interesting to note that we get this result even though the old and the young start off with equal "fundamental power". This can be seen by setting f equal to zero and noting that in this case the two groups choose to tax themselves at zero ($\tau_o=\tau_y=0$), which means that they all choose the same amount of leisure and political power ($\bar{l}_o^{/} = \bar{l}_y = \bar{l}_o = \frac{\gamma}{1+\gamma}$).

It is also interesting to notice that, according to our model, social security programs will not appear until the economy starts growing (this may explain why social security programs were not created until the very end of the XIXth century and they did not become the norm around the world until the XXth century) or government programs become persistent (which probably did not happen until the XIX and XX centuries). This can be seen by assuming $w_y=w_o{}'=w_o=w_y{}'$ and $\rho=0$ and showing that $\tau_o=\tau_y$ and $\bar{l}_o^{/} = \bar{l}_y = \bar{l}_o$. Hence, there is no social security, gerontocracy, or tax induced retirement.

In the absence of SS, Assumption 4 implies that retirement savings is zero. Whether or not savings is positive in the presence of SS depends on the economic growth rate, the form of the pressure function, and the degree of policy persistence. To the extent that tax rates are very different for young and old but the magnitude of social security benefits are small, the young save for retirement in anticipation of little labor and SS income. The other extreme case is that the tax rates are similar for young and old, there is little retirement, and the young anticipate substantial labor and SS income in their old age - the young wish to borrow against their future SS benefits.[26]

Proposition 8   If Assumptions 2-4 hold, there is a borrowing constraint $a \geq 0$, and the constraint binds, then a balanced growth political equilibrium has gerontocracy, retirement and social security:

$$\tau_o > \tau_y , \quad l_y < l_o^{/} = l_o , \quad f > 0$$

Proof   Available upon request.

Proposition 8 suggests that our model is consistent with the creation of SS in a world in which there are binding liquidity constraints (a situation which, many SS researchers think is relevant in the real world - and perhaps even a consequence of SS).

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[26]See also Feldstein (1974) for an analysis of how a SS program inducing retirement may either encourage or discourage retirement savings.

Depending on the form of the rules for induced retirement, it may be the case that induced retirement is the reason why borrowing against SS benefits is impossible! Suppose a worker were to borrow against his future SS benefits. When he reached old age, he would have a stronger incentive to work than those who did not borrow because the latter give up benefits by working. The former also gives up benefits, but that is the problem of his lender who effectively has purchased those benefits. Because allowing borrowing increases the incentive for the old to work, the old lobby would be against it unless they could had another means to discourage their members from working. Furthermore, lenders would be unwilling to lend to a worker using his SS future benefits as collateral unless that worker could also credibly give up his future rights to work.[27]

We started our analysis with the assumption that old and young are "economically" identical. We did so in order to show the economic origins of their political power. However, in the real world there may be non-economic differences between the two groups, differences which may contribute to retirement and the creation of SS. For example, it may be the case that the elderly want to retire simply because people want to enjoy leisure late in their lives (this is reflected in a high discount factor, β). This, of course, will provide additional political strength to the elderly since non-working time is one of the sources of political power in our model. And, to the extent more leisure by the old lowers their marginal political product, it will *reduce* the old group optimal tax rate.

II.D. *Extensions of the Model*
II.D.1. Goods-Intensive Pressure

Our model can be extended in various ways which, while complicating the analysis, would not change the main results. For example, we could allow groups to apply two types of pressure: time-intensive and goods-intensive. As long as the prices of goods-intensive pressure were the same for both groups and the two types of pressure were not too substitutable,[28] ρ and g would still determine which group "wins" the competition. ρ would become relatively more important because high ρ would discourage the application of both time- and goods-intensive pressure by the young whereas high w_y would mainly discourage the application of time-intensive pressure.

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[27]In countries where benefits are reduced continuously with beneficiary earnings, lenders may be willing to lend to workers using the sum of their old age earnings and benefits as collateral since the sum would not reduce with their work decision. Such an arrangement would not work in countries that withhold all benefits from any elderly person who works, even if his earnings fall short of the benefit amount.

[28]For example, if time- and goods-intensive pressure were perfect substitutes and the price of goods-intensive pressure were less than the value of time of both groups, time-intensive pressure would be irrelevant.

II.D.2. Political Competition over Tax Rates

Clearly a group is hurt by a high tax rate for the other group. We could allow each group to devote pressure to increasing its own tax rate and reducing the other group's tax rate while still devoting some pressure to the direct determination of subsidies represented by the function $f(\bar{l}_o, \bar{l}_y)$. Doing so would introduce the interesting possibility of multiple equilibria. For example, in one equilibria the young might devote enough pressure to maintaining a low tax rate for the elderly which would prevent the elderly from being as successful while in another equilibria the old might devote enough pressure to maintaining a low tax rate for the young which would further aggravate the young's disadvantage. We might also allow the young and old lobbies to bargain over tax rates and/or the amount of pressure applied which would introduce the possibility that more efficient allocations would be achieved. As we discussed in the previous section, however, we believe that some inefficiency must be modeled in order to explain the existence and form of social security in the U.S. and around the world.

II.D.3. Within-Group Heterogeneity and 100% Tax Rates

Up to here, our analysis has assumed that all the old are the same and all the young are the same. If there are differences within groups, then we need to model how a group reconciles the different policy preferences of its members. In an effort to be consistent with the kinds of decisions made when members are identical, we can think of decisions as being made by a "political entrepreneur": an individual (or small group of individuals) who enjoys the "profits" of an interest group. Profits consist of funds obtained externally from the group as the result of interest group activity net of benefits paid to its members in order to discourage them from working. The profits of the entrepreneur are then taxed by the group at a nearly 100% rate and distributed to the members in a lump sum fashion (the rate is near 100% so - to a good approximation - members get all the profits, but less than 100% so the entrepreneur has the incentive to maximize profits).

If each member's time worked could be observed by the entrepreneur, his profit-maximizing policy is to pay each member for his leisure time at a wage rate equal to the *marginal political product* of leisure time. A member's marginal political product is likely to be positively correlated with his market productivity, but as long as political productivity does not increase too rapidly with market productivity, the payment from the entrepreneur is a larger fraction of the wage for the low wage member. In other words, more is done by the interest group to encourage its low wage members to stop working.

If the entrepreneur cannot observe each member's time working and he can only observe his total earnings (the product of his work time and wage rate), then the entrepreneur's optimal policy is to pay benefits

to members as a declining function of their earnings (rather than of hours worked).[29] That function should implicitly tax low earnings at a 100% rate, and reduce the marginal benefit reduction rate with higher earnings (this is proved by Mulligan 1998a). As mentioned in Section I, benefit reductions with earnings - including 100% implicit taxation of earnings until the benefit is eliminated - are internationally and historically common policies.

When effort and productivity cannot be separately observed, benefit formulas should use proxies for elderly labor productivity if some are available. Holding constant the amount a beneficiary earns, those with higher productivity indicators should be rewarded with higher benefits because (1) they are probably the ones working the least and (2) they may be somewhat more productive in the political sector. One good proxy may be earnings prior to retirement. The use of life earnings histories as an elderly productivity indicator explains the common, but apparently puzzling (Diamond 1977, p. 279), practice of paying higher benefits to those who had higher life earnings and, in the calculation, giving earnings near to retirement as much or more weight than earnings early in life.

II.E. Why are the Elderly Politically Successful and Other Groups are Less So?

Low Labor Productivity

We assume that the labor productivity of the old (say, those aged 60+) is not larger than that of the young so $w_y^* \geq w_o^*$. Cross-sectional age-average hourly earnings do suggest somewhat lower productivity for those aged 60+ compared with the middle aged (Eg., Mulligan 1998b Figure 2). Furthermore, it should be noted that the value of time of the young may be higher than their average hourly wage because they are engaged in self-financed human capital accumulation while "at work" (see, for example, Stafford and Duncan (1985)). It is therefore preferable to compute labor productivity as earnings divided by productive hours (= hours at work net of time and effort at work spent accumulating human capital) rather than earnings divided by hours at work. A third reason the old may be less productive than age-earnings profiles suggest is because of Lazear-type (1979) long-term employment contracts. Under a Lazear-type contract, "earnings" are not just payment for labor services rendered at the time, but also a return on past investments. Kotlikoff and Gokhale (1992) use panel data on earnings, quits, and new hires for a single large firm in an attempt to infer age-productivity profiles. Their estimates of labor productivity for workers aged 60+ are significantly lower than wages and significantly lower

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[29]Imperfectly observed productivity (and hence imperfectly observed hours) is an intermediate case. We conjecture that, in this case, the entrepreneur's optimal policy is for benefits to decline with a member's current earnings but increase with the observed productivity proxies, such as past earnings. Such a policy closely mimics benefit formulas in use around the world (Sala-i-Martin 1996).

than productivity estimates for younger workers.[30]

To the extent that the elderly have lower labor productivity, our explanation of SS is related to Hirshleifer's (1991) explanation of the "paradox of power" - those who are relatively unproductive in the market sector find it profitable to devote relatively more of their time and effort to the political sector. Our important departure from Hirshleifer is to emphasize the difference between individual and group incentives and how policy might be designed to align those incentives.

Policy Persistence/Group Switching

A first reading of our model may suggest that we predict that many groups with low wages or incomes will enjoy a great deal of political success (and transfers from the other groups) since one of the key determinants of political success in our model is the wage rate of the members of the group. Before we talk about the key differences, let us mention that some of these minority groups do, indeed, get transfers from the other groups. In most OECD countries (including the United States), the poor get some transfers from the rich. However, it is clear that no group is as politically successful as the old so it is still appropriate to ask why the elderly are different.

One difference between the intergenerational conflict and a conflict between two other groups with different values of time is that intergenerational wage differences are temporary to a large degree and hence there is likely to be a positive correlation between wage and work. In other words, an old man with a low labor productivity may well have substantial lifetime wealth and thereby likely to respond to the low productivity by retiring. In contrast, someone with a permanent low wage may still work because wealth and substitution effects offset each other.

Another key distinction between the elderly and other low wage groups is most people expect to be "in the other side of the battle" in the future when it comes to the battle between the young and the old, while they do not expect to switch sides in the battle between men and women, or whites and blacks.[31] In our model, a key determinant of elderly political success was the policy persistence parameter "ρ", which represented the concern by the young for policies helping the future elderly. It was important that ρ did not affect the calculus of the old group, because they had no demand for policy which would help the future young.

For the political battles among other groups, the probability of switching sides at some point in the future

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[30]See also their p. 1216 review of related evidence.

[31]Related arguments have been applied to conflicts between old and young by Browning (1975), Pampel and Williamson (1989, p. 6), and Preston (1984, p. 446).

is not only smaller, but also more symmetric: the probability of a man becoming a woman is more or less the same as the probability of a woman becoming a man, and they are both close to zero. The probability of a black becoming white is probably the same as the probability of a white becoming black (and they are both close to zero). Our theory suggest that when this happens, the political success of the group will be a lot smaller.

The are other conflicts in which group switching is asymmetric, but the asymmetry often goes against the value of time difference and against group size considerations. For example, the employed have an advantage over the unemployed because the employed are unlikely to become unemployed while the unemployed are likely to become employed. But the employed have the higher value of time, which tend to discourage their competing politically against the unemployed. Furthermore, because the employed group has a low exit rate, it tends to be the larger group, is limited in how per member much it can extract from the unemployed and much less limited in terms of how it can subsidize each unemployed person.[32] The old are receiving more members from the young than the young receive from the old, but that does not mean the old is the larger group because the young gain members from birth while the old lose them to death.

Retirement for Other Reasons

We endogenously derive retirement and social security in a model where the old and young are identical except in their productivity and their horizons. Of course, the old and young differ and other ways - one of which may be the supply of labor at any given wage. To the extent the old desire to supply less labor, they can be political successful even if they were the same as the young in terms of productivity and horizons. With a linear pressure function, we see from Propositions 1-3 that an exogenous increase in the demand for leisure does not affect the group-optimal labor income tax rate. If the marginal political product of leisure were diminishing then, holding constant ρ and w, an exogenous increase leisure decreases the group-optimal labor income tax rate. Hence, in our model with $\rho=0$, retirement for reasons other than low productivity is consistent with transfers from young to old, but inconsistent with greater distortion of elderly labor supply. The tax rate on the labor income of the elderly might be greater of ρ were large enough and/or w_o.

Political Power for other Reasons

As we discussed above, an important reason why an interest group's political influence depends on the amount of leisure enjoyed by its members is that a group of citizens without jobs is probably more homogeneous in its political concerns than a group of citizens with jobs. Those with jobs are likely to be from different

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[32]See Becker (1983, 1985) for an analysis of the advantage of small groups.

occupations and industries, each with its own unique political concerns. An increase in the heterogeneity of workers would increase the marginal impact of leisure on policy outcomes (in our model, the derivative of the pressure function with respect to leisure) because it increases the heterogeneity of policy interests among those with jobs relative to those without jobs. To the extent the old are retiring for other reasons, such increases lead to more political power for the elderly.

Leisure also matters for policy outcomes because retirement allows the old to segregate themselves geographically and in time. A decline of the costs of segregation - perhaps because long distance travel between northern cities and the Sun Belt becomes cheaper - would both increase the power of the elderly and increase the marginal impact of leisure on policy outcomes. With a higher marginal political product of leisure for the old, optimal implicit tax rate on the old is higher.

If leisure contributes to political success only to the extent that members are healthy, then increased health among the old would also increase their marginal political product of leisure and increase their optimal implicit tax rate. One might also think that increased health among the old would increase their willingness to work in old age, although there is not much aggregate time series evidence of this (Costa 1998, pp. 82-3). If this did occur, then increased elderly health could, by decreasing elderly leisure, lead to an even higher marginal political product of leisure, a higher implicit tax rate, and less political success by the elderly.

Changes Over Time

The amount transferred from young to old and the manner in which it is transferred has changed over time. In the U.S., for example, we see from Figure 1 that the amount transferred to the old has grown dramatically over the past 45 years. Retirement - measured, say, as the labor force participation rate of those aged 65-69 (see Costa 1998) - has also increased over this period. SS incentives for retirement certainly increased over the period 1939-75 as the level of benefits increased (House Committee 1996, Table 1-14) and no changes in benefit formulas were made to provide better work incentives. The implicit tax rate on elderly labor income probably fell somewhat in the U.S. as pension benefits grew less rapidly and Delayed Retirement Credits were introduced to provide greater work incentives (Myers 1993 p. 274).[33] However, European implicit SS tax rates may have increased since 1975 (Zeitzer 1983 pp. 53, 60; Tracy 1976 p. 16).

All of the changes for the 1939-75 period can be explained by increased economic growth (so that earlier born cohorts are less productive relative to later born cohorts) or an increase in the age-related decline of labor

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[33]Medical benefits have grown rapidly since 1975, but these benefits are more loosely linked to the labor income of the beneficiary.

productivity which increase the group-optimal tax rate for the old, increased retirement, and increased the political success of the elderly. An increase in the political power of the elderly for other reasons - that increases the marginal impact of leisure on policy outcomes- can also account for the growing retirement, political success of the elderly, and implicit taxation of elderly labor incomes. Proposition 3 above shows that an increase in the "desire to postpone leisure to late stages in life" would explain both additional political success of the elderly together with declining implicit rates of taxation of elderly labor income, which perhaps characterizes the later U.S. period.

Over the past century or more, a number of the other determinants of the relative political power of the old have also changed. The industrial revolution enlarged the degree of job heterogeneity,[34] the old have become more healthy, and the costs of geographic segregation have fallen. We predict all of these changes to increase implicit tax rates and the size of SS programs.

II.F. Other Economic Characteristics of Our Approach

In addition to assuming that political competition is time intensive, our model includes four economic characteristics distinguishing it from other models in the literature, characteristics which are discussed below. These characteristics are important for generating the results, and we believe them to be realistic. Of course, the ultimate test of our model is not in its assumptions but its predictions for government policy.

No Commitment

Today's political process has a limited influence on future government policies in our model. In particular, it is feasible for future governments to completely overturn policy plans of past and current governments. This lack of commitment can be seen by our selection of the repeated static Nash equilibrium rather than our searching for and selecting more complicated policy rules that might be subgame perfect. One example of a more complicated (and less plausible?) equilibria is that considered by Browning (1975) where, if generations (all identical) expect that their policy will be permanent (even though it is feasible for future governments to reverse that policy), then it will be permanent.

The lack of commitment is also important in the analyses of "policy reforms" and how political activity

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[34]Pampel and Williamson (1989, pp. 14ff) review a literature studying the atomization of working class political interests with growing industrial and occupational heterogeneity. It should be noted that, according to our approach and the approach of that literature, the relevant measure of heterogeneity is related to the number of different industry or occupations, rather than a measure of wage or income inequality (as in the median voter models of Meltzer and Richard 1981, Tabellini 1992, and others).

responds to them. For example, it is commonly assumed (eg., Kotlikoff et al 1998, Feldstein and Samwick 1997) that a transition to an "individual accounts" or a "fully funded" system is permanent and, implicitly, that future generations will not choose to reverse the transition. Perhaps this assumption is correct, although history has seen more transitions away from fully funded systems to pay-as-you-go (eg., Chile's first system (Edwards 1998, p. 37), France, Germany (Börsch-Supan and Schnabel 1997, p. 7), Sweden's first system (Palme and Svensson 1997, p. 11)) than transitions from pay-as-you-go. There have also been more transitions from individual accounts to pay-as-you-go (eg., Seychelles and Egypt (Gruat 1990, p. 416) and St. Vincent (Haanes-Olsen 1989, p. 19), the American clergy (Mulligan 1997), and proposed reforms of some African (Gruat 1990, p. 408) and Caribbean (Jenkins 1981, p. 633) Provident Funds) than transitions from pay-as-you-go to individual accounts.[35] Hence, while there has been an extensive literature concerned with the time consistency of policy from a public interest point of view (eg., Kydland and Prescott 1977, Stokey 1991), we believe it useful to evaluate SS reforms in models where those reforms are time-consistent from a *political* point of view.

Politicians involved with the establishment of the American SS were also keenly aware of the difficulty of making sustainable policies. Henry Morgenthau, the U.S. Treasury secretary in 1935 said "We cannot safely expect future generations to continue to divert such large sums to the support of the aged unless we lighten the burden upon the future in other directions.... We desire to establish this system on such sound foundations that it can be continued indefinitely in the future" (quoted in Weaver 1982, 85). Some economists has also recognized this problem with elderly transfer programs: Pechman et al 1968 wrote "The only assurance that benefits will continue to be paid is Congressional unwillingness to repeal the program." Our contribution is to build a realistic model of intergenerational government transfers which explicitly recognizes the inability of governments to commit to long term policies.

Free-riding

Some of the interest group models of government decision making in the literature (eg., Becker 1983, Peltzman 1980) do not emphasize the free riding problem in interest group formation and the effects of free riding on the policy choice. Our model is explicit about the free-riding problem faced by an interest group and how that group might advocate distortionary policies - such as a labor income tax - in order to align their members'

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[35]Since Chile and the U.K. continue to pay their old from public funds (4% of GDP for Chile, Edwards 1998 p. 47; 4% of GDP for the U.K., Budd and Campbell 1998 pp. 102-3), it remains to be seen whether in fact either country will make a full transition to individual accounts. Indeed, Chile already appears poised to replace or supplement individual accounts with pay-as-you-go programs in the form of old age subsidies for women, the poor, and others for whom their individual accounts system is anticipated to be "inadequate."

individual interest with the group interest.

Only Economic Differences between Young and Old

Our purpose is to study the *economic* origins of gerontocracy and social security. Our models therefore assume the old and the young are identical in noneconomic ways and different in economic ways. For example, the flow of utility derived from consumption and leisure does not vary with age. Also, both groups enjoy the same political influence when both apply the same pressure. The groups differ in our model according to their planning horizon and in their labor productivity.

In reality, the old and young differ in noneconomic ways and these differences may also affect policy. For example, an important and largely noneconomic difference is the greater respect often enjoyed by the elderly, respect which might cause the old to dominate political and other sectors.[36] Of course it would be easy to show that, in a world were the old enjoy greater respect, they end up winning the political contest. However, unless the origins of this respect were explained, this would not be a satisfactory explanation of the success of the elderly. Furthermore, we believe our comparative advantage is to identify and explore the economic differences.

Abstraction from Political Details

Our interest group model, as well as those of Becker (1983, 1986), Becker and Mulligan (1998), Peltzman (1980) and others, emphasizes the economic pressures on the political system and de-emphasizes the mechanics by which those pressures generate policy outcomes. Because SS programs are and have been in countries with a variety of political systems,[37] we are suspicious that an analysis of the details of a political system could say much about the emergence and durability of SS as a public policy. Instead, we focus on the economic forces we believe to be present in almost any country regardless of the details of its political institutions. We do not believe that political pressures on public policies are something seen only in democracies, rather that organized and cohesive pressure groups are the more successful regardless of the details of the electoral process or even whether there are elections at all. As opposed to other interest group models, however, our model has time as an important input in the political competition.

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[36]Although it might be argued that "respect" is an equilibrium outcome under an "endogenous preferences" interpretation of the political competition (see also Becker (1996)).

[37]Germany's "Iron Chancellor" Otto von Bismarck introduced the first of today's SS programs in 1889. In addition to Bismarck's Germany, other examples of nondemocratic countries that created SS programs are Lenin's USSR in 1922, King Alfonso XIII's Spain in 1919, Emperor Ito's Japan in 1941, or Kuwait in 1976, and others (Sala-i-Martin 1996).

Our interest group approach is not, however, consistent with all conceivable political institutions. In particular, our model does not allow for the possibility that competing lobbies would bargain together to the point of obtaining an efficient allocation without distortionary taxes or transfers.

III. Policy Implications of our Theory:

III.A. Designing Social Security Programs with "Persistence Features"

An interesting implication of our theory of social security is that the elderly understand that the program is more likely to be successful if it is designed with some "persistence features" (features that make ρ large). The main objective of these features is to lower the degree of opposition of the young.

For example, it is easy to imagine that it will be harder to eliminate a program in the future if everyone thinks that the program "owes" to the people who have "contributed" to it. In other words, tomorrow's old will have an easier time "convincing" tomorrow's young that keeping social security is good if they can argue that the old paid a lot when they were young and that they "deserve" some money back. This may explain why most social security budgets are separate from the regular government budget and why they are financed with payroll taxes (rather than from general revenue): even though the money paid by the young has already been spent to finance the old, the fact that social security has its own budget and the fact that workers pay social security taxes separately from their other taxes strengthens the political perception that tomorrow's elderly deserve the benefits as a matter of right. Hence, tomorrow's young will have to fight a lot harder if they want to get rid of the program. An important point of our theory, however, is that tomorrow's young will still be able to eliminate social security if they fight hard enough since promises cannot be enforced intergenerationally.

Another design feature that we may be able to explain is the parallel creation of "trust funds" along with the regular transfer programs. The original Social Security Act in the United States (enacted in 1935 and amended in 1939) allows for the accumulation of a trust fund that would grow substantially over the following decades. The stated purpose of this parallel trust fund is that the interest payments would allow benefit payments to exceed revenue collected through payroll taxes. Our theory may explain the creation of such funds as a "persistence feature": the trust fund is a way to tell the young that people may still be able to collect benefits for a few more decades after the future young refuse to pay social security taxes. In other words, it is a way to introduce persistence (although imperfect because the difficulty with enforcing promises) that makes the program successful by reducing the opposition of the young.

III.B. Increased Life Expectancy and Reduction of Retirement Age

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In the theoretical model developed in the previous section, the number of elderly is fixed and the amount of time they live is constant (they live one period). In that setup, we show that a critical feature explaining the success of the elderly is the probability that members of other groups will belong to the old group in the future (this was captured by the persistence parameter, ρ). Holding constant the definition of "old" (say, people above age T), an exogenous increase in life expectancy will increase the probability that today's young eventually become old thereby increasing the probability of success of the social security program. Similarly, an exogenous reduction in the "retirement age" (and by this we mean the age in which people are eligible to collect their social security benefits) could also be viewed as a way to increase the probability that the young eventually switch groups.

III.C. Forced Savings in the OLG model may Increase Intergenerational Redistribution

Kotlikoff and Sachs (1998), Feldstein and Samwick (1997), Gramlich (1996), and others have suggested that the United States implement a "forced savings" program. It is presumed that the introduction of such a program would result in less intergenerational redistribution by the government. The question, however, is whether this assumption is consistent with the political, social, and economic forces that produced intergenerational redistribution in the first place. Our model of the economic origins of gerontocracy offers a negative answer to this question.

The forced savings proposals usually take the form of a proportion of earnings that accumulate interest and are returned to the worker in the form of, say, an annuity that pays beginning on his or her 65th birthday. Of course, such a program has no affect on the life cycle pattern of consumption and leisure when a young worker can borrow against his old age annuity at a fair rate of return. Let's assume for the sake of argument that such borrowing is not possible. Even so, the life cycle pattern of consumption and leisure is still unaffected if the worker were already saving sufficiently for retirement, because he can substitute his forced savings for his voluntary savings. So let's assume for the sake of argument that there are enough people who would not otherwise save sufficiently for retirement and who cannot borrow against old age annuities to make the forced savings programs of quantitative interest. What are the effects of such a program in our model?

As a first cut at the problem, we assume that young workers are forced to save a fixed proportion of their potential earnings w_y which exceeds what they would voluntarily save. Notice that the young and old lobbies are still active, trying to obtain government transfers from the other group. Perhaps these transfers would not be called "Social Security" in the presence of a forced savings program, but they might take the form of "supplementary pensions," "pension guarantees," "Medicare," "nursing home assistance" or some other regulation or transfer that is disproportionately enjoyed by the elderly. If leisure is a normal good, we can prove

three results:

(i)   Forced savings increases leisure by the old

(ii)   The tax rate chosen by the old lobby falls (because more leisure by the old decreases their marginal political product) or stays fixed (if pressure function is linear).

(iii)   If ρ is small enough, forced savings decreases leisure by the young and increases the transfer from old to young.

The direct steady state effect of the forced savings program on the old is to increase their wealth a, so results (i) and (ii) follow from the normality of leisure and our formula (4) for the optimal tax rate for the old lobby. For ρ small, the young lobby faces an essentially static problem much like the problem for the old. Without the ability to substitute over time (remember that borrowing and lending are ruled out to make our analysis of forced savings interesting), forced savings is just a negative wealth effect for the young which decreases l_y and affects τ_y only through the diminishing marginal political product . Hence, a forced savings program like the one described would increase (not decrease) the size of intergenerational transfers.

If we follow the proposals more closely and model the forced savings program as a tax on the actual (rather than potential) earnings of the young, then we might not be able to sign the effect on labor supply by the young and the effect on the amount transferred from young to old.[38] On the other hand, the proposed forced savings programs require that savings be held as government bonds or corporate securities which, even if workers could not sufficiently reduce their voluntary savings, might discourage *human capital* accumulation, flatten the life cycle wage profile w_o/w_y, and encourage leisure by the old relative to that of the young l_o/l_y. Thus it is likely that, when intergenerational redistribution is determined by time-intensive political competition, a forced savings program would increase the amount of intergenerational redistribution! We also conjecture that, if given the option (which they are not in our model), young lobbies would force or encourage their members to save.

Forced savings proposals typically increase young labor income tax rates and decrease (implicit) elderly labor income tax rates. Because marginal political products diminish, some changes in this direction are to be expected as the outcome of the political equilibrium (see (i)-(iii) above). If a proposal makes these changes beyond what results from diminishing marginal political products, then leisure by the old could decrease relative to that of the young, thereby decreasing the amount of intergenerational redistribution. In other words, encouraging work by the elderly is, in our model, a necessary condition for a reform to decrease the amount of

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[38]We conjecture that, in the log utility case, "wealth" and "substitution" effects of the labor income tax of the forced savings program will cancel and the labor supply of the young will be invariant to the introduction of forced savings. Since the labor supply of the old will fall (our result (i) still holds), this means that transfers from young to old will increase.

intergenerational redistribution.

IV. Determinants of SS Spending in a Cross-Section of Countries

Whenever possible (as in Table 1), our study defines "Social Security" to be government transfers to the elderly which, in the U.S., includes old age public pension payments, some disability, Medicare, some Medicaid, some Veteran's benefits, some Food Stamps and some housing assistance.[39] For now, our preliminary cross-country analysis uses the IMF's definition of "Social Security" which includes old age payments but differs from the ideal measure of "government transfers to the elderly" because it excludes medical and other subsidies for the elderly.

What determines the size of SS programs? Wagner's law suggests that the "wealth of a nation" should be an important determinant ("SS is a luxury good"). Are there other determinants? We address this question by estimating cross-country regressions, where the dependent variable in our regression analysis is total government expenditure on SS as a fraction of GDP from the IMF (various issues), averaged over the available years 1972-90. For the 90 countries for which we have GDP data, this share ranges from 0 to 0.21, with a mean of 0.044 and a s.e. of 0.015. The U.S. ranks 26th on this variable, with a value of 0.061.

Table 5 reports some cross-country regression results. Our column (1) provides a test of "Wagner's Law": log GDP per capita is positively - and statistically significantly - correlated with SS spending/GDP. The coefficient on log GDP per capita is somewhat weaker but still strongly statistically significant when continent dummies are held constant (Column (2).) Hence, it appears that SS is, indeed, a luxury good.

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[39]Another measure - the "generational accounting" of Auerbach et al (1992) - is superior in many respects, but would be very difficult to construct for many countries and many time periods.

independent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Table 5: "Determinants" of Social Security								
(Dependent variable = Social Security Expenditure/GDP, 1972-90 average)								
log(GDP$_{70}$ per capita)	0.038	0.027	0.024	0.002	0.005	0.005	0.006	0.006
	(0.004)	(0.006)	(0.006)	(0.005)	(0.006)	(0.009)	(0.008)	(0.008)
1970 fraction elderly				0.971	0.961	0.985	1.024	0.918
				(0.093)	(0.150)	(0.222)	(0.214)	(0.213)
SS mandatory retirement 1995							0.023	0.025
							(0.010)	(0.010)
firm's share of payroll tax 1995								-0.047
								(0.023)
continent dummies	no	yes	yes	no	yes	yes	yes	yes
N	90	90	79	79	79	55	55	55
se	.041	.035	.032	.026	.026	.028	.027	.026
$\overline{R}^2$	0.48	0.62	0.69	0.79	0.80	0.79	0.81	0.82

Notes: (1) For some countries, 1972-90 averages exclude years with missing data

(2) GDP per capita is measured in 1985 $ and is from the Penn World Tables

(3) "fraction elderly" is fraction of population aged 60+ from United Nations (1990)

(4) "SS mandatory retirement" from Social Security Administration (1995) and as defined by Sala-i-Martin (1996).

(5) "firm's share of payroll tax" from Social Security Administration (1995)

(6) a constant and (dummy=1 for a country not reporting separate social sec. and welfare expenditures) are included in each regression

However, the picture changes substantially when demographic measures are included in the regression. For example, in Columns (4) and (5) we include the share of those aged 60+ in the population in 1970, with Column (3) reproducing the previous result on the same sample of 79 countries. In the 79 country sample for which we have GDP and SS expenditure data, the population share of the elderly ranges from 0.037 to 0.201. As mentioned above, from a "social planner's" point of view, one would expect the fraction of GDP devoted to government programs for the elderly to increase less than one-for-one. However, we see in columns (4) and (5) that SS programs increase almost exactly one-for-one with the elderly population. Furthermore, GDP per capita has no explanatory power. From the "social planner's" point of view it appears that the elderly - not government spending - are a luxury good and that benefits per elderly are independent of the number of elderly to be paid.

In the first section we showed that there were very important regularities in the design of the various SS programs. We construct two indices of the design of SS from the *Social Security Programs Throughout the*

World (which we describe in Section I). The first index measures whether *retirement is mandatory for the receipt of SS.* Retirement incentives, we argue, are crucial for the political success of SS. 74 of 94 countries mandate retirement for SS beneficiaries, 37 of which appear in our 55 country sample for which we have data on our other independent variables.

Columns (6), (7), and (8) introduce our indices of SS design, with column (6) reproducing the previous result on the same sample of 55 countries. Column (7) suggests that, holding constant GDP per capita, and the fraction of the population aged 60+, countries that make retirement a prerequisite of collecting SS benefits spend 2% more of GDP on those benefits. For some points of view, this result is very surprising - *restricted eligibility for the program is associated with a bigger program!* But this result is consistent with our view that *retirement* is an important source of the political power of the elderly.

Although the economics textbook analysis emphasizes the neutrality of the division of a payroll tax between "employer" and "employee", there are reasons to believe that the division does matter. On one hand, it has been claimed (eg., Misiolek and Elder (1988), Pommerehne and Schneider (1978), or Wagner (1976)) that voters are less likely to oppose a "less visible" tax such as the "employer" portion of the payroll tax.[40] According to this claim, taxing employers promotes the political success of a program financed with that tax. On the other hand, the "employer" portion of the payroll tax can interact with minimum wage regulations, with a *ceteris paribus* shift of the payroll tax from employer to employee easing the minimum wage constraint. Thus we expect some firms to oppose the expansion of SS when it is financed with an "employer" payroll tax. To the extent that firms have an influence on policy decisions, a SS program financed with "employer" payroll taxes may have trouble expanding.

To check this possibility, the second index related to the *design* of SS programs measures the *share of the payroll tax rate "paid by" firms.* We construct this variable as the ratio of the employer tax rate to the sum of the "employer" and "employee" payroll tax rates. This variable ranges from 0 to 1 in our 55 country sample, with a mean of 0.60 and a value of 0.50 for the U.S. Column (8) adds this variable to the regression. We find that its estimated coefficient is negative and significant. This result seems inconsistent with the view that a tax less visible to voters is a tax likely to be politically successful. Those countries who tax the employer relatively heavily tend to have smaller SS programs.

Results (not reported in the Table) are very similar when we predict SS per elderly person, as a fraction of GDP. Our two design variables - mandatory retirement and the employer's share of taxes - explain over half

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[40]Although this claim supposes some "irrationality" on the part of voters, a particular voter has very little incentive to understand the economics of most tax policies because the his or her vote almost surely has no affect on policy.

the cross-country variation.

The main lessons of Table 5 are: (1) SS is larger than would be predicted by simple demographics, (2) countries with mandatory retirement tend to have larger SS programs, and (3) the exact "design" of a SS program and its financing is likely to affect its final size.

Of course these are only preliminary results and we plan to extend them in various directions: In Table 5 we measure our dependent variable over the period 1972-90, but our program design variables only pertain to 1995. We will expand our *design data set* (described in the previous section) in the time series dimension back to 1967 and we will merge it with the cross-country data set. Doing so will help us understand some directions of causality as we will be able to see how changes in SS program design lead or lag changes in the size of the program. Other measures of program design to be included are: the degree of progressivity or regressivity of SS taxes, the degree of progressivity or regressivity of benefit formulas, and the program retirement ages for men and women.

We have only begun to an analyze directions of *causality* - whether large programs need to designed differently or whether design affects the size of the program. But Becker and Mulligan (1998) have analyzed this issue and show how, rather than using leads and lags, defense spending can be used as an "exogenous" determinant of the size of government programs.

V. Summary

We introduce a very simple model of time-intensive political competition. Despite its simplicity, it explains a number of "facts":

      i.   the young pay the old; the system redistributes across cohorts

      ii.   old age benefits increase with earnings when young

      iii.   social security benefits tax work by the elderly

      iv.   old age benefits are a nonlinear function of old age earnings

      v.   social security taxes are payroll taxes

      vi.   social security/GDP is positively correlated with economic growth

      vii.   social security/GDP is positively correlated with social security retirement incentives

      viii.   social security is not means-tested

      ix.   social security grows with industrial and occupation diversity

x.   implicit elderly tax rates grow with industrial and occupation diversity

xi.   social security grows with decreased costs of geographic segregation

xii.   implicit elderly tax rates grow with decreased costs of geographic segregation

xiii.   the old are politically active, time-intensively

xiv.   the old are more single-minded in their political activities

xv.   holding constant economic performance, democracies and nondemocracies do not have different social security programs

xvi.   other groups also receive transfers

xvii.   other subsidized groups are less successful than the elderly

xviii. social security is administered and financed by the government

xix.   social security can be "too generous," allowing the old to enjoy as much or more consumption and leisure than do the young

xx.   social security has its "own budget"; taxes paid as young create a feeling of entitlement

xxi.   fully funded and/or individual accounts systems often do not last

We report and cite a number of empirical results that begin to establish these facts, although more empirical research is needed to further describe the nature of public sector intergenerational transfers in the U.S. and abroad. In addition to explaining some of the international history of social security, we offer predictions for the effects of some proposed social security "reforms."

Although we sometimes exposit our model as if the old were literally engaged in a time-intensive battle with the young, we offer a number of other interpretations of our mathematical model. In particular, we argue that less work may be related to more political power if we interpret the lack of work as a measure of political single-mindness. Our model does not explicitly incorporate group size, although it seems clear that our approach can do so and make predictions for the effects of changes in group size on other variables or the effects of other variables on group size.

To the extent we take the time-intensive battle literally, a relevant empirical question is whether the old are more politically active. Answering this question is beyond the scope of this paper, but there is a large political science literature attempting to do so. Active political participation by the elderly was seen in the Townsend Clubs of the 1930's, 1940's, and 1950's (Holtzman 1963). Those Americans aged 60+ are somewhat more likely to vote that those aged less than 60 (Verba and Nie 1972), even though many political scientists used to believe that political participation was lowest at older ages (Jennings and Markus 1988). Although not a political scientist, Preston (1984, p. 447) has claimed that political participation among adults with young children is quite

low.

In order to endogenously derive the use of distortionary labor income taxes, we have assumed that lump sum taxes are available. In fact, all revenue must be obtained from distortionary taxes. Eliminating lump sum taxes entirely from our model is something we leave to future research, and believe that doing so would deliver additional implications such as those derived by Becker (1983, 1985), and Becker and Mulligan (1998).

Noneconomists sometimes believe that there are a fixed number of jobs in the economy and that encouraging retirement is efficiency enhancing because unemployed young are able to find jobs while the old enjoy a leisurely retirement (see Townsend 1943, pp. 189-92 for one of many examples). Economists usually consider such beliefs to be nonsense, but our model explains why this nonsense is so much more successful than other nonsensical theories. In our model, public pensions inducing retirement are inefficient from an aggregate point of view. If such a policy were, say, introduced because policymakers mistakenly think it to be efficient, it would not be outcompeted by more efficient policies as in Becker (1983) and Wittman (1995), but would instead reinforce the political power of those benefitting. Hence, the "economic nonsense" could lead to a large and persistently inefficient public pension program. The causality could also be in reverse, with retirement and other sources of growth of elderly political power leading to attempts by the elderly to convince or "trick" the young into believing the economic nonsense that old age pensions benefit people of all ages. Using the pressure function *f*, our mathematical model includes the possibility that political activity by the elderly leads to economic nonsense.

There are number of other positive theories of social security (eg., Diamond and Mirrlees 1978, Laitner 1989, Sala-i-Martin 1996, Tabellini 1992). Carefully deriving implications of these theories and comparing them to the predictions of our model is attempted by Mulligan and Sala-i-Martin (1999a and b), and beyond the scope of this paper. But Mulligan and Sala-i-Martin show that no single theory in the literature can explain the heavy implicit taxation of elderly labor income together with the lack of means-testing. Our purpose here is to demonstrate how our model explains these and other important facts.

Although our model is consistent with the heavy nonlinear taxation of labor incomes, it does not necessarily imply that mandatory retirement ought to be favored by the old. First, it does not make sense for the elderly to force retirement on an old person whose net private surplus from work exceeds his marginal political product. Second, our model shows that there is an optimal amount of leisure from the group's point of view and exceeding that optimum can be as undesirable as falling short of it. Third, even if leisure were less than the optimum displayed in Figure 2, an increase in leisure only makes sense if the amount transferred from young to old is allowed to endogenously respond; the old are not interested in a policy proposing to increase their leisure while holding fixed (or even cutting) the amount paid by the young.

The reader may wonder whether a person would tolerate a tax on his work in order to increase the

political power of his pressure group. In fact, there are other instances of this type of behavior. Mancur Olson (1971), for example, points out that a union member does not like to attend his union meetings (he has other things that he would like to do with this time) but that same union member favors union rules encouraging attendance at meetings. And those rules are often of the form of a fine for those not attending meeting - in other words, a tax on uses of time hurting the group's collective interest. It has puzzled some observers that a union member simultaneously dislikes attendance but favors rules encouraging attendance by fellow members (see, for example, the study cited by Olson, p. 89-90) but, according to the economic approach to group behavior, these union rules and the social security rules we have emphasized are quite understandable.

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