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The Graying of the Median Voter

Aging and the Politics of the Welfare State in OECD Countries

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The graying of the median voter

Aging and the politics of the welfare state in OECD countries

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Abstract

Analyzing 30 OECD-countries in 1980-2005, this paper documents the effect of an aging electorate on retirement spending. The first outcome is that an increase in the age of the median voter is not significantly associated with an increase in retirement spending relative to GDP. The second outcome is that a higher age of the median voter leads to lower benefits per retiree. These results do not change when health care costs are considered instead of retirement spending. Health care costs –both relative to GDP and per inhabitant– are not significantly influenced by the age of the median voter. An alternative specification with the dependency ratio as the operationalization of aging, shows a positive and significant effect of aging on retirement spending. A positive effect on the generosity of pensions is also not present in this case. These results contradict the main prediction of median voter models that an older median voter successfully pushes for higher individual benefits.

JEL classification: C23; H55; J18

Key words: aging; retirement; political economy

I. Introduction

Aging has called the sustainability of public finance into question (Castles [2004]). This has become more pressing with deficits of most countries ballooning after nationalization of private bank debts. There are two different and distinct ways in which aging may positively influence retirement spending.

The first effect is that there are more retirees on the receiving end of Social Security. As a result, aging naturally leads to higher total retirement benefits relative to GDP. This upward effect of aging on pension expenditures relative to GDP could only be counterbalanced by a considerable decrease of benefits per retiree.

A second effect of aging is that there are more older voters; retirees thus have more political clout. Median voter models argue that this effect is focal and predict that an older median voter successfully pushes for increasing generosity of pensions, see Galasso [2006] and Persson and Tabellini [2000]. In this view, aging will not only lead to higher spending relative to GDP but also relative to the number of retirees. This would lead to a substantial and arguably unsustainable increase in pension expenditure.

This paper assesses the empirical support for both propositions using OECD data from 30 countries between 1980 and 2005. We evaluate the demographic impact on retirement spending relative to GDP and relative to the number of retirees. Additionally the association of aging and health care costs is considered. Frequently aging is assumed to be positively associated with health care costs as well, as elderly need health care relatively more than younger people do.

Only public spending is taken into account here, disregarding savings via pension funds, insurance companies and banks. We are solely interested in the presence or absence of political pressure to increase pensions that is theorized to arise from an older electorate. As governments can influence public spending directly, public pension spending should be first and foremost affected if such political pressure exists. Demographic composition of the electorate is operationalized by the median age of the

population, while robustness checks are carried out for the dependency ratio as an alternative operationalization.

We find some though not conclusive empirical support for the proposition that aging leads to more public spending as a share of GDP. In the baseline regression an increase of the median age does not lead to an increase in public spending as a share of GDP. In several alternative specifications there is however a positive and significant association. Aging has a positive effect when time effects are discarded or when aging is operationalized with the dependency ratio instead of the age of the median voter.

We do not find any support for the stronger claim made by median voter models. In fact we find the exact opposite: aging influences the generosity of individual benefits negatively and significantly in the baseline regression. In some alternative specifications the effect is insignificant and still negative.

The impact of an older median voter on health care costs is comparable to the effect on retirement spending. Generally no significant effect of aging is found. All estimates result from a fixed effect model controlling for several economic and political covariates, including unemployment, GDP per capita, union density, the interest rate and type of government.

Together this suggests that the median voter approach to Social Security is inappropriate. Two approaches are more in line with rising total spending yet decreasing generosity. Gonzales-Eiras and Niepelt [2007] propose a probability voting model. In such models, politicians choose the policy that maximizes the weighted utility of all voters where the weights are determined by the degree to which voters can be swayed by policies. The outcome is that aging leads to higher contributions and lower benefits.

The same conclusion is reached by Breyer and Stolte [2001] who analyze a two-period OLG-model in which the retirees hold all political power and set contributions. The workers can react to contributions by adjusting their labor supply. This prevents the elderly setting a contribution level of 100%. The effect of aging in this set-up is burden sharing by simultaneously increasing contributions and decreasing benefits. This chapter

cannot discriminate between the probability voting approach and the endogenous labour supply set-up.

Several earlier papers investigated the relationship between aging and retirement spending. Breyer and Craig [1997] use OECD-data for 20 countries in 1960-1990 with 10-year intervals and find that benefits as a fraction of GDP are positively and significantly related to the median voter age. Depending on the specification, an increase of one year of the latter increases spending relative to GDP by 0.4-0.6 percentage points. The median age is positively but not significantly related to benefits per pensioner. Tepe and Vanhuysse [2010] reach the same conclusions based on 18 countries between 1980 and 2000 using eight-year intervals. They operationalize aging with the dependency ratio instead of the age of the median voter. Here both are considered. A controversial claim is made by Razin, Sadka and Swagel [2002] who state that a higher dependency ratio is associated with lower pension contributions. This has been challenged by Disney [2007] and Sanz and Velazquez [2007] who criticize both the (static) model specification and the operationalization of aging and Social Security (which also includes unemployment benefits).

Shelton [2008] re-estimates the model of Razin et al.. Most important change in this context is that he uses the number of people over 64 divided by the number of people between 15-64 as the dependency ratio. In one specification a higher dependency ratio has a positive and significant effect on per capita transfers while the dependency ratio is insignificant in a more elaborated model. The difference between Shelton and this study is first that the latter considers benefits per retiree as the dependent variable (instead of transfers per capita). The second difference is that Shelton does not include time effects, political control variables (union density and government features) and the interest rate while the model here does not include openness of the economy (a variable that Shelton includes).

Mulligan, Gil and Sala-i-Martin [2002] have a somewhat different approach. They show that democracies do not spend more on Social Security than undemocratic

countries. They conclude that for Social Security "much more important are economic and demographic variables, such as the aging of the population and economic growth."

Our contribution to this literature is twofold. First, we incorporate more recent data and consider relevant regressors not used earlier. We also use more observations than is common in the literature. This paper has a minimum of 109 observations whereas Breyer and Craig and Tepe and Vanhuysse have a maximum of 76 and 54 observations respectively. This elaborated, respecified and updated approach generally confirms earlier findings, thereby strengthening these previous conclusions. This is all the more relevant because aging is a relatively recent phenomenon that by its nature increases gradually over time. Our data thus include observations with a median age larger than present in earlier studies.

The second and novel contribution is that we also evaluate health care costs. Health care costs are not incorporated in the mentioned literature but are often argued to be related to aging as well. Older voters are arguably as much interested in higher heath care spending as in higher retirement benefits. A full analysis considers both factors, as Tepe and Vanhuysse state: "Recent studies indicate that elderly voters actually care less about the real value of their pensions than about health issues. Future research could therefore usefully analyze the effects of population aging on health care spending." We do exactly that.

The rest of the paper is organized as follows. The next section discusses the political-economic literature on Social Security and in particular the predicted effect of aging on contributions and benefits. The third section discusses the data and the model. The fourth section shows the results whereas the fifth section considers several extensions and robustness analyses.

II. Theoretical background and related literature

There is a well-developed and substantial literature on the political economy of Social Security, see Galasso [2002] and Breyer [1994] for still up-to-date and relevant overviews. We are here only interested in the theorized influence of aging on contributions and benefits. An important and dominant approach in the literature uses the median voter concept as the central analytical framework, see Browning [1975], Persson and Tabellini [2000], Galasso [2006], Conesa and Krueger [1999] and Cooley and Soares [1999].

In median voter models aging has two opposing effects on the preferences of the decisive median voter. A first economic effect is that the rate of return of a Pay-as-you-go system decreases, as the ratio between workers and retirees decreases. This will make a PAYG-system less attractive for all voters, including the median voter. A second political effect is that the median voter will be older. He or she will thus be more and more inclined to support more generous pension benefits. If elections take place once and the result remains in place forever after, this political effect outweighs the economic effect and an older median voter leads to higher benefits per retiree. This is the approach of Browning [1975] and Persson and Tabellini [2000]. In this setting an older median voter successfully pushes for higher benefits and demographics is the main driving force for pension spending. The crucial implication of median voter models is that benefits will be more generous. Persson and Tabellini state “A social planner, for example, would also spend more on pensions with a larger number of elderly people. The model really predicts that pensions per retiree will be higher, the higher the weight on old voters (..), as this shifts the median-voter equilibrium toward a more generous pension system.”

This result hinges on the stringent assumption that elections take place once and the outcome is binding forever after. This assumption is clearly counter-factual as policies change over time.

Alternatively, Conesa and Krueger [1999] and Cooley and Soares [1999] understand PAYG arrangements as an intergenerational game where elections take place each period, see also Sjoblom [1985]. In this case multiple equilibria arise. If voters expect that their own contribution does not influence future contributions made to them, an equilibrium with zero contributions results. If no generation contributes, it is best to do likewise. Positive transfers can be supported by the threat of future generations withholding future contributions in case current working generations do not contribute to current retirees. Then, current contributions do influence future benefits. Generations then contribute to retirees because this results in future generations contributing to them. In this approach, each generation takes into account the behavior of previous generations in a reaction function. This reaction function gives the current contribution as a function of contributions of previous generations and it can be interpreted as a social contract between generations (Sjoblom [1985], Boldrin and Rustichini [2000]). Any transfer scheme that outperforms the default option of zero contributions and zero benefits can result as a subgame perfect equilibrium.

The effect of aging is not clear a priori as multiple equilibria are possible. However, if an effect is predicted, the aforementioned median voter reasoning is applied with an older median voter leading to increased pension contributions and benefits. Galasso [2006] for example predicts a dramatic increase in pension spending: Spain will increase its spending on Social Security from 21.3% of wages to 45.5% in 2050 and the UK from 14.5% to 33.2%.

An alternative prediction than higher benefits per retiree is that aging increases contributions but decreases benefits. The ‘burden of aging’ is shared between working and retired generations. This is the main outcome of an alternative model of Breyer and Stolte [2001]. They postulate that (near) retired generations form a majority, holding all political power. This does not lead to contributions of 100% because young generations respond to taxation by adjusting labor supply. The older generations effectively maximize a Laffer curve that gives total tax revenues as a function of the tax rate. Breyer

and Stolte predict that aging leads to both higher contributions and lower individual benefits. This prediction of higher contributions but lower benefits also results in probability voting models. In these models the incumbent party maximizes political support by maximizing the sum of utility of different cohorts, weighing utility proportional to cohort-size, see Gonzales-Eiras and Niepelt (2007). Probability voting models thereby take the position that larger cohorts have more influence but that minorities are not politically powerless. It also allows for the possibility that pension policy is not the only factor that voters consider in their voting decision.

Yet another view is given by Boldrin and Rustichini [2000] who propose that aging leads to the break-down of social security altogether. Aging makes PAYG less and less attractive and at one point working generations stop contributing to social security. Key in their two-period OLG-model is that this moment of break-down is uncertain because future demographic developments are uncertain. Each generation has the choice to continue social security, facing ex ante a positive probability but not the certainty the next generation will do the same. The last contributing generation will lose ex post, because older generations are not compensated. In this approach aging leads to a certain breakdown of social security at an uncertain moment. As no Social Security system has been totally dismantled in an OECD-country, this prediction cannot be confirmed though it cannot be ruled out that this lies ahead.

III. Data and econometric model

All data are retrieved from publicly available sources of the OECD, the Worldbank and the Comparative Political Data Set.[1] Table 1 provides descriptive statistics.

Table 1.

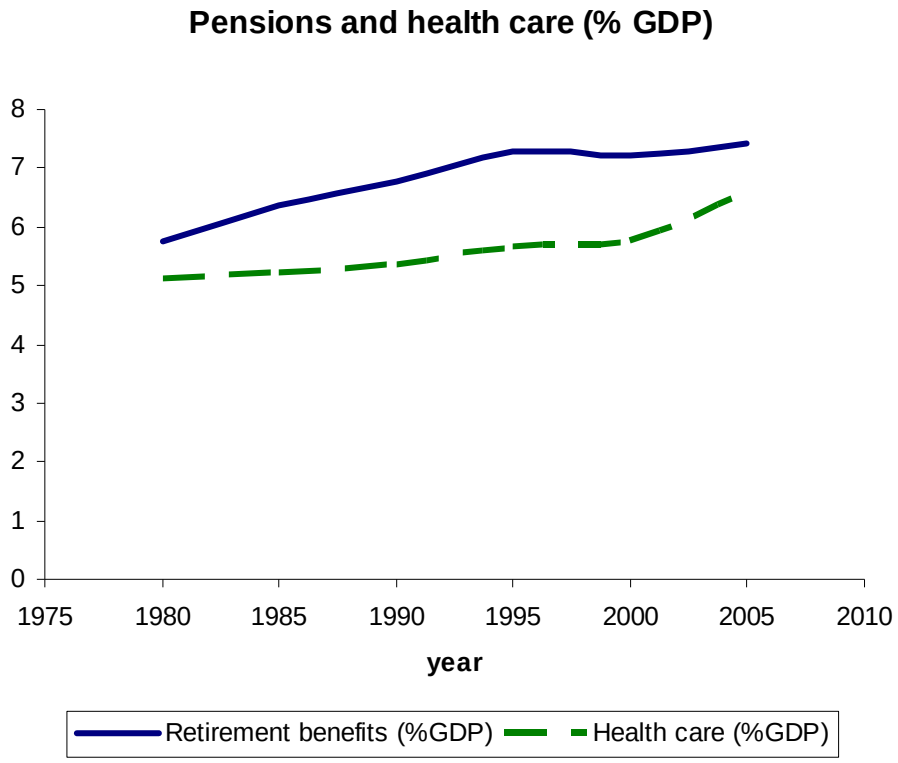
	Mean	Standard deviation	Minimum	Maximum
Retirement spending / GDP	6.23	2.74	0.1	12.60
Benefit / retiree	10020.84	4808.92	312.20	26221.99
Health / GDP	5.57	1.07	3.13	8.24
Health / inhabitant	1350.38	536.06	308.57	4186.19
Median age	34.20	4.89	17.43	43.10
Dependency	21.81	5.38	7.58	32.55
Unemployment	6.72	3.78	0.18	18.76
GDP per capita	21310.02	8401.05	4865.44	59888.22
Union density	39.99	20.62	8.01	86.62
Interest rate	8.72	4.45	1.35	29.03
Government ideology	2.48	1.55	1	5
Minority government	0.16	0.37	0	1
Single party government	0.29	0.46	0	1

The median age of the electorate is proxied by the median age of the whole population, as reported by the Worldbank. The latter does not coincide with the median age of the electorate that is the crucial factor in many theoretical models. This data limitation need not be restrictive as both median ages are driven by the same two factors, namely fertility rates and mortality rates. A second consideration is that the age of the median voter of the electorate does not coincide with the median age of actual voters in any case, since not everybody votes (and older voters tend to do so more).

In total four different dependent variables are considered. The first measure of retirement spending is total spending on retirements relative to GDP. This ranges between 0.1% and 12.1%. The following graph gives the average retirement spending

[1] www.oecd.org, www.worldbank.nl and Armingeon, Engler, Potolidis, Gerber and P. Leimgruber [2010]

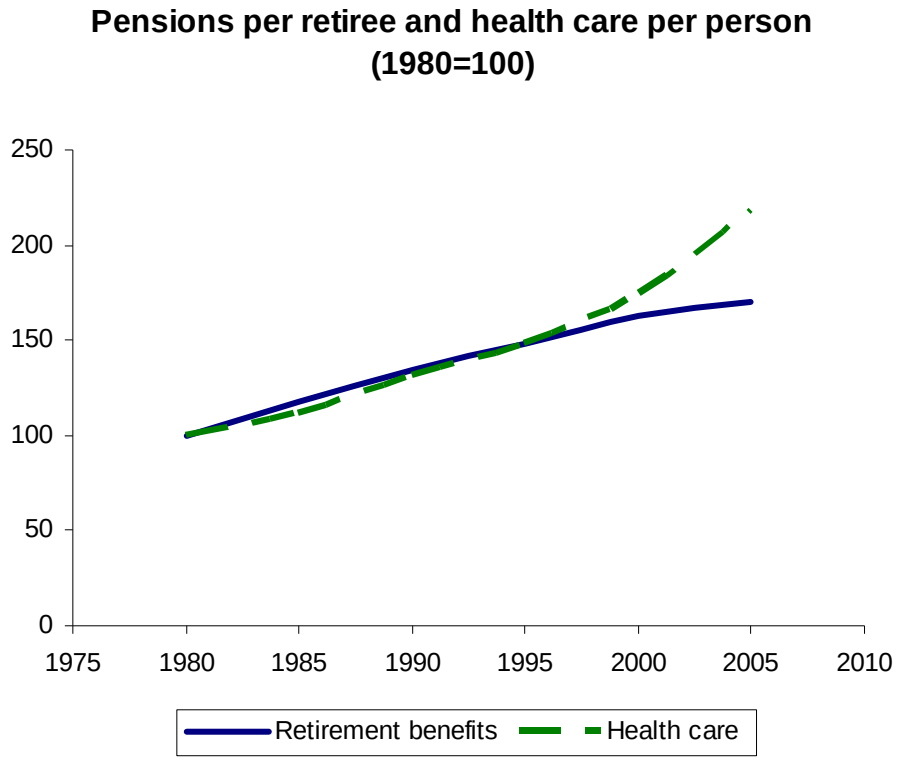
relative to GDP for those 21 countries for which this figure is available in each year.[2] The graph also gives health care spending as a share of GDP for the same countries.



A second measure is benefits per retiree. This figure is derived by dividing total spending by the number of people older than 64. This is an approximation as it does not take differences in the retirement-age into account. The exact number of retirees in countries is however unavailable. The number of people over 64 is the best approximation available but it is a data limitation all the same. This indicator is also used in other studies on the effects of aging. The next graph provides the development of individual benefits for the same 21 countries for which these numbers are available

[2] The 30 countries are Australia*, Austria*, Belgium*, Canada*, Czech Republic, Denmark*, Finland*, France*, Germany*, Greece*, Hungary, Ireland, Iceland*, Italy*, Japan*, Korea, Luxembourg*, Mexico, Netherlands*, New Zealand*, Norway*, Poland, Portugal, Slovak Republic, Spain*, Sweden*, Switzerland*, Turkey, United Kingdom*, United States*. For the 21 countries denoted * data are available for the entire period.

each year; 1980 is the baseline year, indexed 100. It also gives the development of health care costs per inhabitant.



The third variable is health care costs relative to GDP, while the fourth dependent variable is health care costs per inhabitant. Health care costs per retiree are not separately available and can thus not be considered. Meara et al. (2004) find for the USA that per person spending developed differently over time. In 193-1987 spending per person increased relatively faster for persons over 64 years; in 1987-2000 the costs for this age group relatively declined compared with the age group of 35-44 years. For other countries cohort-specific health care spending is not available. The resulting limitation of using health care costs per inhabitant is acknowledged. However this need be not problematic as health care spending is difficult to target at a specific group. If retirees successfully plea for higher healthcare spending, this will thus lead to more

health care available for all voters alike. Whether other age groups make use of increased health care possibilities is another issue.

The regressors can be grouped in economic and political control variables. Unemployment and the interest rate are economic control variables indicating the economic and financial circumstances of a country respectively. High unemployment arguably decreases the scope for social security while a high interest rate hinders debt-financing of retirement expenditure. The effect of GDP per capita is less straightforward. If pensions are indexed to GDP, GDP does not affect retirement spending relative to GDP. If this is not the case and benefits increase less than GDP, higher GDP is associated with lower retirement spending as a share of GDP. There may also be a political effect, when higher GDP makes it politically easier to redistribute; this would lead to higher pensions.

Political factors other than the age of the median voter are potentially important. The first factor considered is union density, ranging from 8% to 86%. A strong union may successfully press for higher benefits for their (former) members. A government of left-wing signature may likewise lead to higher benefits. The ideological signature of the government is indicated by the proportion of the government that is made up of left-wing parties. There were 59 governments that were exclusively made up of right-wing parties whereas 26 governments consisted solely of left-wing parties. We further include dummy variables for two relevant features of government composition. A first dummy indicates whether the government consists of a single party. Such a government may be either more effective in pushing through its own agenda or may shy away from policy changes as blame cannot be shared with other parties. A second dummy indicates whether the government is a minority government or not. A government without a majority in the parliament is arguably less effective in pushing through its own preferred policy. Finally, time effects are considered by a dummy for each time period where the first time period (the year 1980) is the reference category.

The period 1980-2005 is chosen solely for practical considerations of data availability. Five-year intervals are considered instead of one year intervals; the reason being that pension reforms need time to be developed, discussed and implemented and reforms are thus not implemented yearly. A five-year period is chosen because that covers a political cycle in which one (or more) reform(s) can take place. There is also a practical reason to dismiss one year intervals. The median age hardly changes one year from the other and estimation results would therefore not be robust.

The econometric model used is a panel data model with fixed effects, and the coefficients are estimated with the within-estimator. Pooled regression leads to an inconsistent estimator whenever time-unvarying country-specific effects (like habit formation, geography, culture, path-dependent policies) correlate with covariates. Exactly the same holds for the random effects model. For non-experimental data fixed effects are thus more reasonable that the random effects. If the crucial assumption that fixed effects are uncorrelated with all regressors does hold, the fixed-effect estimator used here is still unbiased and consistent, but less efficient than the random effects estimator.

Sanz and Velazquez [2007] consider a dynamic model with a lagged endogenous variable as one of the covariates. We use a static approach instead; lagged values of the median age are already considered below and there is no theoretical reason to assume that reforms take more than a period of five years to react to demographic changes.

A more pragmatic motivation is that with a dynamic specification the observations of the first period could not be used, losing a substantial part of the observations. A dynamic specification is furthermore problematic because there are several missing values.

The base-line regression model is then given by the following equation:

$$y_{i,t}=\alpha_i+\beta_1 Medianage_{i,t}+\beta_2 Unemployment_{i,t}+\beta_3 Interest\ rate_{i,t}+$$

$$\beta_4 GDP\text{-}per\text{-}capita_{i,t} + \beta_5 governmentideology_{i,t} + \beta_6 Minority\ government_{i,t} + \beta_7 Single\text{-}party\text{-}government_{i,t} + \sum_{j=1}^{5} \gamma_j I_{\{t=1980+5j\}} + \varepsilon_{i,t} \quad i=1,2,..,30,\ t=1980, 1985,..,2005$$

Here $y_{i,t}$ is one of the four dependent variables that were discussed. The period-dummies for 1985 until 2005 are given by indicator functions; the year 1980 is the reference category. For health care costs time effects can be interpreted as technological change that improves medical care but also increases medical spending.

In principle the data cover 30 countries over 6 periods, leading to potentially 180 observations. A considerable amount of observations are however missing, in particular from former Communist countries prior to 1990. The base-line model is estimated using 109 observations. This leads to an (unavoidable) loss in efficiency of the estimators. There is no reason to assume that the missing observations are correlated with the effect we are interested in, so we do not consider it likely that the estimators are biased.

IV. Results

The median age of the population does not significantly affect spending as a share of GDP, as table 2 indicates. The estimated effect itself is positive and an increase of one year is associated with an increase of 0.13 percentage point of GDP. The R^2 equals 0.52; while this is reasonable high, not too much can be inferred from it. There is no statistical theory underlying R^2 and it increases when ever more variables are included, irrespective of their relevance.

The median age negatively affects the size of benefits and this effect is significant; the associated t-statistic equals -3.36. The R^2 equals 0.81. This is again reasonably high but again not too much can be made of that. The regression shows no evidence for the claim of median voter models that an older median voter successfully presses for higher retirement spending. In fact, it shows quite the opposite.

Table 2.

VARIABLES	Retirement spending/GDP	Benefits / retiree
Median age	0.134	-0.052***
	(0.113)	(0.015)
Unemployment	0.121**	0.008
	(0.049)	(0.007)
GDP per capita	-1.113	0.761***
	(1.329)	(0.182)
Union density	0.043**	0.007***
	(0.017)	(0.002)
Government ideology	-0.038	-0.007
	(0.069)	(0.009)
Minority government	-0.663**	-0.092**
	(0.294)	(0.040)
Single government	0.238	0.036
	(0.304)	(0.042)
Interest rate	0.010	0.004
	(0.057)	(0.008)
Year 1985	0.356	0.166***
	(0.385)	(0.053)
Year 1990	0.777	0.254***
	(0.531)	(0.073)
Year 1995	1.061	0.373***
	(0.754)	(0.103)
Year 2000	1.548	0.500***
	(0.941)	(0.129)
Year 2005	1.767	0.592***
	(1.127)	(0.154)
Constant	9.640	2.806
	(13.92)	(1.905)
Observations	109	109
R-squared	0.519	0.805
Number of countries	21	21

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The effect of other covariates varies. Union density is positively and significantly associated with both generosity of pensions and retirement spending relative to GDP. This indicates that strong unions can bargain for higher pensions for employees. The

effect is quite substantial; the difference between no unions (so membership of 0%) and full unionization (100%) is five percentage points of GDP worth of pension spending.

Unemployment affects spending relative to GDP positively and significantly. It has to be noted that unemployment is potentially endogenous; this potential problem is addressed below by taking the lagged value of unemployment. A minority government spends less on retirement spending as a share of GDP whereas GDP per capita positively influences the size of retirement benefits. For the latter the coefficient of 0.76 is interesting; this indicates that if total production per inhabitant increases with 1%, benefits of retirees increases with 0.76%. Both regressions show a positive time trend in retirement spending -indicated by the coefficients of the time-dummies- though this is only significant for benefits per retiree.

Table 3 provides regressions with health care costs as the dependent variable. The effect of the median age on health care costs relative to GDP is positive yet insignificant. The same holds for health care costs per inhabitant. Considering the dependency ratio instead of the median age or considering both demographic variables together leads to the same conclusion.

Table 3.

VARIABLES	Health/GDP	Health/inhabitant	Health/GDP	Health/inhabitant
Median age	0.054	0.006		
	(0.076)	(0.014)		
Dependency ratio			0.003	-0.001
			(0.030)	(0.005)
Unemployment	-0.093***	-0.016***	-0.095***	-0.016***
	(0.033)	(0.006)	(0.033)	(0.006)
GDP per capita	-3.353***	0.381**	-3.346***	0.374**
	(0.892)	(0.160)	(0.933)	(0.167)
Union density	-0.024**	-0.005**	-0.024**	-0.005**
	(0.011)	(0.002)	(0.011)	(0.002)
Government ideology	-0.020	-0.004	-0.021	-0.004
	(0.047)	(0.008)	(0.047)	(0.008)
Minority government	-0.408**	-0.071**	-0.408**	-0.073**
	(0.197)	(0.035)	(0.203)	(0.036)
Single government	0.011	0.014	-0.006	0.011
	(0.204)	(0.037)	(0.204)	(0.037)
Interest rate	0.090**	0.018**	0.090**	0.018**
	(0.038)	(0.007)	(0.038)	(0.007)
Year 1985	0.513*	0.107**	0.591**	0.115***
	(0.258)	(0.046)	(0.235)	(0.042)
Year 1990	0.976***	0.197***	1.117***	0.214***
	(0.356)	(0.064)	(0.304)	(0.054)
Year 1995	1.817***	0.363***	2.022***	0.387***
	(0.506)	(0.091)	(0.423)	(0.076)
Year 2000	2.184***	0.447***	2.454***	0.480***
	(0.631)	(0.113)	(0.522)	(0.093)
Year 2005	3.269***	0.641***	3.605***	0.683***
	(0.756)	(0.136)	(0.613)	(0.110)
Constant	36.910***	3.000*	38.580***	3.273*
	(9.342)	(1.677)	(9.516)	(1.704)
Observations	109	109	109	109
R-squared	0.622	0.918	0.620	0.918
Number of countries	21	21	21	21

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

V. Alternative specifications and robustness checks

The models estimated so far rest on several assumptions and operationalizations for which there are sensible and defend-able alternatives. Therefore this section considers several alternatives for the baseline model to assess whether results are robust to changes in the model set-up. The results are given in the appendix.

The median age of the population increases over time and thus correlates with the time effects. The resulting multicollinearity increases standard errors and may obscure a significant effect. When the baseline regression is estimated without time dummies, the positive effect of median age on retirement spending is indeed significant while the negative effect on benefits per retiree becomes insignificant. The positive relation between aging and retirement spending relative to GDP indicates that multicollinearity may have been present. As long as time effects are deemed relevant for explaining government spending they however cannot be omitted in the baseline regression; omitting relevant variables leads to biased estimators.

Thus far the median age of the population has been used as the operationalization of aging. The median age is the crucial factor in the political-economic literature. There are however other notions of aging in the broader pension literature, in particular the dependency ratio. This ratio gives the number of retirees for each 100 persons of working age (15-64 year). This figure is prominent in many discussions as it gives the proportion between the elderly and the working people "supporting" them. The conclusions for this alternative operationalization of aging indeed differ substantially, as table 4 indicates. Now the demographic variable -here the dependency ratio- has a positive and significant effect on spending and an insignificant effect on generosity of benefits. This underlines that the median age and the dependency ratios are different entities. The latter is a better measure for the relative number of retirees, which explains why it is positively associated with pension spending. When more people are eligible for pension benefits, total retirement spending will

automatically increase. In median voter models, the median age is the crucial political variable, as that captures the theorized political clout of elderly. To disentangle the two effects, both variables are jointly used as regressors. In this regression both variables have positive coefficients in both regressions, but only the effect of the dependency ratio on total spending (relative to GDP) is significant.

Policy changes may need some time to respond to the political influence exercised by the median voter. First a government is elected and installed and thereafter it usually takes a considerable time to design, implement and actually execute a reform. For that reason a lagged value of the median voter is considered. As can be seen, the sign of the estimated effects remain the same but now the effects in both regressions are insignificant. One reason is that using lagged values diminishes the number of observations; lagged values of the variables are not available for 1980. The number of observations decreases to 92, which may be too low to estimate fourteen parameters.

The baseline regression itself is estimated with 109 observations. When fewer regressors are used, more observations can be considered. When the omitted variables are relevant (as expected) this generally leads to biased estimates. The estimation results are thus flawed, but can be useful nonetheless as their standard errors are smaller due to the increased number of observations. Regressions with 155 observations but fewer covariates again lead to the same conclusions as the baseline regressions.

The base-line regressions are also re-estimated using lagged values of unemployment instead of contemporaneous unemployment. This specification addresses the possible endogeneity of unemployment. Unemployment may not only affect pension spending but may itself also be influenced by it. Higher spending on pensions may lead to either higher employment (as spending boosts aggregate demand) or to lower employment (as higher taxes may discourage workers).

The overall conclusion is that aging does not lead to more generous pensions. If anything, it leads to lower pensions. In the baseline model aging also does not lead to higher spending relative to GDP. There is however a positive, significant effect when time effects are omitted or when the dependency ratio is considered as an alternative proxy for aging.

Table 4.

VARIABLES	GDP spending	Benefits / retiree	GDP spending	Benefits / retiree	GDP spending	Benefits / retiree
Median age	0.258***	-0.013			0.217*	0.022
	(0.082)	(0.012)			(0.117)	(0.017)
Unemployment	0.151***	0.021***	0.108**	0.010	0.061	0.0022
	(0.036)	(0.005)	(0.043)	(0.007)	(0.073)	(0.011)
GDP per capita	0.152	1.174***	0.568	0.737***	-0.697	0.834***
	(1.037)	(0.153)	(1.206)	(0.203)	(1.385)	(0.200)
Union density	0.039**	0.005**	0.036**	0.007***	-0.014	-0.002
	(0.016)	(0.002)	(0.015)	(0.003)	(0.010)	(0.002)
Government ideology	-0.026	-0.003	-0.060	-0.006	0.284**	0.042**
	(0.067)	(0.010)	(0.061)	(0.010)	(0.130)	(0.019)
Minority government	-0.672**	-0.103**	-0.372	-0.095**	-0.365	-0.058
	(0.284)	(0.0418)	(0.263)	(0.044)	(0.467)	(0.067)
Single government	0.314	0.059	0.295	0.051	-0.887**	-0.116**
	(0.293)	(0.043)	(0.263)	(0.044)	(0.400)	(0.058)
Interest rate	-0.018	-0.005	0.013	0.004	0.072	0.015
	(0.047)	(0.007)	(0.050)	(0.008)	(0.104)	(0.015)
Median age (lagged)						
Dependency ratio			0.200***	-0.005	0.306***	0.015
			(0.039)	(0.007)	(0.075)	(0.011)
Unemployment (lagged)						
Year 1985			0.461	0.092*	0.040	0.022
			(0.304)	(0.051)	(0.702)	(0.101)
Year 1990			0.573	0.126*	-0.209	-0.032
			(0.393)	(0.066)	(0.756)	(0.109)
Year 1995			0.860	0.186**	-0.135	-0.005
			(0.548)	(0.092)	(0.932)	(0.135)
Year 2000			1.075	0.256**	-0.389	-0.041
			(0.674)	(0.113)	(1.057)	(0.153)
Year 2005			1.158	0.287**	-0.305	-0.024
			(0.793)	(0.133)	(1.193)	(0.172)
Constant	-6.429	-2.371*	-6.689	1.437	-1.858	-0.378
	(9.453)	(1.392)	(12.310)	(2.067)	(14.020)	(2.023)
Observations	109	109	109	109	109	109
R-squared	0.499	0.765	0.635	0.778	0.527	0.512
Number of countries	21	21	21	21	21	21

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4. (continued)

	GDP spending	Benefits / retiree	GDP spending	Benefits / retiree	GDP spending	Benefits / retiree
Median age			0.217**	-0.011	0.115	-0.051***
			(0.105)	(0.019)	(0.113)	(0.015)
Unemployment	0.096*	0.013	0.148***	0.0170**		
	(0.057)	(0.008)	(0.041)	(0.007)		
GDP per capita	-0.865	0.855***	-0.630	1.067***	-2.910**	0.608***
	(1.665)	(0.242)	(1.042)	(0.186)	(1.129)	(0.149)
Union density	0.042*	0.004			0.053***	0.007***
	(0.024)	(0.004)			(0.017)	(0.002)
Government ideology	-0.047	0.005			-0.027	-0.005
	(0.080)	(0.012)			(0.069)	(0.009)
Minority government	-0.498	-0.095*			-0.577*	-0.087**
	(0.329)	(0.048)			(0.297)	(0.039)
Single government	-0.034	0.037			0.088	0.030
	(0.375)	(0.055)			(0.307)	(0.041)
Interest rate	0.0138	0.005			0.0134	0.001
	(0.074)	(0.011)			(0.059)	(0.008)
Median age (lagged)	0.017	-0.004				
	(0.026)	(0.004)				
Dependency ratio						
Unemployment (lagged)					0.022	-0.005
					(0.039)	(0.005)
Year 1985			-0.006	0.045	0.729**	0.214***
			(0.348)	(0.062)	(0.352)	(0.046)
Year 1990	0.517*	0.014	0.459	0.078	1.222**	0.321***
	(0.304)	(0.044)	(0.454)	(0.081)	(0.512)	(0.068)
Year 1995	1.027**	0.0516	0.459	0.103	1.983***	0.459***
	(0.493)	(0.072)	(0.605)	(0.108)	(0.608)	(0.080)
Year 2000	1.500**	0.105	0.557	0.095	2.410***	0.596***
	(0.686)	(0.010)	(0.783)	(0.140)	(0.841)	(0.111)
Year 2005	1.845**	0.132	0.555	0.115	2.889***	0.682***
	(0.851)	(0.124)	(0.957)	(0.171)	(0.972)	(0.128)
Constant	11.830	0.473	3.579	-1.318	28.100**	4.335***
	(16.880)	(2.457)	(10.630)	(1.901)	(11.830)	(1.562)
Observations	92	92	155	155	112	112
R-squared	0.423	0.706	0.441	0.702	0.483	0.812
Number of countries	21	21	30	30	21	21

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

V. Discussion and conclusion

This chapter has analyzed whether an older population and thus an older electorate leads to higher pension spending. Pension spending --as a share of GDP-- is not significantly associated with an increase in the age of the median voter. Spending is positively and significantly associated with the dependency ratio. In itself the latter is not very surprising as more people are entitled to pension benefits (for which they contributed earlier in life). It is also in line with preferences of a majority of the population. Boeri et al. [2002] report that questionnaires in Italy and Germany indicate that a majority of citizens disapproves pension-cutting reforms. Considering health care spending instead of retirement expenditure leads to similar conclusions.

The stronger claim that a graying electorate successfully pushes for more pension benefits per retiree, predicted by median voter models, is not supported. If anything, the opposite is the case; aging leads to less generous pension benefits. These results challenge the prominent role attributed to the median voter in both explaining and predicting welfare state changes. The median voter model does not adequately describe determinants of pension benefits.

The empirical inadequacy of median-voter models indicates that other factors -- offsetting the increased potential political clout of retirees-- are important. Two approaches that can explain rising total spending and decreasing generosity are probability voting and endogenous labour supply. The results also indicate that the role of unions have a significant effect on political outcomes. Other potential factors include lobbying of insurance companies and the lack of commitment of government parties. As will be discussed in chapter 6, many reforms are carried through between elections with disregard of party programs or preferences of the majority of voters. Ignoring these factors leads to an incomplete discussion about the sustainability of public finance. This study cannot discriminate between the alternative explanations for the development of retirement spending. The discussion continuous but it is not adequate to base it on a theory that is empirically unfounded.

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