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**Rune Jørgen Sørensen
BI Norwegian Business School**

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Does ageing affect preferences for welfare spending?

A study of peoples' spending preferences in 22 countries, 1985-2006

Rune J. Sørensen

Address: Professor Rune J. Sørensen, BI Norwegian Business School, Nydalsveien 37, N-0484 Oslo, Norway.

E-Mail: rune.sorensen@bi.no

Phone: +47 46 41 05 95

Corresponding author: Rune J. Sørensen

Abstract

A recurrent assertion is that aging will intensify age-related conflict over public budget allocation. If people are led by their self-interest, the young will prioritize public education services, while the elderly will demand better pensions and health-care services. Addressing this issue requires longitudinal survey data and estimation of age (life-cycle), period and cohort effects. Except for a few of studies based on US data, such analyses are non-existent. We use repeated cross-section survey-data for 22 countries. Respondents are classified into ten-year age-groups and birth decades, and we estimate a regression model explaining respondents' public spending preferences. When period and cohort effects are taken into account, elderly people want less education spending, and more health care and pension spending. These life-cycle effects vary considerably between countries, but are generally quite small. Preferences also appear mostly unrelated to left-right party choice.

Keywords: public spending attitudes, life-cycle effect, age structure

1. Introduction

A higher proportion of elderly are expected to increase support for core welfare programs, particularly social security and health care. Implicit in this idea is that public spending preferences reflect peoples' life-cycle interests. Young parents prioritize day-care centers and schooling. As they become elderly and approach retirement age, however, their preferences change. In this phase, they want better health-care services, improved nursing services for the elderly and more generous old-age pensions. Since shifts in public opinion are likely to spill over to actual spending policies¹, testing this hypothesis is crucial for understanding how changing age-structures may affect public budgets.

Nearly all existing studies are based on cross-sectional survey data and interpret age-effects as expressions of life-cycle interests. These estimates may, however, be seriously biased because they neglect cohort and period effects. Only a handful of studies based on US data (Plutzer & Berkman 2005; Street & Cossman; 2006; Fullerton & Dixon 2010) and one based on Swedish data (Svallfors 2008) identify specific *life-cycle effects* on public spending preferences.

Whether these findings apply to other countries is unknown.

This paper adds to the literature by estimating age-effects, period-effects and cohort effects for 22 countries for the period 1985-2006. We estimate the life-cycle effects on preferences for expanding or contracting education, health care and public pension spending. Our findings suggest that people do change their spending preferences over their life-cycles. These effects are modest and vary considerably across countries.

2. Theoretical background

Important government spending programs such as pensions, health care services and schooling are targeted to particular age-groups. Based on the conventional assumption that people have self-regarding preferences defined over outcomes, these spending items are likely to be arenas for age-related budgetary disputes. For example, public pensions are entitlement programs that benefit elderly people only. Self-interested elderly would prefer better pensions since nearly all pension programs are based on pay-as-you-go, and the higher tax-bill is paid

¹Empirical studies suggest that public opinion has a positive impact on actual spending policies (Burstein 2003; Brooks & Manza 2007).

for by young people (Profeta 2002; Mulligan & Sala-i-Martin 2003). Life-cycle interests also pertain to individual public services. Actual health care consumption has a clear age-related profile. About half of health care consumption occurs during the two last years of life (see table 2 in Kotlikoff & Hagist 2005). In contrast, school-aged children and their parents are the primary beneficiaries of education programs. We may therefore expect elderly without school-age children to exhibit higher support for health spending relative to young families, and the converse for education spending.

Public spending programs that benefit the young may be more controversial than those who benefit the elderly. If public spending programs are highly institutionalized and persistent such as social security, even young people have a personal interest in maintaining these programs (for review, see Galasso & Profeta 2002). Young people might support spending programs for the elderly since they expect to become old themselves. Since the elderly cannot become young again, the reverse is not the case (Svallfors 2008:390). The selfish elderly have little to gain by supporting benefits for young people. Therefore, public education spending should be more divisive than health care and old-age pensions. Following this argument, Mulligan and Sala-i-Martin (1999; 2003) and Profeta (2002:332) have stressed that the “single-minded” elderly will bias public policies to their own benefit:

The elderly are single-minded in their politics. The most important concern among elderly voters are government old age subsidies and is believed by many politicians that the votes of the elderly are much more elastic to a candidate's stance on old age subsidies than are the votes of any other group to any other issue.

(Mulligan & Sala-i-Martin 1999:12)

The life-cycle hypothesis can be criticized for ignoring positive externalities related to spending programs. The self-regarding elderly may be interested in supporting services for the young, particularly schooling. Educated children may reduce crime-rates, increase productivity and contribute to the financing health care and old-age pensions. Elderly may gain from higher school spending since more attractive neighborhoods can be capitalized into the value of their homes (Poterba 1998; Brunner & Balsdon 2004). At the same time, higher public spending levels imply larger tax-wedges and reduce incentives to work and invest, which may constrain the elderly demand. The elderly want a sturdy tax base. Fiscal competition among local authorities may also limit the spending demands of self-interested elderly. A mobile young population is likely to migrate out of if the elderly voters redistributes to itself and away from the young (Monten & Thum 2010).

At a more fundamental level, the rational egoist assumption is a misleading caricature of humans (Camerer 2003, ch.2; Ostrom 1998:4-7). Firstly, people display social preferences related to the final distribution. Experimental evidence demonstrates that most people display considerable selflessness for people outside the family, even in the relation to strangers. Spending preferences can be an expression of solidarity within the family² (Goerres & Tepe 2010; Rattsø & Sørensen 2010), loyalty to the local community (Plutzer & Berkman 2004), and more generally, across generations. Related to this interpretation is the idea of positive externalities related to the elderly consumption of leisure. The young benefit when the elderly stop working and enjoy retirement, which may explain why unions often support mandatory retirement schemes (Profeta 2002:332).

The willingness to make contributions that benefit others appears to decrease with ‘social distance’, for example when economic inequalities correlate positively with ideological, geographical, ethnic heterogeneity (Bowles & Gintis 2000:45; Alesina, Glaeser & Sacerdote 2001:41-51). Since most people interact with young and old that comes from their own socio-economic and ethnic group, age-related ‘social distance’ is likely to be relatively low. For

² Goerres and Tepe (2010) exploit an international survey dataset with information about social contacts between young and elderly. They find that elderly people who see their adult children and grandchildren frequently, and who help them financially, are more positive to state provision of public childcare. These finding suggest that intergenerational altruism within the family can lead elderly to take a more positive position with respect to public childcare services. As the authors also note, the elderly may also favor government child-care to relieve themselves from “the duty” of watching their grand-children (Goerres & Tepe 2010:840). In a study of spending policies in Norwegian local authorities for the period 1993-2007, Rattsø and Sørensen (2010) found little evidence suggesting that the young take elders’ interests into account. Neither did they find that grandparents take the needs of the younger generations into account.

example, interaction with grandparents are likely to increase young adults support for old-age benefits (Silverstein & Parrott 1997), and elderly peoples' support for public childcare is be higher when grandparents are familiar with the situation of their adult children (Goerres & Tepe 2010).

Secondly, people have reciprocal preferences. Support for income redistribution also depends on whether recipients are seen as 'deserving' or not (Bowles & Gintis 2000:47; Alesina, Glaeser & Sacerdote 2001:51-52). Widespread opposition to public programs is more likely when people believe that policies favor those who have not made social contributions. Old-age pensions are likely to enjoy widespread support in all age groups since most retirees have paid social security contributions during their active years. Young people are likely to see the elderly as 'deserving', and feel a sense of obligation towards the elderly generations (Svallfors 2008:383). Education and in many cases health care can be seen as preconditions for making future contributions to society. The beneficiaries of age-related spending programs are therefore perceived as deserving.

To identify the life-cycle effect, we need to estimate an empirical model that includes generational and period effects:

The generational model: Generational effects are associated with people's experiences in their formative years. If value orientations and cognitive world-outlooks are relatively stable over the life-cycle, correlations between spending preferences and age could be interpreted as cohort effects. Suppose the elderly can be characterized as the "greatest generation"³ (see Street & Cossman 2006) with a more altruistic perspective on public spending than young people. The experiences of economic crises, the Second World War (WWII) and the reconstruction years after WWII have induced a greater sense of civic culture and solidarity in the elderly generations. When we compare the spending preferences of age groups at a particular point in time, the cohort effect can produce a situation where the elderly prefer higher levels of spending than the young.

³ The concept of political generations remains controversial. For example, Inglehart suggests that economic affluence have reduced the political significance of economic conflicts, and while disputes between the materialists and the post-materialists may be become more important (see the debate between presented in Inglehart & Flanagan 1987).

Alternatively, economic scarcity in younger years may have caused the older generations to prioritize security and materialistic values, while the younger generations put greater emphasis on “autonomy, self-expression and the quality of life” (Inglehart 2008:130). This could induce the younger cohorts to become more sympathetic to public rather than private consumption. The younger cohorts have significantly more education than the elderly (see table 3 below⁴), and younger generations may prefer higher levels of education spending than older generations.

Period effects: Period effects are short- or long-term changes in spending preferences that affect all age groups. A recession could prompt a temporary resistance to generous pensions. This could both amplify and conceal an underlying life-cycle pattern in public spending preferences. Long-term period effects are related to broad socio-economic transformation of society, which affects preferences for government transfers and services. Several authors suggest that economic affluence augments demand for several services, including public education and health care.

Party ideology: Education, health care and pensions are often seen as valence issues; i.e. characterized by broad agreement on policy goals. However, these spending programs redistribute from high to low income households, which commonly induces political conflict within and between age-groups. Moreover, some political parties are perceived to be better at promoting these objectives than others (for review, see Blekesaune & Quadango 2003: 416-417). We might therefore expect voters to shift their choice of party over their life-cycle as they cater to their age-related interests. For example, aging citizens may be inclined to support left-wing parties that support generous social security and health care benefits, or alternatively, they may support conservative political parties to avoid high-taxation on property and financial assets (Rhodebeck 1993; Goerres 2008). To the extent that party preferences vary over the life-cycle, including the indicator of left-right party choice could be of help in the interpretation of life-cycle effects.

Party choice can also be modeled as part of the generational model. Voters are believed to identify with a particular ideology and political party during their ‘formative years’. The party identification remains relatively stable over the life-cycle. We would therefore expect

⁴ According to table 3, the education index has a value of 0.6 for people aged 21-30 years, and 0.34 for those aged more than 80 years of age. This is almost entirely a cohort effect. In our dataset, a person aged 41-50 years and born in 1930-39 has an average education index of 0.40. A similar person born in 1960-69 has an education index of 0.61.

ideological attachment and party choice to be a generational phenomenon that would facilitate the interpretation of cohort effects on public spending preferences.

3. The existing literature on public spending preferences

Ageing is a major factor behind recent increases in public spending growth, primarily due to increases in health care and social security spending. If rates of work participation and retirement patterns do not change, the ratio of older inactive people to working population could double over the next 40 years (OECD 2006). A large number of studies address the impact of aging on levels of public spending. These studies are usually based on the conjecture that young and elderly citizens have divergent public spending preferences. Importantly, these analyses cannot uncover whether estimated age-effects on public spending derive from peoples' *life-cycle* interests. Most empirical studies suggest that the old-age dependency ratio has a *positive* effect of public spending relative to GDP⁵. However, empirical studies also show that ageing has *zero or negative* impact on the generosity of pensions and spending per elderly for services aimed at the elderly population (Lindert 1996; Breyer & Craig 1997; Galasso & Profeta 2004; Sanz & Velázquez 2007; Tepe & Vanhuysse 2009). Belonging to a large age group appears to be a political liability.⁶

The life-cycle hypothesis is commonly tested on cross-sectional survey data. Some of these studies rely on data from a single country, including the USA (MacManus 1995⁷; Hamil-Luker 2001; Brunner & Balsdon 2004), Germany (Wilkoszewski 2009) and Switzerland (Cattaneo & Wolter 2009). Others employ data from a number of countries (Goerres & Tepe 2010; Busemeyer, Goerres & Weschle 2009; Blekesaune & Quadango 2003; Boeri, Börsch-Supan & Tabellini 2001). These papers document a broad support for welfare state programs

⁵ Razin, Sadka and Swagel (2002) argue that a higher old-age dependency ratio causes *lower* labor tax-rates and less generous social transfers. This result has been heavily criticized in several papers including Disney (2007), Simonovits (2007) and Shelton (2008).

⁶ Similar studies rely on sub-national data, see Poterba (1997), Harris, Evans & Schwab (2001), Fernandez & Rogerson (2001), Ladd & Murray (2001), Grob & Wolter (2007) and Rattsø & Sørensen (2010).

⁷ MacManus (1995) addresses the US case on basis of a brief period, 1988-1992, and the case of Florida for the years 1991-1993. She finds that preferences for spending and taxation are best explained by the self-interests of the young, middle-aged and elderly. She makes to attempt to distinguish the life-cycle effects from cohort effects.

across all age-groups. At the same time, these studies find differences between age groups that are consistent with life-cycle hypotheses: the young want higher levels of public spending on education, while the elderly want higher spending on health care and social security.⁸ However, that young and elderly people have different spending preferences does *not* imply that these preferences alter in the way suggested by the life-cycle hypothesis.

We need longitudinal survey-data to identify the importance of life-cycle, cohort and period effects. Only a few such studies exist. First, Rhodebeck (1993) uses US election study data from 1972-1988, and documents that the elderly prefer higher federal spending on social security and health care than young people. But she also finds substantial variation in spending preferences within age groups. Other factors such as income and partisan orientation have a greater bearing on spending preferences. She finds that elderly were *less* likely to support spending programs from which they benefit (social security, health care, care for the elderly (Rhodebeck 1993:350).

Second, Plutzer and Berkman (2005) address the issue of life-cycle versus cohort effects on educational spending preferences over a 30-year period (1973-2002). Support for public education spending has *increased* considerably – the younger cohorts are more positive to increasing school spending. The authors also run regressions with birth year and year interviewed and they find that birth-year is most important (Plutzer & Berkman 2005:79). Age, period and cohort effects are not included in a simultaneous model.

Third, Street and Cossman (2006) use data from the US General Social Survey for the period 1988-2000. Using descriptive tables to isolate life-cycle and cohort effects, they find limited support for the life-cycle/ self-interest hypothesis with respect to education, health care and social security spending. Fourth, Svallfors (2008) represents the sole example of analysis from outside the US. He addresses preferences for public support of the elderly and support for families with children. On basis of Swedish data for the period 1981-2002, he finds that support for the old seems to be increasing in all age groups. The elderly prioritize health care services and old-age support somewhat higher than the young, while the reverse is true when young people assess subsidies to families with children.

⁸ For example: Boeri, Börsch-Supan and Tabellini (2001) asked respondents in Spain, France, Italy and Germany whether government should allocate more resources to pensions and less to unemployed or young job seekers, or vice versa. The elderly are more inclined to shift resources to pensions, while the young want more for resources to job seekers and unemployment benefits. Clearly, age-effects based on cross-sectional studies can both be due to cohort- and/or life-cycle effects.

Finally, only one existing study makes an attempt to estimate period, life-cycle and cohort effects in a regression framework. Fullerton and Dixon (2010) draw on data for the US General Social Survey for the period 1984-2008. They analyze preferences for increasing or decreasing public spending on education, health care and social security. Their methodology is based on classifying respondents into five-year birth cohorts, including survey years to estimate period effects, and the life-cycle effects are estimated by including age and age squared in the regressions.⁹ Their estimates suggest that most age-differentials are due to cohort effects. Young generations are more supportive of public education spending than are the elderly cohorts, which implies that life-cycle interests have little bearing on preferences for school spending. The younger cohorts prefer higher spending on health care services. People appear to prefer somewhat higher levels of health care spending towards the end of their life. Finally, preferences for social security display a somewhat irregular pattern with modest life-cycle and cohort effects.

The US studies suggest that spending preferences change very modestly over the life-cycle. Spending preferences do correlate with age, but this is mostly explained by generational effects. Whether these findings can be generalized to other countries remains an open question.

4. Dataset and descriptive statistics

The current analysis is based on the cumulated Role of Government surveys provided by the International Social Survey Program (ISSP). The ISSP data comprises four repeated cross-section sample surveys for the years 1985, 1990, 1996 and 2006. The current analysis uses the data for all 22 countries in the dataset. To facilitate representative samples, the analyses have been performed with the weight variable provided by the ISSP for the cumulated dataset¹⁰. Further documentation can be found on documentation of the Role of Government modules is available from the GESIS Data Archive's web pages.

⁹ In addition, this allows the explanatory variables to have differential impact depending on the level of the response variable.

¹⁰ Descriptive tables and regression estimates are not sensitive to the application of this weight.

We estimate regression models with desired public spending increases or decreases as response variable. The respondents were asked to state their opinion on the following questions: *Listed below are areas of government spending. Please show whether you would like to see more or less government spending in each area. Remember that if you say “much more”, it might require a tax increase to pay for it.* We coded the responses on the three relevant spending programs to a five-point ordinal scale: *Spend much more, Spend more, Spend the same as now, Spend less, Spend much less.* Respondents who could not or would not answer the question were coded missing. We denote the three variables Education, Health care, and (old-age) Pensions. In table 1, we display descriptive statistics for the response variables.

Table 1 here

To simplify, in table 1 we present average values for the spending index where “spend much more” is coded 1, “spend more” is coded 0.5, “spend the same as now” is coded 0, “spend less” is coded -0.5 and “spend much less” is coded -1. All the numbers are positive, suggesting that the average respondent wants to increase the core welfare programs. A possible concern is therefore that respondents have a general bias towards higher public spending, irrespective of the reminder that it may lead to higher taxes. We designed an aggregate index measuring the extent to which the respondent said that he wanted more spending on other programs, and included it as a control variable in the regressions¹¹. Including these controls did not change the estimates much, and the results are not presented.

Like many other surveys, the descriptive statistics in table 1 show that health care is the most popular item, education spending is number two, and support for old-age pensions is lowest. Elderly people want smaller spending increases for education than do younger persons, while we observe a reverse pattern for old-age pensions. Age appear to have little bearing on preferences for increasing health-care spending.

In table 2, we present number of respondents classified by age-group, cohort and period.

¹¹ The aggregate index was based on all available spending items in the Role of Government survey: Preferences for spending on education, health care, retirement, unemployment, culture, law and order, defense and environmental programs. The aggregate index was defined as the sum of all the individual spending indexes *except* the one defined as response variable in the regression. For example, when analyzing spending preferences for education, the control variable was defined as the sum of all spending indexes except the index measuring preferences education spending.

Table 2 here

In table 2, we see that the dataset contains more than 80.000 respondents. We can compare 22 pairs of cohorts (for given age-groups and periods), and 21 pairs of age-groups (for given cohorts and periods). This allows us to estimate separate life-cycle, period and cohort-effects (see below).

Additional control variables are coded as follows:

Employment: Coded as full-time employment, part-time employment, less than part-time employment, and not employed (helping family member, unemployed, student, housewife, disabled or retired).

Education: Coded as no formal qualification, lowest formal qualification, above lowest qualification, higher secondary education completed, above higher secondary education completed, and university degree completed.

Gender: Coded 1 for male, and 0 for female respondent.

Children: Coded as a dummy variable measuring whether the respondent has children living in the household (=1) or not (=0).

Party: Coded according to the left-right classification of political parties provided by ISSP: 'Far left (communist etc.)'; 'Left/ centre left'; 'Centre/liberal'; 'Right/ conservative'; 'Far right (fascist etc.)'. We code other responses with a missing value¹². In table 3, we display descriptive statistics for these variables. Note that the employment and education have been coded as numerical variables to simplify exposition.

Table 3 here

In table 3, we observe expected patterns for work-participation (major drop after 60 year of age) and education (young people are better educated). Young people have children, and women account for a higher share of the population in the elderly age-groups. In table 3, we

¹² Role-of-government data on party preferences is not available for Italy, Hungary, Latvia, and Spain. The lower number of valid observations in table 5 is mostly due to respondents who decline to answer or the answers cannot be coded for other reasons.

have coded left-wing party choice as negative numbers and right-wing choice as positive numbers. Elderly people tend to vote more right wing than do young people.

5. Methodological approach

The identification of life-cycle, cohort and period effects is a methodological challenge. The basic identification problem is the defining equation, Survey year=Age + Birth year. Survey year measures the period effect, age taps the life-cycle effect, and birth year is the cohort effect. Yang and Land (2006) provide a review of the different methods for handling the identification problem: a) assuming that one of the effects is non-existent; b) using a third variable as “proxy” either for the period effect, the age (life-cycle) effect, or the birth year effect; or c) introducing a non-linearity in the equation.

Following the third approach, Fullerton and Dixon (2010) suggest a model specification where birth years are classified into five-year intervals (cohorts), survey years are taken in as period effects and life-cycle effects are measured by polynomial function of age (age is entered with a linear and quadratic term¹³). It appears rather arbitrary and restrictive to impose this kind functional form. Moreover, the Fullerton-Dixon specification makes the interpretation of life-cycle and cohort-effects somewhat cumbersome. Similar to conventional descriptive analyses of cohort- and life-cycle analysis, we simply classify both age and birth-years into ten-year intervals. We assume that respondents who are classified into the same ten-year intervals have similar preferences, and this facilitates the estimation of life-cycle and cohort effects.

It is easy to see that this solves the identification problem: Consider a survey performed in 1985. A person being 25 years of age is born in 1960. She is classified as being 21-30 years of age, and belongs to the 1960-1969 cohort. A person of 26 years of age belongs to the same age group. As she is born in 1959, she belongs to an earlier cohort, the 1950-1959 generation. The baseline regression model can be expressed this way:

$$\text{Preference index} = a_0 + a_1 \cdot \text{Agegroups} + a_2 \cdot \text{Cohorts} + a_3 \cdot \text{Periods} + a_4 \cdot \text{Country} + \\ b_5 \cdot \text{Country} \cdot \text{Periods} + b_6 \cdot \text{Country} \cdot \text{Cohort} + \text{Residual}$$

¹³ This specification of the age (life-cycle) effect is taken from Yang and Land (2006).

The response variable is the five point index measuring spending preferences for each of the three relevant spending programs. The regression model incorporates fixed effects for each of the 22 countries. The regression model includes eight age-groups, nine (birth-)cohorts and four period-variables. The reference group is a young US citizen (20 years of age or less) born after 1980 (cohort of 1980-1989), and we observe his spending preferences in 2006.

Peoples' stated spending preferences are likely to depend on actual spending levels and other country specific variables. To adjust for such influences, the baseline model comprises the interaction term Country · Period. We also include country-specific cohort effects captured by the Country · Cohort interaction term. For instance, the 1968 generations from the Czech Republic and the United Kingdom have quite different cohort experiences.

We expand the baseline model in three ways. First, we include demographic control variables. Education captures both life-cycle and cohort effects. Most people take education early in life, but uphold their education level for the rest of their life. At the same time, education levels differ between cohorts - the share with higher education increases from one cohort to the next in all countries analyzed. We also control for gender, employment, and whether the respondent has children living in the household and gender. These are life-cycle variables: most have children and get a job after finalizing education. Women usually take more responsibility both for children and elderly family members, and they are commonly more supportive of public sector programs than men (see for example table 1 in Busemeyer, Goerres & Weschle 2009). At the same time, women have longer life expectancy than men. Since women tend to live longer than men, gender is also a life-cycle variable. Including these variables allows us to explore whether the self-interests related to children, employment and gender explains differences in attitudes between age-groups, controlling for cohorts and periods. Second, we expand the model with party preferences to see whether life-cycle interests are mediated by left-right party preferences. Third, we include country-specific life-cycle effects adding the interaction term Country · Age to the baseline model.

6. Empirical analyses

We present the estimates for the regression in table 4. The fixed effects for the interaction terms Cohort · Country and Period · Country effects are quite numerous, and we therefore

display estimates for the life-cycle effects only. We estimate linear models¹⁴ where the dummy variable estimates can be measured as effects on preference index (see table 1).

Table 4 here

Preferences for education spending: Similar to previous studies, elderly people are significantly less likely to support public education spending than are young people. The average spending score is about 0.1 points lower for an elderly as compared to a young reference group (aged less than 20 years). This is a substantial effect when compared with the standard deviation of the education index of 0.4 (table 1).¹⁵ When we include cohort-effects in the baseline regression II, we observe that the age-effects are somewhat lower. The explanation is evident, and similar to the US experience (Plutzer & Berkman 2005; Fullerton & Dixon 2010): People born before 1920 are much less in favor of increasing public education spending than those who belong to younger generations¹⁶. Therefore, life-cycle effects are smaller than suggested by simple age-group comparisons.

Finally, the regression III takes in the control variables education, employment, children and gender. Regression III show that people with higher education are more positive to education. Although the elderly cohorts have less education, we observe no changes in the estimated life-cycle effects. In line with Cattaneo and Wolter (2009), we find that having school-age children in the family increases demand for education spending¹⁷. These results suggest that changes in preferences over the life-cycle are not due to the attainment of more education, that people having children early in life, work-force participation in mid-life, or the larger share of women in the elderly population.

Preferences for health care spending: Similar to table 1, we observe that preferences for health care spending display very modest disparities across age-groups compared to education. Age-related self-interests have little bearing on attitudes to government health care.

¹⁴ The linear model is used to facilitate interpretation, see Angrist & Pischke 2009:104-107) for discussion. The ordinal logistic regression model yields qualitative similar estimates.

¹⁵ Also very similar to the US studies (Street and Cossman 2006; Fullerton & Dixon 2010), we observe a clear positive trend effect: all respondents are more likely to favor higher education spending in 2006 as compared to 1985.

¹⁶ Fullerton and Dixon (2010) analyze US data, and the USA is also included the current analysis. Excluding the US from the dataset does not change the results noticeably.

¹⁷ These regression results are not included in the table.

The baseline regression II indicates that the life-cycle effect is *more* apparent when cohort effects are cleaned out. The explanation is similar to education: the generations born before 1920 are less likely to prioritize public health care than generations born in later periods. It therefore appears as if the age has little effect on preferences for health care spending.

In regression III, we introduce the control variables. People with higher education are less interested in public health care spending than people without higher education. Employment and gender have relatively small and significant effects. Men are less interested in spending increases than are women. When these effects are taken into account, the life-cycle effects are somewhat smaller for the oldest persons and somewhat higher for the younger. Part of the explanation is that the oldest generations have little education, and that women account for a higher share of the most elderly respondents.

Preferences for old-age pensions: Pensions seem to be a policy area of most intensive age-related conflict. In regression I, the spending index is about 0.16 points higher for the elderly as compared to the young. This amounts to about a third of the standard deviation for the index. When cohort effects are taken into account (II), the age effects are much smaller, about 0.07. The explanation is the cohort effect; that older generations put more emphasis on increasing old-age pensions than do people born in later decades. Similar to education, regression III suggests that the life-cycle control variables have very little bearing on the size of the life-cycle effects for old-age pensions.

The life-cycle effect is considerably *smaller* than the simple age-effect for old-age pensions, it is *somewhat smaller* for education, and the life-cycle effect is *somewhat larger* than the age-effect for health-care. Three caveats apply: First, these effects are relatively small. According to table 1, an average adolescent (less than 20 years of age) prefers to increase education by an index value of 0.53. Should the entire population become elderly (71 years or more), the predicted index would drop about 0.43 when other factors are constant. Similarly, the spending index for health care would be expected to raise 0.54 in young age to 0.58 in old age, and from 0.39 to 0.46 for pensions. Second, life-cycle effects are modest in comparison to other factors. The period dummies suggest that general shifts in opinion are as important. Cohort effects are just as important as life-cycle effects for spending preferences. Finally, the life-cycle estimates do not reflect simple selfishness. If this was the case, children should have captured much of the life-cycle effects for school spending and work participation should be of importance for pension spending. These factors fall short of explaining why elderly people

appreciate education less than young people – or why the elderly want higher spending on health care and pensions than the young. Similar to the US studies (Rhodebeck 1993; Plutzer & Berkman 2005:79-80; Street & Cossman 2006; Fullerton & Dixon 2010:663-664), the evidence in favor of age-related selfishness is quite limited.

In table 5, we follow Rhodebeck (1993), Hamil-Luker (2001) and Fullerton and Dixon (2010) and include party choice as an additional explanatory variable in the spending regressions.

Table 5 here

The spending regressions in table 5 suggest that people with leftist preferences desire higher levels of spending on all the three items than to those who lean towards the right.¹⁸ When period and generational effects are taken into account¹⁹, party ideology exerts a relatively modest influence on spending preferences, which corroborates the conjecture that these are valence issues. In agreement with Fullerton and Dixon’s study of the US (Fullerton & Dixon 2010: 659), the cohort and life-cycle effects in table 5 are very similar to those in table 4 (without the party control variable).

A final question is whether life-cycle effects differ between countries. This could be due to at least three factors: solidarity between generations could differ as consequence of economic, ethnic and other types of disparities in societies; the current and future tax-costs related to aging differ due to dissimilar demographic structures; and, the redistributive nature of spending programs, which differ considerably. For example, life-cycle effects on spending preferences may be negligible in systems where levels’ old-age pensions follow actuarial principles, while they may be more important in a redistributive pay-as-you-go system. In figure 1, we display country-specific life-cycle effects. These estimates are based on the baseline model (II) where we control for country specific period and cohort effects. To make the presentation simple, we assume that preferences change linearly over the life-cycle. In

¹⁸ These estimates should be interpreted with some care. Both omitted third variables and reverse causation could bias parameter estimates. For example, one could argue that preferences for welfare spending (education, health care and pensions) should be entered as explanatory variables in a model with party choice as response variable. That the generational differences appear to be stronger than the life-cycle effects indicate that it is more reasonable to see party choice as an exogenous variable in relation to spending preferences than vice versa. However, more elaborate modelling is required to see whether the party choice effects in table 5 are causal effects.

¹⁹ Supplementary analyses (not presented) show the elderly are somewhat more likely to support conservative or right-wing parties. This is almost entirely a cohort effect, *not* a life-cycle effect.

figure 1, we show changes in the spending indexes as consequence of respondents becoming ten years older.

Figure 1 here

The estimated life-cycle effects differ considerably between countries. In the case of the United States, we estimate significant effects for education spending, but none for health care and pensions. This appears to corroborate the results of Fullerton and Dixon (2010), while results are not directly comparable with Plutzer and Berkman (2005) and Street and Cossman (2006). It is hard to see a country classification that explains the cross-national patterns. For example, Japan and Italy have large elderly populations. Yet Japanese citizens do not change education preferences as they become older, while the Italians do. The United States and the United Kingdom have very different health care systems, but health care spending preferences develop similarly over the life cycle. The only safe conclusion is that effects vary considerably across countries.

6. Conclusions

The ‘gerontocracy’ can be described as a society where the elderly want low levels of school spending, and higher levels of health care spending and pensions. They account for a large share of the voting population; they veto proposals to reform benefit schemes; and, they impose high-tax rates on the working population in order to finance generous benefits for the elderly (see for example Mulligan & Sala-i-Martin 2003; Sinn & Uebelmesser 2002; Monten & Thum 2010). At a particular point in time, it would not matter whether these age-related spending preferences result from different life-cycle interests, cohort effects or period-specific factors.

However, if policy conflicts between young and elderly result derive from voters’ life-cycle interests, these are likely to persist. If not, it is hard to predict whether age-related conflicts will exist in the future. We show that people do shift their public spending priorities over their life-cycles, but *not* much. In the case of education, much of the correlation is due to the fact that elderly generations value education spending less than the young. In the case of pensions, elderly cohorts want higher levels of pension spending than young generations. When this is

taken into account, life-cycle interests have a much smaller bearing on pension spending preferences. Health care is a bit different. The cohort effect disguises the existence of a modest life-cycle effect. The elderly are somewhat more inclined to demand higher pension spending increases. In addition, if self-interests account for the life-cycle effects, they should to some extent reflect whether they have school-age children and work participation. The evidence does not support this idea.

As the current elderly generations are replaced, we should see more support for education spending, minor changes in support for health care and less support for generous old-age pensions. Since the life-cycle effects tend to be small and vary significantly between countries, the basis for a general 'gerontocracy prediction' is quite shaky.

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Table 1. Descriptive statistics for respondents' spending preferences.

Average score for preference index.

	Education	Health care	Old-age pensions
0-20 years	0.530	0.539	0.393
21-30 years	0.500	0.522	0.375
31-40 years	0.500	0.512	0.370
41-50 years	0.484	0.519	0.396
51-60 years	0.456	0.533	0.452
61-70 years	0.430	0.530	0.488
71-80 years	0.423	0.554	0.503
81- years	0.421	0.537	0.494
All	0.454	0.510	0.389
Std.dev. a)	0.41	0.41	0.42
Std.dev. b)	0.12	0.14	0.16
(N)	78723	79377	78653

Legend for preference index:

1: Spend much more, 0.5: Spend more, 0: Spend the same as now, -0.5: Spend less, -1: Spend much less.

a) Standard deviation inclusive period and country variations.

b) Standard deviation between countries, given survey year.

Table 2. Number of respondents by age-group, respondents' birthdecade and year of survey.

		Birthyear								All	
		-1909	1910-1919	1920-1929	1930-1939	1940-1949	1950-1959	1960-1969	1970-1979		1980-
		N	N	N	N	N	N	N	N		N
R: Age	Year										
0-20 years	1985							171			171
	1990								675		675
	1996								1541	109	1650
	2006									1352	1352
21-30 years	1985						803	757			1560
	1990							2788			2788
	1996							2634	3450		6084
	2006								1883	2524	4407
31-40 years	1985					812	460				1272
	1990						3059				3059
	1996						2790	4152			6942
	2006							2203	2984		5187
41-50 years	1985				694	444					1138
	1990					2552					2552
	1996					2461	3864				6325
	2006						2233	3306			5539
51-60 years	1985			583	332						915
	1990				1977						1977
	1996				2026	3175					5201
	2006					2147	3272				5419
61-70 years	1985		439	360							799
	1990			1870							1870
	1996			1674	2663						4337
	2006				1596	2529					4125
71-80 years	1985	117	186								303
	1990		880								880
	1996		452	1695							2147
	2006			869	1797						2666
81- years	1985	79									79
	1990	199									199
	1996	99	347								446
	2006	6	178	620							804
All		500	2482	7671	11085	14120	16481	16011	10533	3985	82868

Table 3. Descriptive statistics for demographic variables used in the analysis.

Average scores for all variables.

	Employed	Education	Children	Gender	Party
0-20 years	0.326	0.474	0.331	0.491	-0.023
21-30 years	0.680	0.605	0.252	0.480	-0.052
31-40 years	0.773	0.592	0.464	0.477	-0.049
41-50 years	0.790	0.549	0.373	0.487	-0.046
51-60 years	0.614	0.485	0.131	0.489	-0.042
61-70 years	0.183	0.409	0.060	0.479	-0.016
71-80 years	0.047	0.362	0.046	0.460	0.009
81+ years	0.025	0.338	0.051	0.395	0.026
All	0.571	0.519	0.258	0.479	-0.036
(N)	82388	82807	83485	83324	46441

Legend:

Employed: 1: Full-time employment, 0.5: Part-time employment, 0.25: Less than part-time employment,

0: Not employed (helping family member, unemployed, student, housewife, disabled or retired).

Education: 1: University degree completed, 0.8: Above higher secondary education completed,

0.6: Higher secondary education completed, 0.4: Above lowest qualification,

0.2: Lowest formal qualification, 0: No formal qualification

Children: 1: At least one child in the household, 0: No children in the household

Gender: 1: Male, 0: Female.

Party: -1 if 'Far left (communist etc.); -0.5 if 'Left/ centre left'; 0 if 'Centre/liberal';

0.5 if 'Right/ conservative'; 1 if 'Far right (fascist etc.)'

Table 4. Preferences for spending more vs less on education, health care and old-age pensions.

OLS estimates with spending index as response variable. Clustered standard errors by country.

Demographic factors include employment (classified into four groups), education (classified into six groups), dummy variable for children in the household and gender.

		Education						Health care						Old-age pensions					
		I		II		III		I		II		III		I		II		III	
		Estimate	(Std.err.)	Estimate	(Std.err.)	Estimate	(Std.err.)	Estimate	(Std.err.)	Estimate	(Std.err.)	Estimate	(Std.err.)	Estimate	(Std.err.)	Estimate	(Std.err.)	Estimate	(Std.err.)
Life-cycle effects	81- years	-0.109	0.021	-0.076	0.025	-0.067	0.025	0.013	0.012	0.028	0.024	0.014	0.024	0.152	0.012	0.061	0.024	0.036	0.024
	71-80 year	-0.092	0.015	-0.071	0.019	-0.068	0.019	0.031	0.008	0.038	0.019	0.031	0.019	0.164	0.008	0.072	0.019	0.054	0.019
	61-70 years	-0.072	0.015	-0.061	0.016	-0.062	0.017	0.022	0.007	0.030	0.016	0.029	0.016	0.156	0.008	0.069	0.016	0.065	0.016
	51-60 years	-0.050	0.014	-0.055	0.014	-0.055	0.014	0.021	0.007	0.027	0.014	0.037	0.014	0.114	0.007	0.036	0.014	0.050	0.014
	41-50 years	-0.025	0.014	-0.041	0.012	-0.050	0.012	0.009	0.007	0.012	0.012	0.029	0.012	0.056	0.007	-0.003	0.012	0.026	0.012
	31-40 years	-0.010	0.014	-0.025	0.009	-0.039	0.010	0.004	0.007	0.003	0.009	0.023	0.010	0.028	0.007	-0.012	0.010	0.023	0.010
	21-30 years	-0.014	0.010	-0.019	0.008	-0.026	0.008	0.005	0.007	0.003	0.008	0.024	0.008	0.018	0.007	0.003	0.008	0.035	0.008
	0-20 years	Ref.		Ref.		Ref.		Ref.		Ref.		Ref.		Ref.		Ref.		Ref.	
Including fixed effects:	Country	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
	Period	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
	Country*Period	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
	Cohort	No		Yes		Yes		No		Yes		Yes		No		Yes		Yes	
	Country*Cohort	No		Yes		Yes		No		Yes		Yes		No		Yes		Yes	
	Demographic factors	No		No		Yes		No		No		Yes		No		No		Yes	
Type III tests for fixed effects	Life-cycle	58***	7	2.55***	7	2.75**	7	5.86***	7	1.53	7	2.17*	7	231***	7	14.03***	7	7.37***	7
	Country	72***	21	77***	21	80***	21	386***	21	121***	21	112***	21	542***	21	162.7***	21	148.6***	21
	Period	141***	3	55***	3	43***	3	116***	3	53***	3	58***	3	80***	3	86.1***	3	108.4***	3
	Country*Period	53***	31	47***	31	47***	31	59***	31	53***	31	53***	31	30***	31	24.0***	31	24.4***	31
	Cohort			4.0***	8	4.82***	8			1.08	8	1.49	8			8.94***	8	9.62***	8
	Country*Cohort			2.5***	158	2.87***	158			2.52***	158	2.52	158			4.23***	158	3.97***	158
R-square		0.10		0.11		0.12		0.13		0.13		0.14		0.16		0.17		0.19	
Number of obs.		78175		78175		78175		77389		77389		77389		78114		78114		78114	

Estimates marked with **bold** imply that the estimate is significantly different from zero at the 5% level.

*: p<0.05

** : p<0.01

***:p<0.001

Table 5. Preferences for spending more vs less on education, health care and old-age pensions, dependent on left-right party preference.

OLS estimates with spending index as response variable. Clustered standard errors by country

		Education		Health care		Old-age pensions	
		Estimate	(Std.err.)	Estimate	(Std.err.)	Estimate	(Std.err.)
Life-cycle effects	81- years	-0.057	0.032	0.025	0.032	0.057	0.032
	71-80 year	-0.065	0.026	0.043	0.026	0.066	0.026
	61-70 years	-0.076	0.022	0.030	0.022	0.065	0.022
	51-60 years	-0.069	0.019	0.024	0.019	0.035	0.019
	41-50 years	-0.052	0.016	0.011	0.016	-0.011	0.016
	31-40 years	-0.034	0.014	0.002	0.014	-0.016	0.014
	21-30 years	-0.028	0.012	0.013	0.012	0.008	0.012
	0-20 years	Ref.		Ref.		Ref.	
Political Party	Far left	0.085	0.011	0.080	0.011	0.095	0.011
	Left	0.060	0.006	0.065	0.006	0.061	0.006
	Center	Ref.		Ref.		Ref.	
	Right	-0.053	0.006	-0.056	0.006	-0.032	0.006
	Far right	-0.041	0.015	0.023	0.015	0.058	0.015
Including fixed effects:	Country	Yes		Yes		Yes	
	Period	Yes		Yes		Yes	
	Country*Period	Yes		Yes		Yes	
	Cohort	Yes		Yes		Yes	
	Cohort*Period	Yes		Yes		Yes	
Type III tests for fixed effects		F-value	DF	F-value	DF	F-value	DF
	Life-cycle	2.83**	7	1.59	7	10.88***	7
	Political party	182***	4	208***	4	132***	4
R-square		0.11		0.14		0.15	
Number of obs.		44029		44318		43971	

Estimates marked with **bold** imply that the estimate is significantly different from zero at the 5% level.

*: p<0.05

** : p<0.01

***: p<0.001

Figure 1a. Life-cycle effects (10 year) on preferences for public education spending

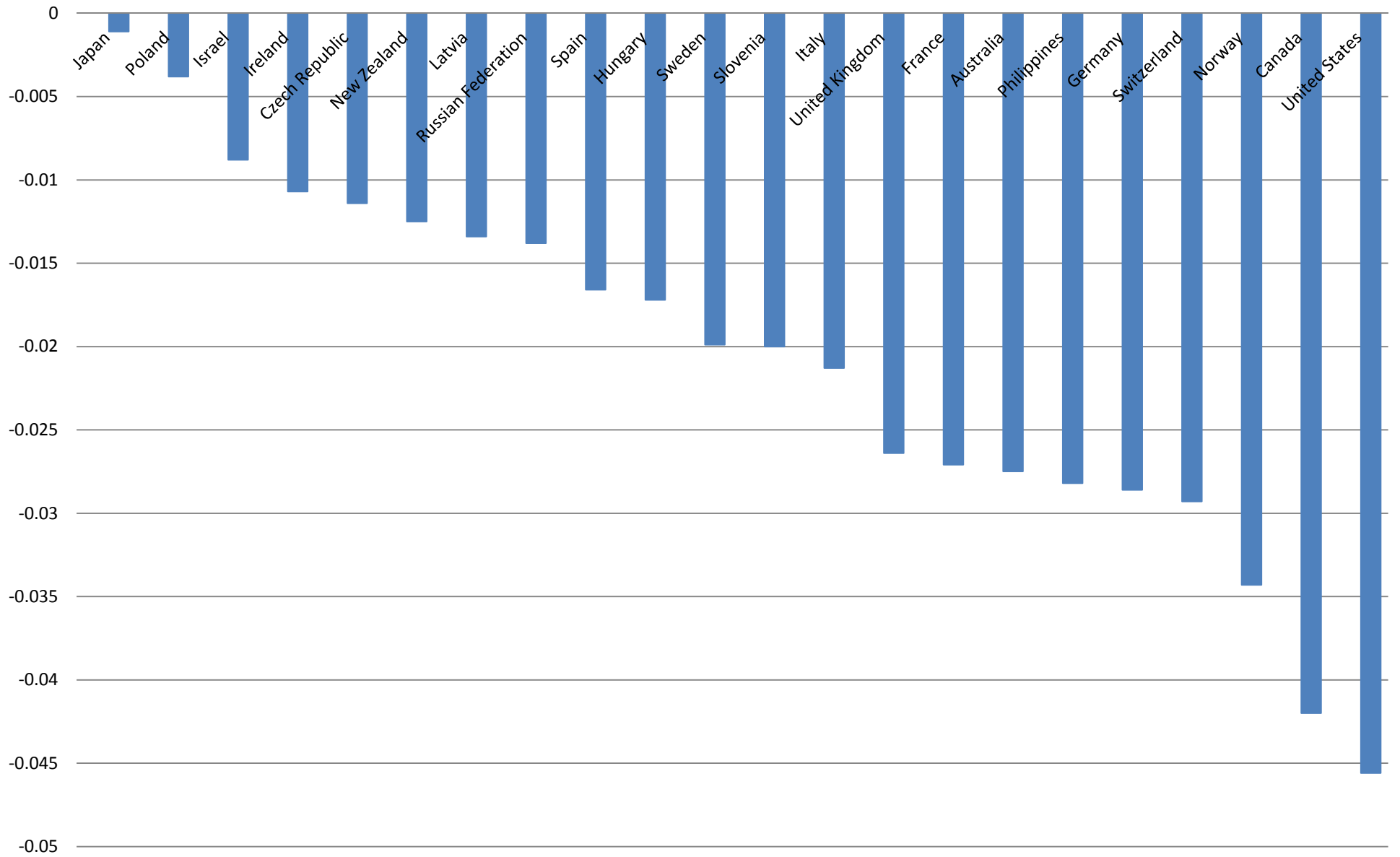


Figure 1b. Life-cycle effects (10 year increase on preferences for public health care spending)

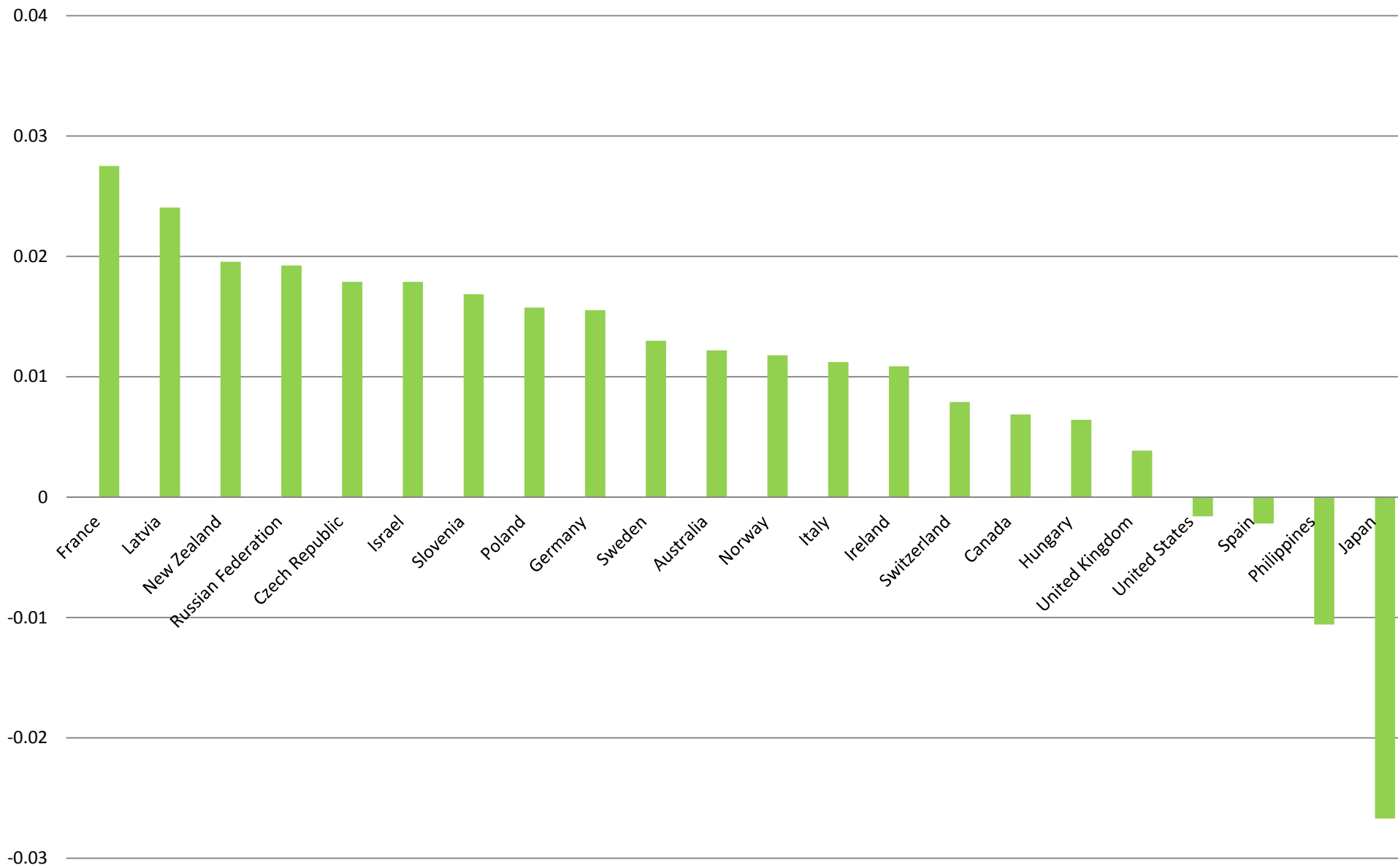


Figure 1c. Life-cycle effects (10 year increase) on preferences for public old-age pensions

