ARE THE ELDERLY A THREAT TO EDUCATIONAL EXPENDITURES?

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Abstract

Empirical research has given cause to fear that the demographic ageing in industrialized countries is likely to exert a negative impact on educational spending. These papers have linked the share of the elderly with the per capita or per pupil spending on education at the local, state-wide or national level, trying to control for other exogenous effects. Although this line of research shows in many cases a negative correlation between the shares of elderly people and educational expenditures, a causal link is difficult to prove. This paper uses a unique and representative survey of Swiss voters of all age groups. The analysis shows that elderly people present a clear tendency to be less willing to spend money on education. They would rather prefer to spend public resources on health and social security than on education. Furthermore the paper shows that much of the negative correlation between the shares of elderly and educational spending is the result of the elderly being politically more conservative and in general less inclined to pay for expenditures in the public sector as a whole.

JEL Code: H52, H72, I22, J18.

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1 Introduction

The demographic ageing process in most industrialized countries will reverse the demographic pyramid within the next decades. While the fraction of school age people will decrease, the fraction of people over the retirement age will almost double within the next forty years. Research in some countries has analyzed the effects these demographic changes will have on educational spending. While the reduction in the number of school age children alone will most probably not free as many resources as expected (see e.g. Grob and Wolter 2007), some papers show that it is the rising share of elderly that will have a negative impact on educational spending. The existing body of empirical research has so far - with one exception (see Brunner and Balsdon 2004) - analyzed the correlation between the shares of elderly and the educational spending at the local, state-wide or national level. The results show in most cases a negative correlation between the two but also notable exceptions, especially on the local levels of government. Differences in the political systems and the financing mechanisms of public spending on education of the analyzed cases and countries may explain some of the divergence in the results. In any case, the data used in these papers does not allow to establish a direct proof that the elderly are less inclined than younger people to spend money on education or that the elderly differ in their preferences for the use of public money. This paper tries to fill some of this gap by using a data-set that has been specifically collected for the purpose of this analysis. In May 2007 a representative sample of over 2000 Swiss nationals (with voting rights) has been surveyed in order to analyze whether there are really age-dependent differences in the willingness to spend money on education and the preferences for the spending of public resources.

The paper is organized as follows: Section 2 devotes some space to the theoretical discussion about age and the preferences for educational spending and lists the most recent empirical literature. Section 3 presents the hypotheses tested and the methodology applied in this paper. The forth section presents the data and provides some descriptive statistics. The empirical results are shown in section 5 and the conclusions drawn in regards to education policy are given in the final section.

2 Are the elderly less willing to spend on education?

The fraction of elderly people is increasing in relation to young people or children in school age and there are reasons to expect that this trend will continue in the future. This demographic shift will have consequences for the way public funds are distributed among different areas. Assuming that each individual in a democratic process is likely to push for his own interest, and that the public budget is limited, one might expect from the ageing median voter a decreasing support for policies which do not directly benefit the elderly. In the median voter theorem the government provides the amount of goods chosen by the median voter (see Downs, 1957). To the extent that the aged median voter might push for an allocation of funds that benefits the elderly, many studies have focused on the effects this might have on the finance of public services targeted to families or children such as education.

If we concentrate on people that are near or already over the retirement age, the age group that will increase the most over the next decades, it is safe to assume that they will not get any direct profit from continuing or starting a formal education. Moreover, most of them have children who already left the formal education system. Thus, following strictly their personal interest, older people most probably have a smaller incentive to spend tax money on education. At the same time, public resources are scarce and limited and older people might prefer to spend public money in favor of policies that benefit them, like health or social security, thereby increasing the pressure on educational spending without directly voting against it.

Still there are some arguments discussed in the literature (see also Grob and Wolter 2007, p. 280/81) why the elderly might choose to continue supporting education in the same way as other age groups.

1. Positive intergenerational externalities. This might produce an effect whereby the older population has a stake in a well-educated population whose higher productivity is essential in financing transfer benefits (old age pension, healthcare system, etc.), the greatest beneficiaries of which are the elderly. This primary argument is based on the rationale that even a purely egoistical voter will not tend to lower spending on education because that would undermine his or her own interests. This line of argument assumes that the median voter

both understands this relationship and that his actions are not solely based on thoughts of short-term gain[1]. However, the latter is a strong argument against this view considering that older voters are more likely to be interested in the short-term rather than the long-term consequences of their behavior, given their shorter life expectancy.

2. If there were a kind of intergenerational altruism that more or less ensures that older people feel bound by a generational contract (see e.g. Poterba 1996), the elderly would enable the young generation to enjoy the same funding that was afforded to themselves during their own youth [2]. One could furthermore assume that the older generation feels the more bound by the generational contract the more they themselves rely on funds with which younger generations are financing public goods that are more often consumed by the older generation[3].

3. U.S. studies in particular indicate a positive correlation between the quality of schooling and housing prices[4]. On the basis of this frequently observed relationship, it might be assumed that older citizens (many of whom are property owners) would try to maintain the value of their property by supporting spending on education. This argument is based on the circumstance that today's property market is dominated by newcomers to an area, who are likely to have school age children and therefore be willing to pay higher property prices in order to secure a higher-quality education for their offspring. It is uncertain whether this

[1]Konrad (1995) and Kemnitz (1999, 2000) put forward this argument, for example.

[2]Berkman and Plutzer (2004) show that the emotional "bond between generations" can only be found for longstanding older residents, whereas elderly newcomers in a district lower spending on education. The results seem to indicate that social capital in the form of "bonding" is an asset for educational expenditures.

[3]Borge and Rattso (2007) investigate the relationship between the fraction of population in a certain age and spending in three sectors: child care, education and care for the elderly. They find, using Danish panel data, that a larger proportion of older people decreases spending in child care and primary and lower secondary education, while the share of younger people does not threaten services for the elderly. According to this empirical evidence it looks as if the intergenerational solidarity does not go always both ways.

[4]Harris et al. (2001) use this argument to explain their empirical results, which identified a negative impact of the number of senior citizens on educational spending at State-level but no negative impact on local (County) educational spending. Declining spending at local level would have more of a negative impact on property prices than spending at State-level. Harris et al. (2001) use this argument to try and reconcile the different results of Poterba (1998) and Ladd and Murray (2001). Capitalization effects have been argued for and shown also by Brueckner and Joo (1991), Brunner and Baldson (2004) and Hilber and Mayer (2004). The capitalization argument also highlights the importance of the financing and decision making mechanisms. The more governments are centralized, the less age dependent regional or even local differences in the level of spending on education is possible. This also means that the level of aggregation of data has to concur with the degree of centralization of political decision making and that empirical results can not be transferred easily from one political system to another.

argument will continue to apply in the future when, due to demographic ageing, more and more potential homebuyers will not have school-age children and will therefore not take the quality of the local schools into consideration when deciding where to buy a new home.

4. As a variant of the above mentioned arguments one could also imagine that the number of older people in a community has no impact on the per-pupil funding but leads to a geographical sorting of people according to their age and respective preferences. In a Tiebout (1956) framework, people would sort into the community that best fits their preferences. According to this line of argument elderly people might choose to live in communities with fewer school age children and with less taxes spent on education. If this sorting takes place, one would not detect a correlation between the shares of elderly in a certain geographical area and the per-pupil spending on education[5]. However, if one would measure the correlation between the shares of elderly and the per-capita spending on education, one would find a negative relationship.

Apart from age there are other factors which might affect the willingness or the ability to pay for education. These factors have to be taken into account as control variables when trying to assess the impact of age in order to avoid biased results. The composition of the population according to race or nationality (see e.g. Alesina et al. 1999 or Robinson 2006) could influence the willingness of the majority of voters to spend money on education. Exogenous shocks, like a substantial rise in unemployment, could increase the competition for public funds and thereby negatively affect the educational budgets (see Baum and Seitz 2003). Last but not least the levels of funding per pupil also depend on the specific needs of the pupils. Pupils with special needs ask for more funding and these pupils are not evenly spread over school districts[6].

Looking at the predictions derived from the more theoretical literature (see e.g. Gradstein and Kaganovich 2004), one cannot safely conclude that there has to be a negative impact of the

[5]Robinson (2007) using school district and Census data from the U.S. finds that elderly individuals with different preferences have sorted into different urbanicity types. He only finds a negative impact of the shares of elderly on the funding levels per pupil in suburban districts and not in urban or rural districts.

[6]Grob and Wolter (2007) find that in Swiss Cantons with higher shares of immigrants - most of whom do not speak any of the national languages and come from low socio-economic backgrounds - the levels of per pupil spending on education are higher. If at the same time the elder Swiss nationals sort into Cantons with low shares of immigrants, not controlling for the share of immigrants in a Canton or school district would bias the coefficients for the share of elderly people.

share of elderly on educational expenditures. Looking at the empirical literature, the picture gets somewhat clearer but the findings are not unanimous. First, the literature on the age effects on educational spending is so far restricted to only a small number of countries (the U.S., Denmark, Germany and Switzerland). Secondly, the evidence coming from this literature is somewhat mixed, with a small majority of papers suggesting a negative impact of the share of elderly on educational expenditures. In the U.S., earlier literature suggesting a negative relationship by South (1991), Button (1992) or Hoyt and Toma (1993) had been corroborated by the findings of Poterba (1996, 1997 and 1998), Fernandez and Rogerson (2001), Harris et al. (2001), Brunner and Balsdon (2004) and to a certain extent also Ladd and Murray (2001), while Berkman and Plutzer (2004), Plutzer and Berkman (2005)[7] and Robinson (2007) found that in certain cases the older cohorts could even be more supportive of education expenditures. In Denmark (Borge and Rattso, 2007) and Switzerland (Grob and Wolter, 2007), negative relationships were found, whereas in Germany, Kempkes and Seitz (2005) did not find a correlation at all between the age composition of the population and education expenditures of West German states. However, Oberndorfer and Steiner (2006)[8], using education expenditures on higher education, found a negative effect of the share of the population over 55 on educational spending.

3 Hypotheses and survey questionnaire

The goal of this paper is to test the willingness to spend money on education and the age-related differences in preferences for public spending as directly as possible. The analysis implements an approach already used by Brunner and Balsdon (2004), in which they asked a sample of potential voters in California to express their opinion on one actual and one fictitious initiative concerning educational expenditures. The same approach makes sense in the context of Switzerland with its highly developed system of direct democracy, where voters are frequently asked to express their views on similar questions at the polls[9].

[7] Plutzer and Berkman (2005) argue that the findings in surveys according to which the older generation is less willing to spend money on education confuse age and cohort effects. In their analysis younger generations have become more supportive of education expenditures as they reach their 60s and 70s.

[8] A German version was published in the journal *Perspektiven der Wirtschaftspolitik* 8 (2), pp.165-183

[9] Direct democracy allows Swiss citizens to influence policy making at almost every stage of decision making through the right to propose new laws or the possibility to hinder new legislation by referendum.

Three specific questions had been developed and tested in a pre-test to analyze the willingness to spend money on education and the preferences for the use of public money:

1. The first question asked the respondents: "Assume that in your Canton of residence[10] an initiative to increase the expenditures on primary and lower secondary school by 10% is launched. If the vote were today, would you support the initiative, yes or no?"[11]

2. The second question of interest is: "Assume your Canton of residence presents a series of measures oriented to improve the education quality. How many extra francs in taxes per year would you be willing to spend in order to implement these measures?" There were four possible answers: zero, 1-100, 101-500 and more than 500 Swiss Francs (CHF)[12].

Both questions tend to answer the same, i.e., how likely people are to support more spending on schools. However, there are some subtle differences between them. In the first question the fact that in order to increase school spending taxes will have to be raised or budgets reallocated is not mentioned. Thus, it is left open who is ultimately going to pay for the increase in educational expenditures. This can lead people to answer in a different way, than if they are asked directly about having to pay extra taxes. As framing effects (see e.g. Bütler and Maréchal 2007) also influence voting behavior in a decisive way, we thought it worthwhile to analyze two different formulations of a seemingly identical question and compare the results.

3. To analyze the question whether age influences the respondents' preferences for specific sectors of public activity, we asked: "Which public expenditures should have priority in the future? Order the following sectors assigning numbers 1 to 5 in the order of your preferences. Assign each number only once." The sectors chosen for comparison were: health, police and justice, education, public transport and social security. The hypothesis is that compared to

[10]The Canton was used as the political and geographical area because such measures are voted in most Cantons at the cantonal level. School districts have various degrees of freedom to implement measures and to run schools but in most Cantons they cannot decide on the overall amount of resources devoted to education. Even if in most Cantons school districts or communities raise the taxes to pay for education, the level of funding and spending is decided on cantonal level in order to assure equity in the provision of education.

[11]The 10% increase in the question can be regarded as a realistic figure in the Swiss context. As a matter of comparison, one can look at the plan of the federal government for the expenditures on education, science and technology for the period 2008-2011. The government had initially proposed a growth rate of 4.5% for the next four year period but the main political parties in the parliament asked for growth rates between 6 and 10%.

[12]1 Swiss Franc (CHF) corresponds roughly to 0.8 USD or 0.6 Euro.

sectors of public activity where specific age groups most probably do not exhibit different patterns of preferences (justice and public transport), elderly people would prefer public spending on health and social security over education more often than younger age groups.

Two questions had then been developed to control for alternative explanations of differences in the willingness to spend public money on education, which could also be age related.

First, elderly people might be against higher public expenditures in general and not only particularly against education expenditures. If this were the case, higher shares of elderly in a district would lead to lower per pupil spending but not because the older cohorts are specifically against spending on education but because they press for lower public spending in general. To avoid the confusing effects that might arise from this we will control for this in the analysis.

Hence, individuals were asked about their willingness to pay taxes in general. The exact question was "Assume you have to vote in an initiative that proposes a reduction of taxes by 10%, financed by a general reduction in public expenditures by 10%. If the vote were today, would you support the initiative, yes or no?"[13]

Secondly, the partisan theory (Hibbs 1977) postulates that parties and ideologies play a role in political decision making, and therefore in determining education expenditures as well. The assumption is that more left-oriented individuals are more likely to encourage public education expenditures, the opposite being true for their right-oriented counterparts[14]. Thus we will control for political ideology as old and young people might differ in their political preferences and it might be the political preferences that matter and not age. If this were the case, not controlling for the political orientation of the people living in a district could lead to wrongly interprete the effect of political ideology as an age effect.

In the aforementioned empirical studies, the political orientation of the population was sometimes measured by the political composition of the government or the parliament but these variables are - depending on the political system - in many cases only crude measures or even mis-

[13]Initiatives with similar postulates had been voted in several Swiss Cantons in the past years. Therefore the question can be regarded as a realistic one in the Swiss political context.

[14]Oberndorfer and Steiner (2006) found in Germany that against their expectations it were the German states with a conservative or coalition government including the conservative party that showed the highest expenditures in higher education.

leading. One can safely assume that if politicians sense that the median voter becomes more conservative then even left-oriented political parties adopt a more conservative approach to many policy questions.

4 Data and Descriptive Statistics

To study the hypotheses presented in the previous section we commissioned the professional survey institute "Gesellschaft für praktische Sozialforschung" (GfS)[15] to collect data from a representative sample of Swiss citizens. The sample contains data on 2025 Swiss citizens over the age of 25. The data was collected in May 2007 using Computed Assisted Telephone Interviewing (CATI). The interviews were held in German, French or Italian depending on the language region. Apart from individual socio-economic and family characteristics, respondents were asked to express their opinion on a series of question concerning education and education financing.

The main control variables, apart from age as the regressor of interest, include education, political orientation, if the respondent has children, whether the children are still in school and household income.

In order to control for political orientation we created three dummies: $right$, $centre$ and $left$. The individuals were asked to indicate their political sympathies using an 11 points scale from 0 to 10, 0 being completely left and 10 completely right. The indicator $right$ was created assigning 1 to all people who responded 7 or higher, $left$ was created assigning 1 to people who responded 3 or lower. The rest, 4, 5, 6, were classified as $centre$ (the distribution of the variable can be seen in Appendix 1).

In order to control for education we created three dummy variables based on the highest level of education attained and following standard degree classification. The three dummies are *primary education* which includes people with completed primary school or lower secondary school. The dummy *secondary education* includes all people with completed grammar school or a vocational training on upper secondary level. Finally *tertiary education* includes all people with a university, university of applied science or higher vocational training degree.

[15]The GfS institute is one of the leading institutes in Switzerland carrying out opinion polls. It has a long tradition in political analyses and representative polls for elections and votes.

Respondents were also asked about their net monthly household income. Each respondent could choose among five income classes. For each income category we generated a dummy variable. Missing values were imputed using the Swiss Labor Force Survey as an information source.

Table 1 provides the descriptive summary of the data. The results show that 71% of the respondents would support a 10% increase in education expenditures. The percentage of support for those over 60 is below the mean, whereas for the age group between 30 and 50 it is above the mean. The difference in support between the group of the 30-50s and the over-60s is statistically significant.

Regarding the question about the willingness to pay more taxes for measures designed to improve the quality of education, the majority of people would be willing to spend either zero or between 0 and 100 extra francs per year. Results suggest that respondents over 50 are more likely to refuse to pay any extra taxes for education and that they are less likely to accept paying between 1 and 100 extra francs than people in 25-50 age-group. When we look at the small group (6%) of people who would be willing to spend more than 500 CHF we do not find a clear age pattern.

The answers to the third question show that almost 46% of the respondents consider that education should be the sector to prioritize in the future, followed by health. However, the fraction of education supporters differs when looking at the ranking made by different age groups. Around 50% of the respondents aged between 30 and 50 prioritize education and about 25% prioritize health. They are the age-group with the largest support for education. The advantage of education over health for people older than 70 is much smaller. Those older than 60 are clearly overrepresented in the group giving the highest priority to social security. Lower support for education is also given by people between 25 and 30. The latter also show a relatively large support for social security. This might be due to the fact that this group is entering the labor market and may fear unemployment or has just founded a family and is more likely to depend on social transfers.

——- Table 1 about here ——

The descriptive results seem to indicate that the elderly are supportive of education but less so than the age group of the 30-50 years old. However this difference might be due to many other factors, like still having children in the school-going age[16], political preferences[17] or income class. To control for all these effects multivariate analyses are used and the results are presented in the next section.

5 Empirical Results

5.1 Are the elderly against increasing education expenditures?

In Section 3 we postulated that senior citizens might be against incrementing education expenditures because of the belief that any extra spending will not provide any direct benefit to them. We will study this hypothesis using the answers to the question on the initiative to increase educational expenditures by 10% using the following probit model:

$$P(yes_i = 1|age_i, x_i) = \Phi(\beta_0 + age_i * \delta + x_i'\beta)$$

Where Φ is the normal cumulative distribution function, *yes* is an indicator variable equal to one if the person answered yes to the question whether he/she was willing to accept an initiative to increase school spending and zero otherwise. x includes all variables other than age that could influence the probability of accepting the initiative, among them political orientation, whether the respondent has children in school age, household income, highest level of education attained and place of residence.

Table 2 presents the results of the probit model using the data described in Section 4. Column 1 shows that age has indeed a negative influence on the probability of supporting an increase in education expenditures[18]. One more year of age decreases the probability of supporting the increase in education spending by 0.15 percentage points (marginal effects)[19]. However, this

[16] Approximately 70% of the 40-49 years old have school age children against only 9% of the older than 70.

[17] Only 15% of the individuals older than 70 classified themselves on the left side of the political scale against about 25% in the 30-60 years age-group. Furthermore: Around one third of the people over 60 would support an initiative for a general reduction of taxes and public expenditures. The fraction of supporters is only between a fifth and a quarter for the 30-50 years old.

[18] We tried two alternative specifications: one including age square and one including a dummy for each age group. The results remain unchanged and we did not find evidence supporting the non linear specifications.

[19] Marginal effects for all coefficients can be obtained from the authors on request

negative effect disappears as soon as we control for political orientation. This means that the age effect in Column 1 just captures the fact that older people have different political preferences than younger ones and that people with a more conservative political orientation are less likely to support the proposed initiative irrespective of age.

Not surprising is the result that people who would like to reduce public spending in general also prefer not to increase school expenditures. The result also shows that the surveyed respondents were consistent in their answer pattern. Moreover, individuals with primary school only are less likely to support an increase in education spending than individuals with a tertiary degree. The same holds for people living on the countryside or in small towns compared to urban regions, even when controlling for the educational level of respondents. This result is consistent with the observation that per pupil spending in urban or even "city"-cantons is significantly higher than in rural Cantons, even when controlling for differences in the price- and income-levels. Homeowners are less likely to support higher education expenditures, a result that is in contradiction with the results found by Grob and Wolter (2007) using panel data on educational expenditures of Swiss Cantons.

——- Table 2 about here ——

Looking at the results in Table 2[20] we do not find evidence that the bigger share of elderly in the group of those who would have voted against an increase in educational spending is due to a genuine age effect. It is rather the result of the elderly having more conservative political convictions, the fact that they are against higher public expenses in general and to a certain extent their lower educational level compared to younger cohorts. In order to see if the results change when we formulate the question in a slightly different way, we present the results in the next subsection using the question which explicitly asks for the willingness to pay higher taxes for educational purposes.

[20]The number of observations depends on the number of respondents who had chosen the answer category "do not know". In order to check whether this might lead to biased results in our regressions, we also carried out "non-response" analysis. This analysis showed, that the group of those respondents with the lowest level of education significantly more often choose not to respond to a question. Unfortunately, we can not correct for this potential bias with a selection correction model as all variables that could influence the choice to answer or not also have a potential impact on our dependent variables.

5.2 Willingness to pay more taxes in order to improve the quality of education

In the questionnaire respondents were asked how many extra francs in taxes per year they would be willing to pay in order to improve school quality. They could give 4 possible answers: 0 CHF (0), 1-100 CHF (1), 101-500 CHF (2) and more than 500 CHF (3). To analyze this a multinomial logit model of the form:

$$P(y_i = j|age_i, x_i) = \frac{\exp(age_i * \delta_j + x_i'\beta_j)}{\sum_{r=0}^{3} \exp(age_i * \delta_r + x_i'\beta_r)} \qquad j = 0, \ldots, 3$$

is used. The vector x includes the same variables as in subsection 5.1 and a constant, and $\delta_0 = 0$ and $\beta_0 = 0$ as normalization for the base category (0).

The results are presented in Table 3. Specification 1 shows that older people are less willing to support a tax increase of between 1 and 500 CHF over no increase. However, they are indifferent between paying 0 extra Swiss francs and more than 500 CHF. Results change little when we include the other controls. Specification 4 shows that the elderly are more likely to prefer to pay zero extra taxes rather than to pay between 1 and 100 CHF but they are also more likely to support an increase of more than 500 CHF in comparison to no increase at all. The probability of being willing to spend more than 500 extra francs per year increases by 0.1 percentage point with each year of age. This might be indicating that even though the majority of the elderly refuse to pay more taxes to support more spending in education, a small fraction, maybe for philanthropic or altruistic reasons, is willing to spend much more than the average person.

As expected, income plays an important role in determining how much extra money people are willing to pay. The higher the household income, the bigger is the probability to support an increase of more than 500 CHF. Homeowners also have a higher probability of supporting an increase of more than 500 Francs. The reasons for this might be twofold: on the one hand - as mentioned in the U.S. literature - the capitalization of education expenditures into house prices might influence homeowners. On the other hand, owning a house could just capture some wealth effects independent of income, homeowners might be better off and thus more willing to invest in education.

People from the French and Italian speaking regions are less likely to support a tax increase of more than 100 CHF as well as individuals who would vote for a general reduction in taxes. Also consistent with the results in the previous question, people with rather leftist convictions are more willing to support an increase higher than 101 Francs. All in all, the results in the analyses of the answer patterns to both questions are rather similar with the exception that when directly asked about the willingness to spend more of the personal income on education, a genuine age effect is observable.

——- Table 3 about here ——

5.3 Which sector of public activity should be prioritized in the future?

Until now the questions referred to the support given to an increase of education expenditures and whether or not respondents were willing to individually pay more taxes for education. In reality, however, voters do rarely express themselves directly against education expenditures but rather show preferences for expenditures in other public domains. In the context of limited fiscal resources differences in the preferences for public goods lead to an increased competition for the scarce public resources. If there is indeed an intergenerational conflict between old and young, the generations would compete for these scarce resources, putting pressure on educational budgets as a result of this conflict. In sections 2 and 3 we hypothesized that the elderly might prefer to allocate more funds to areas from which they expect to obtain a greater benefit, like health and social security. If this were true, they would push expenditures in these sectors at the expense of education.

In order to analyze this hypothesis, respondents were asked which public sectors should be prioritized in the coming years. The possible answers were: education (0), health (1), justice and police (2), public transport (3) and social security (4). The model is as follows:

$$P(y_i = j|age_{25-30i}, age_{50i}, x_i) = \frac{\exp(age_{25-30i} * \delta_{1j} + age_{50i} * \delta_{2j} + x_i'\beta_j)}{\sum_{r=0}^{4} exp(age_{25-30i} * \delta_{1r} + age_{50i} * \delta_{2r} + x_i'\beta_r)} \quad j = 0, \ldots, 4$$

Where age_{25-30} and age_{50} are variables indicating the respective age groups, the latter including

all respondents older than 50 years. People in the reference group therefore have an age between 31 and 49 years. As before $\delta_{10} = 0$, $\delta_{20} = 0$ and $\beta_0 = 0$ for the base category (0).

The results presented in Table 4 (Specification 1) show that individuals older than 50 years old would in fact prioritize health or social security rather than education. These results still hold after controlling for all other variables. Specifically, people older than 50 are on average five percentage points more likely than people between 30 and 49 to prefer social security and four percentage points more likely to choose health as the first priority. As a mirror image they have a nine percentage points lower probability of choosing education as the highest priority. We cannot reject the null hypothesis that the coefficients of age_{25-30} and age_{50} are the same for all outcome categories. This means we have no evidence that the eldest and the youngest group have different interests. However, one should keep in mind that the younger age group is rather small and therefore the coefficient for age_{25-30} is very imprecise.

As it could be expected from the previous results, people with a primary or a lower secondary education are more likely to prioritize all four sectors over education, in comparison to people with a tertiary degree. Residents of the Italian and French speaking regions have a higher probability of preferring health over education spending. Political orientation also has an impact on the probability of preferring a certain sector, respondents with conservative views rated justice and police higher than education. However, they consider education as more important than social security. The opposite is true for respondents with political preferences for the left.

——- Table 4 about here ——

6 Conclusions

The demographic changes in most industrialized countries do not only lead to a smaller number of pupils but also to a much larger share of the population that is in the retirement age. Empirical studies in a small number of countries over the last decade have suggested that the ageing of societies might threaten public expenditures on education because the elderly are less inclined to spend money on education. The different preferences of the elderly have been explained by a

rational behavior of each age group seeking to push public expenditures in domains where they expect the highest personal benefit. The exceptions found in the empirical literature, i.e. the cases where the elderly do not differ in their preferences for educational expenditures from other age groups, are compatible with this assumption because they are found in a context where the elderly also profit from educational spending. Either trough positive capitalization effects; in this case the elderly homeowners profit from the fact that a higher school quality translates into higher house-prices. Or through intergenerational solidarity that depends on the one hand on stable neighborhoods (high bonding) and on the other hand on high levels of political decentralization and fiscal autonomy.

Although the empirical literature seen as a whole does provide a rather coherent picture, it does not provide a direct proof for age-related differences in the preferences for education. In order to fill this gap, following an idea of Brunner and Balsdon (2004), we decided to analyze this question with a more direct approach, simulating political initiatives on education expenditures, which can be regarded as realistic in the Swiss political context. With a representative sample of 2025 Swiss citizens we analyzed the response patterns of different age groups to three questions using a rich set of background variables as controls.

First, we studied whether older citizens might be willing to back an initiative to increase education expenditures by 10%. We did not find evidence that the elderly are less likely to support the initiative than younger people after we control for political orientation and the general willingness to pay taxes for public goods. The fact that the elderly are more conservative in political terms and more likely to support fiscal austerity programs seem to be the reasons for not supporting higher spending on education.

Secondly, we analyzed how many extra taxes voters might be willing to pay in order to improve education quality. This question differs from question one insofar as in the first case it was not clear who would have to pay for the extra expenditures on education. The second question aimed therefore directly at the individual willingness to pay for education. In this case we find evidence that the elderly are more likely to refuse any increase in taxes to finance the education system. But we also find a very small fraction of elderly people who are more likely to support high taxes

even when controlling for income, educational background and other socio-demographic variables. The results indicate that preferences of the elderly are not homogenous, even if the majority is against paying higher taxes for education.

Thirdly, with respect to the sectors the elderly would choose to prioritize, results confirm our hypothesis (and the findings of Borge and Rattso 2007) that older people prefer to support those areas from which they expect a higher direct benefit, namely health and social security.

Overall, the results corroborate the macro-findings of Grob and Wolter (2007) who had found in their panel estimates for Swiss Cantons that higher shares of the elderly population led to lower levels of educational expenditures by showing that the elderly indeed had a lower willingness to spend money on education.

In regard of the high influence of the political orientation and the general willingness to pay for public goods on the willingness to pay for education, it is not entirely clear whether the correlation between age, conservatism and low willingness to pay for public good is a cohort or an age effect. If it is the latter, then the demographic ageing process is indeed likely to exert a significant negative influence on educational budgets in the coming years.

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Tables

Table 1: Descriptive Statistics

	25-29	30-39	40-49	50-59	60-69	>70	Total
10% increase in education expenditures							
Percentage of yes	0.704	0.76	0.749	0.676	0.672	0.685	0.71
	(0.038)	(0.023)	(0.022)	(0.026)	(0.024)	(0.028)	(0.011)
							1837
Willingness to pay more taxes per year. How much?							
0	0.272	0.29	0.256	0.34	0.344	0.367	0.342
	(0.036)	(0.024)	(0.021)	(0.026)	(0.023)	(0.026)	(0.008)
1-100	0.494	0.459	0.371	0.334	0.332	0.316	0.408
	(0.04)	(0.026)	(0.024)	(0.026)	(0.023)	(0.026)	(0.011)
101-500	0.12	0.161	0.228	0.203	0.149	0.145	0.19
	(0.027)	(0.019)	(0.021)	(0.022)	(0.017)	(0.019)	(0.009)
>500	0.019	0.03	0.057	0.069	0.077	0.054	0.06
	(0.011)	(0.01)	(0.011)	(0.014)	(0.013)	(0.012)	(0.006)
							1854
Sector which should have priority in the future							
Health	0.279	0.29	0.246	0.305	0.269	0.328	0.284
	(0.04)	(0.02)	(0.02)	(0.03)	(0.02)	(0.03)	(0.01)
Justice and Police	0.08	0.062	0.043	0.069	0.075	0.045	0.06
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.005)
Education	0.424	0.484	0.538	0.43	0.428	0.392	0.455
	(0.04)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.012)
Public transport	0.03	0.051	0.062	0.054	0.053	0.051	0.052
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.005)
Social security	0.19	0.112	0.11	0.143	0.176	0.184	0.148
	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.008)
							2025
Children attending school							
Percentage of yes	0.044	0.44	0.694	0.436	0.161	0.09	0.346
	(0.016)	(0.026)	(0.023)	(0.027)	(0.018)	(0.016)	(0.011)
							2025

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	25-29	30-39	40-49	50-59	60-69	>70	Total
Education							
Primary	0.437	0.213	0.139	0.236	0.281	0.283	0.244
	(0.04)	(0.021)	(0.017)	(0.023)	(0.022)	(0.025)	(0.01)
Secondary	0.399	0.525	0.548	0.528	0.471	0.515	0.508
	(0.039)	(0.026)	(0.024)	(0.027)	(0.025)	(0.027)	(0.01)
Tertiary	0.165	0.262	0.313	0.236	0.248	0.202	0.248
	(0.029)	(0.023)	(0.023)	(0.023)	(0.021)	(0.022)	(0.01)
							2025
Political orientation							
Right	0.195	0.165	0.154	0.184	0.188	0.201	0.179
	(0.037)	(0.022)	(0.02)	(0.023)	(0.021)	(0.024)	(0.009)
Centre	0.576	0.598	0.582	0.581	0.63	0.65	0.606
	(0.046)	(0.029)	(0.027)	(0.03)	(0.027)	(0.03)	(0.012)
Left	0.229	0.237	0.264	0.235	0.182	0.147	0.215
	(0.03)	(0.02)	(0.02)	(0.022)	(0.018)	(0.018)	(0.01)
							1647
Support for a general reduction in taxes							
Percentage of Yes	0.355	0.228	0.253	0.3	0.303	0.334	28.75
	(0.041)	(0.023)	(0.023)	(0.026)	(0.024)	(0.029)	(0.453)
							1774

Table 2: Probit results of the probability of accepting an increase in education expenditures

	(1)	(2)	(3)	(4)	(5)	(6)
Age	-0.005	-0.004	-0.005	-0.005	-0.004	-0.002
	(0.002)*	(0.002)+	(0.002)*	(0.002)+	(0.003)	(0.003)
Children, yes/no		0.05	0.10	0.09	0.10	0.03
		(0.09)	(0.09)	(0.09)	(0.10)	(0.10)
Children in school		0.17	0.15	0.16	0.14	0.12
		(0.08)*	(0.08)+	(0.09)+	(0.09)+	(0.09)
Education: primary			-0.25	-0.27	-0.23	-0.21
			(0.09)**	(0.10)**	(0.10)*	(0.10)*
Education: secondary			-0.12	-0.13	-0.12	-0.11
			(0.08)	(0.08)	(0.08)	(0.08)
Income: <3000 SF			0.31	0.35	0.27	0.11
			(0.13)*	(0.13)**	(0.14)*	(0.15)
Income: 3000-5000 SF			0.23	0.21	0.16	0.09
			(0.10)*	(0.10)*	(0.10)	(0.11)
Income: 5000-7000 SF			0.04	0.03	0.01	-0.03
			(0.09)	(0.10)	(0.10)	(0.1)
Income: 7000-9000 SF			0.17	0.17	0.13	0.13
			(0.10)+	(0.1)	(0.11)	(0.11)
Countryside			-0.31	-0.33	-0.32	-0.25
			(0.08)**	(0.08)**	(0.08)**	(0.09)**
Small town			-0.26	-0.28	-0.28	-0.23
			(0.08)**	(0.08)**	(0.08)**	(0.08)**
Latin Switzerland			0.04	0.07	0.08	0.08
			(0.07)	(0.07)	(0.07)	(0.08)
Agree to a general tax reduction				-0.27	-0.20	-0.19
				(0.07)**	(0.07)**	(0.07)**
Political orientation: Right					-0.40	-0.37
					(0.09)**	(0.09)**
Political orientation: Left					0.29	0.29
					(0.10)**	(0.10)**
Homeowner						-0.18
						(0.07)*
Constant	0.8	0.66	0.87	0.95	0.93	0.71
	(0.11)**	(0.12)**	(0.15)**	(0.15)**	(0.16)**	(0.21)**
N	1837	1833	1833	1673	1673	1659
Log Likelihood	-1103.60	-1097.17	-1080.57	-972.42	-955.02	-937.76

Standard errors in parentheses
**Significant at the 1%, *significant at the 5%, + significant at the 10%

Table 3: Multinomial logit model of the willingness to pay more taxes to improve the quality of education. How much?

Base Category: 0 CHF	1-100 SF	101-500 SF	>500 SF
(1)			
Age	-0.02	-0.01	0.01
	(0.00)**	(0.00)*	(0.01)
Constant	1.02	-0.07	-2.11
	(0.19)**	(0.23)	(0.37)**
N=1854			
LL=-2241.572			
(2)			
Age	-0.02	-0.01	0.01
	(0.00)**	(0.00)*	(0.01)
Children	-0.09	0.21	-0.15
	(0.15)	(0.19)	(0.29)
Children in school	-0.06	-0.01	0.25
	(0.14)	(0.17)	(0.26)
Constant	1.09	-0.15	-2.25
	(0.21)**	(0.26)	(0.42)**
N=1849			
LL=-2231.362			

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Base Category: 0 CHF	1-100 SF	101-500 SF	>500 SF
(3)			
Age	-0.01	-0.005	0.02
	(0.00)**	(0.01)	(0.01)*
Children	-0.14	0.12	-0.18
	(0.16)	(0.20)	(0.31)
Children in school	-0.02	-0.09	0.21
	(0.14)	(0.18)	(0.28)
Male	-0.03	0.02	0.25
	(0.11)	(0.14)	(0.22)
Education: primary	-0.02	-1.28	-1.26
	(0.17)	(0.22)**	(0.38)**
Education: secondary	-0.12	-0.7	-0.52
	(0.15)	(0.16)**	(0.24)*
Income: <3000	-0.25	-1.07	-1.65
	(0.22)	(0.31)**	(0.49)**
Income: 3000-5000	-0.002	-0.99	-1.7
	(0.18)	(0.23)**	(0.36)**
Income: 5000-7000	0.2	-0.22	-0.91
	(0.18)	(0.20)	(0.29)**
Income: 7000-9000	0.19	0.15	-0.52
	(0.19)	(0.21)	(0.30)+
Countryside	-0.09	0.20	-0.37
	(0.14)	(0.17)	(0.27)
Small town	0.01	0.24	-0.25
	(0.13)	(0.17)	(0.25)
Latin Switzerland	-0.14	-0.51	-0.66
	(0.12)	(0.16)**	(0.26)*
Constant	1.07	0.52	-1.15
	(0.27)**	(0.33)	(0.51)*
N=1849			
LL=-2135.3202			

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Base Category: 0 CHF	1-100 SF	101-500 SF	>500 SF
(4)			
Age	-0.01	-0.001	0.02
	(0.00)**	(0.01)	(0.01)*
Children	-0.1	0.09	-0.18
	(0.18)	(0.22)	(0.32)
Children in school	-0.12	-0.20	0.13
	(0.16)	(0.19)	(0.29)
Male	-0.04	0.05	0.30
	(0.13)	(0.16)	(0.24)
Education: primary	-0.31	0.24	0.39
	(0.15)*	(0.22)	(0.37)
Education: secondary	-0.26	0.88	0.84
	(0.19)	(0.24)**	(0.40)*
Income: <3000	-0.42	-1.09	-1.36
	(0.25)+	(0.34)**	(0.52)**
Income: 3000-5000	-0.08	-0.91	-1.50
	(0.20)	(0.25)**	(0.39)**
Income: 5000-7000	0.11	-0.24	-0.95
	(0.19)	(0.22)	(0.31)**
Income: 7000-9000	0.16	0.12	-0.68
	(0.20)	(0.22)	(0.32)*
Countryside	-0.01	0.19	-0.49
	(0.15)	(0.19)	(0.29)+
Small town	0.05	0.26	-0.33
	(0.15)	(0.19)	(0.27)
Latin Switzerland	-0.10	-0.51	-0.69
	(0.13)	(0.17)**	(0.28)*
Homeowner	0.02	0.17	0.64
	(0.13)	(0.17)	(0.27)*
For general reduction in taxes	-0.6	-1.13	-0.53
	(0.13)**	(0.18)**	(0.26)*
Political orientation: Right	-0.25	-0.29	-0.31
	(0.17)	(0.22)	(0.33)
Political orientation: Left	0.19	0.58	0.89
	(0.17)	(0.20)**	(0.28)**
Constant	1.44	-0.01	-1.05
	(0.39)**	(0.50)	(0.78)
N=1624			
LL=-1858.5764			

Standard errors in parentheses
**Significant at the 1%, *significant at the 5%, + significant at the 10%

Table 4: Multinomial logit model of which public expenditures should have priority in the future

Base Category: Education	Health	Justice/Police	Public Transport	Social Security
(1)				
Age: 25-30	0.23	0.56	-0.41	0.73
	(0.21)	(-0.35)	(0.49)	(0.25)**
Age: >50	0.32	0.40	0.12	0.62
	(0.11)**	(0.21)+	(0.21)	(0.15)**
Constant	-0.65	-2.28	-2.19	-1.53
	(0.09)**	(0.16)**	(0.16)**	(0.12)**
N=2025				
LL=-2665.6035				
(2)				
Age: 25-30	0.15	0.32	-0.55	0.57
	(0.23)	(0.39)	(0.51)	(0.27)*
Age: >50	0.34	0.45	0.15	0.62
	(0.13)**	(0.23)+	(0.24)	(0.16)**
Children	-0.18	-0.33	-0.29	-0.21
	(0.15)	(0.26)	(0.28)	(0.18)
Children in school	0.03	0.07	0.04	-0.09
	(0.14)	(0.26)	(0.27)	(0.18)
Constant	-0.54	-2.08	-2.00	-1.33
	(0.13)**	(0.24)**	(0.24)**	(0.17)**
N=2019				
LL=-2655.0894				
(3)				
Age: 25-30	-0.001	0.04	-0.82	0.48
	(0.26)	(0.43)	(0.58)	(0.3)
Age: >50	0.33	0.34	-0.01	0.59
	(0.15)*	(0.26)	(0.25)	(0.19)**
Children	-0.22	-0.02	-0.23	-0.08
	(0.18)	(0.31)	(0.31)	(0.22)
Children in school	0.03	0.22	0.13	-0.18
	(0.16)	(0.28)	(0.28)	(0.20)

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Base Category: Education	Health	Justice/Police	Public Transport	Social Security
Male	-0.41	0.28	0.46	-0.17
	(0.13)**	(0.23)	(0.23)+	(0.16)
Education: primary	0.72	0.49	0.63	0.57
	(0.19)**	(0.31)	(0.34)+	(0.25)*
Education: secondary	0.62	0.27	0.57	0.81
	(0.15)**	(0.26)	(0.28)*	(0.20)**
Homeowner	-0.35	-0.27	-0.09	-0.46
	(0.13)**	(0.23)	(0.24)	(0.17)**
Married	0.05	-0.48	0.35	0.12
	(0.15)	(0.24)+	(0.27)	(0.18)
Income: <3000	0.34	0.40	0.63	0.04
	(0.27)	(0.43)	(0.44)	(0.32)
Income: 3000-5000	0.39	-0.03	0.16	0.16
	(0.21)+	(0.35)	(0.35)	(0.24)
Income: 5000-7000	0.32	0.07	0.09	-0.20
	(0.19)+	(0.32)	(0.32)	(0.23)
Income: 7000-9000	0.3	0.03	-0.47	-0.25
	(0.2)	(0.33)	(0.37)	(0.24)
Countryside	-0.07	-0.29	-0.1	-0.03
	(0.15)	(0.27)	(0.28)	(0.19)
Small town	0.13	0.12	0.24	0.33
	(0.15)	(0.25)	(0.27)	(0.18)+
Latin Switzerland	0.77	0.24	-0.03	0.13
	(0.13)**	(0.23)	(0.25)	(0.17)
For general reduction in taxes	0.64	0.40	0.8	0.48
	(0.14)**	(0.23)+	(0.23)**	(0.17)**
Political orientation: Right	-0.16	0.53	0.24	-0.74
	(0.18)	(0.25)*	(0.30)	(0.27)**
Political orientation: Left	-0.27	-0.54	0.64	0.38
	(0.17)	(0.35)	(0.27)*	(0.19)*
Constant	-2.04	-3	-3.49	-2.86
	(0.33)**	(0.55)**	(0.58)**	(0.41)**
N=1755				
LL=-2188.1831				

Standard errors in parentheses
**Significant at the 1%, *significant at the 5%, + significant at the 10%

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