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"Honey, I shrunk the kids' benefits!" – Revisiting intergenerational conflict in OECD countries.

Tim Krieger, Jens Ruhose

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“Honey, I shrunk the kids’ benefits!” —
Revisiting intergenerational conflict in OECD countries.

Tim Krieger* Jens Ruhose†

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Abstract

Intergenerational conflicts may arise when interests of different age groups do not align. We examine cross-country data to find evidence for this conflict in OECD countries. We derive our results from a FGLS estimation model, which is complemented by a System-GMM estimation. Data covers a panel of 22 OECD countries over the time period 1985-2005. We find little support for intergenerational conflict in general; however, those who are close to (statutory) retirement age dislike public expenditure for families and education because, once they retire, they have to adapt to lower retirement income levels compared to previous work income. This effect lasts for a transitory period only.

Key Words: Intergenerational Conflict, Family Benefits, Population Ageing, Education Expenditure, Voting, Retirement Income Shock.

JEL Codes: D72, H50, J13, J14, I22.

*University of Paderborn, Department of Economics, Warburger Str. 100, D-33098 Paderborn, Germany; E-mail: tim.krieger@notes.uni-paderborn.de; Phone: +49 5251 60 2117

†IfO Institute - Leibniz Institute for Economic Research at the University of Munich, Poschingerstr. 5, 81679 Munich, Germany; E-mail: ruhose@ifo.de; Phone: +49 89 9224 1388

1 Introduction

Intergenerational conflicts may arise when interests of different age groups do not align. This is especially true when it comes to preferences for (re-)distributing scarce resources among groups in society. In the public realm, a given tax revenue can be spend on diverse transfer programs; likewise, depending on who the main beneficiaries of public spending are, public support for taxation may differ. A substantial share of public spending is age-related, ranging from child care, maternity benefits and public education to pensions, long-term care and other old-age benefits. While the first group of transfers is of particular interest to younger individuals and families with children, the latter group concerns mostly elderly people. Arguably, a conflict may arise between the young and old generations when they – via the political process – enter into bargaining about the shares of public revenues going into their pockets. It is the main aim of the present contribution to revisit the idea of intergenerational conflict and to provide new empirical evidence on its existence, or rather non-existence, in the international realm.

Many studies have investigated the size of the welfare state, thereby referring to the role of the electoral process. In his seminal contribution, Downs (1957) predicts that the government provides the amount of goods chosen by the median voter. Browning (1975) points to the fact that the median voter herself will become older in an ageing society. Hence, under these circumstances one would expect that an increasing share of (public) resources will be transferred to the elderly. In particular, this should be the case when majority voting is applied to a pay-as-you-go (PAYG) social insurance system, which will turn out to be inefficiently large (cf. Browning 1975; Sjoblom 1985). This may be explained from the fact that voters close to retirement (but still employed), i.e., voters with a high ‘median age’, tend to vote for high contributions to social security as the basis for high retirement benefits, given a balanced social security budget. The older the (selfish) median voter, the shorter the time span as a contribution payer and the earlier the point in time to enjoy the increased pension benefits. Hence, the marginal benefit of further tax increases exceeds its marginal costs due to an increased rate of return on contributions. Therefore, an ageing society devotes more and more resources to the elderly.¹

This basic mechanism, however, has been challenged by some authors. Galasso and Profeta (2004, 2007) argue that, in a country with a PAYG system, voters could also have the intention to vote for a smaller social security system as the profitability decreases for a single voter when the retirees-to-workers ratio increases. A similar argument has been put forward by Razin et al. (2002).² In general, it therefore appears that the effect of the elderly on social spending is ambiguous from a theoretical perspective.³ Empirical evidence, however, indicates that one should expect an increasing welfare state when a society ages (cf., e.g., Pampel and Williamson, 1985; Lindert, 1996; Breyer and Craig, 1997).

Figure 1: Population Shares 65+ of Selected OECD-Countries, 1950-2050. Countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States. Source: United Nations (2009).

When public resources may either be channeled toward the young or the old (and given that there is just one pie to divide), one has to take the possibility into consideration that the selfish elderly will systematically use their voting power to shift resources from the young to themselves. Eventually, a country's political system may turn into a 'gerontocracy' as Sinn and Übelmesser (2002) predict to happen to Germany by 2016. This problem will be aggravated by the fact that essentially all OECD countries exhibit a greying of their societies, as this excludes migration as a powerful 'exit option' which could restrain gerontocratic tendencies in society (cf. Haupt and Peters, 2003; Leers et al., 2004). In fact, Figure 1 shows that the proportion of those aged 65 and older is expected to increase for all countries in the next decades.

Selfishly focussing on the momentary level of benefits only, may, however, not be the most promising strategy for elderly voters in terms of lifetime-utility maximization. For instance, investments into education and, thus, human capital tend to foster economic growth which ultimately increases the pie available for redistribution among the involved generations (cf., e.g., Logan and Spitze, 1995; Gradstein and Kaganovich, 2004). Furthermore, property prices may increase on average with a better educated workforce or because of positive effects from new school buildings in the neighbourhood (Harris et al., 2001; Brunner and Balsdon, 2004). Hence, it might be advantageous to the elderly to forego (increases in) old-age benefits in the short-run to generate even higher benefits in the medium-run. More generally, Esping-Andersen and Sarasa (2002) have shown that social investments in children today will have strong and positive secondary welfare effects in the future. This helps to maintain the living standard of the elderly. Hence, investments in families

and education are not necessarily a zero-sum, but possibly a positive sum game for the whole population.

Empirically, the question whether the elderly support policy measures aiming at increasing the pie is still open to debate.⁴ At an international level, Busemeyer (2007) does not find an effect of the share of elderly on educational spending in OECD countries between 1981 and 2000. Lindert (1996), however, indicates a positive relationship between educational spending and the share of those ageing 65 and older in OECD countries between 1962 and 1981. Using U.S. county-level data from 1970 to 1990, Ladd and Murray (2001) also conclude that the elderly are not able or not willing to influence the spending behaviour with respect to education.⁵ On a more aggregate level, Fernandez and Rogerson (2001) find that the share of those 65 and older have only a small impact on (K-12) educational expenditures in the US states over the same time period. In a recent study on Brazilian municipalities between 1991 and 2000, Arvate and Pereira Zoghbib (2010) show that the elderly support public expenditures in favour of younger generations. This can be explained by specific family arrangements, as in particular elderly who co-reside with the younger people are likely to support public expenditure on education.

While the previously presented studies tend to reject intergenerational conflict on public (education) spending, the vast majority of studies seems to support the existence of this type of conflict, i.e., these studies (especially those dealing with sub-national units) find a negative effect of the share of the older population on public educational spending. In his seminal contribution, Poterba (1997) finds that US states with a larger fraction of elderly residents show a significantly lower per-child educational spending between 1960 and 1990. Harris et al. (2001) find an analogous relationship at the US school district level, although the magnitude is small. Earlier on, Inman (1978) found that school districts in New York with larger shares of old people spent less per pupil than other districts. For California, Brunner and Balsdon (2004) show that support for school spending generally declines with age, but even more so for state-level spending compared to local school spending. This can partly be explained by the previously mentioned fact that investments in local schools tend to increase property prices which is beneficial for (elderly) landowners. Finally, Cattaneo and Wolter (2009) confirm for Switzerland that older people are less willing to support educational expenditures, but rather prefer to spend public resources on health and social security.

As indicated above, education subsidies are only one possible use for public resources directed toward the young. There are also family benefits, including, for instance, child allowances, parental leave support payments, direct financing and subsidizing of providers of childcare and early education facilities or child tax credits. The main goals of these benefits include poverty reduction, general family support or raising fertility. While there is little doubt in the literature that – private or public – spending on education fosters growth (cf., e.g., Glomm and Ravikumar, 1992; Eckstein and Zilcha, 1994; Benabou, 1996), an analogous relationship is much more difficult to

establish for the case of family benefits. In fact, Fanti and Gori (2007, 2009, 2011) show in a series of growth models that public child allowances tend to be fertility-neutral in the long run, while at the same time reducing human capital accumulation. In contrast, the financing of the public education system is beneficial to both fertility and human capital, i.e., only public education may help to increase the pie. Hence, according to these studies, if (at all) the elderly want to support the young in order to benefit from a larger pie, they should focus on public education rather than on other types of family or child benefits. This finding gets weakened to some degree, however, when – in the process of human capital formation – private inputs complement the public education input through, e.g., effective parental time (cf., e.g., Glomm and Kaganovich, 2003; Viaene and Zilcha, 2003; Houtenville and Smith Conway, 2008). If family benefits in fact help to increase these private inputs, positive growth effects can be expected. However, it is not clear whether (cash) benefits are used in a growth-enhancing way or whether they are ‘wasted’. Since it appears reasonable to assume at least some ‘leakages’ to occur,⁶ family benefits should find less political support by the elderly than education spending. In turn, this implies that intergenerational conflict should be more pronounced when it comes to family benefits compared to education subsidies.

Surprisingly, except for Braude (2001) there is – to our best knowledge – no empirical literature that systematically investigates intergenerational conflict on family benefits (and in combination with conflict on education spending). For a cross-country sample of OECD member states, Braude (2001) finds a positive correlation between family benefits and the share of retirees in population. Interestingly, when splitting up the group of retirees into the younger cohorts aged 65 to 69 years and those cohorts aged 70 years and older, he observes a negative correlation for the younger of these groups, i.e., for those who are close to the ‘typical’ statutory retirement age of 65 years. For the oldest old, the positive correlation remains unchanged which can partly, but not conclusively, be explained by changes in the sex ratio (i.e., the number of males per 100 females). For instance, in the US the sex ratio was 82 for persons 65 to 69 years old in 1994, but only 39 for those aged 85+ (US Census Bureau, 2011).

In the present contribution, we take Braude’s (2001) analysis as a starting point for further investigations. Our approach differs from Braude (2001) in several important respects. First, we re-estimate his findings of intergenerational conflict based on a more sophisticated empirical strategy, including a careful investigation of potential endogeneity problems using a system-GMM estimation. These endogeneity problems may arise from, e.g., Tiebout effects or effects of educational spending and family benefits on fertility. Second, we consider different types of transfers toward the young, as indicated by Figure 2 that also shows potential transfer flows and feedback effects. Our previous discussion suggests that intergenerational conflict should be more or less pronounced when comparing family benefits and educational spending. Third, we investigate cross-country heterogeneity (e.g., different national welfare state traditions) by additionally running one-way fixed

Figure 2: Intergenerational conflict, spending options and potential feedback effects

effects models. Fourth, we are able to provide a fuller account of explanations for preference reversal at age 70, which is a common finding by both Braude's (2001) and our analysis.

Methodologically, our argument rests on the assumption that governments will choose a transfer policy in line with the median-aged voter's preferences. Rational voters aim at maximizing their individual utility derived from consumption possibilities which increase if either a larger share of an existing pie is shifted to them or if the pie increases while the shares remain the same. If the median voter's age increases, she will prefer either of these two options, while a priori it is not clear which option will effectively be chosen. However, by considering family benefits we are able to avoid the problem that we cannot clearly predict whether intergenerational conflict exists or not when looking at educational spending only. Given that positive feedback effects via increased growth are expected to be (relatively) smaller in the case of family benefits, intergenerational conflict should show up here more clearly than for educational spending. Furthermore, in cross-country comparison national spending patterns should not only depend on countries' age structures, but we would also expect changing patterns due to the ageing of societies on the time axis.

Our main findings indicate little support for intergenerational conflict on the national level. Only among those aged 65 to 69 years, there is some support for this idea which can be explained by – among other things – a transitory income effect after entering retirement. When retirement begins, personal income often drops substantially compared to previous work income. Reduced consumption possibilities make the newly retired reluctant to generously support families; however, this effect vanishes over time as people adapt to their new income level. Furthermore, we find that parents seem to support education spending more than family benefits. When controlling for potential endogeneity, our findings remain qualitatively robust except that the intergenerational conflict becomes – in contrast to our initial expectation and our basic regressions – relatively more pronounced for family benefits compared to education spending. Finally, we also provide evidence

that country differences with respect to public spending are strongly influenced by the welfare state tradition.

The reminder of the paper is organised as follows. In section 2, we describe the empirical strategy where we first discuss the basic FGLS estimation procedure before turning to the complementary System-GMM estimation for tackling potential endogeneity problems. In section 3, we present the data and a description of the relevant variables. Section 4 contains our main results with respect to the existence of intergenerational conflict based on two-way fixed effects estimates. Then, section 5 provides a comparative policy analysis based on a one-way fixed effects model. Section 6 deals with explaining the specific preferences of those aged 65 to 69 years. The last section concludes.

2 Empirical strategy

2.1 The Basic Estimation Framework (FGLS)

In order to grasp the idea of intergenerational conflict, we focus on the impact of the ageing of societies on age-dependent social spending directed toward the young population in a cross-section of countries. Intergenerational conflict occurs whenever an increasing population share of the elderly causes family and education spending to go down. We consider an international, rather than district level, comparison in order to keep potential Tiebout-effects as small as possible and, thus, to avoid endogeneity problems. Tiebout effects may arise when families leave a district due to low benefit levels, thereby blowing up the share of the elderly in population.

Equation (1) describes our basic framework for estimating the effect of the elderly voting age population on family benefits (later in the paper, we proceed analogously with education spending):

$$Y_{i,t} = \mu_i + \gamma_t + \mathbf{X}_{i,t}'\beta + \epsilon_{i,t} \quad (1)$$

Here, $Y_{i,t}$ is family benefits as percentage of GDP of country i at time t . In an alternative setup, the dependent variable is the log of family benefits per child (0–19 years old). The main explanatory variables of interest are age-structure variables. Thus, we look at the impact of the elderly voting age population on the provision of family benefits, where we also consider different age cohorts as will soon become evident. These variables will be complemented by a range of control variables like GDP per capita, fraction of children, population density etc. All explanatory variables are included in $\mathbf{X}_{i,t}$ of equation (1). β is a coefficient vector. μ_i are state-fixed effects. Hence, we are mainly exploiting the within-variation of a particular country over time and avoid unobserved heterogeneity which might drive the results. γ_t covers time-fixed effects.

Initial tests indicate that we have to take care of autocorrelation and heteroscedasticity in the data.

The error term $\epsilon_{i,t}$ is therefore modelled as an AR(1) process to capture the autocorrelation of the variables. It still allows the error term to be heteroscedastic due to potential misspecification or omitted variable bias. Thus, estimation takes place within a feasible generalized least squares (FGLS) panel data estimation framework. In addition, we also discuss a couple of models in which we also make use of the cross-sectional variation. We do so by omitting the country-fixed effects as we would like to explore the effect (or correlation) of other variables on (with) family benefits.

2.2 Dealing with Possible Endogeneity (System-GMM)

Even when using an international comparison and including time- and country-fixed effects, we cannot entirely exclude the possibility that our research design might suffer from endogeneity. This is because the Tiebout effect could arise also in the international arena, or, because variables like GDP per capita might be affected by spending on family benefits. Furthermore, neither of the age variables under consideration is necessarily endogenous in a strict sense. More specifically, the age structure of a country is affected by family benefits; it changes over time when these benefits change the incentives for childbearing. Hence, the observed age structure could already be influenced through earlier differences in family benefits. So, we might argue that these variables are fixed or predetermined in the short run, but endogenous in the long run. We take care of this problem by using a Generalized Methods of Moments (GMM) estimator (Hansen, 1982). This estimator can be taken to solve more general types of models as it relies only on the solution of (the corresponding empirical) moment conditions or orthogonality conditions. We can also include a number of instruments to allow for a more causal interpretation.

When employing a dynamic panel data model with an AR(1) error structure (such as the one in equation (1)), the important question arises what kind of moment conditions should be used, given that both a fixed-effect estimator and a random-GLS estimator are biased (cf. Baltagi, 2005: 135–136). Here, in order to check the reliability of our estimates with respect to the endogeneity issue and dynamic panel data distortions, we choose a System-GMM estimator (Arellano and Bond, 1991; Blundell and Bond, 1998). The System-GMM method estimates equation (1) simultaneously in levels and in first-differences, thereby instrumenting the levels equation with lagged differences and the difference equation with lagged levels. The idea in both settings is that the past levels/differences are unrelated to the current error term and are therefore valid instruments.⁷ Blundell and Bond (1998) show that these additional moment restrictions lead to an increased efficiency of the estimator.⁸

With this approach there are more instruments than parameters. Thus, we can test via the Hansen test (Hansen, 1982) whether the additional moment restrictions are close to zero. Here, the null hypothesis is that the moment conditions are jointly valid, i.e., the vector of empirical moments is

randomly distributed around zero.⁹ Thus, high p -values should indicate the acceptance of the null hypothesis (H_0) that all additional instruments are mutually strictly exogenous.¹⁰

3 Data and Variables

3.1 Dependent Variables: Family Benefits and Education Spending

The dependent variables in our empirical model are ‘family benefits as percentage of GDP’ and ‘(log) family benefits per child (aged 0–19 years)’ for the case of family benefits. Analogously, we define ‘public expenditure on education as percentage of GDP’ and ‘(log) public expenditure on education per school-ager (aged 5–29 years)’ for education spending.

Turning to family benefits, we took the first variable directly from OECD data. It expresses the public resources dedicated to families as a fraction of GDP. The latter variable is constructed as follows. First, family benefits as percentage of GDP are divided by 100; then, this figure is multiplied with real GDP (which is also drawn from the OECD to ensure the highest degree of consistency). Afterwards, this number is divided by the number of children scaled by 1,000.¹¹ All dependent variables are averaged over the five year horizon to avoid the incidental inclusion of years which might face particular shocks.

The variables on education expenditure are extracted and computed in a similar way as those for the family benefits. However, data availability is more limited here. Thus, we were only able to extract data from 1990 onwards. In addition, the figures are from two distinct sources as we had to refer to data from both the OECD and the UNESCO. We assured comparability by checking overlapping observation points. In most cases, the difference was very small. The ‘per school-ager’-variable is constructed analogously to the ‘per child’ family benefits variable. The difference is that we use the 5–29 years age group. This modification should cover all persons who are in school or enjoying tertiary education (until completion of a PhD).

The characteristics of the dependent variables are pictured in summary table 11 of the appendix. The full sample includes 110 observations, i.e., 22 countries with five observations each.¹² The data on educational expenditure was not available for the year 1985. Another four observations were missing for different countries.¹³ Interestingly, mean values for the education variables are considerably higher than the mean values for the family benefits variables. This indicates that, on average, a country puts more resources into education than into the support of families.

3.2 Explanatory Variables: Different Measures of Age Structure

We now turn to the description of our explanatory variables. Our main variable, *V65up*, is defined as the population aged 65 years and older relative to the voting-age population (age 20–99). Further variables of interest are *V6069* and *V6569*. They represent the relatively youngest groups of voters among all elderly persons in society. They are defined analogously to *V65up*, i.e., we take the ratio of the population aged 60–69 and 65–69 years, respectively, to all persons aged 20 years and older. *V2544* describes the share of people in the age group between 25 and 44 years in total voting age population. This group is considered benefiting most from public expenditure on children because it is most likely characterized by families with children. To control for the population of children or school- and college-aged young adults in a country, we include the variables *Child* when estimating the effects on family benefits and *SUB529* in case of educational expenditure. *Child* is defined as the proportion of children in working population (20–64). *SUB529* is defined as the proportion of all persons aged 5 to 29 years in working age population. All data on the age structure is drawn from the United Nations Population Division (UN 2009).

A full list of all independent variables, including the source and the way of construction, can be found in the appendix. In addition, the summary statistics of these variables are available in the appendix, too.

3.3 Control Variables

Population Density is the midyear population divided by land area in square kilometers and averaged over the five year period. The measure is taken from World Bank (2010) data. On the one hand, population density may change expenditure on education or expenditure on family benefits as a country with a lower density might be interested in increasing their population. Then, both expenditures might encourage families to get more children. On the other hand, we expect returns to scale especially when it comes to the education system, i.e., in areas with low population density running a school system is relatively more costly.

GDP/capita and *Growth* denote real GDP per capita and the growth rate of real GDP per capita, respectively. They control for the wealth and the prospects of a country. In a sense, they contribute to increasing the ‘pie’ and, thus, allow for more generous government spending (assuming that tax rates are not lowered too strongly in response). Furthermore, *Trade Openness* may be interpreted as a measure not only of economic prosperity and dynamics, but also of future-orientation. A high level of trade openness means strong competition in which a country can only sustain in the long run when investing into ‘brains’. This variable is calculated by imports plus exports divided by GDP and is drawn from Penn World Tables (Heston et al., 2009). It is averaged over five years each.

Castles (1989, 1994) finds that religion affects different dimensions of public policy. This is especially true as the Catholic Church often serves as a substitute for the government, e.g., when providing child care or schooling. Therefore, *Catholics* denotes the fraction of Catholics in a country and we include that control variable in our regressions as well. Data is from the Vatican, Congregation for the Clergy (Holy See, 2008). The percentage numbers are averaged over the full time span, i.e., from 1982 to 2005. This was necessary because data is not available for all time periods and countries. The percentage numbers decrease slightly for most of the countries but nevertheless remain relatively stable.

Fractionalization data, which is used in *Ethnic Fraction* for ethnic fractionalization, *Language Frac* for language fractionalization and *Religion Frac* for religious fractionalization, is taken from Alesina et al. (2003). A higher index number indicates higher fractionalization. A priori, the sign of the effect of fractionalization on the spending variables is not clear. While, on the one hand, there may be the attempt to reduce societal divides along, e.g., religious lines by spending more money, it could also be the case that, e.g., little respected ethnic minorities in a country have an above average number of children. In this case, the majority might be less generous with respect to providing child-related resources. *EHII* is the *Estimated Household Inequality Index* from the University of Texas Inequality Project (UTIP, 2008; Deininger and Squire, 1996). Economic inequality often arises along family lines between those with and without children. Typically, supporting families with children is seen as a measure to reduce inequality. Note that, again, these figures are averaged over the five year period.

Federalism is an index on federalism and decentralization. Lower values indicate unitary and centralized states and higher values federal and decentralized states. The original data source is the Lijphart data set on institutions (Lijphart, 1999). We use the recalculated data by Armingeon et al. (2010). Federal states with ageing population may compete for young families and therefore increase the expenditure on education or family benefits ('race-to-the-top'). Eventually, this may lead to an increase in the country's overall expenditure.

The decommodification index, variable *Decommodification*, is drawn from Scruggs (2006) and Scruggs and Allan (2006). It is based on the seminal work by Esping-Andersen (1990) and categorizes countries according to their welfare-state tradition. Esping-Andersen (1990) distinguishes three types of welfare states: liberal (e.g., the UK), conservative (e.g., Germany) and social-democratic (e.g., Sweden). However, later authors have used additional categories and the decommodification index even provides a continuous variable. A low level of decommodification implies that the market plays the decisive role in keeping a certain standard of living, i.e., the individual standard of living depends on work income in the first place because there is hardly any alternative to this income source. In contrast, with high levels of decommodification even losing one's job does not reduce the standard of living significantly due to generous welfare benefits (which are

independent of individual work history). Hence, a high value of the index represents a welfare state that is generous across the board, which includes education and family benefits as well.

Furthermore, we use in section 6 two more variables which are described in the following. On the one hand, this is the *Effective Retirement Age* for men. The data is drawn from the OECD (2011) and averaged over the five year period. On the other hand, we use the *Pension Generosity Index* by Scruggs (2006); Scruggs and Allan (2006). The index is also averaged and has a range between 0 and 24. Higher values indicate a more generous pension system.

Note that we used the comprehensive data of the ‘QoG Social Policy Dataset’ (Samanni et al., 2010) for all variables other than the Age Structure, Effective Retirement Age and Catholics data. The summary statistics for all explanatory variables are described in Table 11.¹⁴

4 Results on Intergenerational Conflict

In this section, we present estimates on intergenerational conflict with respect to the two dimensions under consideration, i.e., family benefits and education spending. We aim at investigating whether there is evidence for intergenerational conflict at all, how strong the conflict is and whether there are any differences when considering either family or education benefits.

In the first subsection, we present models that are estimated using so called ‘two-way fixed effects’; in the second subsection, we deal with potential endogeneity by running a System-GMM model for both spending variables. Two-way fixed effects models imply the use of both time- and country-fixed effects, i.e., all time- and country-specific shocks are excluded. As a result, we are only using information over time and broadly neglecting the cross-section information. This has the advantage that we can control for differences in the level of benefits which are due to specific (unobserved) country characteristics. Hence, we are able to carefully draw conclusions on a causality basis, rather than just interpreting correlations. The disadvantage of such an approach is that we cannot estimate the influence of factors which are (almost) constant through time.

In comparative public policy analysis this disadvantage is not trivial, as Busemeyer (2007) argues, because its main interest is especially in the cross-country variation. Hence, ‘one-way fixed effects models’, where only time fixed effects are included, have their justification, too. Since we are also interested in international comparisons of the role of institutional influences, we propose a one-way fixed effects model in the following section.

Note that all tables presented in the following include χ^2 -test statistics to verify the overall significance of the included variables.

4.1 The Two-Way Fixed Effects Model

We start our analysis of intergenerational conflict with a two-way fixed effects model on family benefits. In regression (1), (2) and (3) of Table 1, our dependent variable is ‘family benefits as a percentage of GDP’. Regressions (4), (5) and (6) cover ‘log family benefits per child’. In both settings we find that the population share of the elderly, $V65up$, is positively correlated with the measures of family benefits – with the exception of regression (1). However, there, the coefficient is very close to zero and also not significant. This implies that there is no indication of intergenerational conflict in general. We rather observe the opposite, as suggested by regression (4). The remaining four regressions – (2), (3), (5) and (6) – investigate whether this finding is driven by the oldest among the elderly, i.e., those aged at least 70 years (the ‘*oldest old*’). In these regressions, this share is indicated by $V65up$ which effectively covers only those aged 70 years and older due to the inclusion of $V6069$ and $V6569$, respectively, in the same regression. That is, the coefficients of $V65up$ and $V6069 / V6569$ multiplied by the respective fraction of the age group add up to the total effect of the entire elderly population given in regressions (1) and (4).

We find that the positive correlation is only significant for the ‘per child’ spending variable. However, it is striking to see that the voting population aged 60–69 and 65–69 years is negatively related to public spending on family benefits. Quantitatively, this effect implies that a 1%-point increase in the share of those aged 60–69 years decreases public expenditure on family benefits per GDP by 0.12%-points. The effect is slightly larger for the group aged 65–69 years where we have a reduction of 0.17%-points on average. Given that we should expect more than a 1%-point increase in the share of the elderly (cf. Figure 1), and that the mean expenditure on family benefits is currently at only 1.86% (cf. Table 11), the expected drop appears to be quite substantial. The estimates are somewhat smaller for the regressions using log benefits per child as dependent variable.

With respect to the remaining variables, we find that the voting age population at age 25 to 44 years, i.e., the group that is most likely to have young children, has no significant influence on spending behaviour. The *Child* variable is negatively related to the expenditure on family benefits, but it is only significant in the ‘per child’ specifications. It seems to be the case that a larger number of children is served with the same share in GDP, implying lower per-capita spending. That is to say that the missing effect in the GDP regressions indicate that the fraction of children in the population has a relatively low impact on family benefit spending per se. Under these conditions, it is clear that countries with a larger fraction of children show a significant negative relationship between family benefits and the fraction of children in the population. All other variables, such as GDP per capita, population density and GDP growth, are insignificant. The reason might be that there is only little variation through time in these variables. As we can see in the next section, the variation for these variables is considerably more pronounced in the cross-section.

[Table 1 here]

Let us now turn to education expenditure. Table 2 depicts in regressions (1), (2) and (3) the estimates using ‘public expenditure on education as a percentage of GDP’ as dependent variable, while in regressions (4), (5) and (6) ‘public expenditure on education per school-ager’ is the dependent variable. The results differ substantially from our estimates of the family benefits model. In particular, we do not find a significant effect of the elderly on education spending. This is in line with our initial reasoning because education spending has the tendency to increase the pie much more directly than spending on families. It appears that the elderly recognize this fact and therefore do not oppose education expenditure, i.e., spending on family benefits is more subject to the population age structure than expenditure on education.

Any comparison of the results should be made with some caution, though, because our sample is reduced due to limited data availability. However, when using a similarly restricted sample in the family benefits case our conclusions remain qualitatively unchanged.¹⁵ Another problem might be that the data is extracted from two different sources (OECD and UNESCO), but we checked comparability of the data by analyzing differences of overlapping data points and found a very similar data structure (implying a roughly consistent data collection and processing between the OECD and the UNESCO). Whether endogeneity is a matter of concern, possibly reducing the comparability of results, will be the topic of the next subsection.

An interesting difference between family and education spending occurs with respect to the effect of the age group 25–44 years. A large share of this age group in total population leads to significantly higher levels of educational expenditures, but not family benefits. Obviously, this group has a sufficiently strong position in society to generate general support to the educational system, e.g., by convincing the elderly that these expenditures are not against their interests.

GDP per capita and population density are again not significant because of low variation through time. However, GDP growth is positive and significant in regressions (1) through (3) for public expenditure on education as a percentage of GDP. As a control for the fraction of school-ager in the population, we include *SUB529* instead of *Child*. Like the *Child* variable in the family benefits estimation, the *SUB529* is negative and mostly significant. This is in contrast to the findings by Busemeyer (2007) who found a positive relationship.

[Table 2 here]

4.2 The System-GMM Model

As discussed above, we cannot entirely exclude endogeneity problems, e.g., due to Tiebout effects or family and/or education spending affecting fertility. Therefore, we will now present the results from

System-GMM regressions, thereby focussing on those scenarios that already distinguish between different age groups among the elderly, i.e., for convenience we exclude the regression containing *V65up* only as it can be concluded from the presented regressions. Starting again with family benefits, regressions (1) and (2) in Table 3 cover the models for ‘family benefits as percentage of GDP’, while regressions (3) and (4) show the results for ‘family benefits per child’. All regressions use robust and Windmeijer-corrected standard errors. Time dummies are always included and used as instruments in every estimation.

In order to run this estimation model, we assume that there is no variable that is strictly *exogenous* to family benefits. At the same time, we also claim that there are no strictly *endogenous* variables.¹⁶ Instead, we treat the variables as if they were *predetermined* (but not strictly exogenous). Thus, when public expenditure on families or education increase, the other variables may adjust over time, but only in the long run and not in the short run.¹⁷

Compared to the FGLS estimation, we now find that *V65up* (here indicating those aged 70 years and older) is positive and significant in all settings, i.e., the oldest old support funding for family benefits. Again, this is the opposite of an intergenerational conflict. Those close to retirement (*V6569*) are still not supportive. We can also infer that GDP per capita plays an important role in the determination of family benefits which was not the case in the two-way fixed effects FGLS model. Population density is still negative but not significant.

In quantitative terms, we observe coefficients that are about four to five times larger (in absolute values) compared to the one in the previous subsection (Table 1). This indicates that the previous results may indeed be biased. Under the System-GMM approach a 1%-point increase in the population share of those aged 65–69 years decreases the expenditure on family benefits per GDP by 0.67%-points, while previously the drop was only 0.17%-points.

[Table 3 here]

We use the same approach to investigate the age structure effects on public expenditure on education. The results are depicted in Table 4. Again, regressions (1) and (2) describe the models for ‘educational spending as percentage of GDP’ and regressions (3) and (4) present the results for the ‘per school-ager’ estimation.

Compared to the two-way fixed effects FGLS model the results shift slightly in favor of the existence of intergenerational conflict. The impact of the share of the oldest old (*V65up*) is – except for regression (4) – still insignificant (although the sign is positive), but *V6069* and *V6569* now have significant negative signs. This also matters quantitatively as an increase in the fraction of those aged 65–69 years by 1%-point will lead to an almost 1%-point drop in public education expenditure per GDP.

GDP/capita and the population density are not related to educational spending which is surprising as we expected that wealthier countries would invest more in education. The System-GMM results do not support this hypothesis. The fraction of school-agers, however, reduces the funds dedicated to education significantly. Note that the fraction of children is not significant in the family benefits models.

Interestingly, the comparison between the family benefits and education expenditures models shows that results reverse when switching from FGLS to System-GMM estimation. Our initial conclusion that intergenerational conflict is more pronounced in the case of family benefits appears no longer to hold when endogeneity is corrected for. Obviously, the implied bias has been much larger for education expenditures, e.g., because the Tiebout effect matters more for education spending than for family benefits. This effect could have disguised that substantial private education inputs complement the public ones.

One should keep in mind, however, that the number of observations is rather small for a System-GMM application. We tried to make our estimate as conservative as possible by driving down the number of instruments as far as possible and using measures for small sample correction of the standard errors. Nevertheless, we cannot completely rule out that the results are driven by small sample sizes. However, together with the FGLS estimation we are confident that the qualitative results of our analysis are not affected by this bias. But the size of the coefficient should be treated with caution.

[Table 4 here]

5 Comparative Policy Analysis: Using One-Way Fixed Effects Models

In the previous section, we argued that two-way fixed effects models discard all cross-sectional variation. For comparative policy analysis differences between countries, even if small, are of major interest. In this section we will therefore have a closer look at a selection of variables that could have an impact on family benefits and education spending, as can be seen from Table 5 (dependent variable: ‘family benefits as a percentage of GDP’) and Table 6 (‘education spending as a percentage of GDP’).¹⁸ With this approach we try to catch some of the cross-country heterogeneity. Note, however, that all regressions still include time-fixed effects.

The results show a similar pattern as in the two-way fixed effects models above. The sign of *V6569* is negative and significant, indicating an intergenerational conflict between the young and those among the elderly who are close to retirement.¹⁹ The voting population aged 65 years and older

now has a positive *and* significant sign. This finding indicates that the significance of *V65up* – which occurred only in the System-GMM, but not in the FGLS estimation – is in fact driven by unobserved cross-country heterogeneity. The driving factor of this finding shows up in regression (8) of Table 5: there, we include the decommodification index of Scruggs and Allan (2006) into the regression. This index reflects the welfare state tradition which can normally not be observed directly. The consequence is that the variable *V65up* turns insignificant. In other specifications of the model, significant estimates for *V65up* might as well be driven by a country’s institutional tradition.²⁰ This effect does not come as a surprise as in countries with a high decommodification score there is a generally generous support to all societal groups.²¹ So, if a group in society does support age-related benefits to the young, it will do so with even more emphasis in one of these countries.²²

Further variables of interest are GDP per capita and the population density. Wealthier countries, indicated by a higher GDP per capita, show more expenditure on family needs. Countries which are more densely populated show less expenditure. Hence, there is evidence that more sparsely populated countries try to increase their population by increasing the amount of funds dedicated to families. GDP growth only has an effect in the reduced samples of regressions (7) and (8).

The percentage share of Catholics in a country is negatively associated with family benefits. This finding is in line with Lindert (1994) who describes a similar negative relationship with respect to social spending for the period 1880–1930. More generally, Castles (1994) finds that there exist clear relationships between Catholicism and a variety of public policies (without considering family benefits explicitly). Arguably, the reason for the negative correlation with respect to family benefits is that the Catholic Church serves as a substitute for the government. In contrast, the Protestant Church, especially in Scandinavian countries, has been said to be more able to align their policies with the government (cf. Busemeyer, 2007).

In a seminal contribution, Goldin and Katz (1997) pursued the question why the United States lead in education between 1910 and 1940. One of their findings was that states with more equally distributed income and wealth show a higher school achievement. Hence, they argued that a higher homogeneity within the population should lead to higher funds in education. In general, inequality comes in different forms. A first set of measures for (societal) inequality comes from the fractionalization data by Alesina et al. (2003). It shows that a higher ethnic fractionalization is in fact associated with lower funds for family benefits. Furthermore, a higher religious fractionalization is correlated with higher public spending (regression (3)). The explanation could be that a high religious fractionalization means lower power of the Catholic Church. This, in turn, implies the need for additional government activity. Interestingly, the language fractionalization (regression (4)) does not seem to play a role as a factor for family benefits as a percentage of GDP. However, it is significant for per-child family benefits (not shown). A more narrow definition of (income)

inequality is mirrored in the estimated household inequality index (EHII) in regression (7). The same picture as for the ethnic fractionalization appears. This indicates that heterogeneity in terms of ethnicity and income distribution leads to lower political support for age-related redistribution. Regression (2) also tests the share of the voting population which is most likely parents of young children. The coefficient is positive but insignificant. The same can be found for the Federalism index in regression (5). Hence, countries with a larger decentralisation do not automatically exhibit a race-to-the-top in social spending. It should be noted that the picture changes if we look at expenditure per child (not shown here). There, the coefficient is highly significant, indicating a race-to-the-top in expenditure per child. This is in line with Montén and Thum (2010) who argue theoretically that fiscal competition in an ageing society mitigates the exploitation of the young. Contrary to our initial conjecture, Trade Openness is negatively and significantly associated with family benefits. We can only guess why this is the case. Some authors argue that, at least for developing countries, the openness to trade increases the probability of external shocks which might lead to negative budget balances for the counteracting of trade instabilities (Combes and Saadi-Sedik, 2006). This can also be the driving factor behind the correlation found here. However, we also have to mention that the common sense of the current literature on trade openness and social expenditure reveals a positive connection which is at odds with our results (Rodrik, 1998).

[Table 5 here]

Finally, we turn to the results for the education variables (Table 6), which, essentially recover our findings from the family benefits one-way fixed effects models. The variable *V65up* is in all specifications (with the exception of regression (8)) positive and significant. This indicates again that intergenerational conflict vanishes among the oldest old. However, we still receive negative and (almost) always significant results for the share of people aged 65–69 years.²³ This suggests the presence of intergenerational conflict on educational expenditure only between the young and those elderly close to retirement age.

The influence of the voting population aged 25–44 years is positive and significant in the specification in which education expenditure per GDP is the dependent variable. It is, however, insignificant when looking at the expenditure per school-ager. The latter finding is more in line with the literature. For example, Lindert (1996) found no effect of the age group of 20 to 39 on educational spending in OECD-countries. Lindert (1996) also found that the percentage of Catholics in OECD countries for the period 1960–1981 is negatively related to educational spending. Our analysis supports the finding of a negative correlation. However, it should be noted that the existing evidence for the relationship between educational spending and Catholicism is ambiguous. For instance, Castles (1989) shows that the impact was negative only in the 1960s, but no longer in the 1980s (when our sample begins). The explanation that Castles (1989) provides is that for a long time (in

the 19th and early 20th centuries) the Catholic Church was not convinced that the state should provide education for (Catholic) children. Thus, the politicisation of educational spending led to lower public spending in countries with a strong catholic heritage.

The Federalism-Index turns out to be negative but insignificant. However, when we consider educational spending per school-ager (not shown here), we find a positive and significant effect which hints at a competition effect driving up spending in more decentralised countries.²⁴

Surprisingly, the coefficients on ethnic fractionalization are no longer significant. In addition, the variables on religious and language fractionalization are only significant in the ‘per school-ager’ regressions. Economic inequality, as indicated by the EHII-Index, however, is still negatively related in both settings.²⁵ This finding is analogous to Lindert (1996) who found that income inequality and educational spending are negatively, but insignificantly correlated. The decommodification index and trade openness resemble qualitatively the coefficients in the family benefits regressions.

When comparing the results for family benefits and educational spending, we find that the impact of the size of age groups is generally stronger for the case of the latter explanatory variable. This is also true for the correlation with the decommodification index. The welfare state tradition seems to play a more important role in the determinants of educational benefits as compared to family benefits. However, the effect on educational spending is not as robust as the effect on family benefits which might be inferred from the fact that not all coefficients of *V6569* in Table 6 are significant.

[Table 6 here]

6 ‘Young Old’ vs. the ‘Oldest Old’: Some Thoughts on a ‘Different’ Generational Conflict

While the main finding of our previous analyses is that the elderly are generally supportive with respect to public social spending, it is striking to see that within the group of retirees preferences differ substantially. In the majority of specifications, the oldest old support spending on education and family benefits, while those around (statutory) retirement age use their voting power to decrease the public support for younger people. This preference reversal is somewhat puzzling to explain. One reason might be that retirees become more supportive when they age. However, this conjecture is difficult to justify. Under the rational choice model, the change in attitudes must be a consequence of exogenous variations of costs and benefits that have an impact on these very attitudes, but there does not seem to exist very convincing ideas supporting this view. Alternatively, one may hypothesize that preferences of the elderly remain stable, but the socio-demographic environment changes as people age. For instance, the age of first birth has been continuously increasing

in more recent working age cohorts. This could also have an impact on elderly persons as they become grandparents only at higher ages. As grandparents, elderly people tend to become more generous toward their grandchildren, possibly including an increased willingness to accept public family and education spending. Hence, if the elderly become grandparents only at a sufficiently old age, this may explain the observed preference reversal. However, empirical evidence indicates that the average age of having the first grandchild is well below statutory retirement age (e.g., AARP 2002).

Another argument has been put forward by Braude (2001) who argues that a gender effect could explain preference reversal. The basic idea is that women have a higher life expectancy than men. Thus, older cohorts should include a larger share of women. Indeed, in our sample the share of women in the age cohort 65–69 years is 52,8% (in 2005). This share rises to 59,6% in the age group 70 years and older. There is convincing evidence that women are more generous than men in their voting behaviour (cf., e.g., Hernes, 1987; Thomas, 1994; Borre and Goul Andersen, 1997). Hence, we may speculate that support for public spending targeted at the young should increase with age.

Table 7 shows some regressions testing the gender hypothesis. The first three regressions cover the relationship between family benefits per GDP and the age structure whereas the last three regressions do the same for family benefits per child. Regressions (1) and (4) use a two-way fixed effects model. Models (2) and (5) cover one-way fixed effects specifications. The last two regressions, regressions (3) and (6), show the System-GMM estimates. The specification of the System-GMM models have not changed compared to the models above. The variable $V65up_F$ describes the share of females in the cohort aged 65 years and older. $V65up_M$ represents the share of males.

We get weak evidence that the fraction of females in the age group 65 years and older is indeed positively related to expenditures on family benefits. The opposite is true for males, where the coefficients turn negative. However, the coefficients are only significant in regressions (2) and (5) where we use the cross-sectional variation by excluding country-fixed effects. Regressions (1) and (4) with time- and country-fixed effects and regressions (3) and (6), where we estimate the System-GMM models, show no significant relationship. This is in line with Braude (2001) who found also only weak evidence for a relationship in the aggregated data.

The table for the public expenditure on education analysis (Table 8) resembles the results of the family benefits estimation. Again, only regressions (2) and (5) show significant coefficients where we omit the country-fixed effects. All other regressions, i.e., the regressions with two-way fixed-effects and the System-GMM estimation produce coefficients that are not statistically significant (but have the expected sign). Hence, a gender effect might be in place in at least some countries.

[Table 7 here]

[Table 8 here]

Empirically, the most convincing results are provided by regressions that take the public pension system explicitly into account. Here, two important – interrelated – aspect have to be considered. First, the generosity of pension systems differs substantially between countries (cf. Krieger and Traub 2011); and second, effective retirement age differs from statutory retirement age in most countries, although to different degrees. When entering retirement, work income is replaced by payments from the public pension system which is typically not sufficient to keep consumption at the accustomed level (cf. Hamermesh 1984).²⁶ Although private dissavings counter this effect to some degree, newly retired individuals have to adapt to this new situation with reduced financial security and a lower standard of living. In fact, under these circumstances even a significant reduction in life satisfaction may be experienced, especially if retirement occurs involuntarily (cf. Heybroek 2011). However, ultimately people get accustomed to the new income and consumption levels after a transitory period. Arguably, during the transitory period it is a very rational strategy for individuals to show some reluctance to transferring resources via the public system toward younger generations. Only later, they return to their generally favorable view on intergenerational redistribution. In international comparison we therefore expect to see – *ceteris paribus* – stronger opposition of the age group 65 to 69 years toward education and family spending in countries with a low generosity of the pension system, as here the drop of (public) pensions relative to previous work income is particularly large.

This reasoning might suffer, however, from the problem that retirement decisions are to some degree endogenous and dependent themselves on the generosity of the pension system (e.g., Coile and Gruber 2007, Gustman and Steinmeier 2005; Liebman et al. 2009; Liebman and Luttmer 2011). Low expected benefits might lead to later entry into retirement. To take account of this potential effect, we employ two different empirical strategies to give as broad a picture as possible of this argument. First, we run a regression using *Pension Generosity* as explanatory variable. We find that indeed those countries with the least generous pension systems face the strongest opposition to education and family benefits (cf. Table 9). This can be seen from the direct effect of the pension generosity. Those countries with a larger index are less able (or less willing) to finance benefits directed at the young. The interaction term between generosity and *V6569* indicates however, that the negative direct effect of *V6569* is mitigated by a more generous pension system. This effect is more pronounced for a smaller set of countries and for educational expenditure as for family benefits.

Second, we consider *Effective Retirement Age* as an alternative explanatory variable in Table 10. While *V6569* indicates a fixed age span, the process of adaption of this age group to lower retirement income and consumption may have started already years before when effective retirement is low, i.e.,

an individual who retired at age 57 (65) will have relatively less (more) reservations with respect to transfers toward the young. In addition to this effect, effective retirement age already takes into account the endogenous retirement decision, so we avoid the potential bias from endogenous decisions. Our findings indicate that in those countries with a low effective retirement age, the age group 65 to 69 years is indeed relatively more supportive (although the sign is still negative) toward intergenerational redistribution than the same group in countries with a high effective retirement age. By taking a smaller set of countries due to data limitations in regressions (3) to (6), we find that the direct effect of a higher effective retirement age is positive on family benefits and educational expenditure. This effect is plausible as countries with a higher retirement age should have more funds available due to less pension funding. The interaction term in these regressions is negative indicating a relatively larger negative impact of the population aged 65 to 69 in countries with a higher retirement age on benefits for the young already mentioned above. Remarkably is that the sign of $V6569$ switches from negative, which is found in all other tables, to positive through the inclusion of the retirement variables. This means that taking into account the effective retirement and its interaction with the population group of those 65 to 69, leads to a strong support of the same age group for family benefits and educational expenditure.

[Table 9 here]

[Table 10 here]

Hence, we can conclude from this exercise that the retirement incentives are the most plausible explanation for the observation that individuals close to statutory retirement age tend to oppose education and family benefit spending, although there is support for these measures if we look at all elderly persons together. Next to this effect, the increasing share of women in the elderly population seems to contribute to explaining these findings.

7 Conclusion

This paper contributes to the analysis of intergenerational conflict. We use various econometric methods to indicate that the intergenerational conflict might be an age-dependent phenomenon. While there is support for intergenerational redistribution toward the young in general, i.e., when all retirees are considered in aggregate, we find that among all elderly the sub-group of those who are close to (statutory) retirement age dislike public expenditure for families and education most. Accordingly, this opposition changes into support once the retired grow older. Among the oldest old, i.e., those aged 70 and over, there is clear support for transfers directed at the young. Overall, we can conclude that intergenerational conflict is no major concern – at least at the national level

– in OECD countries. Therefore, the pessimistic view by many authors that ageing societies will ultimately end up as gerontocracies where the elderly will inevitably shift resources into their own pockets cannot be sustained. This, however, does not exclude the possibility that intergenerational conflict may be observed at the district level.

The age-dependency of intergenerational support among the elderly, which indicates a ‘different’ generational conflict between the ‘young old’ and the ‘oldest old’, is a striking and somewhat surprising effect. We tested two main explanations for this result, the role of women’s higher life expectancy and the role of the pension system. We find weak support that an increasing share of women, who tend to be more generous than men, among the oldest old explains why this age group becomes more supportive toward educational and family spending. Empirically stronger support yields the hypothesis that the (public) pension system explains why those aged 65 to 69 years oppose this kind of spending. Entering retirement usually implies an often substantial reduction in consumption possibilities due to a drop in available economic resources. New retirees need to adapt to this lower consumption level, which is easier if the level of redistribution toward the young is lower. Hence, during a transitory time period these individuals strongly oppose redistribution. Ultimately, they adapt to their new living conditions and opposition becomes weaker or possibly vanishes.

Our analysis also shows that higher cultural heterogeneity and economic inequality is associated with lower public expenditure on family benefits or education. The percentage of Catholics in the country is negatively correlated, indicating a strong influence of the Catholic Church on educational and family issues in countries with a strong catholic heritage. A lower population density is mostly associated with higher funds. This can be driven by the desire of the government in sparsely populated countries to increase the population. We were also able to confirm a strong positive relationship between Scruggs and Allan’s decommodification index on the one side and family benefits as well as expenditure on education on the other side. An index of federalism indicates a race-to-the-top as it is positively correlated in most settings to the social benefits under review.

Notes

¹Note that young and skilled immigration could counteract this development. However, the median voter will also decide about immigration policy and choose a too low level of immigration (cf., e.g., Haupt and Peters, 1998; Krieger, 2003, 2004; Scholten and Thum, 1996).

²Razin et al. (2002) also provide empirical evidence in favour of this argument. However, Shelton (2008) shows – in a more detailed study where he splits dependent people into children and retirees – that the ratio of retirees to the population is positively associated with the level of transfers.

³Cf. Galasso and Profeta (2002) for a survey of political-economy models concerning the size of social security systems.

⁴Cf. Poterba (1998) for an older survey about demographic change, intergenerational linkages and public finance.

⁵Note, however, that all studies at a regional level may possibly be exposed to a Tiebout effect. For instance, Smith Conway and Houtenville (1998) show that the migration decision of the elderly is heavily influenced by educational spending and also property taxes in the US states. This suggests the use of an instrumental-variable estimation strategy to rule out this influence. For cross-country analyses, the Tiebout effect appears far less relevant (if it exists at all) given low migration rates and differing dominant migration motives.

⁶In Germany, there has recently been a fierce political debate whether benefits aiming at improving young children's (extracurricular) educational attainment should be granted in cash or in-kind (i.e., as a voucher).

⁷Some of the lagged instruments would not be available as instruments in cases where the residual in the differenced model is serially correlated (cf. Roodman, 2006). Note that we still expect autocorrelation in the residuals of the model in levels. Arellano and Bover (1995) proposed a test for autocorrelation in the differenced residuals which is also valid in the System-GMM procedure. We found that there is no serial correlation of that specific form in the data.

⁸However, Hsiao (2003: 90) suggests to use only a modest amount of instruments as he questions the efficiency gain through a large number of instruments in a finite sample.

⁹The Hansen test, which is in fact a variant of the Wald test, can also be seen as a test of misspecification. If we omit any important variables, they will be shifted into the error term which will then lead to a correlation with the instruments. Subsequently, the moment conditions will not be randomly assigned around zero (cf. Roodman, 2009).

¹⁰Unfortunately, the Hansen test is not robust to the number of included instruments. As the number of instruments increases, the Hansen test also tends to accept H_0 too often (cf. Roodman, 2009). However, until now there is no rule which determines the optimal number of instruments. Roodman (2009) argues that one should decrease the number dramatically to investigate possible distortions. In the present study, there is a *natural* upper bound according to the number of countries used. Roodman proposed two possibilities to reduce the instrument count. The first is to use only some lags as instruments. Hence, we only used lags one and two because the correlation should decrease with the time lag. The second alternative is to 'collapse' the instrument matrix. This option creates only one instrument for each not strictly exogenous variable and lag distance. Otherwise the instrument matrix contains instruments for each variable, lag distance *and* time period.

¹¹Hence, strictly speaking, the variable is not '(log) family benefits per child' but '(log) family benefits per 1,000 children'.

¹²These countries are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom and the United States.

¹³These countries are Belgium (1995), Luxembourg (1995, 2005), USA (1995). We omit these three countries in the subsequent analysis.

¹⁴The Federalism Index is not available for Turkey. EHII data is missing for Switzerland, the year 2005 for all countries and for Belgium (2000), Luxembourg (2000) and Portugal (1995, 2000). Decommodification can not be analysed for Greece, Luxembourg, Portugal, Spain and Turkey because of missing observations.

¹⁵Restricting the sample analogously to the education case yields insignificant coefficients for the *V6569* variable in the family benefits estimation, but the *V6069* variable remains negative and significant throughout these regressions. That the qualitative results remain unchanged is especially true for a comparison of the System-GMM estimates. The results are available from the authors upon request.

¹⁶GDP per capita might be viewed as a truly endogenous variable. Taking account of this in our System-GMM estimation does not, however, change our results, so we stick to our initial estimation model. The results of this exercise are available from the authors upon request.

¹⁷Each regression carries the F -statistic to test for the overall significance of the variables. However, the Hansen-test is not the χ^2 test statistic but the p -value of the corresponding test. The reason for this change in notation is that a large p -value, i.e. close to one, indicates a misspecification of the test. This is due to the fact that the Hansen test is not robust to the inclusion of too many instruments (Roodman, 2009). We can also infer directly from the p -value that the test is never significant at conventional levels. Thus, we can carefully accept the null hypothesis of exogeneity of the instruments.

¹⁸Results for family benefits per child or education spending per school-ager are not very different from the ones presented. We indicate any differences, but otherwise omit the tables here. They are available from the authors upon request.

¹⁹Results for *V6069* do not differ qualitatively from the results of *V6569*. Results can be received from the authors upon request.

²⁰Unfortunately, the index is not available for all countries in the sample. Thus, the number of countries is reduced and comparison to the full sample must be made with caution.

²¹In fact, the literature on the relationships between socio-economic status and health has emphasized that countries with a high level of decommodification have lower health inequalities, lower infant mortality and higher life expectancy at birth (e.g., Coburn, 2000; Bambra, 2005; Navarro et al., 2006).

²²Note, however, that we do not get this result for the ‘per child’ specification (not shown here).

²³Results for *V6069* again do not differ qualitatively from the results of *V6569*.

²⁴See e.g., Cameron and Hofferbert (1974) for an extensive discussion of the impact of federalism on education finance.

²⁵However, we have to be careful in drawing a conclusion because of a very low number of observations left.

²⁶The precise drop in consumption around the time of retirement has been estimated to be quite substantial. Mariger (1987) estimates a reduction of 43% for the U.S., Banks et al. (1998) a 35% decline for the U.K. More recent studies find downward shifts of 10-20% (Bernheim et al. 2001) and 15-20% (Hurd and Rohwedder 2005) again for the U.S.

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8 Tables

Table 1: **Family Benefits - Two-Way-FGLS Models**

	(1)	(2)	(3)	(4)	(5)	(6)
V65up	-0.088 (2.186)	1.450 (2.624)	3.467 (2.664)	6.423** (3.134)	8.449** (3.321)	9.677*** (3.692)
V6069		-12.05*** (3.117)			-6.115* (3.312)	
V6569			-16.99*** (4.999)			-9.324* (5.394)
V2544	1.964* (1.174)	-0.215 (1.422)	1.267 (1.152)	1.475 (1.686)	1.179 (1.700)	1.936 (1.694)
Child	-0.214 (0.736)	-0.393 (0.763)	-0.324 (0.734)	-2.519** (1.084)	-2.495** (1.088)	-2.431** (1.080)
Population Density	-0.007 (0.005)	-0.001 (0.005)	-0.005 (0.005)	-0.009 (0.006)	-0.008 (0.006)	-0.009 (0.006)
GDP/capita	0.002 (0.004)	0.001 (0.004)	0.001 (0.004)	0.002 (0.004)	0.003 (0.004)	0.003 (0.004)
Growth	0.006 (0.012)	0.010 (0.011)	0.008 (0.012)	-0.017 (0.015)	-0.014 (0.015)	-0.016 (0.015)
Constant	1.090 (1.004)	3.267*** (1.188)	1.747* (1.003)	-0.174 (1.318)	0.292 (1.350)	-0.496 (1.326)
Time Fixed Effects	✓	✓	✓	✓	✓	✓
Country Fixed Effects	✓	✓	✓	✓	✓	✓
Observations	110	110	110	110	110	110
Countries	22	22	22	22	22	22
$\chi^2(32)$ -Test	2467***	2809***	3450***	992***	987***	1011***

Standard errors in parentheses and corrected for heteroscedasticity and an autoregressive process of order 1. Time- and Country-Fixed Effects are included in all regressions. Models 1-3 with Family Benefits as % of GDP and Models 4-6 with log Family Benefits per Child (0-19) as Dependent Variable. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Table 2: **Public Expenditure on Education - Two-Way-FGLS Models**

	(1)	(2)	(3)	(4)	(5)	(6)
V65up	-1.985 (6.914)	-1.658 (7.015)	-7.823 (8.279)	0.630 (1.508)	0.701 (1.546)	-1.256 (1.797)
V6069		-3.831 (7.360)			-0.534 (1.739)	
V6569			14.80 (15.51)			6.035 (3.899)
V2544	10.95*** (3.338)	10.76*** (3.358)	9.889*** (3.400)	2.666*** (0.832)	2.651*** (0.831)	2.470*** (0.829)
SUB529	-4.572* (2.692)	-3.961 (2.887)	-4.737* (2.595)	-2.381*** (0.600)	-2.326*** (0.648)	-2.488*** (0.563)
Population Density	0.007 (0.008)	0.008 (0.008)	0.006 (0.008)	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)
GDP/capita	-0.006 (0.007)	-0.005 (0.007)	-0.008 (0.007)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Growth	0.105*** (0.023)	0.106*** (0.023)	0.103*** (0.023)	0.002 (0.006)	0.002 (0.006)	0.002 (0.006)
Constant	2.421 (3.748)	2.463 (3.757)	3.212 (3.714)	1.153 (0.854)	1.172 (0.859)	1.292 (0.824)
Time Fixed Effects	✓	✓	✓	✓	✓	✓
Country Fixed Effects	✓	✓	✓	✓	✓	✓
Observations	76	76	76	76	76	76
Countries	19	19	19	19	19	19
$\chi^2(28)$ -Test	1449***	1412***	1364***	7968***	7876***	8528***

Standard errors in parentheses and corrected for heteroscedasticity and an autoregressive process of order 1. Time- and Country-Fixed Effects are included in all regressions. Models 1-3 with Public Expenditure on Education as % of GDP as Dependent Variable. Models 4-6 with log Public Expenditure on Education per School-Ager (5-29) as Dependent Variable. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Table 3: **Family Benefits - System-GMM Models**

	(1)	(2)	(3)	(4)
V65up	15.61* (8.743)	29.35*** (8.434)	24.98*** (7.890)	34.81*** (10.49)
V6069	-22.73 (13.88)		-21.69 (12.61)	
V6569		-67.15*** (22.61)		-58.56* (33.05)
Child	-1.797 (1.980)	-0.128 (1.081)	-2.144 (2.409)	-1.504 (2.061)
GDP/capita	0.011** (0.004)	0.011** (0.004)	0.010*** (0.003)	0.010*** (0.002)
Population Density	-0.004 (0.003)	-0.003* (0.002)	-0.002 (0.002)	-0.002 (0.001)
Constant	2.417 (2.788)	-0.0586 (1.211)	-1.074 (2.890)	-2.619 (1.986)
Time Fixed Effects	✓	✓	✓	✓
Observations	110	110	110	110
Countries	22	22	22	22
$F(7, 21)$ -Test	4.53***	2.65**	4.50***	3.72***
Hansen-Test	0.345	0.289	0.106	0.232
Instruments	20	20	20	20

Models 1 and 2 with Family Benefits as % of GDP and Models 3 and 4 with log Family Benefits per Child (0-19) as Dependent Variable. Two-step GMM estimation. Robust and Windmeijer-corrected standard errors in parentheses adjusted for small sample size. Time-Fixed Effects included in all regressions. gmm-Style: All variables except for Time Dummies. iv-Style: Time-Dummies. Lags 1 and 2 considered as instruments. Instrument-matrix collapsed.

Table 4: **Public Expenditure on Education - System-GMM Models**

	(1)	(2)	(3)	(4)
V65up	21.15 (16.53)	24.63 (19.60)	9.411 (6.863)	11.07* (5.373)
V6069	-43.22** (16.28)		-13.95** (5.634)	
V6569		-99.82** (35.66)		-35.75*** (9.565)
SUB529	-6.827** (2.390)	-6.650* (3.457)	-4.443*** (1.438)	-4.264*** (0.832)
GDP/capita	0.014 (0.016)	0.014 (0.014)	0.006 (0.004)	0.005 (0.003)
Population Density	-0.003 (0.003)	-0.004* (0.002)	-0.001 (0.001)	-0.001 (0.001)
Constant	10.48** (4.464)	10.32* (5.769)	3.546* (1.903)	3.569** (1.410)
Time Fixed Effects	✓	✓	✓	✓
Observations	76	76	76	76
Countries	19	19	19	19
$F(6, 18)$ -Test	12.90***	16.16***	8.29***	23.68***
Hansen-Test	0.141	0.195	0.163	0.244
Instruments	19	19	19	19

Models 1 and 2 with Public Expenditure on Eduaction as % of GDP and Models 3 and 4 with log Public Expenditure on Education per School-Ager (5-29) as Dependent Variable. Two-step GMM estimation. Robust and Windmeijer-corrected standard errors in parentheses adjusted for small sample size. Time-Fixed Effects included in all regressions. gmm-Style: All variables except for Time Dummies. iv-Style: Time-Dummies. Lags 1 and 2 considered as instruments. Instrument-matrix collapsed. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5: Family Benefits as % of GDP - One-Way-FGLS Models

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
V65up	14.66*** (4.221)	15.75*** (4.423)	17.16*** (4.275)	13.75*** (4.104)	11.60*** (4.180)	15.66*** (4.172)	9.317** (4.121)	3.428 (3.817)
V6569	-28.61*** (8.303)	-30.02*** (8.532)	-29.00*** (8.332)	-26.35*** (8.060)	-26.48*** (7.405)	-31.04*** (8.934)	-23.47*** (9.104)	-24.42*** (6.487)
Child	0.500 (1.024)	0.538 (1.022)	1.338 (1.037)	0.533 (1.033)	0.655 (1.132)	0.0920 (0.967)	1.035 (0.864)	-0.948 (1.485)
GDP/capita	0.014*** (0.002)	0.014*** (0.002)	0.017*** (0.002)	0.013*** (0.002)	0.015*** (0.002)	0.015*** (0.002)	0.010*** (0.002)	0.007* (0.004)
Growth	0.015 (0.015)	0.016 (0.015)	0.011 (0.015)	0.018 (0.016)	0.027* (0.016)	0.021 (0.015)	0.056*** (0.017)	0.064*** (0.020)
Population Density	-0.002*** (0.001)	-0.002*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.002*** (0.001)	-0.003*** (0.001)	-0.002*** (0.001)	-0.003*** (0.001)
Catholics	-0.958*** (0.274)	-0.998*** (0.267)	-0.781*** (0.274)	-0.946*** (0.280)	-0.923*** (0.297)	-1.127*** (0.257)	-0.893*** (0.183)	0.0623 (0.499)
Ethnic Fraction	-1.967*** (0.349)	-1.954*** (0.344)	-2.490*** (0.435)	-3.129*** (0.867)	-2.468*** (0.624)	-2.031*** (0.344)	-1.750*** (0.438)	-2.246*** (0.691)
V2544		0.541 (2.379)						
Religion Fraction			1.122** (0.506)					
Language Fraction				1.477 (0.932)				
Federalism					0.112 (0.086)			
Trade Openness						-0.059** (0.024)		
EHII							-0.137*** (0.022)	
Decommodification								0.058*** (0.022)
Constant	0.547 (1.029)	0.191 (1.576)	-0.777 (1.125)	0.615 (1.020)	0.524 (1.085)	0.860 (1.007)	5.431*** (1.130)	1.382 (1.284)
Time Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓
Observations	110	110	110	110	105	110	80	85
Countries	22	22	22	22	21	22	21	17
χ^2 -Test	122***	127***	134***	108***	107***	139***	459***	65***

Standard errors in parentheses and corrected for heteroscedasticity and an autoregressive process of order 1. Time Fixed Effects are included in all regressions. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Public Expenditure on Education as % of GDP - One-Way-FGLS Models

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
V65up	20.42*** (5.814)	26.16*** (6.911)	19.98*** (6.064)	19.76*** (5.846)	23.08*** (6.648)	20.62*** (5.615)	19.31** (9.527)	10.45 (7.965)
V6569	-40.28* (20.92)	-31.24 (21.41)	-40.50* (20.74)	-38.56* (21.52)	-54.76** (23.19)	-32.71 (20.70)	-44.98* (27.08)	-41.10 (27.88)
SUB529	-2.933* (1.557)	-3.049** (1.554)	-2.828 (1.824)	-2.894* (1.643)	-3.397 (2.607)	-2.055 (1.366)	1.382 (1.896)	-0.0212 (2.453)
GDP/capita	0.021*** (0.004)	0.020*** (0.004)	0.020*** (0.004)	0.019*** (0.004)	0.021*** (0.003)	0.020*** (0.004)	0.008** (0.003)	-0.003 (0.005)
Growth	0.001 (0.021)	0.010 (0.023)	0.002 (0.021)	-0.001 (0.021)	-0.006 (0.025)	0.017 (0.020)	-0.022 (0.023)	0.046 (0.031)
Population Density	-0.004*** (0.001)	-0.004*** (0.001)	-0.004*** (0.001)	-0.004*** (0.001)	-0.004*** (0.001)	-0.004*** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)
Catholics	-1.110*** (0.223)	-1.276*** (0.246)	-1.119*** (0.221)	-1.076*** (0.227)	-0.973*** (0.240)	-1.071*** (0.226)	-0.336 (0.279)	-0.643** (0.292)
Ethnic Fraction	-0.229 (0.466)	-0.257 (0.449)	-0.377 (0.489)	-0.630 (0.704)	-0.142 (0.497)	-0.319 (0.467)	1.383* (0.815)	0.839 (0.627)
V2544		8.763** (4.366)						
Religion Fraction			0.170 (0.505)					
Language Fraction				0.497 (0.774)				
Federalism					-0.035 (0.071)			
Trade Openness						-0.156*** (0.048)	-0.240*** (0.052)	
EHII								0.119*** (0.027)
Decommodification								2.746 (2.128)
Constant	5.356*** (1.841)	0.257 (3.257)	5.420** (2.262)	5.420*** (1.999)	6.169** (2.644)	4.637*** (1.721)	11.66*** (2.400)	✓
Time Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓
Observations	76	76	76	76	72	76	51	60
Countries	19	19	19	19	18	19	17	15
χ ² -Test	266***	240***	264***	274***	200***	191***	162***	143***

Standard errors in parentheses and corrected for heteroscedasticity and an autoregressive process of order 1. Time Fixed Effects are included in all regressions. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Family Benefits - Different Models

	(1)	(2)	(3)	(4)	(5)	(6)
V65up_F	12.11 (10.12)	43.63*** (9.287)	83.06 (49.27)	14.71* (8.724)	33.92*** (6.132)	105.6 (63.33)
V65up_M	-17.58 (12.58)	-39.25*** (11.78)	-74.73 (79.75)	-9.004 (10.22)	-18.05*** (6.598)	-102.8 (93.81)
Child	0.202 (0.749)	1.176 (0.953)	2.326 (1.869)	-2.130** (0.974)	-1.215 (0.870)	2.221 (2.726)
GDP/capita	0.002 (0.004)	0.013*** (0.002)	0.011* (0.006)	0.004 (0.003)	0.010*** (0.001)	0.006 (0.004)
Population Density	-0.010** (0.005)	-0.003*** (0.001)	-0.006* (0.003)	-0.012*** (0.004)	-0.001*** (0.001)	-0.003 (0.003)
Catholics		-1.016*** (0.242)			-0.653*** (0.158)	
Ethnic Fraction		-1.862*** (0.333)			-0.569** (0.224)	
Constant	1.833** (0.781)	-0.329 (1.030)	-2.944* (1.530)	0.350 (0.837)	-1.762*** (0.789)	-4.940** (2.276)
Time Fixed Effects	✓	✓	✓	✓	✓	✓
Country Fixed Effects	✓					
Observations	110	110	110	110	110	110
Countries	22	22	22	22	22	22
χ^2 -Test	2279***	143***		1262***	277***	
F-Test			5.13***			6.83***
Hansen-Test			0.250			0.386
Instruments			20			20

Models 1 - 3 with Family Benefits as % of GDP and Models 4 - 6 with log Family Benefits per Child as Dependent Variable. Standard errors in parentheses. AR(1) disturbances and heteroscedastic errors in Models 1,2,4,5. Models 3 and 6: System-GMM estimates. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Table 8: **Public Expenditure on Education - Different Models**

	(1)	(2)	(3)	(4)	(5)	(6)
V65up_F	27.40* (15.86)	38.95*** (11.71)	37.66 (58.84)	0.416 (3.675)	10.46** (4.270)	22.07 (24.54)
V65up_M	-24.94 (16.10)	-12.15 (16.02)	-2.924 (73.88)	-0.590 (3.378)	-5.214 (4.480)	-12.30 (31.01)
SUB529	-0.941 (1.998)	-0.754 (1.404)	-4.600 (4.424)	-2.832*** (0.291)	-3.562*** (0.517)	-3.301 (2.287)
GDP/capita	-0.006 (0.007)	0.018*** (0.004)	0.029 (0.022)	0.001 (0.001)	0.007*** (0.001)	0.009* (0.005)
Population Density	0.011 (0.011)	-0.004*** (0.001)	-0.004 (0.003)	-0.001 (0.002)	-0.001*** (0.0002)	-0.001 (0.001)
Catholics		-1.546*** (0.265)			-0.498*** (0.084)	
Ethnic Fraction		0.145 (0.447)			0.297* (0.157)	
Constant	4.396** (2.202)	2.130 (1.444)	2.882 (5.649)	2.732*** (0.359)	2.326*** (0.641)	1.196 (2.414)
Time Fixed Effects	✓	✓	✓	✓	✓	✓
Country Fixed Effects	✓			✓		
Observations	76	76	76	76	76	76
Countries	19	19	19	19	19	19
χ^2 -Test	964***	217***		11960***	530***	
F-Test			0.85			3.63**
Hansen-Test			0.173			0.126
Instruments			19			19

Models 1 - 3 with Public Expenditure on Education as % of GDP and Models 4 - 6 with log Public Expenditure on Education per School-Ager (5-29) as Dependent Variable. Standard errors in parentheses. AR(1) disturbances and heteroscedastic errors in Models 1,2,4,5. Models 3 and 6: System-GMM estimates. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Pension Generosity Tests

	(1)	(2)	(3)	(4)	(5)	(6)
V65up	0.015 (3.280)	0.654 (1.592)	-1.608 (4.178)	3.368* (1.818)	-6.589 (7.444)	0.792 (1.358)
V6569	-62.57** (24.75)	-17.25 (10.70)	-118.6*** (34.46)	-35.74*** (13.61)	-119.2*** (43.92)	-22.87*** (7.618)
Pension Generosity	-0.145 (0.106)	0.003 (0.046)	-0.452** (0.190)	-0.089 (0.079)	-0.571*** (0.207)	-0.086** (0.035)
V6569xPension Generosity	3.062* (1.770)	0.724 (0.739)	8.764*** (3.032)	2.533** (1.165)	9.522*** (3.151)	1.584*** (0.524)
Child	-3.189*** (1.099)	-5.157*** (0.521)	-3.080** (1.556)	-4.465*** (0.763)	2.073 (2.831)	0.0932 (0.551)
GPD/capita	-0.008** (0.004)	-0.006*** (0.002)	-0.012** (0.005)	-0.003 (0.003)	0.007 (0.007)	0.005*** (0.001)
Growth	0.031* (0.017)	0.003 (0.008)	0.005 (0.023)	-0.006 (0.009)	0.085*** (0.033)	-0.009 (0.006)
Population Density	-0.003 (0.005)	-0.004 (0.003)	-0.003 (0.007)	-0.006* (0.003)	-0.001 (0.014)	-0.005* (0.003)
Constant	6.604*** (1.511)	3.337*** (0.665)	10.32*** (2.519)	3.597*** (1.212)	10.66*** (3.433)	1.894*** (0.672)
Time Fixed Effects	✓	✓	✓	✓	✓	✓
Country Fixed Effects	✓	✓	✓	✓	✓	✓
Observations	85	85	60	60	60	60
Countries	17	17	15	15	15	15
χ^2 -Test	2278***	4755***	3886***	13565***	1523***	16394***

Standard errors in parentheses and corrected for heteroscedasticity and an autoregressive process of order 1. Time- and Country-Fixed Effects are included in all regressions. Models 1 and 3 with Family Benefits as % of GDP, Models 2 and 4 with log Family Benefits per Child (0-19), Model 5 with Public Expenditure on Education as % of GDP as Dependent Variable and Model 6 with log Public Expenditure on Education per School-Ager (5-29) as Dependent Variable. Omitted countries due to data availability in regressions 3-6 are Belgium and the USA. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Table 10: **Effective Retirement Age Tests**

	(1)	(2)	(3)	(4)	(5)	(6)
V65up	2.858 (1.917)	6.264* (3.583)	6.657** (3.112)	8.597 (5.618)	-7.781 (6.446)	-1.000 (1.428)
V6569	-75.82 (46.60)	-66.79 (81.92)	195.0** (96.25)	100.4 (161.2)	948.2*** (215.9)	254.6*** (50.09)
Eff. Retirement Age	-0.077 (0.053)	-0.097 (0.086)	0.162* (0.090)	0.055 (0.147)	0.732*** (0.201)	0.191*** (0.046)
V6569xEff. Reti. Age	0.915 (0.720)	0.960 (1.323)	-3.179** (1.506)	-1.583 (2.533)	-14.85*** (3.397)	-3.941*** (0.785)
Child	-0.177 (0.720)	-2.668** (1.090)	-0.250 (0.756)	-3.379* (1.838)	-6.043*** (1.274)	-2.096*** (0.309)
GDP/capita	0.002 (0.004)	0.001 (0.004)	-0.010** (0.004)	-0.007 (0.006)	-0.017*** (0.006)	-0.001 (0.001)
Growth	0.007 (0.013)	-0.027* (0.014)	-0.062*** (0.014)	-0.073*** (0.021)	0.078*** (0.020)	-0.003 (0.005)
Population Density	-0.010** (0.005)	-0.009 (0.005)	-0.008 (0.006)	-0.013 (0.010)	0.014* (0.008)	0.002 (0.002)
Constant	7.186** (3.460)	7.124 (5.455)	-8.024 (5.970)	-2.200 (9.455)	-38.04*** (12.96)	-10.21*** (2.936)
Time Fixed Effects	✓	✓	✓	✓	✓	✓
Country Fixed Effects	✓	✓	✓	✓	✓	✓
Observations	110	110	76	76	76	76
Countries	22	22	19	19	19	19
χ^2 -Test	5539***	1177***	8433***	1147***	2074***	8124***

Standard errors in parentheses and corrected for heteroscedasticity and an autoregressive process of order 1. Time- and Country-Fixed Effects are included in all regressions. Models 1 and 3 with Family Benefits as % of GDP, Models 2 and 4 with log Family Benefits per Child (0-19), Model 5 with Public Expenditure on Education as % of GDP as Dependent Variable and Model 6 with log Public Expenditure on Education per School-Ager (5-29) as Dependent Variable. Omitted countries due to data availability in regressions 3-6 are Belgium, Luxembourg and the USA. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

9 Appendix

Table 11: **Summary Statistics**

Variable	Mean	Std. Dev.	Min.	Max.	N
<i>Dependent Variables</i>					
Family Benefits/GDP	1.86	1.09	0.03	4.42	110
Family Benefits/Child (log)	0.174	1.096	-5.13	2.11	110
Education Expenditure/GDP	5.18	1.32	2.2	8.30	84
Education Expenditure/School-Ager (log)	1.18	0.62	-1.29	2.09	84
<i>Age Structure Variables</i>					
V65up	0.188	0.032	0.077	0.246	110
V6069	0.123	0.016	0.069	0.156	110
V6569	0.057	0.009	0.027	0.075	110
V2544	0.405	0.033	0.34	0.503	110
SUB529	0.597	0.12	0.43	1.14	110
Child	0.455	0.12	0.31	1.07	110
<i>Control Variables</i>					
Population Density	123.071	120.611	1.999	478.287	110
GDP per capita	68.371	48.379	12.772	279.582	110
GDP Growth	7.455	3.95	0.62	20.98	110
Trade Openess	2.062	1.533	-1.724	8.700	110
Catholics	0.408	0.381	0	0.974	110
Ethnic Fractionalization	0.239	0.207	0.012	0.712	110
Language Fractionalization	0.239	0.203	0.018	0.644	110
Religious Fractionalization	0.408	0.259	0.005	0.824	110
Federalism	2.5	1.506	1	5	105
EHII	36.461	3.993	27.997	47.453	80
Decommodification Index	27.334	5.746	17.905	40.415	85
Effective Retirement Age	63.077	2.690	58.29	70.95	110
Pension Generosity	12.376	2.828	6.289	18.741	85

Table 12: List of Dependent Variables

Variable	Explanation	Source
V65up	Population of age 65 and over as a fraction of the voting age population (20-99)	United Nations (2009)
V6069	Population of age 60 to 69 as a fraction of the voting age population (20-99)	United Nations (2009)
V6569	Population of age 65 to 69 as a fraction of the voting age population (20-99)	United Nations (2009)
V2544	Population of age 25 to 44 as a fraction of the voting age population (20-99)	United Nations (2009)
Child	Population of age 0 to 19 as a fraction of the working age population (20-64)	United Nations (2009)
SUB529	Population of age 5 to 29 as a fraction of the working age population (20-64)	United Nations (2009)
Population Density*	Average midyear population divided by land area in square kilometres.	World Bank (2010)
GDP capita*	Average real GDP per capita (constant prices: chain series).	Heston et al. (2009)
Growth*	Average growth rate of real GDP per capita (constant prices: chain series).	Heston et al. (2009)
Trade Openness*	Average openness to trade measured as exports plus imports as a percentage of GDP. Constant prices, reference year 1996.	Heston et al. (2009)
Catholics	Fraction of Catholics. Percentage numbers are averaged over the time span of 1982 to 2005.	Holy See (2008)
Ethnic Frac*	Ethnic Fractionalization Index. Higher numbers mean higher fractionalization.	Alesina et al. (2003)
Language Frac*	Language Fractionalization Index. Higher numbers mean higher fractionalization.	Alesina et al. (2003)
Religion Frac*	Religion Fractionalization Index. Higher numbers mean higher fractionalization.	Alesina et al. (2003)
Federalism*	Index on federalism and decentralization. Lower values indicate unitary and centralized states.	Armington et al. (2010); Lijphart (1999)
EHII*	Average Estimated Household Inequality Index. Higher Values indicate a higher inequality.	UTIP (2008); Deininger and Squire (1996)
Decommodification*	Decommodification Index	Scruggs (2006); Scruggs and Allan (2006); Esping-Andersen (1990)
Effective Retirement Age	Average Effective Retirement Age for Men	OECD (2011)
Pension Generosity*	Pension Generosity Index. The index varies theoretically between 0 and 24, where higher scores indicate a more generous pensions system.	Scruggs (2006); Scruggs and Allan (2006); Esping-Andersen (1990)

All variables with an asterisk (*) are drawn from Samanni et al. 2010. Averages are simple five year averages corresponding to the time intervals if not else quoted.

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