Family background, informal networks and the decision to provide for old age: A siblings approach

Bettina Lamla

10-2012

MEA DISCUSSION PAPERS

Alte Nummerierung: 261-12

Family background, informal networks and the decision to provide for old age:
A siblings approach

Bettina Lamla[1]

This version: July 2012

Abstract

In order to encourage people to take out voluntary private pensions to supplement decreasing statutory provisions Germany introduced the so-called Riester pensions. The complex design of the new product might have created entry barriers into the market helping to explain the slow adaption path in the eligible population until today. Existing empirical evidence has not properly taken into account the search and decision costs related to Riester pensions. I use information on family background in order to account for the predisposed ability to manage relevant information as well as to capture the impact of information sharing within families. I conclude that parental erudition as well as experience in financial matters are determinants of their children's preferences and ability in financial decision making, however, omission does not seem to lead to misleading results on other coefficients. Contemporaneous as well as sequential correlations in Riester ownership between siblings are pronounced. While the former might be due to shared preferences, I take the latter as evidence for information sharing. Positive externalities help to overcome entry barriers in the Riester market by dispersing information. The family as a source of information becomes less important with time as the number of Riester owners in other social circles grows. Once a critical mass has been reached positive spillovers create a social multiplier which should result in dynamic demand for Riester contracts. Indeed official statistics exhibit increasing uptake rates among low income individuals for whom initial entry barriers were comparably high.

JEL classification: D83, D91

---

[1] [1]Munich Center for the Economics of Aging at the Max-Planck-Institute for Social Law and Social Policy, Munich.
Email: lamla@mea.mpisoc.mpg.de

1. Introduction

Innovations, and in particular innovative financial products, induce transaction costs. These costs might differ between individuals depending on their ability to acquire and process relevant information for a purchase decision.

In many western countries people did not have to deal with the market for private old age provision products until recently as the welfare state was providing generous public pensions. However, with global demographic change challenging public budgets, most of these countries undertook dramatic pension reforms in the last years: Monolithic pension systems were reformed into multi-pillar systems, thereby shifting responsibility for retirement income from the state towards individuals. Standard economic theory predicts that a change to less generous public pensions would increase private savings due to a crowding-out effect. Ambiguities in the relationship between public pension wealth and private savings arise, however, depending on income and substitution effects, capital market conditions, and behavioral biases (see Feldstein, 1974; Kahneman and Tversky 1979, Thaler 1981).With people being restricted in their ability to manage information (Delavande et al., 2008; van Rooij et al.,2011) this might result in less than optimal savings and offset the governments' policy. Many countries have therefore tried to actively encourage people to take out voluntary private pensions to supplement decreasing statutory provisions. As part of the major pension reform, Germany introduced a new type of state-subsidized private old age provision scheme, the so-called Riester pensions in 2001.

By 2010, almost 10 years after its introduction, 40% of the eligible population was covered by a Riester contract (Coppola and Reil-Held, 2009; Geyer, 2011). Coverage rates vary across socio-economic strata revealing that especially low income and low educated individuals are hard to reach. The ongoing discussion of why certain groups do not provide for old age and how successful subsidies are in targeting the population at risk of old age poverty has sparked controversies in the academic world for many years[2]. Existing evidence, however, has not properly taken into account the search and decision costs related to Riester pensions. Individuals might face entry barriers, such as a simple lack in information, when joining the Riester market and differ in their ability to overcome these barriers. Peers in turn can help eliminating these barriers as they disperse information and thereby lower transaction costs.

The contribution exploits information on family background in order to account for the predisposed ability to manage relevant information as well as to capture the importance of families as a form of social network. In order to reduce omitted variables I control for family background in two ways: (1) by subtracting a family fixed effect and, (2) through the inclusion of proxy variables. Beyond shared preferences and genetic components, families can be considered a source for cost-effective and reliable information. In an attempt to establish the effect of social interactions I look at the contemporaneous correlations in Riester ownership as well as the sequence of Riester market entrance between siblings.

---

[2] See e.g. Venti and Wise (1990) and Gale and Scholz (1994) on Individual Retirement Accounts in the U.S.

The rest of the paper is organized as follows. Section 2 presents some key features of Riester pensions and contains an overview of the relevant literature. The section ends with stating my hypotheses. Section 3 describes the identification strategy. Apart from the data and sample used, I present the model specifications. Section 4 reports the estimation results, and section 5 concludes.

2. Related literature and Hypotheses
2.1. Riester pensions: The key features

As part of the major German pension reform in 2001, Riester pensions were introduced with the aim of promoting the take-up of supplementary pensions to fill the emerging pension gap.[3] Compared to a situation without reforms in 2001 and 2004, the public pension level will be lower by 14.4% in 2030 (Börsch-Supan and Gasche, 2010). Riester pensions are state-subsidized private saving plans. In the period between 2002 and 2009 demand for Riester contracts rose, especially after reforms in 2005, among all income groups. While the share of low-income households owning a Riester pension is still comparably low, this group shows dynamic demand measured as a percentage increase in uptake rates (Börsch-Supan et al., 2012).

Riester contracts are rather complex financial products: To start with, the subsidies are bound to eligibility criteria. Basically everyone who is affected by the decreasing statuary pensions is eligible for subsidies, yet the concrete eligibility rules are complicated (Börsch-Supan et al., 2012, p.4). A distinction is made between direct and indirect eligibility. Directly eligible are employees paying mandatory contributions to social insurance, unemployed and recipients of other wage compensation benefits, self-employed, farmers as well as civil servants. Indirect eligibility is derived from eligibility of the spouse. Coppola and Gasche (2011) demonstrate that especially low-income households are ignorant of their eligibility for subsidies under the Riester scheme. The authors find that low knowledge of the pension system is correlated with a higher probability to misreport households' eligibility for the Riester-subsidies.

In addition, the financial advantages of Riester pension plans are not immediately obvious to everyone and its quantification requires some mathematical skills (Börsch-Supan et al., 2012). For certified Riester products subsidies exist in the form of a basic benefit matching the own contribution and a tax deduction, depending on the amount contributed to the contract and the marginal tax rate of the owner of the contract. Low income individuals receive a relatively high subsidy due to the matching basic benefit, higher income individuals profit from the tax deductions (Börsch-Supan and Gasche, 2010). While subsidies are particularly generous for low income individuals[4], targeting individuals with high risk of old age poverty, there is widespread misperception of the generosity of the state-subsidy in this group (Coppola and Gasche, 2011). At

---

[3] See Börsch-Supan and Wilke (2004) and Wilke (2009) on the pension reform process in Germany.
[4] Subsidies are also relatively high for families with children. Families receive an additional subsidy of 185 euro for each child. For children born after 2007 the additional benefit amounts to 300 euro.

the same time, only those who are aware of incentives can respond to them (Chan and Stevens, 2008).

Given that an individual chooses to buy a contract, he/she might find it difficult to decide which Riester product to pick. Saving possibilities are diverse with more than 5000 different products (BzSt, 2011). Moreover, there is an ongoing public debate about the intransparency of costs related to the contracts. Hagen and Reisch (2010, p.5) point out the nature of Riester contracts as "trust-goods", with consumers being unable to evaluate the value of the contract even after the purchase. In fact, miscounseling or bad products are among the main reasons why Riester contracts are terminated or decommissioned (Ziegelmeyer and Nick, 2012).

In conclusion, an individual has to manage a series of tasks until he/she can make a purchase decision: First, one needs to *identify the need* to provide privately for old age. As many field studies and laboratory tests show, people are much more short-sighted and much less able to process economic and financial information than their rational counterparts and thus, might fail to realize the need to save for retirement (e.g., Kahneman and Tversky 1979, Thaler 1981). Second, the individual needs to *gather information* on other relevant pension products as well as Riester specific information on eligibility and subsidies, which can be hard to grasp. Third, the individual has to *pick* one of the offered contracts without knowing which one suits best to his/her personal circumstances.

More than ten years after its introduction a vast amount of research has been undertaken on the topic "Riester pensions".[5] The literature on Riester pensions in Germany (e.g. Coppola and Reil-Held, 2009; Geyer, 2009; Pfarr and Schneider, 2010) has highlighted the following: Riester ownership is significantly influenced by age and income as well as gender. Moreover, individuals living in the east of Germany tend to buy Riester contracts more often. The same is true for individuals with children. Coppola and Reil-Held (2009) add saving motives to their regression and find that an increased importance of the old-age saving motive or saving due to subsidies is correlated with a higher probability to own a Riester contract. The authors' take that as a sign for the effectiveness of the incentives. Pfarr and Schneider (2010) in turn stress the importance of complementary products in the form of life insurances which they interpret as an indicator for crowding-in, also found in Börsch-Supan et al. (2008).

Existing evidence, however, has not properly taken into account the search and decision costs related to Riester pensions. Given that Riester pensions are rather complex in comparison to other well-established products present on the market (e.g. life insurance), entry barriers might explain the observed slow adaption path in the eligible population even ten years after its introduction.

2.2. Riester pensions and the role of families

Parental erudition as well as experience in financial matters and attitude towards saving are strong determinants of their children's preferences and ability in financial decision making (e.g.

---

[5] See Blank (2011) for an overview.

Lusardi et al., 2010; Ashby et al., 2011). First of all members from one family are more alike than randomly selected individuals due to a number of reasons, such as a shared environment when being young resulting in similar role models and peer groups and influencing preferences. Moreover, many individual characteristics related to financial decisions also have a genetic component.[6] Using a sample of identical and fraternal twins Barnea et al. (2010) decompose variance in investment decisions. The authors claim that similarities in investment behavior are to a large extent due to genetic predisposition, even after controlling for a wide range of covariates and the frequency of interaction.

By now there is broad consensus that financial literacy influences the decision to save for retirement. Studies of financial literacy[7] find that in particular low income and low educated households as well as women often lack financial literacy and thus, accumulate insufficient retirement wealth. In a multivariate analysis Bucher-Koenen (2011) adds to the usual socio-demographic determinants for Riester ownership measures of financial literacy. The regression results reveal that financial literacy is positively related with any form of private old age provision. In her conclusion the author points out that there is the possibility of omitted variable bias due to missing information on, for example, cognitive abilities which in turn are determined by family background (Becker, 1964).

Lusardi et al. (2010) examine financial literacy among the young and find that financial literacy is strongly related to socio-demographics and mothers' education, which is -among other variables- interpreted as a proxy for family financial sophistication. Mothers' educational attainment also proves to be an important determinant for thinking about retirement (Lusardi et al. 2010; Lusardi, 2003). These studies lack sufficient information on fathers' educational attainment. Indeed, Loehlin (2005) finds that across studies the correlations in different characteristics between mothers and children are on average higher than the correlation between fathers and their children. However, the still prevalent male breadwinner model in Germany might make fathers the financial decision maker of the household and, therefore role models in investment decisions. The fact that men are usually found be financially more literate than women, might reinforce their position (see Lusardi and Mitchell, 2008). It is a priori not clear whether the influence of the father exceeds the influence of mothers' characteristics on Riester ownership or the other way around. The composition of the parents' portfolio is a further indicator for children's ability to handle financial issues. For instance, Lusardi et al. (2010) show that young people whose parents have stocks and retirement savings are significantly more likely to understand financial rationales such as risk diversification reflecting the opportunity of children to learn from their parents.

Indeed, many studies make peers the main source of financial advice and contributors to financial decisions (e.g. Brown et al, 2008; Duflo and Saez, 2002). Hong et al. (2004) develop a theoretical model with two types of investors, non-social and social ones. Non-social and social investors

---

[6] See Barnea et al. (2010) for an overview.
[7] See Lusardi and Mitchell (2011) for an overview.

face fixed participation costs when entering a market, but for the latter group these costs decrease when the participation rate among peers is higher. The model predicts a social multiplier effect due to positive externalities. Empirically the authors show that sociable households who interact more with neighbors or attend church are more likely to possess stocks. Similar results are reported in Guiso et al. (2004) who find that households living in high social capital areas, measured as participation rates in elections and blood donation, tend to invest more in stocks. Using a sample of young Americans, Lusardi et al. (2010) reveal significant relations between peer characteristics and financial literacy.

The main identification problem in such studies is that households are not randomly assigned to peer groups. Sorting and matching is endogenous (Li, 2009). Manski (1993) demonstrates formally the considerations involved in identifying peer effects: First, group members share a common social environment. Second, people with similar preferences are members of the same group. In order to overcome the endogeneity problem, Duflo and Saez (2003) analyze a randomized experiment. They study the role of peer effects in TDA (Tax Deferred Accounts) plan participation using data on employees at a university. The experiment encouraged randomly selected employees of certain departments to attend an information fair which promised rewards for attendance. The authors show that the effect on enrollment rates in TDA plans was similar between treated and untreated department a few months after the fair, which they take as evidence for social networks dispersing information.

Without a credible instrument or experiment at hand, an alternative solution to overcome the endogeneity problem is to study families given that they are "*connected for a purely exogenous reason*", namely biology (Li et al., 2009, p.5). Prior work has shown that family and friends are of particular importance when it comes to financial advice. Especially in low social capital areas, narrow subgroups such families are considered a valuable source for information (see Guiso et al., 2004 and references therein). Lusardi (2003) uses a sample restricted to 50-61 year old Americans. She reports that individuals learn to plan for retirement from older siblings and from the experience of old parents. In her descriptive analysis she shows that respondents who do not think about retirement are less likely to have older siblings that could provide advice on preparation for retirement. Moreover, she uses the age difference to the oldest sibling as an instrument for planning in a savings regression. The author claims that this should capture "*search and psychological costs of planning*" (Lusardi, 2003, p.8). If the older sibling can give guidance due to his/her own experience that can be considered a straightforward form of planning. Given the public debate on the intransparency of the cost structure of Riester contracts (Hagen and Reisch, 2010), reliable information form a trusted person outside the offering institution, such as a sibling, might be of particular importance in overcoming entry barriers. Provided that someone within the family has entered the Riester market, he/she can disperse knowledge on eligibility and other related questions and thereby lower entry costs. Therefore, I expect strong and positive correlations between Riester ownership of family members going *beyond shared preferences*.

However, shared preferences cannot be disentangled from positive externalities due to information sharing when looking at contemporaneous correlations only. Li (2009, p.5) claims that families are tied by exogenous biological relationships unlike households who are formed through e.g. marriage. However, there are possible scenarios in which investment decisions within families are coordinated. For instance, when parents buy a Riester pension they might give uniform advice to all of their children and children might want to mimic their parents.

In an attempt to solve the endogeneity problem when establishing the effect of social interactions, Li (2009) looks at the sequence of stock market entrance. He finds that the likelihood of entering the stock market within the next five years is higher if the respondents' parents or children had entered the stock market during the previous five years. The author argues that these findings highlight the importance of information sharing: Stockmarket knowledge and experience acquired by family members in the past is assumed to influence ones' own participation decision. Following this approach I expect not only contemporaneous, but also sequential correlations to be pronounced. The likelihood of a family member entering the Riester market should be higher if someone within the family has bought a Riester contract in the previous period, other things held constant.

If positive externalities exist that might create a social multiplier once a critical mass has been reached (Becker and Murphy, 2000; Glaeser et al., 2003). In that case public policy will have a direct effect on individuals and an indirect effect through social interaction, leading to dynamic demand for Riester contracts and a better future coverage with private pensions in the population. The family as a source of information should become less important as soon as the group of Riester owners in the population is large enough and information on eligibility and subsidies is widely dispersed.

Summing up, I claim that (1) family background is strongly correlated with search and decision costs therefore needs to be considered when assessing the determinants of Riester ownership. (2) Contemporaneous and sequential correlations in Riester ownership are pronounced among family members, even after controlling for other factors. While the former might be due to shared preferences, the latter should result from information sharing. And, (3) as information on eligibility criteria and subsidies are widely dispersed in the general population information sharing within the family should become a less important determinant for Riester ownership.

3. Identification strategy
3.1. Data and sample

The Socio-Economic Panel Study (SOEP) is an annually conducted, representative household panel study starting in 1984.[8] The SOEP provides information on all household members who

---

[8] See Wagner, Frick and Schupp (2007) and Haisken-DeNew and Frick (2005) for a detailed description of the GSOEP.

reach the age of 17. Its structure is very similar to the American Panel Study of Income Dynamics (PSID) with an individual questionnaire for all household members containing questions about e.g. education, occupation and earnings and a complementing biography questionnaire which covers information on the life course (e.g. marital history, social background, employment biography etc.). In addition, there is a questionnaire answered by only one person with questions on the situation of the household as a unit. A question on Riester ownership was part of the individual questionnaire in the years 2004, 2006, 2007 and 2010. The wording is as follows: "*Did you subscribe a Riester contract since 31st December 2001?*".

The SOEP traces members of original sample households, i.e. persons leaving original sample households form new households, consisting of grown children and separated spouses. [9] These newly formed households are added to the SOEP population, including all non-original sample household members. Due to this feature I am able to construct a sample consisting of siblings, defined as persons having the same biological mother, including half-siblings. They are matched using her never-changing identification number. Information on the father is associated with each sibling also using his identification number. In principle, even richer family relationships could be established by matching grandparents and own children. However, this would result in a rather small sample size.

In summary, individuals who have at least one sibling in the SOEP and whose mother is already part of the SOEP population are considered in the sample.[10] As pointed out in section 2, in order to be eligible for subsidies certain criteria have to be fulfilled.[11] Because all persons in a household answer the individual questionnaire, I am also able to account for eligibility of the spouse which in turn leads to indirect eligibility for the individual under observation. The analysis is restricted to individuals with German nationality as foreigners might have a limited opportunity to learn from their relatives on public and private old age provision in Germany. For the first part of my analysis I need a cross section and use wave 2010, that is the latest publically available wave. Later on, when looking at sequential correlations I exploit the longitudinal character of SOEP and use waves 2004, 2006, 2007 and 2010. The final sample size accounts to 1228 siblings in year 2010.

While the special tracing rules in combination with the length of the panel allow the construction of such a complex sample, attrition is a potential weakness.[12] If only certain siblings remain part of the SOEP after moving out from their parents, the sample will suffer from sample selection bias. Because the sample requires the observation of at least two siblings as adults this adds to the scope of the attrition problem (Fitzgerald, 2011). However, comparing original sample members

---

[9] See Schonlau et al. (2010) for a discussion on tracing rules.
[10] Data was extracted using PanelWhiz (Haisken-DeNew and Hahn, 2010).
[11] Eligible are all individuals where at least one spouse is an employee subject to social security contributions, pays voluntary social security contributions, is a civil servant or unemployed.
[12] See Kroh (2011) for an analysis of attrition in the SOEP.

and their descendants, Spiess et al. (2008) find no evidence that one group is more volatile in participation behaviour than the other.

Fitzgerald et al. (1998) find that intergenerational correlations in earnings, education and welfare participation are slightly stronger for a subsample of children who did not drop out from the PSID and whose parents were already part of the PSID sample. If family ties are especially strong in samples of second generation respondents and the finding can be conferred to the SOEP this would imply that the inter-generational as well as intra-generational correlations found in my results should be understood as an upper bound.

Descriptive statistics in Table 1 reveal that the coverage with Riester contracts is lower than reported by official statistics. This should be ascribed to the rather low average age, resulting from the construction of the sample. Given that the individuals are rather young the influence of parents on their children should be pronounced. The average network size is 2.4 siblings with a maximum of 7 adult siblings under observation in 2010, reflecting the extent of possible social interaction. In comparison to the overall SOEP population the parents of the siblings sample are on the average better educated, especially the mothers.[13]

---

[13] Descriptive statistics comparing the two samples are available upon request from the author.

Table 1: Descriptive statistics	
Variable	Mean
Riester	32.7
male	52.8
age	29.8
east	23.4
Hauptschule	22.4
Realschule	33.8
Abitur	32.8
post secondary degree	22.3
married	28.7
child under 16 in HH	31.8
HH net income	2856.2
mother: Hauptschule	50.0
mother: Realschule	38.6
mother: Abitur	11.2
father: Hauptschule	55.1
father: Realschule	29.1
father: Abitur	15.6
father: vocational degree	70.7
father: university degree	16.8
mother: vocational degree	64.2
mother: university degree	13.5
parents own life insurance	53.9
No. of siblings	2.4
N	1228

Source: SOEP 2010, restricted sample

3.2. Model specifications

In this paper, I focus on the use of family information in order to assess the determinants of Riester ownership. I estimate a series of logistic and complementary loglog regressions[14], modeling the likelihood of having a Riester contract.

For reasons of comparison a baseline model is estimated first. The dependent binary variable indicates whether the individual owns a Riester contract. As explanatory variables, captured under X, I include socio-economic characteristics that are usually found to be significantly correlated with the ownership of private pensions and in particular with Riester contracts. These controls contain a dummy indicating the gender and whether the household is located in East Germany, age as well as age squared. The educational attainment of the respondent is included

---

[14] See Wooldrige (2002) for logistic regressions and Jenkins (2005) for cloglog regressions.

(school degree plus a dummy whether the respondent had some sort of postsecondary training) as well as whether he/she is married and has children under 16 years living in the household. Household net income is divided into quintiles ε is a standard normal error. The reference period is 2010, the latest available wave of SOEP.

$$\Pr(Riester) = \beta_0 + X\delta + \varepsilon \tag{1}$$

I expect the coefficients in the baseline specification to be biased upwards. As argued in section 2, family background should be highly correlated with the costs and opportunities for buying a Riester contract. For instance, inherited cognitive ability will not only correlate with educational attainment (Becker, 1964) but also influence how easily information regarding Riester contracts can be obtained and processed. In order to reduce the bias, I (1) estimate a family fixed effects model and, (2) include proxy variables for family background. Both strategies have their advantages and allow for different interpretations:

The first strategy exploits the idea that - at least part of - the unobserved heterogeneity is common to members of one family. Under this assumption the difference in unobserved characteristics should be lower within than between families. Index s identifies a sibling while f denotes the family. The error term is split into two components, α_f and ε_{sf}. Explanatory variables captured under X_{sf} are assumed to be correlated with the family specific component α_f, but not with the idiosyncratic error ε_{sf}. The idiosyncratic error needs to be strictly exogenous after taking out α_f. This assumption must hold for all regressors included (Wooldridge, 2002). The fixed effects transformation will eliminate all effects which do not vary within the same family by subtracting the family averages (eq. 3).[15] By taking differences measurement errors are amplified which might lead to attenuation bias (Grilliches, 1977). The bias resulting from comparison across siblings is nevertheless lower than comparing individuals across time. Moreover, standard errors are large due to the large number of parameters that have to be estimated (Schnabel and Schnabel, 2002, p.9). Nevertheless, the family-fixed effects model is valuable: It reflects pure individual decisions to buy a Riester contract as opposed to coordinated family decisions by disentangling genetic influences from individual characteristics.

$$\Pr\left(Riester_{sf}\right) = \beta_0 + X_{sf}\delta + \alpha_f + \varepsilon_{sf} \tag{2}$$

$$\Pr(Riester_{sf} - \overline{Riester_s}) = (X_{sf} - \overline{X_s})*\delta + \varepsilon_{sf} - \overline{\varepsilon_s} \tag{3}$$

In the model above the family fixed effect is treated as a nuisance parameter (Durlauf and Ioannides, 2010, p. 465). Yet, it is interesting to study the influence of the family in a more direct way. In an attempt to partially capture unobserved components in the error term ε I extend the baseline model (eq. 1) and include proxies controlling for the ability and willingness to manage Riester related information. More specifically, I control for mothers' and fathers' highest schooling degree. In addition, I add a dummy which equals 1 if the respective parent has a

---

[15] Notation is analogous to Schnabel and Schnabel (2002).

vocational degree or a college degree. These variables should capture the innate ability as well as time preferences. Higher educated individuals are not only better equipped to handle financial issues, but they are also known to save more in general as they are more patient (Browning and Lusardi, 1996). As pointed in part 2, whose characteristics are more strongly correlated with their children's financial decisions remains unclear. In addition, I add a dummy which equals 1 if the parents own a life insurance contract. Life insurances are the most wide-spread financial asset in Germany (Börsch-Supan et al., 2009). On the one hand, this variable accounts for the parents' preferences for saving, especially as most of these people coming from older cohorts did not have to save privately to sustain adequate living standards after retirement because they could rely on high public pensions. On the other hand side, the variable influences the extent to which children could learn from their parents about financial matters and thereby, how easy it is for them to overcome possible entry barriers in the Riester market.

Specific information on eligibility, subsidies and on the design of a particular Riester product should lower entry costs even further. Therefore, a dummy variable is included which indicates whether one of the siblings owns a Riester contract. Information advantages should result in a higher likelihood to buy a Riester contract.[16] Moreover, I control for the size of the considered network using the number of siblings in the sample.

The added variables are endogenous to the model. It does not allow disentangling shared preferences from whether information sharing took place. In order to partially overcome the identification problem, I focus on sequential correlations. The underlying idea is that in $t=0$ no family member owns a Riester contract. For some exogenous reasons the first sibling buys a Riester contract in the period between $t=0$ and $t=1$. Then information sharing takes place during the next period, lowering the entry barrier for the other siblings. In $t=2$ the next sibling has bought a Riester contract until in infinity all siblings own such a private pension plan (Figure 1). As pointed out in Manski (1993), isolating social interaction parameters is almost impossible in the absence of full randomization. If sequential correlations are supposed to be only due to information sharing the identification assumption requires that the factors influencing the decision of one sibling between t and $t+1$ are not correlated with the decision of the other siblings made after $t+1$ (Li, 2009, p.8). Unless I am willing to make the assumption above, shared preferences might still play a role.

---

[16] I do not consider whether parents own a Riester as this would require accounting for their eligibility. However, some of the parents have never been eligible as they were already retired when the product was introduced.

Figure 1: Information sharing within the family over time
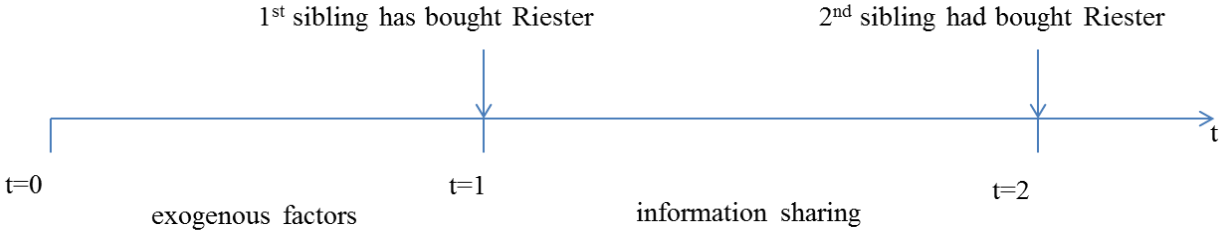
Eq. 4 represents a piecewise constant hazard function which is estimated by complementary loglog regressions.[17] γ contains year dummies. A discrete-time hazard model consist of (a) a baseline risk profile over time and (b) shift parameters that capture the effect of the covariates on the baseline hazard. The higher the hazard, the greater the risk to buy a Riester contract in a given year. The main variable of interest is the one-period lag of whether a sibling has bought a Riester contract.

Variation in the covariates acts to vertically shift the entire baseline hazard function. Among the usual assumptions of linearity and homogeneity, a proportionality assumption must hold in a simple discrete-time hazard model: Proportionality assumes that the vertical displacement in the hazard rate per unit difference in the predictor is the same in ever year (Singer and Willet, 1993). However, I have reason to believe that the family as a source of information has a time-varying effect when a critical mass has been reached. Therefore interaction terms with time are included in a further step.

$$\Pr(Riester) = \beta_0 + \beta_1 Riester\_Sibling_{t-1} + X\delta + time\gamma + \varepsilon \tag{4}$$

4. Results

I estimate a series of logistic and complementary loglog regressions, explaining the probability to own a Riester contract. Standard errors have been adjusted for heteroskedasticity, allowing for clustering at the level of the mother. Tables 2 and 3 report odd ratios.

Table 2 displays odd ratios for the baseline model (column 1), the family-fixed effects model (column 2) as well a model including parental education and whether the parents own a life insurance as proxies for family background (column 3). Column 4 extends the latter model by controlling for contemporaneous correlations in Riester ownership between siblings.

In order to estimate the family fixed effects model the sample size is decreased from 1228 to 422 observations. The observations had to be dropped because there is no variation in the outcome variable *Riester* across siblings, suggesting that shared preferences, coordinated decisions and information sharing play a role: In 806 cases either every sibling owns a Riester by 2010 or no

---

[17] See Singer and Willet (1993) and Jenkins (2005)

one does. Due to the selected sample the family fixed effects model needs to be interpreted with caution.

In contrast to other findings (Coppola and Reil-Held, 2009, Pfarr and Schneider, 2010) individuals who are married or have children or live in the east are not more likely to buy a Riester contract in my sample. This might be partially due to the low average age of the sample population which also leads to a neglect of an age effect.

Education and income are found to be important determinant for Riester ownership: Especially individuals with a medium degree as well respondents who have some sort of postsecondary training are more likely to buy a Riester contract in comparison to individuals with a low schooling degree. The effects of education however turn insignificant in the family fixed effects model. This might be partially explained by a lack of variance in educational attainment between siblings. However, using a sample of twins Barnea et al. (2010, p. 601) find that education is relevant for stock market participation, but it is mainly the genetic factor of education that is important.

Overall, the coefficients do not differ much between the baseline and the proxy models which might indicate the included proxies only captures part of the unobserved heterogeneity. However, this is not true for the effect of income. For all models the results reveal that individuals in the second and fourth income quintile buy Riester contracts more often than individuals at the lower end of the income distribution. Comparison between column 1, the baseline model, and the specifications including proxy variables shows that the coefficient for the third income quintile becomes insignificant when controlling for parental education and the coefficient for the fourth quintile is reduced. Tis implies that for the upper end of the income distribution much of the observed differences in uptake rates seem to be driven by family background, while for individuals in the lower income quintiles current own income predominates the influence of family characteristics.

Turning to the added explanatory variables in column 3, I find that mothers' occupational training is not a significant determinant for Riester ownership, while fathers' is. Individuals' whose father has completed vocational training or holds a college degree are more likely to buy Riester contracts. This is opposed to the usual finding that the characteristics of the mother are stronger determinants for the behavior of their children (Loehlin, 2005). As mentioned above, the fact that fathers are still the main earners in families might make them role models in financial decisions. In addition, a common finding in financial literacy literature is that men have higher financial literacy than women (Lusardi and Mitchell, 2008). This might strengthen their position as the person in charge of the households' finances.

Extending the proxy model in column 4 by a further control variable, namely a dummy indicating whether at least one of the parents own a life insurance, significantly improves the model fit as confirmed by a likelihood ratio test for nested models. On the one hand side, the variable captures transmitted preferences for saving from parents to their children. On the other hand, it reflects

whether parents are familiar with financial products and to what extent their children can learn from them in their decision making.

Intra-generational learning between siblings might be of even more importance as siblings are usually in the same stage of the life cycle and have therefore similar preferences and needs. Besides that, siblings can share information and give advice to each other if one of them already owns a Riester pension. The added variables in column 5 reveal that Riester ownership between siblings is significantly correlated, while the size of the network does not seem to be a crucial factor.

Table 2: Results after logistic regressions					
Riester	(1)	(2)	(3)	(4)	(5)
male	0.873	0.740	0.864	0.860	0.856
	(0.113)	(0.167)	(0.113)	(0.113)	(0.114)
age	0.929	0.915	0.927	0.918	0.911
	(0.059)	(0.134)	(0.060)	(0.059)	(0.057)
age sq.	1.001	1.001	1.001	1.001	1.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
east	0.929	0.174	0.822	0.873	0.925
	(0.150)	(0.220)	(0.143)	(0.153)	(0.150)
Hauptschule	ref.	ref.	ref.	ref.	ref.
Realschule	1.570**	1.871	1.435*	1.399*	1.381*
	(0.243)	(0.634)	(0.227)	(0.222)	(0.216)
Abitur	0.984	1.841	0.898	0.865	0.915
	(0.225)	(0.949)	(0.215)	(0.209)	(0.219)
post secondary degree	1.619*	1.370	1.608*	1.614*	1.549
	(0.389)	(0.720)	(0.386)	(0.391)	(0.371)
married	1.431	1.709	1.445*	1.511*	1.508*
	(0.264)	(0.556)	(0.269)	(0.286)	(0.280)
child under 16 in HH	1.217	1.212	1.228	1.245	1.239
	(0.196)	(0.370)	(0.203)	(0.208)	(0.203)
income q1	ref.	ref.	ref.	ref.	ref.
income q2	1.701*	1.414	1.714*	1.691*	1.644*
	(0.381)	(0.536)	(0.386)	(0.381)	(0.372)
income q3	1.560*	1.753	1.523	1.465	1.437
	(0.336)	(0.690)	(0.332)	(0.321)	(0.315)
income q4	1.759**	1.820	1.702*	1.596*	1.568*
	(0.362)	(0.775)	(0.353)	(0.333)	(0.324)
income q5	1.223	0.743	1.178	1.115	1.093
	(0.263)	(0.322)	(0.257)	(0.242)	(0.232)

Table 2: Results after logistic regressions (cont.)					
mother: Hauptschule			ref.	ref.	ref.
mother: Realschule			1.350	1.340	1.306
			(0.227)	(0.224)	(0.199)
mother: Abitur			1.240	1.257	1.263
			(0.339)	(0.341)	(0.319)
father: Hauptschule			ref.	ref.	ref.
father: Realschule			0.895	0.865	0.852
			(0.165)	(0.159)	(0.145)
father: Abitur			0.670	0.664	0.693
			(0.164)	(0.163)	(0.160)
mother: no job training			ref.	ref.	ref.
mother: vocational degree			1.082	1.066	1.049
			(0.199)	(0.195)	(0.176)
mother: university degree			1.075	1.004	1.000
			(0.319)	(0.297)	(0.276)
father: no job training			ref.	ref.	ref.
father: vocational degree			1.713*	1.655*	1.624*
			(0.37)	(0.356)	(0.328)
father: university degree			1.964*	1.908*	1.879*
			(0.589)	(0.570)	(0.529)
parents own life insurance				1.456*	1.422**
				(0.214)	(0.190)
sibling(s) own(s) Riester					1.817**
					(0.339)
No. of siblings					0.860
					(0.076)
N	1228	422	1228	1228	1228

Source: SOEP 2010. Exponentiated coefficients (Odd ratios), cluster-robust standard errors in parentheses.
 * (**,***), Significant at 10% (5%, 1%).

As explained above contemporaneous correlations alone, even after controlling for all other covariates, do not allow disentangling shared preferences from information sharing which in turn should result in lower transaction costs when entering the market. Table 3 therefore displays results after complementary loglog regressions, taking into account sequential correlations. The model in column 1 includes only time dummies in order to identify a possible trend in uptake rates. Column 2 and 3 extend the previous model by adding a lagged dummy for whether a sibling has bought a Riester contract in the previous period (column 2). Both specifications use the full set of independent variables from the extended model in column 5 of Table 2. As to account for non-proportionality in the effect of the main variable of interest over time, i.e. the

lagged dummy indicating whether a sibling owns a Riester contract, I include interaction terms in column 3.

If the risk of event occurrence was independent of time the hazard function would be flat (Singer and Willet, 1993). However, positive externalities in the form of information advantages should help to overcome entry barriers in the Riester market and create a social multiplier (Becker and Murphy, 2000; Glaeser et al., 2003) which in turn would result in dynamic demand for Riester contracts. Indeed, the hazard of buying a Riester contract significantly increases with time during the period 2004 and 2010 (column 1). There is a large increase in the hazard rate between 2004 and 2006 which is probably the result of simplification reforms kicking in. After a period of initial enthusiasm, demand for Riester pensions flattened already shortly after introduction in 2003/04. The limited growth and public debates about the complex eligibility and subsidy structure led to a simplification of the design in 2005, aiming at an improvement in the acceptance of the new product by the eligible population as well as providers (Börsch-Supan et al.,2012, p. 7). Official statistics display a dramatic increase after the legislative changes (BMAS, 2011), confirming that the complexity of the design did constitute entry barriers.

Provided that a sibling has bought a Riester contract in the previous period the likelihood of buying a Riester pension is significantly elevated (column 2). As already suggested by the results above information sharing among siblings takes place. Once someone within the family has acquired knowledge on Riester products he/she will communicate this information to the rest of the family and can give advice to the others in their decision making process (see section 2.1).

However, considering interaction terms with time shows that information sharing within the family becomes less important over the years (column 3). While shortly after the introduction of Riester pensions reliable information from a trusted person, such as a sibling, might have been of particular importance in overcoming entry barriers, especially when taking into account that the product was new and already publically criticized, the family as a source of information becomes less crucial as the group of Riester owners in the other social circles grows. Once a critical mass has been reached positive spillovers will create a social multiplier (Glaeser et al., 2003). As a matter of fact, the rate of increase in Riester uptakes flattened after 2008 and some socio-demographic strata may have already reached saturation levels (Börsch-Supan et al., 2012). The group of low income households in turn still exhibits dynamic demand.

Table 3: Results after cloglog regression			
Riester	(1)	(2)	(3)
2004	0.0963***		
	(0.009)		
2006	0.169***	0.0462***	0.0467***
	(0.013)	(0.040)	(0.040)
2007	0.237***	0.0585***	0.0591***
	(0.015)	(0.049)	(0.051)
2010	0.396***	0.0975**	0.116*
	(0.021)	(0.083)	(0.100)
Riester: sibling (t-1)		1.736***	
		(0.235)	
Riester: sibling (t-1)* 2006			2.334***
			(0.489)
Riester: sibling (t-1)* 2007			2.138***
			(0.350)
Riester: sibling (t-1) *2010			1.248
			(0.199)
Further control	NO	YES	YES
N	5908	3035	3035

Source: SOEP 2004-2010. Exponentiated coefficients, cluster-robust standard errors in parentheses. * (**,***), Significant at 10% (5%, 1%).

Further controls: See Table 2, column 5

5. Conclusion

In this paper I use information on family background in order to give a reliable assessment of the determinants of Riester ownership by considering variables that are related to decision costs and by capturing the impact of information sharing within families.

I find that family background significantly influences the likelihood of owning a Riester pension, in particular fathers' occupational attainment. While it is usually the mothers' characteristics that are strongly correlated with the preferences and attitudes of their children, the reverse seems true when it comes to financial decisions. In addition, if parents own a life insurance their children are more likely to subscribe a Riester contract capturing not only transmitted preferences, but also the extent to which children can learn from their parents' proficiency in handling financial products. Overall, coefficients between specifications do not differ much, apart from a model subtracting a family fixed effect which uses a selected sample. One exception, however, is the influence of income for certain groups. Controlling for family background in the proxy models, I conclude that the effect of income on participation in the Riester market is lower for high income individuals than I would have concluded in the baseline model. In the case of low income

individuals own current income seems to drive the purchase decision, predominating family characteristics. Summing up, I find that parental erudition as well as experience in financial matters and attitude towards saving are determinants of their children's preferences and ability in financial decision making. However, omission either did not lead to misleading results in existing literature on Riester pensions or, the included proxy variables only capture a small part of unobserved heterogeneity.

The hazard of buying a Riester contract significantly increases with time during the period 2004 and 2010, with a large step-up after 2005 when simplifications to eligibility rules and product design were introduced. The dramatic increase in uptake rates after the legislative changes, exhibited in official statistics, can be ascribed to the lowering of entry barriers in the market. Contemporaneous as well as sequential correlations in Riester ownership between parents and their children as well as siblings are pronounced, even after controlling for other factors. While the former might be due to shared preferences, I take the latter as evidence for information sharing. However, the identification strategy does not allow isolating the pure effect coming from social interactions and hence, results need to be interpreted with caution. Positive externalities help to overcome entry barriers in the Riester market by dispersing information on eligibility and the generosity of subsidies. Once a critical mass has been reached positive spillovers create a social multiplier (Glaeser et al., 2003) which should result in dynamic demand for Riester contracts. Indeed official statistics exhibit increasing uptake rates among low income individuals for whom initial entry barriers were comparably high.

An optimistic interpretation of the results is that the more time elapses since the pension reforms, the higher the coverage with private old age provisions. Combining my findings however draws another picture: If only certain groups get in touch with information on and, hence engage in voluntary old age provision wealth inequality might rise in the future. Already today, about one out of four households in Germany think that they will not be able to sustain an adequate standard of living without social assistance in the old age (Lamla, 2012). While lowering the entry barriers for Riester pensions through further simplifications and more transparency in the market is certainly a promising way in order to diminish the extent of old age poverty, public policy needs to tie in with the initial step in the decision to buy any type of pension, that is the identification of the need to provide privately for the old age. Raising awareness through better information and educational programs is therefore of utmost priority.

References

Ashby, Julie S., I. Schoon and P.Webley. 2011. "Linkages between Saving Behavior in Adolescence and Adulthood". *European psychologist*, 16(3): 227-237.

Barnea, Amir, Henrik Cronqvist and Stephan Siegel. 2010. "Nature or nurture: What determines investor behavior?". *Journal of Financial Economics*, 98: 583-604.

Becker, Gary S. 1964. "Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education". Chicago: University of Chicago Press.

Becker, Gary S. and Kevin M. Murphy. 2000. "Social Economics". Cambridge, Massachusetts: Harvard University Press.

Blank, Florian. 2011. "Die Riester-Rente – Überblick zum Stand der Forschung und sozialpolitische Bewertung nach zehn Jahren". *German Review of Social Policy*, *Sozialer Fortschritt* 6-11: 109-114.

Börsch-Supan, Axel, Annette Reil-Held and Daniel Schunk. 2008. "Saving incentives, old-age provision and displacement effects: Evidence from the recent German pension reform"*, Journal of Pension Economics and Finance, 7 (3): 295-319*

Börsch-Supan, A., M. Coppola, M., Essig, L., Eymann, A. and Schunk, D. (2009): The German SAVE Study: Design and Results. MEAStudies n°5. Universität Mannheim.

Börsch-Supan, Axel and Martin Gasche. 2010. "Kann die Riester-Rente die Rentenlücke in der gesetzlichen Rente schließen?" MEA Discussion Paper 201-2010.

Börsch-Supan, Axel and Christinia B. Wilke. 2004. "The German Public Pension System: How it was, How it will be". NBER Working Paper 10525.

Börsch-Supan, Axel, Michela Coppola and Anette Reil-Held. 2012. "Riester Pensions in Germany: Design, Dynamics, Targeting Success and Crowding-In". In: *Matching Defined Contributions (MDC) Schemes: Role and Limits to Increase Coverage in Low and Middle Income Countries*, ed. Holzmann, R., Hinz, R., Takayama, N., Tuesta, D. The World Bank, Washington D.C.

Brown, Jeffery, Zoran Ivkovic, Paul Smith and Scott Weisbenner. 2008. "Neighbours Matter: Causal Community Effects and Stock Market Participation." *Journal of Political Economy*, 111: 1155-1182

Bucher-Koenen, Tabea. 2011. "Financial Literacy, Riester Pensions, and Other Private Old Age Provision in Germany". MEA Discussion Paper 250-11.

Bundesministerium für Arbeit und Soziales. 2006. "Renten- und Alterssicherungsbericht 2005". http://www.bmas.de, Berlin.

Bundeszentralamt für Steuern (BzSt). 2011.
http://www.bzst.de/DE/Steuern_National/Zertifizierungsstelle/zertifizierung_node.html
(download: 2 March 2012)

Browning, Martin and Annamaria Lusardi. 1996. "Household Saving: Micro Theories and Micro Facts." *Journal of Economic Literature*, 34(4): 1797-1855.

Chan, Sewin and Ann Huff Stevens. 2008. "What you don't know can't help you: Pension knowledge and retirement decision making". *The Review of Economics and Statistics,* 90 (2): 253-266.

Coppola, Michela and Anette Reil-Held. 2009. "Dynamik der Riester-Rente: Ergebnisse aus SAVE 2003 bis 2008". MEA Discussion Paper 195-09.

Coppola, Michela and Martin Gasche. 2011. "Die Riester-Förderung — Mangelnde Information als Verbreitungshemmnis". Wirtschaftsdienst, 91(11): 792-799.

Delavande, Adeline, Susann Rohwedder and Robert Willis. 2008. "Preparation for Retirement, Financial Literacy and Cognitive Resources". University of Michigan, Retirement Research Center, Working Paper 2008-190.

Duflo, Esther and Emmanuel Saez. 2002. "Participation and investment decisions in a retirement plan: the influence of colleagues' choices". *Journal of Public Economics*, 85: 121-148.

Duflo, Esther and Emmanuel Saez. 2003. "The Role of Information and Social Interactions in Retirement Plan Decisions: Evidence from a Randomized Experiment". *Quarterly Journal of Economics*, 118 (3): 815-842.

Durlauf, Steven N. and Yannis M. Ioannides. 2010. "Social Interactions". *Annual Review of Economics*, No. 2: 451-478.

Feldstein, Martin. 1974. "Social Security, Induced Retirement, and Aggregate Capital Accumulation". *Journal of Political Economy*, 82(5): 905-926.

Fitzgerald, John M. 2011. "Attrition in Models of Intergenerational Links Using the PSID with Extensions to Health and to Sibling Models". *B E J Econom. Anal Policy*, 11(3), Art. 2.

Fitzgerald, John, Peter Gottschalk and Robert Moffitt. 1998. "An Analysis of the Impact of Sample Attrition on the Second Generation of Respondents in the Michigan Panel Study of Income Dynamics". *The Journal of Human Resources*, 33(2): 300-344.

Gale, William G. and John Karl Scholz. 1994. "IRAs and household saving". *American Economic Review*, 84: 1233-1260.

Geyer, Johannes. 2011."Riester-Rente: Rezept gegen Altersarmut?". Wochenbericht des

DIW Berlin Nr. 47/2011.

Glaeser, Edward L., Jose A. Scheinkman and Bruce I. Sacerdote. 2003. "The Social Multiplier". *Journal of the European Economic Association*, 1(2): 345-353.

Grilliches, Zvi. 1977. "Estimating the returns to schooling. Some econometric problems". *Econometrica*, 45(1): 1–22.

Guiso, Luigi, Paola Sapienza and Luigi Zingales. 2004. "The Role of Social Capital in Financial Development". *The American Economic Review*, 94(3): 526-556.

Haisken-DeNew, John P. and Markus Hahn. 2010. "PanelWhiz: Efficient Data Extraction of Complex Panel Data Sets - An Example Using the German SOEP". *Journal of Applied Social Science Studies*, 130(4): 643-654.

Haisken-DeNew, John P. and Joachim Frick. 2005. "Desktop Companion to the German Socio-Economic Panel Study (GSOEP)". German Institute for Economic Research, Berlin.

Hagen, Kornelia and Lucia A. Reisch. 2010. "Riesterrente: Politik ohne Marktbeobachtung". Wochenbericht des DIW Berlin Nr.8/2010.

Hong, Harrison, Jeffrey D. Kubik and Jeremy C. Stein. 2004. "Social Interaction and Stock-Market Participation". *The Journal of Finance*, LIX (1): 137-163.

Jenkins, Stephen P. 2005. "Survival analysis". Unpublished manuscript. https://www.iser.essex.ac.uk/files/teaching/stephenj/ec968/pdfs/ec968lnotesv6.pdf

Kahneman, Daniel and Amos Tversky. 1979. "Prospect theory: An analysis of decision under risk" *Econometrica*, 47(2): 263-291.

Kroh, Martin. 2011. "Documentation of Sample Sizes and Panel Attrition in the German Socio Economic Panel (SOEP) (1984 until 2010)". DIW Berlin, Working Paper 59.

Lamla, Bettina. 2012. "Disincentives in the welfare state: The effect of minimum income security on private old age provision". Unpublished manuscript.

Li, Geng. 2009. "Information Sharing and Stock Market Participation: Evidence from Extended Families". Federal Reserve Board, Working Paper.

Loehlin, John. 2005. "Resemblance in Personality and Attitudes Between Parents and their Children: Genetic and Environmental Contributions" *in Unequal Chances: Family Background and Economic Success.* Samuel Bowles, Herbert Gintis and Melissa Osborne Groves eds. Princeton: Princeton University Press: 192-207.

Lusardi, Annamaria, Olivia S. Mitchell and Vilsa Curto. 2010. "Financial Literacy among the Young". *The Journal of Consumer Affairs*, 44(2): 358-380.

Lusardi, Annamaria. 2003. "Planning and Saving for Retirement". Dartmouth College, Working Paper.

Lusardi, Annamaria and Olivia S. Mitchell. 2008. "Planning and financial literacy: How do women fare?". NBER, Working Paper 13750.

Lusardi, Annamaria and Olivia S. Mittchell. 2011. "Financial literacy around the world: an overview". PEF, 10(4): 497-508.

Manski, Charles F. 1993."Identification of Endogenous Social Effects: The Reflection Problem". *The Review of Economic Studies*, 60: 531-542.

Pfarr, Christian and Udo Schneider. 2010. "Angebotsinduzierung und Mitnahmeeffekt im Rahmen der Riester-Rente: eine empirische Analyse". DIW Discussion Paper 341.

Schnabel, Isabel and Reinhold Schnabel. 2002. "Family and gender still matter: The heterogeneity of returns to education in Germany". Mannheim: ZEW Discussion Paper No. 02-67.

Schonlau, Matthias, Nicole Watson and Martin Kroh. 2010. "Household survey panels: how much do following rules affect sample size?". DIW Discussion Paper No. 347.

Singer, Judith D. and John B. Willet. 1993. "It's about Time: Using Discrete-Time Survival Analysis to Study Duration and the Timing of Events". *Journal of Educational Statistics*, 18(2): 155-195.

Spiess, Martin, Martin Kroh, Rainer Pischner and Gert G. Wagner. 2008. "On the Treatment of Non-Original Sample Members in the German Household Panel Study (SOEP) – Tracing, Weighting, and Frequencies". DIW Discussion Paper No. 98.

Thaler, Richard H. 1994. "Psychology and Savings Policies." *American Economic Review*, 84(2): 186-92.

Van Rooji, Maarten, Annamaria Lusardi and Rob Alessie. 2011. "Financial literacy and stock market participation". *Journal of Financial Economics,* 101: 449-472.

Wagner, Gert G., Joachim R. Frick and Jürgen Schupp. 2007. "The German Socio-Economic Panel Study (SOEP) – Scope, Evolution and Enhancements". SOEP Papers on Multidisciplinary Panel Data Research, DIW Berlin.

Wilke, Christina B. 2009. "German Pension Reform". *Sozialökonomische Schriften,* 34.

Wooldridge, Jeffrey M. 2002. *Econometric Analysis of Cross Section and Panel Data.* Cambridge, Massachusetts: MIT Press Ltd.

Ziegelmeyer, Michael and Julius Nick. 2012. "Back out of private old-age provision – Prevalence, reasons and households at risk for terminated and contribution free Riester contracts". Unpublished manuscript.