Determinants of occupational pension provision – an undersupply by SMEs?

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Abstract

Demographic change causes an undersupply of financial old age benefits within the statutory pay-as-you-go pension system in Germany. Therefore, the provision of occupational as well as private pensions has to be enhanced. However, there seems to be an undersupply of occupational pension provision particularly in small and medium sized enterprises (SMEs). Using survey data of the German Socio-Economic Panel (GSOEP) and the German SAVE survey, the present paper studies the determinants of occupational pension provision in Germany. It shows that occupational pensions and their possible undersupply depend not only on supply-side factors such as firm size and industry, but also on demand-side factors such as individual socio-demographic attributes and people's savings motives.

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1. Introduction

Since the late 1960s, Germany faces a demographic change with an aging population while the rate of reproduction is stabilizing at a level of 1.4 children per woman. This results in an undersupply of financial old age benefits through the statutory pay-as-you-go pension system, if contribution rates to this system and/or retirement age remain constant. Therefore politicians as well as researchers claim that own responsibility for old age income should be enhanced by more use of private and occupational pension systems.
Incentives are set by the state through instruments like tax benefits for both firms and employees, portability rules or shorter vesting periods. Some researchers recommend a switch from the pay-as-you-go system to the funding principle which would be useful for each pillar (statutory, occupational and private). An advantage is that it is based on an interpersonal redistribution instead of an intertemporal one. However, a positive real interest rate cannot be guaranteed (Krupp and Weeber 2001, Breyer 2000).
Since January 1st, 2002, the German occupational pension system via *Entgeltumwandlung* is mandatory for employers if employees ask for it. To save for retirement five pension plan types (*Durchführungswege)* are optional for the employer (BetrAVG §1a I, as amended on 09.12.2004 (BGBl. I p. 3242)).[1] They allow for employer-based financing, employee-based financing or hybrid financed pension plans. Up to now, the employer-based system has been dominant in Germany, but because of complexity many employers do not provide any occupational pension yet or would like to switch to an employee-based system. This results in an undersupply of pensions because employees are not obliged to demand such a system. Especially small and medium-sized enterprises (SMEs) face the problem of undersupply. In descriptive surveys they often name high costs as an obstacle for providing an occupational pension.
Economic research still misses to explain econometrically which factors affect the demand for occupational pensions in Germany. The purpose of this paper therefore is to evaluate the determinants of the observed gap in occupational pension provision between German firms. We first formulate hypotheses on supply and demand for occupational pensions in section 2. In section 3, the hypotheses will be examined econometrically on the basis of the German Socio-Economic Panel (GSOEP) and the German SAVE survey. Finally, section 4 concludes.

2. Overview of previous literature

2.1 Stylized facts

Several analyses based on surveys showed that a gap in pension provision between SMEs and large firms was an apparent phenomenon in Germany.
Most of the interviewed people state that they do not believe the statutory pension system to be effective enough to provide money for old age. Individual retirement income by statutory pension paybacks won't be sufficient to hold the standard of living. However, many of them do not seem to be adequately informed about this issue. The same applies to employers. A lot of them are not aware of the fact that they are obliged to provide their employees a system of deferred compensation (R+V 2004, p.5). Most of the authors identify a gap between SMEs

[1] BetrAVG = Law on the Improvement of Company Pensions. Pension plan types are: book reserve schemes (*Direktzusage*), direct insurance (*Direktversicherung*), *Pensionskasse*, support fund (*Unterstützungskasse*), and pension fund (*Pensionsfonds*).

and large firms in pension provision, as well as between Eastern and Western Germany (Kortmann and Haghiri 2005, Müller 2004, R+V 2004).
People's willingness to save additional money for retirement is still unsatisfactory but it can be explained by the fact that the lower people's incomes the lower are their savings for retirement (Reifner et al. 2003, p.19/20). The German social security system offers poor and unemployed people the possibility to receive a fix transfer income (*Sozialhilfe*) which does not enable people to make payments to an occupational system dependent on income.
Pension rejection often occurs if employees feel a lack of information by employers or consultants. They expect consultants to act as information intermediaries. If this criterion is fulfilled properly employees demand an occupational pension plan (HDI PM 2005, p.20/21, R+V 2004, p.6). In most cases of pension rejection, employees are not interested in retirement provision, because they fear risks, they overestimate benefits from the statutory pension system, or they do not have enough money left to save. Sometimes, employees also fear to ask their employer for a plan (HDI PM 2005, Müller 2004, Delta Lloyd 2004).[2]
Similar results are found by other authors who evaluated the influence of mobility on pension adoption (Hernæs et al. 2006, Rabe 2004, Andrietti 2001, Taylor 2000, Even and Macpherson 1994, Gustman et al. 1994, Allen et al. 1993, Gustman and Steinmeier 1993). These authors find different kinds of evidence for mobility enhancing or constraining effects of occupational pensions.
Participation rates in private or occupational systems are low in the US, UK, Norway and Germany as well as small companies provide less for their employees than large companies. Although individual reasons differ a commonly named reason for pension plan rejection is that a low income does not enable people to care for old age income but to consume the whole income amount at present (Ghilarducci and Lee 2005, Hinz and Turner 1998, Even and Macpherson 1994).
Finally, despite 401(k) plans[3] which are popular in the US and do not have excessive administration cost, particularly SMEs reject pension plan provision. All these results show that pension gaps between SMEs and large firms are an important policy point at present in various countries.
The studies for Germany named above remain on a descriptive level to show the development of occupational pension plan supply and demand. It is therefore necessary to show econometrically which determinants have a statistically significant impact on pension plan provision. Therefore, we derive several hypotheses from economic theory in the following chapter.

2.2 Theoretical background and hypotheses

Based on economic literature we are able to evaluate reasons as to why people demand an occupational pension.
Mitchell (1988) notes that employees make up suboptimal decisions concerning their pension plans as they are imperfectly informed about tax deference, different channels to choose and other characteristics. As incentives to ask for a pension plan are different a divergence of efforts on employee and employer side occurs. Employers are more likely to offer a plan if the firm is profitable because the company is more able to pay for pension plans.

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[2] Unemployed are left out of these surveys as they are not able to make payments to an occupational pension system during their period of unemployment. Self-employed people are excluded in most cases because their savings for old age can be added to private pension provision.
[3] 401(k) plans are used in the US as a hybrid financed instrument of deferred compensation with an option for the employee to opt out of this system. This way employees are permitted to benefit from current tax deferrals on current wages (Kusko et al. 1998 among others). A short discussion of 401(k) plans can be found in Munnell and Sundén (2006).

The influence on both employer and employee side can be explained differently. We start with three supply side arguments although no clear separation between supply and demand side is possible.

First, pension systems could act as a mechanism of employee retention which might be in the interest of both employees and employers. Money can be saved by a defined contribution plan or by a defined benefit plan. Gustman and Steinmeier (1993) show that defined contribution plans are more portable and therefore associated with higher employee turnover than defined benefit plans as a new employer only needs to pay the defined contributions to the employee without having to guarantee the final amount of pensions from a defined benefit plan. This hypothesis can be supported for the UK (Taylor 2000). Several authors call benefit plans a sponsoring mechanism of employers as the employees' contributions are save for retirement. By funding a pension, the employer receives a credit from the employee which will be paid back when the latter retires. However, the compound interest rate might be lost due to a job change before retirement. Then a new pension with a lower capital stock has to be built up there (Dorsey et al. 1998, Ippolito 1997, Kotlikoff and Wise 1985, Lazear and Moore 1984).[4]

A further argument of matching the interests of employer and employee is made by Backes-Gellner and Pull (1999). They claim that a benefit provision in retirement periods is efficient if employees consider benefits to be better than the monetary equivalent at present. This is consistent with Mitchell (1988) who recommends a better information policy about pension benefits in order to increase individual action to insure themselves for old age.

A second argument is based on Lazear (1979) and the theory of efficiency wages. By an avoidance of shirking before retirement employees are able to realize the individual benefit amount of a pension plan. Employees earn lower wages than their marginal product of labour at younger age and higher wages when they get older. So employer and employee build up an implicit contract. An anticipated possible capital loss evoked by job loss because of shirking leads to a reduction of employee mobility. Otherwise people would look for a job in which they are not offered a pension (McCarthy 2006, Allen et al. 1993). That fringe benefits and occupational pensions increase motivation and loyalty could be proved for the US (Allen et al. 1993) but not for Germany (Frick et al. 1999). Our first hypothesis therefore is

H_1: A longer tenure in a firm goes along with higher motivation. As motivation is enhanced by occupational benefits there is a positive relationship between the probability of adopting a pension and tenure.

The third argument refers to economies of scale. If a firm employed a large number of employees it could offer a pension plan that required possibly higher fixed costs of administrative expenses which differ across ways of pension provision. So, the costs per employee decrease with firm size. Furthermore, the risk of becoming insolvent or not being able to fund pensions due to business cycle fluctuations is higher for small firms. Furthermore, large firms are more able to calculate the probability of a sudden case of death which could result in high payments, reduce cash-flow and may cause insolvency, if the employer did not save enough for an event like that. Finally, economies of scale and bankruptcy risk differ across lines of business (Horiba and Yoshida 2002, Aoki 1984, Mitchell and Andrews 1981).

This leads us to two further hypotheses:

H_2: Large companies are more likely to offer a pension plan than small companies.

H_3: The demand for occupational pension plans differs across lines of business and regions.

Based on human capital theory we have to add that people who are well informed and have a longer job tenure tend to be more productive than others. The reason for this is that employees acquire firm-specific human capital (Becker 1964). This could not be rejected for the US (Cornwell and Dorsey 2000).

[4] In Germany this mechanism depends on the arrangement between employer and employee. The German law (§1b BetrAVG) guarantees the repayment of contributions to a pension system if the employee is older than 30 years or the entitlement exists for at least five years when the employee changes the job.

As Mitchell (1988) points out educated employees and women are better informed about pension plan details as they are more likely to be involved in the process of getting information about pension determinants. Therefore we develop hypothesis 4.

H_4: As female and well educated people are better informed, they know better about the advantages of occupational pensions and therefore have a higher probability of participating in a plan.

Several sociodemographic factors (like schooling, hours worked, gender) and their influence on individual income which Mincer (1976) evaluated are supposed to influence retirement income, too. Freeman (1985) additionally uses information about labour union membership showing both theoretically and empirically that it has a positive influence on pension plan demand.

Thus, we expect:

H_5: The demand for occupational pension plans depends on sociodemographic attributes (e.g. income, age, marital status, position, and number of children).

H_6: Savings motives based on individual circumstances influence the willingness to provide for retirement.

3. Empirical evidence

3.1 Data

To test our hypotheses we use data from the German Socio Economic Panel (GSOEP) and the German SAVE survey. The GSOEP is an annual survey among German individuals with questions concerning several socioeconomic factors with every wave focusing on a special topic. From 1985 to 1995 questions concerning occupational pensions were asked. Thus, the most recent data available refer to 1995.[5] Table 1 displays answers to the questions about occupational pension coverage. As shown in the first column, in 1995 almost 2000 people in our dataset worked in a firm that offered a pension plan, but only 1392 of them (73%) were entitled in a plan (see second column). It is an astonishing fact that 16% of those who answered the corresponding question did not know whether their firm offered a pension plan. This is a hint to an undersupply of information inside firms as a lot of people are not aware of their possibility to make retirement provisions. Moreover, only 35.7% of the total number of employees entitled in an occupational pension plan are female.

Table 1: Answers to questions about supply and claims of occupational pensions (percentages in parentheses)

	supply	entitled in an occupational pension	claims from earlier employer
yes	1941 (24.16)	1392 (73.15)	467 (5.85)
no	4778 (59.47)	305 (16.03)	7009 (87.78)
don´t know	1315 (16.37)	206 (10.82)	509 (6.37)
total	8034 (100)	1903 (100)	7985 (100)

Note: This table includes self-employed people. Later on, they will be left out of our analysis, because most other studies attribute occupational pensions of self-employed people to the private pillar.

Source: GSOEP, wave 12 (1995)

[5] Due to a small number of answers in earlier waves we concentrate our analysis on the year 1995 and compare the results to those of the year 2005 based on the German SAVE survey. As the "Riester-pension" had been introduced in 2001 we are not able to evaluate a relationship between Riester pension and occupational pensions in 1995. For a detailed description of the survey see Haisken-DeNew and Frick (2005).

Another possible reason for the apparent low mobility might be that before 2002 the portability and vesting rules had been more complex. The rules concerning vesting periods are a popular example. The BetrAVG has been revised several times and legislators tried to simplify the rules but in some cases like vesting and portability it is still complex due to several exceptions (BetrAVG §1 I 1, as amended on 05.10.1994 (BGBl. I p. 2911)).
After excluding self-employed people from our analysis 31% of those who are subordinates in a small firm do not own an occupational pension whereas almost 85% of those employed at a large firm (2000 and more) have claims in a pension system.[6]
Concerning hypothesis 5 derived above, our dataset suggests that people with higher wages[7] have a higher probability to participate in an occupational pension scheme. To show this we took the income quartiles and related them to firm size with respect to the fact that the person owns a claim in occupational pensions. Table 2 points out that in our dataset most people with high income are employed in large firms, which refers to the thesis that large firms achieve economies of scale in administration costs.

Table 2: Number of pension participants with respect to income and firm size

	firm size				
Incomequartiles	Below 5	5 to <20	20 to < 200	200 to < 2000	> 2000
1. quartile	7	10	23	21	34
2. quartile	2	19	37	57	39
3. quartile	5	15	71	114	143
4. quartile	6	23	84	196	354
Total	20	67	215	388	570

Note: firm size measured by number of employees
Source: own calculations based on GSOEP, wave 12 (1995)

Table 3 shows a difference between pension provision in small and large firms. These firms almost equally employ married people. Of all married employees almost 83% own a pension plan, but 64% (57%) of employees having a pension plan and being married work in a large (small) firm. Small firms employ a larger percentage of people with an occupational training needed for their job, in contrast a university degree is needed more often in large firms which have a higher percentage of people covered by a pension plan. No clear evidence can be found for differences across firm sizes with reference to a combination of university degree and occupational pension coverage or marital status and pension coverage.

Table 3: Percentage of employees fulfilling different criteria with respect to firm size

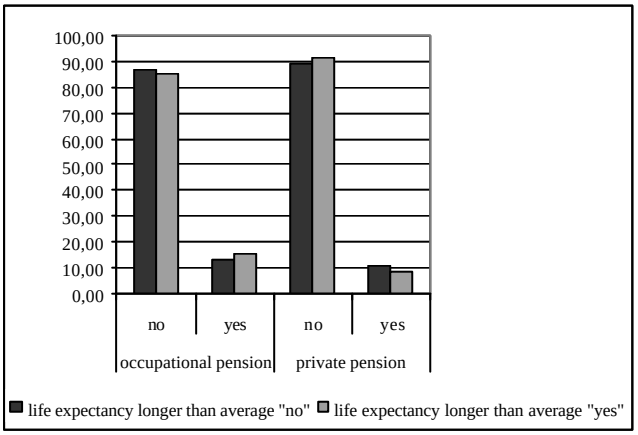
firm size	occupational pension	occupational training	university degree	occupational training + pension	university degree + occupational pension	married + occupational pension
< 5	n.a.	57.49	9.24	59.02	27.97	57.43
5 < 20	68.91	60.07	10.64	69.20	9.86	73.34
20 < 200	79.53	51.48	15.42	52.89	21.28	63.56
200< 2000	83.27	52.80	15.28	61.71	14.40	69.65
more than 2000	84.62	50.84	23.19	51.83	22.61	64.08

Note: firm size measured by number of employees
Source: own calculations based on GSOEP, wave 12 (1995), weighted.

[6] SMEs can be defined differently: Some use yearly turn-over or total assets. The EU defines SMEs up to a number of 250 employees. Deviating from this we define in our dataset SMEs due to the data structure from less than 5 employees to an upper limit of 200 employees.
[7] We approximate wages by using average monthly income.

On a descriptive basis no clear answer can be given on the question about the relation between education and pension coverage. 81% of employees with a university degree are entitled in a pension plan but almost 83% of those with no university degree are entitled in a pension plan, too. [8]
In order to find out whether people's attitude towards pension plan adoption changed during the past ten years we use the German SAVE survey. This dataset includes socio-economic attributes, questions on people's savings behaviour as well as attitudes towards assets and income. The survey started in 2001 and the second wave followed in 2003. The third wave we use, including 2305 households, was collected in summer 2005.[9] The weights used on the multivariate level are based on the distribution of income and age of the German sample census of the respective year. After excluding unemployed people we are able to do estimations based on the answers of 2102 heads of the households.[10]
In terms of a decreasing amount of money paid to retirees by the statutory pension system it could be useful for those who believe to have an above-average life expectancy to provide for old age via occupational pensions. These may care for themselves as they could be influenced by lower payoffs and could possibly face old age poverty. The SAVE data show on a descriptive basis that only 15.0 (8.5) percent of those expecting to live longer than the average use occupational (private) pension plans to prepare for retirement (see figure 1). Its statistically significant influence on individual pension plan demand still needs to be evaluated.

Figure 1: Life expectancy and pension plans (in percentages)



Source: own calculations based on SAVE dataset 2005, weighted

Furthermore, it can be argued that private pension plans may serve as a substitute for occupational pensions. The SAVE dataset shows that 19.3 percent of those participating in an occupational pension plan have a private pension as well and 8.3 percent of those not having an occupational pension have a private pension instead. Therefore the descriptive statistics do not support the argument of occupational and private pensions being substitutes.
A closer look has to be taken on the multivariate level. To test the above hypotheses, we will do the following estimations.

[8] On the multivariate level weights based on a person level projection factor defined as the inverse of the corrected probability to be drawn (*korrigierte Ziehungswahrscheinlichkeit*) are used.
[9] More detailed information on the composition of the dataset and its methodological aspects can be found in Schunk (2006a) and Schunk (2006b).
[10] In contrast to the GSOEP the SAVE dataset contains information on savings behavior. Now it is easier to count for certain savings motives but we are no longer able to count for lines of business or firm size.

3.1 Estimation method

To test our hypotheses we use data consisting of all male and female employees working full-time or part-time[11] above age 16 using a binary probit model. People can hold claims in occupational pensions either at the current employer, at a former employer or not at all.[12] First, we estimate the probability P of an individual person i (or a firm) owning (offering) an occupational pension in terms of a vector of socioeconomic attributes X_i. Socioeconomic attributes included in vector X_i of individual i are:

OP_i	dummy variable equal to 1 if individual i acquires claims of an occupational pension or (in a second set up) if a firm offers individual i a pension plan
TEN_i	tenure (years) of employee i at his current employer
FIRMSIZE	vector of dummy variables for the number of employees of the firm individual i is employed in[13]
INDUSTRY	vector of dummy variables for industry at one-digit level
$REGION_i$	dummy variable equal to 1 if individual i lives in Western Germany
$GENDER_i$	dummy variable equal to 1 if person i is male
EDU_i	dummy variable equal to 1 if individual i needed a university degree to get his or her job[14]
INC_i	average gross monthly income of person i (in 2005 we use average net income of person i)
$MARITAL_i$	dummy variable equal to 1 if individual i is married
AGE_i	age (years) of person i
FOP_i	dummy variable equal to 1 if person i owns an occupational pension from a former employer
$POSITION_i$	dummy variable equal to 1 if individual i is a blue-collar worker
$CHILD_i$	dummy variable equal to 1 if there are children under age 16 living in the household of individual i, in 2005 it is the number of children under 16 living in the household of individual i
$MOTIVE_i$	vector of variables including dummy variables on whether person i expects to live longer than average, whether i owns a Riester pension (supported by the state) and whether i owns a private pension (except Riester), as well as questions on the degree of risk to become unemployed, on satisfaction with the individual economic situation, on the standard of living and on whether person i gets by with individual income.

Our regression model can be written as (3)

$$\begin{aligned} OP_i = {} & \alpha_0 + \alpha_1 TEN_i + \alpha_2 FIRMSIZE_i + \alpha_3 INDUSTRY_i + \alpha_4 REGION_i \\ & + \alpha_5 GENDER_i + \alpha_6 EDU_i + \alpha_7 INC_i + \alpha_8 MARITAL_i + \alpha_9 AGE_i \\ & + \alpha_{10} FOP_i + \alpha_{11} POSITION_i + \alpha_{12} CHILD_i + \alpha_{13} MOTIVE_i + u_i \end{aligned} \tag{3}$$

[11] Unemployed people in occupational training or social programs are left out of the analysis.

[12] Those who answered "don't know" will be treated as missing.

[13] D1: less than 5 employees, D2: 5-19, D3: 20-199, D4: 200-1999, D5: 2000 and more

[14] For 1995 we use EDU as proxy for education of individual i because data about the exact level of education are not available. This way we are able to catch up time preferences as those who do longer benefit from educational services in order to earn higher wages in future have a small time preference. Therefore they are less likely to demand pensions or other forms of savings (see for example Börsch-Supan (2001) and Rodepeter (1997) among others).

We also tried to estimate determinants of the supply of an occupational pension on firm side.[15] All observations have been weighted in our multivariate analyses.

3.3 Results

Our regressions provide insights into the German occupational pension system and people's pension plan adoption.[16]

With reference to the question whether people **demand** a pension plan and how long they acquire claims from it we are able to point out the following. Table 4 and table 5 can be used to compare the pension plan demand in 1995 with that of 2005. They show that in 1995 provision behaviour is less motivated by personal attributes but caused by firm characteristics. In 2005 individual factors become more important. The sign of personal attributes remains the same in all cases. Personal income has the expected positive and significant influence on the dependent variables as proposed by H_5. People who earn higher wages are more able to provide for the future. Furthermore, the impact of age is statistically highly significant which indicates that older people are aware of the fact that they should prepare for their retirement age. The influence of marital status is only predictable for 2005. Therefore it cannot be concluded that single adults seem to be less accountable for others and therefore care less for themselves. Married have a statistically significant higher probability to participate in a plan in 2005. The influence of being a man is not significant so that it is not possible to reject (or not) the hypothesis of women being better informed than men and therefore having a higher probability to adopt a pension. Given that our analyses include only working men and women this argument needs to be taken carefully.

On the contrary, in 1995 those who are supposed to be highly educated (people having a university degree) provide less for old age by the second pillar. In 2005, we are not able to find evidence. A possible reason for this result might be that young, high-skilled employees, who are more career-minded, neglect old age pension provision because they want to be more mobile, and are not willing to bind themselves to a company facing reductions in the capital stock if they change jobs. Besides this, high skilled employees might possibly use the third pillar (private pensions) as a substitute for occupational pensions because fewer problems like restricted portability occur there.[17] To control for this with the data of 2005 we used two variables (Riester pension[18] and private pension) that include information about the individuals' attitude towards private pension provision (table 5, columns II and III). In 2005, both the ownership of a Riester pension or another private pension have a statistically significant positive influence which is against the opinion that private pensions are substitutes for occupational pensions. It seems as if the chance to care occupationally is higher for those who provide for old age privately as well because they are better informed about the need to save. As both employed men and employed women are included in our analysis it cannot be stated that typically men act as the head of the household and therefore care more for their family. To have children under age 16 living in the household based on the argument of care does not have a statistically significant impact on adoption or duration of claims. But the larger the number of children an individual has in 2005 the less he or she provides for old age. A popu-

[15] To do this we used firm-specific information provided by the individual answers of those participating in the GSOEP. The results of this analysis are available from the author on request. An econometric study on the supply of an occupational pension in Lower Saxony has been carried out by Schnabel and Wagner (1999).

[16] The results of our sensitivity analyses on supply and demand side arguments are displayed by tables 4 and 5 in the appendix.

[17] In our study we are not able to control for this possibility as the people participating in the GSOEP have only been asked questions about private provision in 2002. The SAVE dataset we use to control for changes during the past ten years includes answers on private pension provision.

[18] The Riester pension had been introduced in 2001 by the German ministry of labor and social affairs with the aim to support especially people of lower income levels. Therefore people demanding this product are offered support by tax deferrals.

lar argument for this is that families need to spend money to care for their family and therefore have less money left to save. Furthermore, if people own a plan from a former employer they are more likely to have a plan at their current employer as they seem to be informed about their possibilities and show the willingness to care for retirement income (see table 5, columns I to IV).

Therefore, *H_4 can neither be rejected nor confirmed*.

Being employed as a blue-collar worker does not have a clearly identified influence on both pension plan adoption and duration of plans in all cases. Additionally, with tenure being highly statistically significant *we are not able to reject H_1*. People who plan to care for retirement income seem to be aware of the fact that they need to benefit from the compound interest effect and therefore are willing and motivated to stay longer at an employer and hold a pension.

Like Mitchell and Andrews (1981), who were able to show differences across lines of business and regions for the US we find both industry and regional effects for Germany although they cannot be identified clearly (see table 4 columns II and III).[19] People employed in Western Germany are statistically more probable to be included in a plan due to historical effects. Besides, people from Eastern Germany might have a different attitude towards financial old age provision as they could rely more on state activity. The economic development of each region and its influence on firms may play an important role because those firms that face a positive economic development are more likely to provide a pension plan due to a higher ability to fund them. Differences in sector-specific demand and supply for occupational pensions may be related to the historical background, too. Another possible reason might be that people employed in sectors like farming and construction have a lower mean tenure than employees in other sectors. Therefore they are less likely to provide for old age. An argument for the positive sign of financial intermediaries might be that this line of business is one of the external intermediaries to offer pension products. They may use their advantages in information and should therefore be aware of the need to prevent.

Furthermore, as columns III and IV of table 4 point out firm size is an important factor. We find out that a small supply in pension plans occurs in small firms. People employed in firms with 5 to 19 employees have a significantly lower probability to participate in an occupational pension plan and a lower duration of plans than firms employing 2000 and more employees. This can be explained by scale economies and the fact that large firms are more likely to have a historical background in plan provision. Furthermore, large firms are more likely to survive business cycle fluctuations and therefore are more willing to provide a pension plan. The dimension of payments depends on the duration of the plan.

Thus, *we cannot reject hypotheses H_2 and H_3*.

To control for different attitudes towards saving we included variables that are supposed to capture the current situation of living, risks and other savings motives (see table 5).

The estimation results for 2005 show that *H_6 cannot be rejected*. People make up different minds on their current standard of living. The more they are satisfied with their economic situation and their standard of living the more likely they are to save for retirement. Contrary to our assumptions the risk to become unemployed does not have a statistically significant impact. If people expect to have longer life expectancy they are more likely to participate in a pension plan.

4. Conclusion

Currently pension savings decrease in large companies. Others underestimate the costs arising from offering a pension plan to employees. In most cases a decrease is caused by a

[19] This may be determined by the number of observations in each category and the resulting variance.

large position of pensions in the balance sheet which causes worse ratings with the result of worse conditions for receiving credits. Therefore, rating agencies ask companies to use pension funds or other instruments to reduce internal pension savings. Besides, companies offer pensions to their workforce by several aims (e.g. economic reasons, motive of foresight, responsibility for the workforce). Therefore it is important to evaluate what people look like who adopt an occupational pension. In this analysis we have shown that differences exist both across SMEs and large firms as well as across regions. Our results are supported by other descriptive studies carried out for Germany which indicate that a gap between different firm sizes occurs. We point out that pension plan provision differs across lines of business. These results are in line with theoretical and empirical literature which arguments that employees of higher education and those with low income as well as young employees seem to face information problems concerning the necessity to provide for old age. Besides information problems young people might have a higher discount rate than older people and prefer to spend more money on consumption and do not care for old age.
Besides, the willingness to participate in an occupational pension plan could be dependent on individual payments to the statutory pension system. It could thus be expected that those paying small amounts to the statutory system are aware of not receiving large paybacks at retirement age and do hence demand occupational plans.
Important determinants of saving for retirement are individual attitudes and satisfaction with the standard of living. This has been measured by several variables. The more satisfied people are at present the more they want to keep it in future and therefore they care more for retirement.

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Appendix

Table 4: Estimation results: Determinants of pension plan provision (1995)

	I	II	III	IV
observations	1257	1197	1191	1212
Wald Test	***23.50	***24.04	***30.71	***33.26
intercept	-0.231	-0.063	0.007	0.055
personal attributes				
gross income	0.00002	5.23*10-6	3.72*10-6	9.81*10-6
	(0.55)	(0.17)	(0.12)	(0.30)
male	0.086	0.089	0.073	0.035
	(0.60)	(0.60)	(0.50)	(0.24)
married	0.019	-0.018	-0.027	-0.030
	(0.13)	(-0.11)	(-0.17)	(-0.19)
age	***0.018	0.008	0.009	0.008
	(2.62)	(0.97)	(1.02)	(0.94)
university degree	(*) -0.247	-0.009	-0.026	-0.079
	(-1.51)	(-0.05)	(-0.15)	(-0.47)
western Germany	**0.371	*0.289	0.228	0.235
	(2.38)	(1.73)	(1.32)	(1.38)
claims at earlier employer		**0.709	***0.759	***0.686
		(2.41)	(2.72)	(2.61)
tenure		**0.024	**0.023	**0.025
		(2.03)	(2.03)	(2.13)
tenure * earlier claims		*-0,041	**-0.044	**-0.044
		(-1.87)	(-2.01)	(-2.12)
line of business				
manufacturing of goods		0.043	0.015	
		(0.28)	(0.10)	
financial intermediaries		*0.453	*0.406	
		(1.86)	(1.66)	
firm size				
5 to <20 employees			*-0.447	*-0.475
			(-1.69)	(-1.81)
2000 and more employees			0.055	0.082
			(0.40)	(0.62)

Note: ***= significant at 1%, **= significant at 5%, *= significant at 10%, estimation method: binary probit, dependent variable: claims in an occupational pension, z-values in parentheses, results weighted by a person level projection factor

Reference groups: **line of business**: people employed in agrarian, mining, electricity, construction, sale, hotels, restaurants, and others; **firm size**: less than 5 employees and 20 to < 2000 employees

Source: own estimation based on GSOEP (1995), wave 12

Table 5: Estimation results: Determinants of pension plan provision (2005)

	I	II	III
observations	2102	2102	2102
Wald Test	***72.98	***128.22	***129.46
intercept	***-3.492	***-4.321	***-4.305
personal attributes			
net income	***0.00005	**0.00004	**0.00004
	(3.09)	(2.40)	(2.39)
male	0.036	0.025	0.022
	(0.44)	(0.32)	(0.27)
married	***0.413	***0.385	***0.385
	(4.27)	(4.15)	(4.14)
age	***0.101	***0.110	***0.109
	(4.28)	(4.75)	(4.67)
age2	***-0.001	***-0.001	***-0.001
	(-4.77)	(-5.26)	(-5.18)
university degree	0.054	-0.015	-0.024
	(0.48)	(-0.13)	(-0.21)
number of children	**-0.070	*-0.064	(*) -0.054
	(-1.95)	(-1.85)	(-1.58)
western Germany	***0.256	**0.196	**0.202
	(2.80)	(2.10)	(2.18)
motives			
expects to live longer than average		***0.258	***0.255
		(2.76)	(2.74)
risk to become unemployed		-0.006	-0.004
		(-0.31)	(-0.21)
acceptable standard of living		**0.042	**0.042
		(2.04)	(2.05)
satisfaction with economic situation		***0.069	***0.067
		(3.37)	(3.26)
owns a Riester pension		(*) 0.191	
		(1.54)	
private pension insurance			**0.216
			(1.92)

Note: ***= significant at 1%, **= significant at 5%, *= significant at 10%, estimation method: binary probit, dependent variable: claims in an occupational pension, z-values in parentheses, weighted results are based on the distribution of income and age of the German sample census

Source: own estimation based on SAVE dataset, wave 2005