

Dummann, Kathrin

Working Paper

Determinants of occupational pension provision in Germany

Thünen-Series of Applied Economic Theory - Working Paper, No. 75

Provided in Cooperation with:

University of Rostock, Institute of Economics

Suggested Citation: Dummann, Kathrin (2007) : Determinants of occupational pension provision in Germany, Thünen-Series of Applied Economic Theory - Working Paper, No. 75, Universität Rostock, Institut für Volkswirtschaftslehre, Rostock

This Version is available at:

<https://hdl.handle.net/10419/39776>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Thünen-Series of Applied Economic Theory
Thünen-Reihe Angewandter Volkswirtschaftstheorie

Working Paper No. 75

Determinants of Occupational Pension Provision in Germany

by

Kathrin Dummann

Universität Rostock

Wirtschafts- und Sozialwissenschaftliche Fakultät
Institut für Volkswirtschaftslehre

2007

Determinants of Occupational Pension Provision in Germany

by
*Kathrin Dummann**

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 econometrically the determinants of occupational pension provision in Germany. It shows that occupational pensions 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.

JEL-classifications: C25, G23, J14

key words: Occupational Pensions, Retirement Provision, Demographic Change, SMEs

* corresponding author:

University of Rostock, Department of Economics, Ulmenstr. 69, 18057 Rostock, Germany,
kathrin.dummann@uni-rostock.de

1. Introduction

Since the late 1960s, the German population ages while the rate of reproduction is stabilizing at a level of 1.4 children per woman. This demographic change 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. Also people themselves are not satisfied with their financial situation for old age and are willing to place responsibility for financial income on to both private and statutory organizations (Wunder and Schwarze 2005, p.25).

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 of this capital-based system 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 three different methods of financing (employer-based, employee-based or hybrid financed). 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 occupational old age pensions because employees are not obliged to demand such a system. This problem is common also in other countries like the US, UK and Norway. Especially small and medium-sized enterprises (SMEs) face the problem of undersupply. In descriptive surveys they often name high administration costs and cost of search for or information about external suppliers and their offered range of products as an obstacle for providing an occupational pension.

Economic research still misses to explain econometrically the incidence of occupational pensions in Germany. The purpose of this paper therefore is to evaluate

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*).

the determinants of the observed gap in occupational pension provision between German firms. We first formulate hypotheses on supply and demand for occupational pensions and provide an overview of recent literature 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 and gives an outlook on future research.

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, the US, UK and Norway. Some of these found significant differences across lines of business.

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. More than 75% 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 and large firms in pension provision, as well as between Eastern and Western Germany (Kortmann and Haghiri 2005, Müller 2004, R+V 2004).

An amazing result of the surveys is people's unsatisfactory willingness to save additional money for retirement. 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.

New findings in those surveys are provided by answers to the questions why people want to participate in a pension plan and why they reject participation.

The most often named arguments to enhance demand are advice by and competence of the consultant or the employer. Employees are aware that they are not able to inform themselves about recent developments or statutory advancements. Therefore 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).

People are more likely to demand a pension plan if they realize that their employer feels social responsibility² or wants to increase motivation and corporate identification. In most cases of pension rejection, employees are not interested in retirement provision, because they think the offered system is too risky, the benefits from the statutory pension system are overestimated, or they will 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).³

Similar results are found by other authors who evaluated whether mobility of employees served as an additional factor of influence (see table 1).

Table 1: Survey of similar studies on job mobility and occupational pensions

Hernæs et al. (2006)	Rabe (2004)	Andrietti (2001)	Taylor (2000)	Even/ Macpherson (1994)	Allen/ Clark/ MacDermed (1993)	Gustman/Steinmeier (1993)
Norway	Germany	Denmark, Ireland, UK, Netherlands	UK	USA	USA	USA
young employees have a shorter job tenure, do rarely adopt an occupational pension due to the will to get ahead	mobility varies in terms of sectors and wage differentials between employers	occupational pensions are not repressing mobility internationally, need to differentiate between DB and DC plans	not able to prove that employees do not change jobs due to occupational pensions	young male people wish to be more flexible and prevent less	portability serves as a mechanism of selfselection and is mobility enhancing	lack of pension portability does not affect job mobility, backloading effect is very low

Source: own creation

Note: DB = defined benefit plan, DC = defined contribution plan

Additionally, Gustman et al. (1994) mention that mobility is affected by employee's current wage and their potential capital loss. Rabe (2004) and Andrietti (2001) prove this argument for several European countries.

As Germany, countries like the US, UK, and Norway face the following problems: low participation rates in private or occupational pension systems and less retirement plan provision in SMEs than in large companies. A commonly named reason for this is: young employees and those with low income reject a participation in an occupational plan. Individual reasons are different (Ghilarducci and Lee 2005, Hinz and Turner 1998, Even and Macpherson 1994). Moreover, it has been shown that long job tenures are the result of offered pension plans (Mealli and Pudney 1996).

² This is a modern substitute for employee retention.

³ These surveys include only answers from employees, unemployed are left out 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.

Finally, despite 401(k) plans⁴ 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. To fill this gap, we derive several hypotheses from economic theory in the following chapter.

2.2 Theoretical Background and Hypotheses

Given the gaps in the provision of pension plans by the statutory pension system, reasons as to why people demand a certain category of pension need to be evaluated.

Mitchell (1988) notes that employees make up suboptimal decisions concerning their pension plans as they are imperfectly informed about tax deferral, different channels to choose and other characteristics. She mentions a divergence of efforts on employee and employer side due to the fact that employees have different incentives to ask for a plan. Employers are more likely to offer a plan if the firm is profitable. An equilibrium between demand by employees and supply by employers could be achieved only if we lived in a world without information cost.

Several authors identified parameters influencing a person's individual decision to participate in an occupational pension plan subject to the assumption that employers offer some. What reasons do arise for the demand for and supply of occupational pensions? Economic literature developed different hypotheses to explain influences on both employee side and employer side. The first three arguments refer mainly to supply side factors, although a clear separation between supply side and demand side is not possible.

First, pension systems could act as a mechanism of employee retention. This may be in the interest of both employees and employers. Participation in a plan implies that the employer saves a certain amount of money for the employee's retirement period. Either the same amount of money is saved as a wage deferral (defined contribution) every period or the employee is being paid out a fixed pension amount at the

⁴ 401(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).

beginning of the retirement period (defined benefit). 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. Taylor (2000) supports this hypothesis for the UK. Several authors call benefit plans a sponsoring mechanism of employers due to the fact that the employees' contributions are save for retirement and therefore act as a backloading mechanism. By funding a pension, the employer receives a credit from the employee which will be paid back when the latter retires. However, the employee is likely to loose the compound interest rate if he or she quits the job before retirement and changes to another employer. 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).⁵ A further argument of matching the interests of employer and employee is made by Backes-Gellner and Pull (1999) who claim that the provision of a benefit in retirement periods is efficient if employees consider benefits to be better than the monetary equivalent at present. This supports the finding of Mitchell (1988) that it is better to inform employees about pension benefits and thus increase individual action to insure themselves for old age.

A second argument that is closely related to the hypothesis of employee retention is based on Lazear (1979). He shows that employees are able to realize the individual benefit amount of a pension plan. Therefore they avoid shirking before retirement. This is due to efficiency wages: employees earn lower wages than their marginal product of labor 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. Moreover, the avoidance of shirking may have the additional effect of decreasing training costs and the costs of finding and recruiting new staff as employees have an incentive to work harder and have a longer tenure (McCarthy 2006, Allen et al. 1993). An impact on motivation and loyalty by fringe benefits or occupational pensions could be proved for the US (Allen et al. 1993) but not for Germany (Frick et al. 1999). Our first hypothesis therefore is

⁵ 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.

H₁: 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 achieved by large firms. If a firm employed a large number of employees it could offer a pension plan that required possibly higher fixed costs of administrative expenses.⁶ So, the costs per employee decrease with firm size. Furthermore, large firms have a higher probability to survive business cycle fluctuations and are more able to earn extra money to pay for higher pensions. A small firm would not be able to pay a pension if it went bankrupt. The risk of becoming insolvent is higher for small firms than for large firms. Furthermore, a case of death or invalidity could result in high payments, which reduce cash-flow and may cause insolvency, if the employer did not save enough for an event like that. This risk is higher for small firms than for large firms because large firms are more able to calculate the probability of a sudden case of death. 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:

H₂: Large companies are more likely to offer a pension plan than small companies.

H₃: The demand for occupational pension plans differs across lines of business and regions.

From the view of human capital theory we have to add that people who are well informed and stay longer at a firm tend to be more productive than others. The reason for this is that employees acquire firm-specific human capital that as a result increases firm productivity (Becker 1964). This could not be rejected for the US (Cornwell and Dorsey 2000).

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

H₄: 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.

⁶ Administration costs differ across ways of pension provision.

Mincer (1976) tested several sociodemographic factors (like schooling, hours worked, gender) and their influence on individual income. We suggest that these factors influence retirement income, too, as Blundell et al. (1994) found out that demographic attributes and labor market variables do significantly influence intertemporal behavior. Freeman (1985) additionally uses information about labor union membership based on the model of union monopoly power and its collective voice, showing both theoretically and empirically that it has a positive influence on pension plan demand. Besides, Gustman et al. (1994) argue that mobility is affected not only by the employee's current wage, but also by the capital loss occurred from a job change.

Thus, we expect:

H₅: The demand for occupational pension plans depends on sociodemographic attributes (e.g. income, age, marital status, position, and number of children).

H₆: Savings motives based on individual circumstances influence the willingness to provide for retirement.

These hypotheses shall be tested in the following chapter.

3. Empirical analysis

3.1 Data

The data used in this study have been taken 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 1995.⁷ The dataset of our analysis contains 13768 people who were asked to participate in the survey.⁸ The answers to the questions about occupational pension coverage are displayed in table 2. 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 question “In some companies the employees are offered a company pension in addition to social security. Does your company offer this for all or some of its employees?” 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, 87.8% of the people considered in this study are not entitled in plans from an earlier employer. This could possibly be due to the fact that the mean age of people owning an occupational pension is 41.7 years. People of this age are more likely to be bound to the firm than younger employees who are more career-minded. 35.7% of the total number of employees entitled in an occupational pension plan are female, and 64.3% of them are male.

Table 2: 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)

⁷ Due to a small number of answers in earlier waves and therefore resulting small variance in the dataset 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.

⁸ The number of answers differs between the different parts of the questionnaire. 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 restrictive and more complex. The rules concerning vesting periods are a popular example⁹ :

An employee participating in an occupational pension plan keeps his entitlements if he leaves the firm before occurrence of an insured event only if he is at least 35 years old and either the pension promise exists for at least 10 years or the employee is employed at that firm for at least 12 years and his pension promise exists for at least 3 years (BetrAVG §1 I 1, as amended on 05.10.1994 (BGBl. I p. 2911)).

After exclusion of 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.¹⁰ This can be seen from table 3.¹¹

Table 3: Percentage of claims in terms of firm size

firm size	claims in a pension system	
	no (in %)	yes (in %)
< 5 to < 20	31.09	68.91
20 to < 200	20.47	79.53
200 to < 2000	16.73	83.27
2000 and more	15.38	84.62

Source: GSOEP, wave 12 (1995), weighted, firm size measured by number of employees

Concerning hypothesis 5 derived above, our dataset suggests that people with higher wages¹² 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 4 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 4: Number of pension participants with respect to income and firm size

income quartiles	firm size				
	below 5	5 to <20	20 to < 200	200 to < 2000	> 2000
1st quartile	7	10	23	21	34
2nd quartile	2	19	37	57	39
3rd quartile	5	15	71	114	143
4th 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)

⁹ 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.

¹⁰ 19 self-employed people are excluded from this part of our analysis.

¹¹ 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.

¹² 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. Table 5 shows that 81% of those with a university degree are entitled in a pension plan but almost 83% of those with no university degree as qualification for their current job are entitled in a pension plan, too.¹³

Table 5: Relation between university degree and pension coverage (percentages in parentheses)

	no pension	pension
no university degree	17.14	82.86
university degree	18.87	81.13

Source: own calculations based on GSOEP, wave 12 (1995), weighted.

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 that besides socio-economic questions includes questions on people's savings behavior 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 2005.¹⁴ 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 (because they are not able to acquire claims from occupational pension plans that year) we are able to do estimations based on the answers of 2102 heads of the households.¹⁵

In times of demographic change with 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 would be extremely 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 fill their individual gap in financial benefits (see table 6). But there is still the question whether supposed life expectancy has a statistically significant influence on individual pension plan demand.

¹³ 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.

¹⁴ More detailed information on the composition of the dataset and its methodological aspects can be found in Schunk (2006a) and Schunk (2006b).

¹⁵ In contrast to the GSOEP the SAVE dataset contains information on savings behavior which makes it easier to count for certain savings motives but we are no longer able to count for lines of business or firm size. Therefore, we are not able to estimate whether substantial differences in pension coverage exist across lines of business or firm sizes.

Table 6: Life expectancy and pension plans (percentages in parentheses)

		life expectancy longer than average	
		no	yes
occupational pension	no	1432 (87.0)	380 (85.0)
	yes	223 (13.0)	67 (15.0)
		life expectancy longer than average	
		no	yes
private pension	no	1487 (89.85)	409 (91.5)
	yes	168 (10.15)	38 (8.5)

Source: own calculations based on SAVE dataset 2005

Furthermore, it can be argued that people participating in private pension plans may value these 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 (see table 7). It is amazing that more than 90 percent of those not participating in occupational plans do not provide for old age on their own.¹⁶ Calculated with reference to the whole survey we see that 79% of all people participating in the SAVE survey care neither privately nor occupationally for old age. Therefore the descriptive statistics do not support the argument of occupational and private pensions being substitutes.

Table 7: Private versus occupational pensions (percentages in parentheses)

		private pension	
		no	yes
occupational pension	no	1662 (91.7)	150 (8.3)
	yes	234 (80.7)	56 (19.3)

Source: own calculations based on SAVE dataset 2005

A closer look has to be taken on the multivariate level. To test the above hypotheses, we will do the following estimations.¹⁷

3.1 Estimation method

We use data consisting of all male and female employees working full-time or part-time¹⁸ above age 16. People can hold claims in occupational pensions either at the

¹⁶ A possible explanation might be a misunderstanding in the questionnaire: Many people who participate in this survey might not have a usual product which could be counted as a private or occupational way of pension provision. But in 1995 almost 9 million households (almost 2.3 million households at the age of 40-50 years) in Germany were owners of a flat or a house which can be counted as a way to provide for old age (source: GSEOP 1995). This might be due to the fact that real estate (or reverse mortgage) as a mechanism to provide for retirement becomes more and more popular now but had not been regarded that way in 1995. The same argument applies to life insurances.

¹⁷ The importance of micro-level data for demand analysis compared to aggregate data has been evaluated and discussed by Blundell et al. (1993).

actual employer or at a former employer or not at all.¹⁹ As the resulting dependent variable is a binary one we have to estimate a binary probit model underlying the assumption of a cumulative standard normal distribution function.

First we estimate the probability P of an individual person i (or a firm) owning (offering) an occupational pension ($Y = 1$) in terms of a vector of socioeconomic attributes X_i which can be written as

$$P_i = \Pr(Y = 1) = \Pr(I_i^* \leq I_i) = F(I_i) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\beta_1 + \beta_2 X_i} e^{-t^2} dt \quad (1)$$

with I^* incorporating an unobservable utility index²⁰ of individual i and t being a standardized normal variable $t \sim N(0,1)$.

As the utility index I is being defined as $I_i = F^{-1}(I_i) = F^{-1}(P_i) = \beta_1 + \beta_2 X_i$ it can be estimated econometrically as (2) with u_i being the error term

$$I_i = \beta_1 + \beta_2 X_i + u_i. \quad (2)$$

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 ²¹
$INDUSTRY$	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 ²²
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

¹⁸ Some studies only include employees working more than 37.5 hours a week. We included also people working part-time into our analysis, since both groups are offered occupational pensions. Unemployed people in occupational training or social programs (like year spent by young people doing work in the area of social services or military service) are left out of the analysis.

¹⁹ Those who answered "don't know" will be treated as missing.

²⁰ This is what Gujarati (1995) names a critical value in decision making.

²¹ D1: less than 5 employees, D2: 5-19, D3: 20-199, D4: 200-1999, D5: 2000 and more

²² For 1995 we used EDU as proxy for education of individual i because data 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).

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.

Therefore the structural part of the regression can be written as (3)

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

Afterwards we evaluated what attributes significantly influenced the duration of claims in occupational pensions. Therefore, we did OLS estimations using the same socioeconomic attributes like in equation (3) but with the logarithm of duration (years) of claims in occupational pensions as the dependent variable and the log of income and age as independent variables.

We also tried to estimate determinants of the supply of an occupational pension on firm side.²³ However, due to insufficient attributes of the firms that supply an occupational pension to their employees these regressions could be improved if more firm specific attributes were available.²⁴ 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.²⁵

To start with the **supply** side of our analysis (see table 9) we did regressions on the impact of firm-specific variables influencing the supply of a pension plan by a

²³ To do this we used firm-specific information provided by the individual answers of those participating in the GSOEP.

²⁴ An econometric study on the supply of an occupational pension in Lower Saxony has been carried out by Schnabel and Wagner (1999).

²⁵ The results of our sensitivity analyses on supply and demand side arguments are displayed by tables 9 to 12 in the appendix.

company. Column I shows the impact of gross income and firm size on pension plan provision. We find that income (as a proxy for wages paid) has a positive influence on pension plan supply.²⁶ Furthermore, in the regressions tabulated in columns I through III we identify statistically significant differences between firm sizes. Firms with a small number of employees (no more than 20) do less often offer an occupational pension plan than firms with more than 2000 employees compared to the reference group.²⁷ Across lines of business (columns II and III) we identified statistically significant differences. Financial intermediaries and manufacturing firms are more likely to provide a pension system than firms in the construction industry and the reference group.

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 10 and table 11 can be used to compare the pension plan demand in 1995 with that of 2005. They show that in 1995 provision behavior 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

²⁶ An inclusion of other firm-specific factors (like turnover or number of employees) could enable us to draw more concrete conclusions on pension plan supply from employer side but due to data shortenings we are not able to do that.

²⁷ It would be interesting to evaluate whether the age of a company has a statistically significant impact on the supply of an occupational pension plan.

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.²⁸ To control for this with the data of 2005 we used two variables (Riester pension²⁹ and private pension) that include information about the individuals' attitude towards private pension provision (table 11, columns VI and VII). 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 popular 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 10, columns II to VI).

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 profit from the compound interest effect and therefore are willing and motivated to stay longer at an employer and hold a pension.

²⁸ 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.

²⁹ 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.

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 10 columns II to VI and table 11 columns II to VII).³⁰ 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. In construction, sales, hotels and restaurants it has not been common in history to provide pension plans. Another possible reason might be that people employed in sectors like farming and construction have a lower mean tenure than employees in other sectors (see table 8). 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.

Table 8: Mean tenure by line of business

	tenure	st.d.
farming/agrarian	10.3	(9.7)
mining	11.4	(8.3)
manufacturing of goods	15.8	(10.0)
electricity	15.8	(11.6)
construction	11.6	(9.6)
sale, hotels, restaurants	13.0	(9.5)
financial intermediation	11.8	(9.8)
others	11.8	(9.4)

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

Note: table 8 includes the mean tenure of people who are entitled in an occupational pension plan, numbers are given in years, standard deviation in parentheses

Furthermore, as columns V and VI of table 10 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 (table 10 and 12) 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

³⁰ This may be determined by the number of observations in each category and the resulting variance.

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 11).

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.

To sum up the results for the duration of an entitlement (see table 12) we find that individual income, marital status, age, university degree and being occupied in a small or large firm have a huge impact on the decision of a person to stay in a pension plan for a longer period. Differences across lines of business could not be identified clearly.

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 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 using econometric methods. 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. Less provision by single adults and people with children could not be identified in 1995 but in 2005 people's provision for old age decreases with the number of children.

Concerning information differences across individuals it would be interesting to investigate the effects of individual labor union membership. Labor unions are able to collect and pool information and afterwards pass it to their members. Furthermore they have a larger impact on wage discussions as well as fringe benefits. Therefore, labor unions are supposed to have a greater impact on pension provision as has been shown by other authors for the US. 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. To eliminate the named gaps further research needs to be done on questions concerning the possibility for the state to set incentives for both employers and employees to adopt a pension scheme and improve information policy.

Acknowledgements:

The author thanks Doris Neuberger, Lucinda Trigo Gamarra, Hans Eggert Reimers, Alexander Conrad, and the participants in the Economic Research Seminar at the University of Rostock for helpful comments on this paper. The usual disclaimer applies.

The data used in this publication were made available to us by the German Socio-Economic Panel Study (GSOEP) at the German Institute for Economic Research (DIW), Berlin and the German SAVE survey by the Mannheim Research Institute for the Economics of Aging.

Appendix

Table 9: Estimation results: Determinants of probability of pension plan supply (1995)

dependent variable	company offers an occupational pension		
	I	II	III
observations	5566	5367	5367
Wald Test	354.31	412.61	422.55
intercept	***-1.003	***-1.105	***-1.097
gross income	***0.0001 (8.63)	***0.0001 (9.35)	***0.0001 (9.37)
line of business			
manufacturing of goods		***0.316 (5.11)	***0.308 (4.86)
construction			-0.076 (-0.78)
financial intermediaries		***0.902 (7.10)	***0.895 (7.02)
firm size			
5 to <20 employees	***-0.641 (-7.76)	***-0.593 (-6.96)	***-0.587 (-6.83)
2000 and more employees	***0.621 (9.67)	***0.568 (8.84)	***0.563 (8.68)

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

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

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

Table 10: Estimation results: Determinants of pension plan provision (1995)

	I	II	III	IV	V	VI
observations	1257	1257	1218	1197	1191	1212
Wald Test	***15.04	***23.50	***26.07	***24.04	***30.71	***33.26
intercept	0.079	-0.231	0.008	-0.063	0.007	0.055
personal attributes						
gross income	0.00003	0.00002	0.00001	5.23*10-6	3.72*10-6	9.81*10-6
	(0.76)	(0.55)	(0.41)	(0.17)	(0.12)	(0.30)
male	0.089	0.086	0.057	0.089	0.073	0.035
	(0.63)	(0.60)	(0.39)	(0.60)	(0.50)	(0.24)
married	0.008	0.019	-0.023	-0.018	-0.027	-0.030
	(0.05)	(0.13)	(-0.15)	(-0.11)	(-0.17)	(-0.19)
age	***0.018	***0.018	0.007	0.008	0.009	0.008
	(2.70)	(2.62)	(0.83)	(0.97)	(1.02)	(0.94)
university degree	*-0.274	(*) -0.247	-0.063	-0.009	-0.026	-0.079
	(-1.68)	(-1.51)	(-0.37)	(-0.05)	(-0.15)	(-0.47)
western Germany		**0.371	*0.298	*0.289	0.228	0.235
		(2.38)	(1.80)	(1.73)	(1.32)	(1.38)
claims at earlier employer			**0.631	**0.709	***0.759	***0.686
			(2.29)	(2.41)	(2.72)	(2.61)
tenure			**0.025	**0.024	**0.023	**0.025
			(2.19)	(2.03)	(2.03)	(2.13)
tenure * earlier claims			**0.042	*-0.041	**0.044	**0.044
			(-1.99)	(-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 11: Estimation results: Determinants of pension plan provision (2005)

	I	II	III	IV	V	VI	VII
observations	2102	2102	2102	2102	2102	2102	2102
Wald Test	***71.91	***72.98	***93.75	***94.16	***122.54	***128.22	***129.46
intercept	***-3.257	***-3.492	***-3.663	***-3.645	***-4.327	***-4.321	***-4.305
personal attributes							
net income	***0.00006 (3.39)	***0.00005 (3.09)	***0.00005 (3.05)	***0.00005 (3.05)	**0.00004 (2.55)	**0.00004 (2.40)	**0.00004 (2.39)
male	0.042 (0.53)	0.036 (0.44)	0.021 (0.26)	0.021 (0.28)	0.019 (0.24)	0.025 (0.32)	0.022 (0.27)
married	***0.437 (4.58)	***0.413 (4.27)	***0.432 (4.52)	***0.435 (4.71)	***0.389 (4.20)	***0.385 (4.15)	***0.385 (4.14)
age	***0.098 (4.32)	***0.101 (4.28)	***0.107 (4.64)	***0.108 (4.66)	***0.112 (4.78)	***0.110 (4.75)	***0.109 (4.67)
age2	***-0.001 (-4.83)	***-0.001 (-4.77)	***-0.001 (-5.21)	***-0.001 (-5.20)	***-0.001 (-5.31)	***-0.001 (-5.26)	***-0.001 (-5.18)
university degree	0.019 (0.17)	0.054 (0.48)	0.054 (0.47)	0.049 (0.43)	-0.012 (-0.10)	-0.015 (-0.13)	-0.024 (-0.21)
number of children	** -0.075 (-2.11)	** -0.070 (-1.95)	** -0.076 (-2.13)	** -0.079 (-2.32)	* -0.059 (-1.69)	* -0.064 (-1.85)	(*) -0.054 (-1.58)
western Germany		***0.256 (2.80)	***0.254 (2.78)	***0.247 (2.68)	**0.192 (2.08)	**0.196 (2.10)	**0.202 (2.18)
motives							
expects to live longer than average			***0.319 (3.48)	***0.313 (3.42)	***0.257 (2.76)	***0.258 (2.76)	***0.255 (2.74)
risk to become unemployed				-0.019 (-0.96)	-0.005 (-0.26)	-0.006 (-0.31)	-0.004 (-0.21)
acceptable standard of living					**0.042 (2.05)	**0.042 (2.04)	**0.042 (2.05)
satisfaction with economic situation					***0.069 (3.42)	***0.069 (3.37)	***0.067 (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

Table 12: Determinants of pension plan entitlement duration (1995)

	I	II	III	V	IV	VI
observations	927	927	927	915	923	911
F-Test	***59.41	***49.55	***43.38	***34.80	***34.83	***30.26
R ²	0.2970	0.2971	0.3012	0.3026	0.3189	0.3181
intercept	***-6.061	***-6.079	***-5.812	***-5.744	***-5.577	***-5.569
personal attributes						
gross income (log)	***0.276 (3.20)	***0.278 (3.20)	***0.285 (3.22)	***0.258 (2.84)	**0.224 (2.43)	**0.214 (2.31)
male	**0.178 (2.18)	**0.174 (2.04)	**0.183 (2.14)	**0.184 (2.12)	**0.179 (2.07)	**0.183 (2.09)
married	*0.164 (1.79)	*0.164 (1.79)	**0.225 (2.37)	**0.225 (2.31)	***0.239 (2.57)	**0.241 (2.52)
age (log)	***1.564 (12.13)	***1.564 (12.09)	***1.477 (11.06)	***1.505 (11.31)	***1.529 (11.03)	***1.54 (11.28)
university degree	***-0.555 (-5.51)	***-0.551 (-5.33)	***-0.535 (-5.11)	***-0.525 (-4.96)	***-0.529 (-5.18)	***-0.524 (-5.07)
blue-collar		0.011 (0.14)	0.016 (0.19)	0.018 (0.21)	0.004 (0.04)	0.012 (0.14)
children younger than 16			** -0.144 (-2.04)	** -0.141 (-2.00)	** -0.141 (-1.97)	** -0.139 (-1.96)
line of business						
manufacturing of goods				0.086 (1.02)		0.039 (0.46)
financial intermediaries				*0.159 (1.61)		0.113 (1.08)
firm size						
5 to <20 employees					** -0.340 (-2.18)	** -0.329 (-2.10)
2000 and more employees					**0.191 (2.50)	**0.179 (2.24)

Note: ***= significant at 1% level, **= significant at 5% level, *= significant at 10% level, estimation method: Ordinary least squares (OLS), dependent variable: duration of claims in pension plans (log), t-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

References

- Allen, S.G., R.L. Clark and A.A. Mc Dermid, (1993), Pensions, Bonding, and Lifetime Jobs, *Journal of Human Resources*, Vol. 28, Nr. 3, p. 463-481
- Andrietti, V., (2001), Occupational Pensions and Interfirm Job Mobility in the European Union. Evidence from the ECHP Survey, CeRP Working Paper No. 5/01
- Aoki, M., (1984), *The co-operative game theory of the firm*, Oxford: Clarendon Press
- Backes-Gellner, U. and K. Pull, (1999), Betriebliche Sozialpolitik und Maximierung des Shareholder Value: ein Widerspruch?, *Zeitschrift für Betriebswirtschaftslehre*, 69. Jhg. Heft 1, p. 51-70
- Becker, G.S., (1964), *Human Capital - A Theoretical and Empirical Analysis with Special Reference to Education*, New York et al.: Columbia
- BetrAVG §1 I 1, as amended on 05.10.1994 (BGBl. I p. 2911)
- BetrAVG §1a I, as amended on 09.12.2004 (BGBl. I p. 3242)
- Blundell, R., P. Pashardes and G. Weber, (1993), What do we learn about consumer demand patterns from Micro Data?, *American Economic Review*, Vol. 83, No. 3, p. 570-597
- Blundell, R., M. Browning and C. Meghir, (1994), Consumer Demand and the Life-Cycle Allocation of Household Expenditures, *Review of Economic Studies*, Vol. 61, No. 1, p. 57-80
- Börsch-Supan, A., (2001), Introduction to "International comparison of household savings behaviour: A study of life-cycle savings in seven countries", *Research in Economics*, Vol. 55, No. 1, p. 1-14
- Breyer, F., (2000), Kapitaldeckungs- versus Umlageverfahren, *Perspektiven der Wirtschaftspolitik*, Vol.1 No.4, p. 383-405
- Cornwell, C. and S. Dorsey, (2000), Are Pension-Providing Firms More Productive?, Mimeo, University of Georgia, June
- Delta Lloyd AG and F.A.Z.-Institut für Management-, Markt- und Medieninformationen GmbH, (2004), Kundenkompass Betriebliche Altersversorgung: aktuelle Arbeitnehmerbefragung; Ziele und Erwartungen, Wiesbaden, Frankfurt/ Main, [Delta Lloyd 2004]
- Dorsey, S., C. Cornwell and D. Macpherson, (1998), Pensions and Productivity, W.E. Upjohn Institute for Employment Research, Kalamazoo, Michigan
- Even, W.E. and D. Macpherson, (1994), Why did male pension coverage decline in the 1980s?, *Industrial and Labor Relations Review*, Vol. 47, No. 3, p. 439-453
- Freeman, R.B., (1985), Unions, Pensions, and Union Pension Funds, *Pensions, Labor, and Individual Choice*, University of Chicago Press: Chicago et al.
- Frick, B., J. Frick and J. Schwarze, (1999), Zusatzleistungen, Arbeitszufriedenheit und Fluktuationsneigung: Empirische Analysen mit dem "Sozio-ökonomischen Panel", in: B. Frick, R. Neubäumer und W. Sesselmeier (Hrsg.): *Die Anreizwirkungen betrieblicher Zusatzleistungen*, Rainer Kampp Verlag, München und Mering, p. 9-31

- Ghilarducci, T. and M. Lee, (2005), How Lower Middle-Class Workers Obtain Employer Pensions, Final Report for Retirement Research Foundation Grant: #2003-077, <http://www.nd.edu/~tghilard/documents/Final%20report2003-077.doc>, 11. Mai 2006
- Gujarati, D., (1995), Basic Econometrics, 3rd edition, McGraw-Hill, Inc.
- Gustman, A.L. and T.L. Steinmeier, (1993), Pension portability and labor mobility, *Journal of Public Economics*, Vol. 50, p. 299-323
- Gustman, A.L., O.S. Mitchell and T.L. Steinmeier, (1994), The Role of Pensions in the Labor Market: A Survey of the Literature, *Industrial and Labor Relations Review*, Vol. 47, No. 3, p. 417-429
- Haisken-DeNew, J.P. and J.R Frick, (2005), Desktop Companion to the German Socio-Economic Panel Study (SOEP), DIW, Berlin
- HDI Pensionsmanagement and F.A.Z.-Institut für Management-, Markt- und Medieninformationen GmbH, (2005), Pensionsmanagement im Mittelstand - Was Unternehmen von bAV-Dienstleistern fordern - eine aktuelle Bestandsaufnahme, Wiesbaden, Frankfurt/ Main, [HDI PM 2005]
- Hernæs, E., J. Piggott, T. Zhang and S. Strøm, (2006), The Determinants of Occupational Pensions, Memorandum No 01/2006, Department of Economics, University of Oslo
- Hinz, R.P. and J.A. Turner, (1998), Pensions coverage initiatives: Why don't workers participate?, in: Living with Defined Contribution Plans, p. 17- 37
- Horiba, Y. and K. Yoshida, (2002), Determinants of Japanese corporate pension coverage, *Journal of Economics and Business*, Vol. 54, p. 537-555
- Ippolito, R.A., (1997), Pension Plans and Employee Performance - Evidence, Analysis, and Policy The University of Chicago Press, Chicago and London
- Kortmann, K. and P. Haghiri, (2005), Situation und Entwicklung der betrieblichen Altersversorgung in Privatwirtschaft und öffentlichem Dienst 2001-2004 – Endbericht, Untersuchung im Auftrag des Bundesministeriums für Gesundheit und Soziale Sicherung, München
- Kotlikoff L.J. and D.A. Wise, (1985), Labor compensation and the structure of private pension plans: evidence for contractual versus spot labor markets, *Pensions, labor, and individual choice*, p. 55-85
- Krupp, H.J. and J. Weeber, (2001), Risiken der Alterssicherung - Umlage- und Kapitaldeckungsverfahren im Vergleich, in: H.C. Mager, H. Schäfer und K. Schrüfer (Hrsg.): Private Versicherung und Soziale Sicherung, Marburg: Metropolis, p. 185-202
- Kusko, A.L., J.M. Poterba and D.W. Wilcox, (1998), Employee decisions with respect to 401(k) plans, Living with defined contribution pensions, Philadelphia: Univ. of Pennsylvania Press, p. 98-112
- Lazear, E.P., (1979), Why is there Mandatory Retirement?, *Journal of Political Economy*, Vol. 87, No.4, p. 1261-1284
- Lazear, E.P. and R.L. Moore, (1984), Incentives, Productivity, and Labor Contracts, *The Quarterly Journal of Economics*, Bd. 99, No. 2, p. 275-296

- McCarthy, D., (2006), The Rationale for Occupational Pensions, *Oxford Review of Economic Policy*, Vol. 22, No. 1, p. 57-65
- Mealli, F. and S. Pudney, (1996), Occupational Pensions and Job Mobility in Britain: Estimation of a random-effects competing risks model, *Journal of Applied Econometrics*, Vol. 11, p. 293-320
- Mincer, J., (1976), Progress in Human Capital analyses of the distribution of earnings, in: A. B. Atkinson (eds.): *The personal distribution of incomes*, Allen & Unwin (u.a.): London, p. 136-192
- Mitchell, O.S., (1988), Worker Knowledge of Pension Provisions, *Journal of Labor Economics*, Vol. 6, No. 1, p. 21-39
- Mitchell, O.S. and E.S. Andrews, (1981), Scale economies in private multi-employer pension systems, *Industrial and Labor Relations Review*, Vol. 34, No. 4, p. 522-530
- Müller, C., (2004), bAV-Report 2004: Ergebnisse der 5. Welle der Unternehmensbefragung, psychonomics AG, Köln, Nov.
- Munnell, A.H. and A. Sundén, (2006), 401(k) Plans are Still Coming Up Short, An Issue in Brief, Number 43, Center for Retirement Research at Boston College
- R+V, (2004), Betriebliche Altersversorgung für den Mittelstand, Eigenverlag, Wiesbaden
- Rabe, B., (2004), Occupational Pensions and Job Mobility in Germany, ISER Working Paper 2006-4
- Reifner, U., A. Tiffe and A. Turner, (2003), Vorsorgereport - Private Alterssicherung in Deutschland, Bertelsmann Stiftung, Gütersloh
- Rodepeter, R., (1997), Identifikation von Sparprofilen im Lebenszyklus, Mannheim SFB 504 Discussion Paper No. 97-01
- Schnabel, C. and J. Wagner (1999), Betriebliche Altersversorgung: Verbreitung, Bestimmungsgründe und Auswirkungen auf die Personalfluktuatation, in: B. Frick, R. Neubäumer und W. Sesselmeier (eds.): *Die Anreizwirkungen betrieblicher Zusatzleistungen*, Rainer Kampp Verlag, München , p. 69-93
- Schunk, D., (2006a), The German SAVE-Survey: Documentation and Methodology, MEA-Discussion-Paper 109-06, University of Mannheim
- Schunk, D., (2006b), An Iterative Multiple Imputation Procedure for Dealing with Item Nonresponse in the German SAVE Survey, Mimeo, University of Mannheim
- Taylor, S., (2000), Occupational Pensions and Employee Retention, *Employee Relations*, Vol.22, No. 3, p. 246-259
- Wunder, C. and J. Schwarze, (2005), Zufriedenheit mit der Alterssicherung und Präferenzen für alternative Sicherungsmodelle, *Zeitschrift für Sozialreform*, Jg. 51, Heft 1, p. 7-39