The Determinants of Early Retirement in Switzerland

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JEL Classification: J11, J14, J26
Keywords: early retirement, determinants, Switzerland

1. Introduction

Within the next few decades, Switzerland will experience large demographic shifts as a falling birth rate together with an increasing life expectancy leads to an aging population. Although Switzerland is still privileged with regard to the employment rate of older workers and the state of its social security system (see Dorn and Sousa-Poza, 2003), this demographic development will nonetheless have a significant impact on the public pension scheme, as well as on the labor market. More specifically, the future financing of the unfunded public pension system will be challenged. Whereas there are currently four working-age people to provide support for every person aged 65 and over, by 2020 this dependency ratio will fall to 2.5.[1] In the labor market, the growth of the labor supply will slow down and eventually become negative. According to predictions by the Swiss Federal Statistical Office (2003a), this diminishment of the work force will begin within the next ten to fifteen years.

To date, such changing demographic trends have not been accompanied by raised labor market participation of older individuals. Early retirement became increasingly popular in Switzerland during the 1990s. In 1991/92, 21.8% of all individuals who were within three years of reaching the legal retirement age had already retired from the active workforce (Figure 1). Eight years later, in

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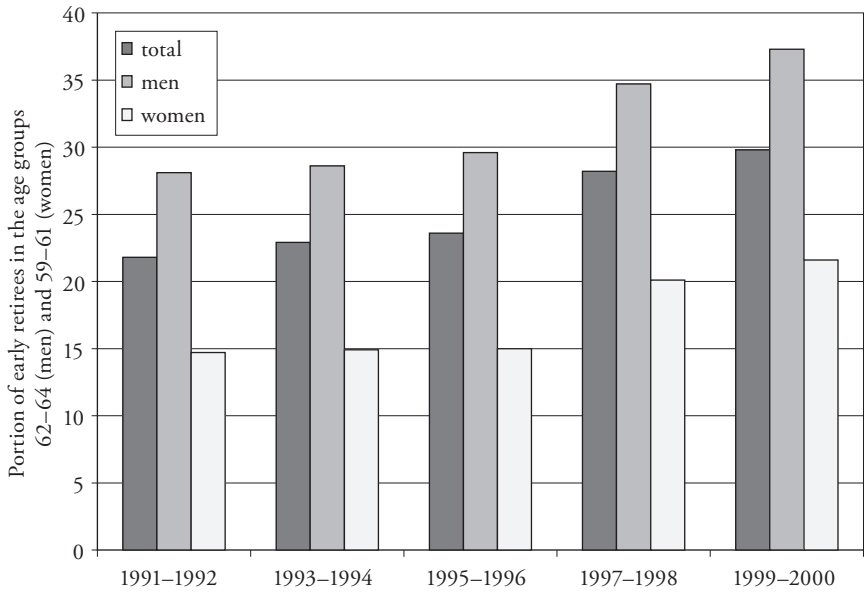
1 The dependency ratio is defined here as the number of people aged 20–64 divided by the number of people aged 65 and older; see Swiss Federal Statistical Office (2003a).

Figure 1: Trend to Early Retirement in the 1990s



Source: Swiss Federal Statistical Office (2000).

1999/2000, this quota had increased to 29.8%. A further notable increase in early retirement took place in 1997/1998, following the introduction of an early claim option for public old-age pensions up to two years before the legal retirement age.

A plan to make the retirement age even more flexible was planned in the 11th revision of the old-age insurance law, which was rejected in a popular referendum in May 2004. However, the opportunities for, and conditions of, an early claim on old-age benefits continue to be the subject of a heated political debate, especially with regard to the financial support for the early retirement of people with lower incomes. Undoubtedly, a better understanding of the phenomenon of early retirement is crucial for policymakers.

This study aims at contributing to such an understanding by analyzing the determinants of early retirement in Switzerland. Whereas empirical studies do exist on this topic (e.g., Baldenweg-Bölle, 1997; Carnazzi, 2000; Gaillard et al., 2003; Balthasar et al., 2003), this current investigation contains a series of novel features not previously offered. Specifically, its use of data from an interesting new social-security module incorporated into the 2002 Swiss Labor

Force Survey (SLFS) enables inclusion of additional and informative explanatory variables, especially with regards to coverage in the three-pillar social security system. In addition, the new SLFS module allows analysis of a significant portion of early retirees who continue working to a limited extent. Finally, our study addresses the important issue of the extent to which the financial situation of older individuals influences their early retirement decisions, an aspect too often neglected in previous research.

The study is structured as follows: Section 2 gives an overview of previous empirical research in Switzerland. Section 3 provides an explanation of the dataset and methodology. Section 4 presents the results, and Section 5 concludes the paper.

2. Previous Research

Because of its increasing incidence in the 1990s, early retirement in Switzerland became a subject of growing interest for economists. While earlier contributions, e.g., Schmid (1994), focused on the discussion of other countries' experiences with early retirement and the possibility of an introduction of early retirement options in the Swiss old-age provision system, empirical research on retirement in Switzerland only began recently. The determinants of retirement have been analyzed in Baldenweg-Bölle (1997), Carnazzi (2000), and – within the governmental research program "future of old-age provision" – Gaillard et al. (2003) and Balthasar et al. (2003).[2] Baldenweg-Bölle (1997) analyzed data from three large pension funds that were provided by the Schweizerische Kreditanstalt (a large bank), Migros (a supermarket chain), and the Canton of Zurich (a public employer). Her study encompassed 2,369 observations of individuals who retired in the early 1990s; however, because of the different data sources, only a limited number of variables could be analyzed for the entire sample. An overview of the key results is presented in Table 1. In addition, despite the choice of pension funds from different economic sectors, the results are not representative for the Swiss population. Carnazzi (2000) was the first to analyze retirement based on Swiss Labor Force Survey (SLFS) data, although her longitudinal analysis of the 1991 to 1995 surveys was not restricted to retirement but extended more generally to people whose labor market status had, for whatever

2 In the framework of the same governmental program, Wanner et al. (2003) analyzed the transition to inactivity for older men only.

reason, changed from "active" to "non-active". The total sample included 323 observations of workers who had left the labor force between the ages of 55 and 85. Hence, no special attention was given to *early* retirement. The contribution by Gaillard et al. (2003), based on SLFS data from 1991 to 2000, is the first to have focused exclusively on the determinants of early retirement. Using a total of about 8,800 observations, the authors analyzed the probability of early retirement using both a cross-sectional analysis and a small panel analysis. A special feature of their study was the integration of information, drawn from the Swiss Health Survey (SHS), about a respondent's health status. However, in their models, health status did not prove a significant determinant of early retirement. Balthasar et al. (2003) analyzed a variety of retirement-related topics based on their own 2001 survey, which included 3,123 observations of individuals aged 61 to 73 (men) and 59 to 71 (women). The econometric analysis of the probability of early retirement was based on 788 individuals who had already reached the official retirement age. The use of a survey especially designed to meet the needs of their research allowed the authors to gather information not included in the SLFS up to that date. The only variable not provided by the SLFS that consistently proved a significant determinant of early retirement in the estimated models was "membership in a recreational organization". People who belong to such organizations take early retirement more frequently. Additional results are summarized in Table 1.

The results summarized in Table 1 show a rather heterogeneous picture; nevertheless, even though direct comparison is difficult because of different definitions and specifications of samples, variables, and models, some general observations can be made:

– As regards *socio-demographic variables*, age is significant and positively correlated with the probability of retiring early, as postulated by life-cycle models (see Mitchell and Fields, 1982; Burtless, 1986; Gustman and Steinmeier, 1986; Gustman and Steinmeier, 2000). Marital status has no apparent impact on the probability of early retirement; however, the labor-market activity status of the partner may have. For most other socio-demographic variables, results differ among the studies. With regard to gender particularly, the findings of Carnazzi (2000) and Balthasar et al. (2003) appear contradictory, yet the contradiction has a logical explanation: Carnazzi, who found that women retire at a lower age than men, did not account for the different legal retirement ages of women and men. In contrast, Balthasar et al., who found the number higher for men than women, examined the proportion of people who retire within six years of reaching the legal retirement age.

Table 1: Determinants of Retirement – Overview of Results of Selected Studies

	Promotes early retirement	No significant influence found	Hinders early retirement
Socio-demographic characteristics			
Age (high)	G		
Sex (female)	C		B
Marital status (married)		BB, C, G, B	
Partner's labor force status (active)			(G)
Household size (one person)		B	
Educational level (high)		G, B	(BB), C
Nationality (foreigner)	(BB)	C, B	(G)
Health status (bad health)	(B)	G	
Type of profession ("blue collar")	(BB)	C	G
Socio-economic characteristics			
Labor income (high)	BB	B	
Asset income (existing)			C
Potential pension income (high)		B	(BB)
Invalidity pension (is received)		C, B	
House owner status (owner)		C, G	
Employment characteristics			
Labor market status (unemployed)	C	B	
Type of employment (self-employed)		B	C, G
Hierarchical position (supervisor)	G, (B)		(BB), C
Work experience (high)	C		
Tenure (high)	C, (B)		
Part-time employment		C	
Working time regulation (flexible)	C		
Company size (small)			(B)
Economic sector (public sector)	C, G		
Other factors			
Leisure organization (active member)	B		
Regional unemployment rate (high)		B	C
Year (late 1990s)	G, B		

BB = Result of Baldenweg-Bölle, C = Result of Carnazzi, G = Result of Gaillard et al., B = Result of Balthasar et al.; brackets indicate that the determinant was not significant in all models.
Source: Results of econometric analysis by Baldenweg-Bölle (1997, pp. 244-255), Carnazzi (2000, p. 142), Gaillard et al. (2003, pp. 30, 33, 36, 40, 83, 85 – results refer to men only), Balthasar et al. (2003, pp. 114, 116).

– For the *socio-economic variables*, few significant results have been found. Of the two studies based on SLFS data, neither included a variable for labor income, most probably because the non-response rates for this variable are usually quite high in the SLFS (see Sousa-Poza and Henneberger, 2000). However, Carnazzi (2000) found a negative impact of asset income on the probability of early retirement that contradicts the life-cycle model.
– Some significant results were found for *employment-related variables*. Early retirement seems to be rare among self-employed workers but frequent for employees of the public sector. The effect of having a supervisory position, although significant in all studies, is contradictory: both negative and positive correlations have been obtained.

3. Data and Methods

The data for the empirical analysis in this current study are taken from the 2002 SLFS.[3] The SLFS, a representative survey of the labor force structure and characteristics in Switzerland, has been collected annually by the Swiss Federal Statistical Office since 1991. Households to be contacted are selected by random drawing from the Swiss telephone register. The selected households are then contacted by phone, and an inventory is made of all people living in the household. One household member who is at least 15 years old is then randomly chosen as the target respondent for each household and interviewed in detail.

In comparison to former surveys, the SLFS 2002 contains two novel features that make it especially suitable for the study of early retirement.

– In 2002, the questionnaire was supplemented with a special social-security module containing various questions that directly address the topics of old-age provision and early retirement. For the first time, all respondents aged 55 to 70 years were asked whether they had retired early. This inclusion allows us to identify not only those who have retired and completely withdrawn from the workforce but also those who have kept working to some extent after early retirement. As has been shown by Singh and Verma (2003) for a sample of Canadian workers, this group is potentially large.
– The second improvement in the SLFS 2002 was more general: the sample size was greatly expanded. A total of 41,353 individuals were interviewed instead

3 An elaborate discussion of the SLFS methodology is given in Swiss Federal Statistical Office (2003b) and Swiss Federal Statistical Office (1996).

of the approximately 17,000 individuals of earlier years. The number of observations has thus more than doubled. Thus, while most previous studies on (early) retirement have been forced to pool observations over many years in order to reach a reasonable sample size, this current study is able to analyze the determinants of early retirement based solely on recent data, i.e., based on the early retirements that took place in 2001 and the spring of 2002.[4]

To take full advantage of the 2002 SLFS features outlined above, this study will conduct a cross-sectional rather than a panel analysis. The SLFS data would theoretically allow for a panel analysis but, because of the massive expansion of the 2002 sample size, only about one third of all SLFS 2002 respondents have been interviewed previously.[5] Thus, the use of a panel would substantially reduce the number of observations. Moreover, the important questions in the special SLFS module on social security are only available for the 2002 SLFS and hence of limited applicability in a panel.

The term "retirement" can have various meanings; however, the OECD (1995) distinguishes between three broad definitions of retirement:

– being a recipient of a public or private old-age pension, regardless of the current employment status;
– being out of the labor force, regardless of the reason for ceasing work and no matter whether an old-age pension is being drawn; or
– having a self-described status of retired, regardless of employment status and receipt of a pension.

These definitions of retirement can easily be transformed into definitions of early retirement if the retirement takes place prior to the individual reaching the legally defined retirement age.

In empirical research, the definition of retirement has often been dictated by the available data. In an overview of the (American) literature on retirement, Hurd (1990) not only identified the definitions "permanent departure from the labor force" and "self-assessed retirement" but also "leaving a firm" and "sudden and discontinuous drop in hours of work".

4 We will henceforth refer to this sixteen-month period as "2001/02". The interviews for the SLFS 2002 took place in late April and early May of 2002.

5 In the rotating panel of the SLFS, a household is interviewed over a period of five years, with 20% of the previously included households being replaced by new households each year.

Previous analyses based on SLFS data, e.g., the contributions by Gaillard et al. (2003) or the Swiss Federal Statistical Office (2000), have defined early retirement as follows:

(1) being out of the labor force,
(2) stating retirement as the reason for being out of the labor force,
(3) having been working previously, and
(4) belonging to a certain (older) age group.

Conditions (1) and (2), which combine the latter two of the aforementioned OECD (1995) retirement concepts, have been largely predetermined by the available data. A set of classifying questions at the beginning of the SLFS questionnaire groups the respondents according to their labor force status. In SLFS waves prior to 2002, only those who were not working could – as one of several reasons for not working – assess themselves as having retired early. Therefore, the numerically important phenomenon of retirees who still work to a limited extent (maybe only a few hours a week) was neglected.[6]

For the new social-security module of the SLFS 2002, however, *all* respondents aged 55 to 70 years were asked whether or not they had retired early. Therefore, we do not need to mix several OECD (1995) retirement concepts because retirement can be defined according to the third concept alone, i.e., as a self-declaration of people describing their own status, regardless of employment status and receipt of a pension. Based on this definition, it is also possible to identify working early retirees.

The exact wording of the SLFS 2002 question on early retirement was *"Have you gone or been sent into early retirement?"* For people who had reported earlier in the survey that they were working, the question was especially introduced by the phrase *"Today, there are many people who have gone or been sent into early retirement and who nonetheless have started to work again. Therefore, I ask you: […]"*.

6 In accordance with the recommendations by the International Labor Organization (ILO) and the Organization for Economic Co-operation and Development (OECD), the SLFS defines economically active persons as individuals who have undertaken paid work for at least one hour during the week preceding the survey, either as an employee or in a self-employed position. (The definition also includes (a) contributory family members who did work in a family business during the reference week, and (b) persons who maintain a formal employment relationship with an employer, but who did not work during the reference week because of illness or holidays.) Any person who does paid work for at least one hour a week is therefore considered as belonging to the active labor force.

This formulation shows a clear intention of the Swiss Federal Statistical Office to identify early retirees that still work.

The requirement that people must have been economically active in the past follows from the concept that (early) retirement is a status that follows work (see OECD, 1995). Therefore, our empirical analysis will solely consider individuals who were working at some point within the four years preceding the survey. This condition will ensure that the early retirees are only compared to non-retired individuals who *could* potentially have gone into early retirement. Thus, the sample excludes individuals who have not been employed for a longer period of time (e.g., homemakers) but includes people who drew unemployment benefits for the maximum period of two years after their last employment.

As regards age restriction, the upper limit is clearly defined by the legal retirement age. Even though, as discussed earlier, *retirement* can be defined in different ways, there is broad consensus that *early* retirement is retirement prior to reaching the legal retirement age (see, for instance, OECD, 1995). Furthermore, early retirement is an issue that only concerns older individuals, suggesting that younger people should be excluded from the analysis. Through its design of the SLFS 2002, the Swiss Federal Statistical Office implicitly suggests that the issue of early retirement in Switzerland becomes relevant beginning at the age of 55, because the questions referring to early retirement were only posed to individuals of at least that age. Therefore, our analysis will be limited to women aged 55 to 63 and men aged 57 to 65 at the time of the survey, which defines a range of 9 years for both women and men. One final condition for inclusion in the analytical sample is that the individual must not have retired previous to 2001.

A summary of the definitions of the early retirement variable is given in Table 2. Of the 3,724 observations included in the sample, 297 (or 8%) refer to respondents who assessed themselves as having retired early in 2001/02.

To analyze the determinants of early retirement, we will estimate logit models in which the dependent variable is defined as in Table 2. The logit specification assumes a logistic distribution of the dependent variable (early retirement). This assumption could be problematic for estimates that rely heavily on the tails of the distribution, which is the case here because relatively few persons in the sample retired early. As a check for robustness of our results, we re-estimated our basic equation (Table 8) using a probit model. The probit model assumes normality which has very different tails than the logistic distribution. However, the results were almost identical to those obtained with the logit model.[7]

7 Such a robustness check has been previously used by Kahn and Lang (1992).

Table 2: Definition of the Explained Variable "Early Retirement in 2001/02"

Variable: Early retirement in 2001/02	
Defined for N = 3,724	Observations of women aged 55 to 63 and men aged 57 to 65 at the time of the survey who have been working at some point in time within the four years preceding the survey and who have not retired early before 2001
Assumes value	1, if the respondent was retired early in 2001/02 0, if the respondent was not retired early in 2001/02

For the multivariate regressions, a variety of explanatory variables will also be used that represent socio-demographic, professional, socio-economic, and employment-related respondent characteristics. The descriptive statistics will include all the subsequently presented variables; however, the multivariate regressions will use only those variables that contain information about a respondent's situation prior to early retirement. They can therefore be interpreted as determinants, or triggers, of an early retirement decision.

On the one hand, this interpretation applies to the socio-demographic and professional characteristics, which describe the situation before retirement quite accurately because (a) they can be assumed to have been stable over a short period of time and (b) they are not directly affected by retirement. On the other hand, some important employment-related variables will be used that refer – in the case of early retirees who are no longer economically active – to a respondent's job prior to retirement.

Those early retirees who continue working after retirement were interviewed about their current rather than their former employment. Thus, even though the variables referring to their employment will not be used in the multivariate regressions, special attention will be given to post-retirement jobs in the descriptive statistics.

With regard to socio-economic variables, the special 2002 SLFS social-security module contains interesting information about the respondents' situations *after* retirement. These data on old-age pensions and the respondents' perception of their economic situation will also be discussed below.

At the same time, information referring to income *before* retirement is scarce. Unfortunately, the retired respondents were not asked about their labor income prior to retirement. However, even in previous research based on longitudinal data in which this information was available, financial factors have rarely been

analyzed. This omission is most probably due to the relatively low response rates for questions referring to income (see Sousa-Poza and Henneberger, 2000). Nonetheless, it is unfortunate because income is an important determinant of the retirement decision.

In this study, imputed wage rates were estimated by computing an extended human-capital wage function. This wage will be used as an explanatory variable in the regressions. The wage function was calculated based on the observations referring to non-retired individuals for whom both labor income data and human capital indicators (education, experience), as well as other characteristics supposedly correlated to income, are available.[8] In an ordinary least squares (OLS) regression, annual labor income is explained by gender, education, profession, economic sector, hierarchical position, working time, tenure, and work experience.

Life-cycle models suggest that the timing of retirement is influenced by a worker's wealth. This aspect will also be taken into consideration by a dummy variable that captures whether a respondent has an annual asset income in excess of 1,000 CHF.

An overview of the explanatory variables is given in Table A1 in the appendix.

4. Determinants of Early Retirement in Switzerland

4.1. Descriptive Statistics

The SLFS 2002 sample includes 3,724 women aged 55–63 and men aged 57–65 who, according to the definition above, were possible candidates for early retirement in 2001/02. Of these, 297 persons (8%) went into early retirement in 2001/02. According to a weighted extrapolation of the SLFS data, these observations represent approximately 36,000 individuals from a population of about 460,000 older workers.

Table 3 classifies the early retirees and their not-retired peers according to socio-demographic and professional characteristics. More than 60% of all the early retirees are men. The civil status does not seem to influence the retirement

8 Labor income data are available for three out of four people who had not retired (i.e., for whom the variable "early retired in 2001/02" assumes the value 0) but for none of the early retired. It is assumed that the persons whose labor income is known are representative of the entire sample.

decision; however, the partner's labor-force status does. Older people living with a partner have a higher probability of remaining employed if the partner also works, and they also retire more frequently if the partner is no longer active in the labor market. As regards regional and nationality differences, there is only a slight and insignificant tendency for early retirement to be more common in the German-speaking region of Switzerland and among Swiss nationals.[9] One interesting result with regard to educational level is that, contrary to the findings of some studies reviewed in section 2, the probability of early retirement does not appear to increase linearly with the level of education. However, individuals with a low educational level are least likely to go into early retirement. Not surprisingly, early retirement becomes more probable as an individual approaches the legal retirement age. With regard to professions, the results suggest that early retirement is more common for white-collar workers than for blue-collar workers: managers, academic professionals, and technicians are well represented among the early retired; whereas service and sales people, craftsmen, and especially farmers go into early retirement less frequently.

The employment characteristics are presented in Table 4. For individuals who retired early, the information refers to the last job before retirement. One interesting finding is that individuals who were unemployed at some point within the 10 years preceding the survey are less likely to go into early retirement than those who were never unemployed. As spells of unemployment have a negative effect on an individual's private and occupational old-age pension, this result comes as no surprise. However, it does suggest that, in Switzerland, a transition from unemployment to early retirement is not very frequent. Self-employed workers rarely go into early retirement. Of the early retirees, only 2% had been self-employed compared to 15.7% in the reference group. One explanation for this large difference is that coverage by a pension fund is not compulsory for self-employed workers. Similar considerations apply for part-time employees who often earn less than the co-ordination deduction[10]. Employees in supervisory positions account for 40% of early retirees but only 28% of those who had not yet retired. This finding underscores the fact that early retirement is relatively frequent among managers and other professionals.

9 It is possible that some foreigners return to their country of origin after retiring, hence an underestimation of the proportion of early retired foreigners is likely.

10 The co-ordination deduction is a threshold of annual labor income (currently 25,320 CHF) above which an employer must insure its employees in an occupational pension fund.

Table 3: Descriptive Statistics of Socio-demographic and Professional Characteristics

	Early retired		Not early retired		ANOVA	Signifi-
	N[(a)]	Mean	N[(a)]	Mean	Prob.[(b)]	cance[(c)]
Sample size	297		3427			
Extrapolation	36,263		426,582			
Socio-demographic characteristics						
Male	297	0.606	3427	0.458	0.000	++
Married	297	0.653	3427	0.631	0.444	0
Lives with labor-force active partner	297	0.249	3427	0.387	0.000	- -
Lives with non-active partner	297	0.394	3427	0.224	0.000	++
German-speaking region	297	0.721	3427	0.676	0.118	0
Foreigner	297	0.128	3427	0.162	0.125	0
Low educational level	294	0.129	3420	0.232	0.000	- -
Intermediate education	294	0.633	3420	0.552	0.008	++
High education	294	0.238	3420	0.216	0.387	0
Years until legal retirement age (in years)	297	3.111	3427	5.212	0.000	- -
Professions						
Managers and legislators	295	0.105	3415	0.075	0.066	0
Academic professionals	295	0.193	3415	0.152	0.061	0
Technicians and associated professions	295	0.248	3415	0.194	0.026	+
Clerks	295	0.166	3415	0.158	0.719	0
Service and sales people	295	0.092	3415	0.139	0.021	-
Skilled agricultural workers	295	0.010	3415	0.042	0.008	- -
Craftsmen	295	0.095	3415	0.132	0.072	0
Machine operators and assemblers	295	0.051	3415	0.047	0.756	0
Workers in elementary occupations	295	0.041	3415	0.062	0.143	0

All variables are dummies if not otherwise indicated in brackets.
(a) number of observations for which the necessary information exists.
(b) probability that mean value of variable is equal for both groups.
(c) +/++ positive difference significant at the 5%/1% level;
- /- - negative difference significant at the 5%/1% level.

Table 4: Descriptive Statistics of Employment Characteristics before Early Retirement

	Early retired, not working		Not early retired		ANOVA	Signifi-
	N[(a)]	Mean	N[(a)]	Mean	Prob.[(b)]	cance
Number of observations	201		3427			
Employment-related characteristics						
Part-time job	107	0.271	3270	0.394	0.010	-
Employment rate (in % of full-time equivalency)	107	85.8	3164	81.2	0.095	0
Temporary job	98	0.031	2453	0.051	0.374	0
Working on call	95	0.021	2446	0.059	0.123	0
Self-employed	200	0.020	3427	0.157	0.000	- -
Employee in a supervisory position	130	0.400	3368	0.280	0.003	++
Unemployed within last 10 years	201	0.065	3422	0.131	0.006	- -
Work experience (in years)	131	38.1	3332	29.9	0.000	++
Tenure						
Tenure (in years)	107	25.7	3282	18.7	0.000	++
Tenure of less than 10 years	107	0.122	3282	0.298	0.000	- -
Tenure between 10 and 20 years	107	0.196	3282	0.261	0.130	0
Tenure of more than 20 years	107	0.682	3282	0.440	0.000	++
Company size						
Up to 10 employees	102	0.255	3141	0.403	0.003	- -
11 to 100 employees	102	0.265	3141	0.322	0.221	0
More than 100 employees	102	0.480	3141	0.275	0.000	++
Sector of economic activity						
Agriculture	126	0.008	3346	0.042	0.057	0
Manufacturing	126	0.135	3346	0.164	0.380	0
Energy and water supply	126	0.032	3346	0.008	0.003	++
Construction	126	0.024	3346	0.053	0.151	0
Wholesale and retail trade	126	0.159	3346	0.172	0.689	0
Hotels and restaurants	126	0.016	3346	0.025	0.513	0
Transport and communication	126	0.064	3346	0.042	0.230	0
Financial sector	126	0.103	3346	0.043	0.002	++
Real estate, renting, business activities	126	0.087	3346	0.098	0.683	0
Public administration	126	0.111	3346	0.060	0.019	+
Education	126	0.087	3346	0.076	0.637	0
Health and social work	126	0.079	3346	0.132	0.084	0
Other activities	126	0.095	3346	0.085	0.683	0

All variables are dummies if not otherwise indicated in brackets.
(a) number of observations for which the necessary information exists.
(b) probability that mean value of variable is equal for both groups.
(c) +/++ positive difference significant at the 5%/1% level;
- /- - negative difference significant at the 5%/1% level.

Early retirees had an average tenure of more than 25 years in their last job, seven years more than individuals in the reference group. The work experience of the two groups is 38 and 30 years, respectively. These differences can be partly attributed to the fact that the early retirees are already two years closer to the standard retirement age. Moreover, employees with longer tenure and work experience have higher salaries and better pension-fund coverage, which can facilitate early retirement. The size of a company is also positively related to the probability of early retirement. Whereas almost half of all early retirees had been employed by companies with more than 100 employees, only slightly more than a quarter of the non-retired individuals were working for companies of a similar size. Large companies often have their own pension funds and thus the possibility to promote early retirement by means of pension fund regulations. Individuals employed in the banking and insurance sector, energy and water supply sector, or in public administration are more likely to go into early retirement. A smaller probability of early retirement is encountered in agriculture and in the health-care sector.

The special 2002 SLFS module on social security makes available detailed information on the income situation of early retirees (see Table 5). The average annual household income of the early retirees was about 110,000 CHF. Categorized into income groups, 41% of early retirees lived in households with an income below 75,000 CHF, and for another 45%, the household income was between 75,000 and 150,000 CHF. The financial status of the early retirees is quite similar to that of individuals who had not retired early, which is surprising given that the latter group would still be receiving a normal labor income. The fact that almost two-thirds of the retired persons reported a decrease in total income after retirement gives rise to the assumption that many of them had a high income prior to retirement. Such a favorable economic situation is also reflected in the higher probability among retirees of having asset income. A total of 42% of the retirees had an annual asset income in excess of 1,000 CHF, in contrast to only 29% of those who had not yet retired. Moreover, the early retirees felt less financially restricted than their non-retired peers. This effect is especially pronounced with regard to expenditures for vacations, and can (although at lower significance levels) also be observed for other "luxury" expenses.

In total, 89% of the early retired persons were receiving some kind of old-age benefit. The sources of this income were, however, unequally distributed over the three pillars of the Swiss old-age provision system. The importance of an early claim on a public old-age pension is limited. Only one third of the early retirees went into retirement at an age at which such an early claim would be possible, i.e., at age 62 for women and 63 or 64 for men. Additionally, of these individuals, less than half actually used the option of an early claim. A more important source

Table 5: Descriptive Statistics of Socio-economic Characteristics

	Early retired		Not early retired		ANOVA	Signifi-
	N[(a)]	Mean	N[(a)]	Mean	Prob.[(b)]	cance[(c)]
Number of observations	297		3427			
Income						
Annual household income						
Total amount (in K CHF)	93	109.4	1260	134.9	0.362	0
Less than 75K CHF	93	0.409	1260	0.385	0.651	0
Between 75K and 150K CHF	93	0.452	1260	0.443	0.870	0
More than 150K CHF	93	0.140	1260	0.172	0.422	0
Annual asset income > 1,000 CHF	286	0.416	3283	0.287	0.000	++
Old-age provision						
Insured by a pension fund			2797	0.788		
Contributes to 3rd pillar			2996	0.558		
Old-age income						
Early drawing of public old-age pension	96	0.427				
Any form of 2nd pillar benefit	297	0.818				
Pension fund pension	294	0.575				
Amount of pension (in CHF/month)	169	3340.0				
Bridge pension	268	0.515		*Variables refer to retired persons only*		
Amount of bridge pensions (in CHF/month)	138	1676.9				
One-time pension fund payment	291	0.230				
Any form of 3rd pillar benefit	293	0.218				
3rd pillar pension	237	0.038				
One-time 3rd pillar payment	291	0.189				
Any of the above old-age benefits	297	0.892				
Income situation after retirement						
Better than before retirement	289	0.062				
The same as before retirement	289	0.294		*Variables refer to retired persons only*		
Worse than before retirement	289	0.644				
Perceived financial restrictions						
Consumption goods	275	0.120	3275	0.157	0.106	0
Food	292	0.017	3396	0.023	0.500	0

	Early retired		Not early retired		ANOVA	Signifi-
	N[(a)]	Mean	N[(a)]	Mean	Prob.[(b)]	cance[(c)]
Clothing	291	0.052	3368	0.067	0.322	0
Leisure, hobbies	289	0.038	3311	0.061	0.109	0
Vacation, trips	287	0.063	3312	0.119	0.004	- -
Inviting guests	290	0.031	3337	0.032	0.968	0
Going out	279	0.054	3252	0.087	0.053	0
Medical treatment, dentist	292	0.041	3360	0.050	0.514	0
Continuing education	258	0.054	2979	0.053	0.951	0

All variables are dummies if not otherwise indicated in brackets.
(a) number of observations for which the necessary information exists.
(b) probability that mean value of variable is equal for both groups.
(c) +/++ positive difference significant at the 5%/1% level;
- /- - negative difference significant at the 5%/1% level.

of income was occupational benefit plans. A total of 82% of the early retirees were receiving either a regular pension, additional pension income until the legal retirement age (a "bridge pension"), a one-time pension fund payment, or a combination of the above. The average monthly payment amounted to 3,340 CHF for a regular pension and to half that sum for a bridge pension. The latter does, according to the pension fund case studies by Hammer et al. (2003), usually replace income from public old-age insurance until a public pension can be drawn. About 22% of the retirees were also receiving payments out of a special third-pillar account, which is subject to favorable taxation regulations.

The fact that pension-fund income is very important for early retirees suggests that people who do not retire early often lack coverage by a pension fund. This hypothesis, however, is not supported by the data. Of the people who were not retired, 79% were paying regular contributions to an occupational benefits plan. This proportion is nearly equal to that of the early retirees who were receiving pension fund benefits. Of course, it is possible that the people who were not retired had been, on average, offered less attractive early retirement conditions by their pension funds. As regards the third pillar, individuals who had not retired also enjoyed relatively good coverage: more than half of them were paying regular contributions into a third-pillar account. This proportion is clearly higher than the 21.8% of the early retirees who were already receiving payments from such an account.

As discussed above, the 2002 SLFS social-security module allows us to identify those individuals who assess themselves as early retired but who keep working to

some limited extent. This group is of notable size: 31% of those who retired in 2001/02 were still active in the spring of 2002.[11] In their analysis of a large Canadian telecommunications firm, Singh and Verma (2003) have shown that 40% of early retirees return to work, most taking part-time employment or becoming self-employed. Table 6 compares socio-demographic and selected socio-economic characteristics of the working retirees to those of the early retirees who had ceased working. Table 7 compares the jobs of the working retirees with the jobs of their non-retired peers.

With regard to the socio-demographic characteristics, few significant differences emerged between the working early retirees and their non-working peers. The most notable exception is the labor force status of the partner. As suggested earlier, people tend to align their status to that of their partner. Therefore, people whose partner is still economically active go into early retirement relatively rarely, and if they do, they often keep working after retirement. The contrary applies to individuals with a non-active partner, who retire more often and continue working less frequently after retirement. The relatively low proportion of people with a low level of education among the working retirees seems somewhat counterintuitive. It is plausible that these persons might not be very affluent and would therefore benefit from additional labor income after retirement. However, many of them may have gone into early retirement for reasons that prevent them from continuing work, such as incapacity or illnesses. As regards socio-economic factors, the working early retirees had a higher household income than those who had ceased working. This finding is not surprising since the former group still had a labor income. In consequence, fewer working retirees reported that their financial situation had worsened since retirement. However, even when the average labor income of the working early retirees, as given in Table 7, is subtracted from household income, the latter is still slightly higher, as in case of the non-working retirees. This observation suggests that people who continue working after early retirement do not necessarily do so for financial reasons. This interpretation is supported by the fact that few differences exist between the two groups with regard to other sources of income like old-age benefits and asset income. As expected, people who keep working after early retirement usually do so to a reduced extent. Three-quarters of the working early retirees surveyed had a part-time job of less than 50% full-time equivalency. More than one-fifth held a temporary job, and the same fraction worked on an on-call basis. These proportions are four times higher than in the reference group.

11 In total, 67.7% of the early retirees assessed themselves as not working, 31.0% as working, and 1.7% as unemployed.

Table 6: Comparison of Working and Non-working Early Retired People

Early retired	working		not working		ANOVA	Signifi-
	N[(a)]	Mean	N[(a)]	Mean	Prob.[(b)]	cance[(c)]
Number of observations	92		201			
Socio-demographic characteristics						
Male	92	0.565	201	0.617	0.403	0
Married	92	0.598	201	0.677	0.190	0
Lives with labor-force active partner	92	0.348	201	0.204	0.008	++
Lives with non-active partner	92	0.228	201	0.468	0.000	- -
German-speaking region	92	0.794	201	0.702	0.100	0
Foreigner	92	0.098	201	0.144	0.274	0
Low educational level	89	0.079	201	0.154	0.079	(-)
Intermediate educational level	89	0.640	201	0.627	0.826	0
High educational level	89	0.281	201	0.219	0.254	0
Years until legal retirement age (in years)	92	3.283	201	2.990	0.308	0
Socio-economic characteristics						
Annual household income (in KCHF)	35	146.1	59	85.7	0.055	(+)
Annual asset income > 1,000 CHF	86	0.454	196	0.403	0.431	0
Early drawing of public old-age pension	33	0.485	62	0.403	0.450	0
Any form of 2nd pillar benefit	92	0.761	201	0.846	0.080	(-)
Any form of 3rd pillar benefit	90	0.167	199	0.246	0.132	0
Any of the above old-age benefits	92	0.891	201	0.896	0.914	0
Income situation after retirement						
Better than before retirement	86	0.105	199	0.045	0.059	(+)
The same as before retirement	86	0.337	199	0.281	0.346	0
Worse than before retirement	86	0.558	199	0.673	0.063	(-)

All variables are dummies if not otherwise indicated in brackets.
(a) number of observations for which the necessary information exists.
(b) probability that mean value of variable is equal for both groups.
(c) (+)/+/++ positive difference significant at the 10%/5%/1% level;
(-)/-/- - negative difference significant at the 10%/5%/1% level.

Table 7: Descriptive Statistics of Employment Characteristics after Early Retirement

Early retired, working	N[a]	Mean	Not early retired N[a]	Mean	ANOVA Prob.[b]	Significance[c]
Number of observations	201		3427			
Employment-related characteristics						
Annual labor income						
Total amount (in K CHF)	73	54.1	2574	71.0	0.009	- -
Less than 50K CHF	73	0.575	2574	0.382	0.001	++
Between 50K and 100K CHF	73	0.247	2574	0.417	0.004	- -
More than 100K CHF	73	0.178	2574	0.202	0.615	0
Part-time job	91	0.747	3270	0.394	0.000	++
Employment rate (in % of full-time equivalency)	85	47.6	3164	81.2	0.000	- -
Temporary job	66	0.227	2453	0.051	0.000	++
Working on call	65	0.215	2446	0.059	0.000	++
Self-employed	92	0.196	3427	0.157	0.320	0
Employee in a supervisory position	92	0.217	3368	0.279	0.192	0
Unemployed within last 10 years	92	0.076	3422	0.131	0.124	0
Work experience (in years)	90	34.8	3332	29.9	0.002	++
Tenure						
Tenure (in years)	92	17.6	3282	18.7	0.394	0
Tenure of less than 10 years	92	0.391	3282	0.298	0.055	0
Tenure between 10 and 20 years	92	0.217	3282	0.261	0.343	0
Tenure of more than 20 years	92	0.391	3282	0.440	0.351	0
Company size						
Up to 10 employees	88	0.477	3141	0.403	0.160	0
11 to 100 employees	88	0.250	3141	0.322	0.152	0
More than 100 employees	88	0.272	3141	0.275	0.961	0
Sector of economic activity						
Agriculture	92	0.022	3346	0.042	0.334	0
Manufacturing	92	0.098	3346	0.164	0.088	0
Energy and water supply	92	0.011	3346	0.008	0.711	0
Construction	92	0.022	3346	0.053	0.188	0
Wholesale and retail trade	92	0.196	3346	0.172	0.562	0
Hotels and restaurants	92	0.011	3346	0.025	0.386	0
Transport and communication	92	0.087	3346	0.042	0.034	+
Financial sector	92	0.087	3346	0.043	0.045	+

Early retired, working	N[(a)]	Mean	Not early retired N[(a)]	Mean	ANOVA Prob.[(b)]	Significance[(c)]
Real estate, renting, business activities	92	0.087	3346	0.098	0.718	0
Public administration	92	0.044	3346	0.060	0.514	0
Education	92	0.130	3346	0.076	0.054	0
Health and social work	92	0.076	3346	0.132	0.116	0
Other activities	92	0.130	3346	0.085	0.124	0

All variables are dummies if not otherwise indicated in brackets.
(a) number of observations for which the necessary information exists.
(b) probability that mean value of variable is equal for both groups.
(c) +/++ positive difference significant at the 5%/1% level;
- /- - negative difference significant at the 5%/1% level.

As a consequence of the reduced employment, the labor income of the working early retirees was significantly lower than that of the people who were not retired. More than half of the working retirees were earning less than 50,000 CHF a year. However, if their reduced work time is taken into account, these wages are quite high. Whereas their work time was more than 40% lower than that of the reference group, the difference in labor income was less than 25%.

The results for tenure indicate that many early retirees still work for their former employer. Given that retirees who had changed employer after an early retirement in 2001/02 had no more than one year of tenure with a new employer at the time of the 2002 survey, the average tenure of 17.6 years in their present jobs for all working early retirees implies that many workers were still with the same employer. Assuming that the working retirees had a tenure of about 25 years at the time of early retirement,[12] it can be concluded that roughly two-thirds of all working retirees had not changed employer. Thus, their employers appear to support a more gradual transition into retirement. It is, for instance, conceivable that some of the early retirees work for their former employer on a mandate basis.

Both working retirees and their non-retired peers worked in companies of similar size. As regards their sector of economic activity, financial (i.e., banking and insurances), transport and communications, and education are the sectors with the higher proportions of working early retired. However, given that these

12 According to Table 4, the early retirees who had not continued working had a tenure of about 25 years in their last job before retirement.

sectors all have relatively high frequencies of early retirement to begin with, it is therefore not surprising that the working retirees seem to be concentrated in these areas of activity. A somewhat smaller incidence of working early retired is found in manufacturing.

4.2. Regression Analysis

The results of the binary logit model are presented in Table 8. They confirm that men are more likely to go into early retirement than women. The odds ratio of 1.484 indicates that the odds of retiring early are 48.4% higher for men.[13] The partner's labor market activity status has the expected influence on the early retirement decision. People with a non-active partner retire more frequently than those who do not live with a partner, while having a partner who is still economically active reduces the probability of early retirement. Individuals with a low level of education go into early retirement less frequently than those with an intermediate level, who constitute the reference group. However, between persons having high and intermediate levels of education, there is hardly any difference. While those with low education levels might face difficult financial situations that prevent early retirement, those with higher education are less likely to face such a constraint. Nonetheless, for those with the highest level of education, this effect might be offset by the prospect of a large additional income from staying in the workforce, and probably by a higher preference for work relative to leisure.

In accordance with the predictions of the life-cycle model, the further away a person is from the legal retirement, the greater the decrease in the probability of an early retirement. Neither nationality nor region of residence appears to have a significant influence on early retirement.

The basic model was first extended by the inclusion of a set of dummy variables referring to profession. The results in Table 9 reveal a pronounced difference between white-collar and blue-collar workers. Those in white-collar professions, like managers, scientists, and technicians, have a probability of early retirement similar to that of clerks. However, for farmers, craftsmen, plant workers, and people in elementary jobs (blue-collar workers), early retirement is less frequent than for clerks. The same applies for service and sales persons. The differences

13 We also analyzed the determinants of early retirement for men and women separately (not shown here). The results of these regressions largely coincide with those obtained for the entire sample. Furthermore, an advantage of the regressions based on the entire sample is that they provide us with sufficient observations to conduct a more robust analysis.

Table 8: Socio-demographic Determinants of Early Retirement

	Coefficient	S.E.	Odds ratio
Constant	–1.541**	(0.189)	0.214
Socio-demographic characteristics			
Years until legal retirement age (in years)	–0.274**	(0.024)	0.760
Male	0.395**	(0.136)	1.484
Lives with labor-force active partner	–0.289	(0.164)	0.749
Lives with non-active partner	0.367*	(0.153)	1.443
German-speaking region	0.196	(0.142)	1.216
Foreigner	–0.243	(0.188)	0.785
Low educational level	–0.670**	(0.191)	0.512
High educational level	0.035	(0.153)	1.036
Number of observations	3714		
Log likelihood	–920.23		
McFadden pseudo-R^2	0.105		

All variables are dummies if not otherwise indicated in brackets.
*/** denotes significance at the 5%/1% level.

are, however, only statistically significant for farmers, craftsmen, and service and sales persons. The distinction between white-collar and blue-collar professions has a noteworthy economic background. According to the Swiss Federal Statistical Office (2003b), there is a considerable income gap between the two groups. For workers between the ages of 55 and 64, the median annual wage is 73,500 CHF for clerks and between 92,700 and 123,000 CHF in other white-collar professions. Blue-collar workers, however, only earn between 63,900 and 70,500 CHF. The results reported in Table 9 hence support the hypothesis that early retirement is more prevalent among people with higher incomes.

A second extension to the model incorporated information about the type of employment (self-employment, employment in a supervisory position) and the sector of economic activity of the employing company. To ensure comparability with earlier studies, the public sector was chosen as the reference group. A further variable denotes whether a person has been unemployed within the last ten years. The results are presented in Table 10.

Of the three variables referring to general employment-related characteristics, self-employment has the strongest impact on early retirement. Self-employed workers rarely retire early, which, as already mentioned, can be explained by the

Table 9: Socio-demographic and Professional Determinants of Early Retirement

	Coefficient	S.E.	Odds ratio
Constant	–1.329**	(0.225)	0.265
Socio-demographic characteristics			
Years until legal retirement age (in years)	–0.290**	(0.025)	0.748
Male	0.540**	(0.151)	1.715
Lives with labor-force active partner	–0.278	(0.166)	0.758
Lives with non-active partner	0.354*	(0.155)	1.425
German-speaking region	0.214	(0.144)	1.238
Foreigner	–0.199	(0.193)	0.819
Low educational level	–0.435*	(0.201)	0.647
High educational level	–0.250	(0.179)	0.778
Professions			
Managers and legislators	0.024	(0.263)	1.025
Academic professionals	0.092	(0.246)	1.096
Technicians and associated professions	0.060	(0.209)	1.062
Clerks	Reference		
Service and sales people	–0.575*	(0.259)	0.563
Skilled agricultural workers	–1.979**	(0.617)	0.138
Craftsmen	–0.867**	(0.270)	0.420
Machine operators and assemblers	–0.339	(0.334)	0.712
Workers in elementary occupations	–0.590	(0.350)	0.555
Number of observations	3700		
Log likelihood	–897.17		
McFadden pseudo-R^2	0.122		

All variables are dummies if not otherwise indicated in brackets.
*/** denotes significance at the 5%/1% level.

fact that self-employed workers are exempt from the obligation of being insured by a pension fund. Furthermore, self-employment may allow for a more gradual transition into retirement. Finally, some possible reasons for early retirement, such as an attractive offer by the employer, do not apply for self-employed workers.

One noteworthy finding is that workers who experienced a period of unemployment during the decade preceding the survey were significantly less likely to go into early retirement than those who had not been unemployed. As discussed above, this finding is evidence against a massive transition from unemployment

Table 10: Socio-demographic and Employment-related Determinants of Early Retirement (I)

	Coefficient	S.E.	Odds ratio
Constant	–1.358**	(0.395)	0.250
Socio-demographic characteristics			
Years until legal retirement age (in years)	–0.354**	(0.039)	0.702
Male	0.471*	(0.225)	1.601
Lives with labor-force active partner	–0.575*	(0.280)	0.562
Lives with non-active partner	0.394	(0.224)	1.483
German-speaking region	0.010	(0.211)	1.010
Foreigner	0.203	(0.263)	1.225
Low educational level	–0.419	(0.271)	0.657
High educational level	0.760	(0.254)	0.925
Employment-related characteristics			
Self-employed	–2.150**	(0.606)	0.116
Employee in supervisory position	0.141	(0.206)	1.152
Unemployed within last 10 years	–1.315**	(0.472)	0.268
Sectors of economic activity			
Agriculture	–1.669	(1.067)	0.188
Manufacturing	–0.846*	(0.394)	0.429
Energy and water supply	0.933	(0.656)	2.542
Construction	–1.340*	(0.672)	0.262
Wholesale and retail trade	–0.502	(0.379)	0.605
Hotels and restaurants	–0.783	(0.792)	0.457
Transport and communication	0.007	(0.483)	1.007
Financial sector	0.558	(0.428)	1.747
Real estate, renting, business activities	–0.412	(0.435)	0.662
Public administration	Reference		
Education	–0.138	(0.447)	0.872
Health and social work	–0.720	(0.444)	0.487
Other activities	–0.270	(0.427)	0.764
Number of observations	3460		
Log likelihood	–442.63		
McFadden pseudo-R^2	0.182		

All variables are dummies if not otherwise indicated in brackets.
*/** denotes significance at the 5%/1% level.

Table 11: Socio-demographic and Employment-related Determinants of Early Retirement (II)

	Coefficient	S.E.	Odds ratio
Constant	–3.179**	(0.626)	0.042
Socio-demographic characteristics			
Years until legal retirement age (in years)	–0.304**	(0.046)	0.738
Male	–0.231	(0.285)	0.793
Lives with labor-force active partner	–0.650*	(0.319)	0.522
Lives with non-active partner	0.365	(0.257)	1.440
German-speaking region	–0.098	(0.236)	0.907
Foreigner	0.248	(0.302)	1.281
Low educational level	–0.563	(0.343)	0.570
High educational level	0.209	(0.280)	1.232
Employment-related characteristics			
Self-employed	–1.934**	(0.638)	0.145
Employee in supervisory position	0.170	(0.235)	1.185
Unemployed within last 10 years	–0.280	(0.506)	0.756
Work experience (in years)	0.029**	(0.011)	1.029
Tenure (in years)	0.028**	(0.010)	1.029
Company size			
Up to 10 employees	0.298	(0.314)	1.347
11 to 100 employees	Reference		
More than 100 employees	0.679*	(0.270)	1.973
Sectors of economic activity			
Agriculture	–1.724	(1.092)	0.178
Manufacturing	–1.150**	(0.435)	0.317
Energy and water supply	0.526	(0.739)	1.691
Construction	–2.232*	(1.068)	0.107
Wholesale and retail trade	–0.639	(0.413)	0.528
Hotels and restaurants	–0.336	(0.806)	0.715
Transport and communication	–0.237	(0.539)	0.789
Financial sector	0.087	(0.485)	1.091
Real estate, renting, business activities	–0.578	(0.475)	0.561
Public administration	Reference		
Education	–0.412	(0.501)	0.662
Health and social work	–0.518	(0.476)	0.596
Other activities	–0.583	(0.514)	0.558
Number of observations	3178		
Log likelihood	–349.72		
McFadden pseudo-R^2	0.194		

All variables are dummies if not otherwise indicated in brackets.
*/** denotes significance at the 5%/1% level.

to early retirement. It should be noted that, in 2001, the unemployment rate in Switzerland was at a relatively low 2.5%, down by 1.7 percentage points from its peak in 1997. The analysis of early retirement in 2001/02 hence refers to a period of low and falling unemployment. The study by Carnazzi (2000), however, was based on SLFS data from 1991 to 1995; that is, in a period of rising unemployment (the unemployment rate quadrupled from 0.5% in 1990 to 2% in 1991 and further increased to 3.5% by 1995). According to Carnazzi, during this period unemployment increased the probability of early retirement.

With regard to economic sectors, the public sector has a larger probability of early retirement than most other areas of activity. This result confirms earlier findings of Gaillard et al. (2003) and Carnazzi (2000). A very low probability of early retirement is observed for manufacturing and construction. Because work in these sectors is more physically demanding, workers might want to retire early due to health problems; however, because wages are rather low in these sectors, workers probably do not have the financial cushion needed for an early retirement.

A third extension to the model added in dummy variables for the company size of the employer in anticipation that doing so would allow testing of the hypothesis that large companies promote early retirement. Also included are variables referring to an employee's work experience and tenure. The results are presented in Table 11.

Both work experience and tenure have a positive impact on the probability of early retirement. It seems plausible that people who have already been executing their jobs for a long time in the same company have acquired experience that is valuable for the employer, and they are therefore rewarded with higher wages and possibly promotions. Both work experience and tenure can thus be linked to income, which again supports the hypothesis of an increased probability of early retirement for people with higher wages. Moreover, people with more work experience, and especially with long tenure, have probably built up a solid second pillar. They can also take advantage of pension fund rules that provide early retirement benefits to workers above a certain tenure threshold only (see Hammer et al., 2003).[14]

14 An interesting change can be observed for the gender variable. While men have a significantly higher probability of early retirement than women in the previous models, this effect has, due to the correlation between gender and experience, disappeared. This outcome may explain the results of Carnazzi (2000). Her models displayed a significantly higher probability of early retirement for women than for men. This strong effect may have been caused by the fact that she looked at the absolute age of retirement rather than at the difference between age

A positive influence on the probability of early retirement was also found for large companies. As mentioned above, large companies often have their own pension funds (for a discussion of examples, see Hammer et al., 2003). The *de facto* control of an occupational benefits plan allows a company to support its early retirement policy with appropriately designed financial incentives. Therefore, large companies can (and do) support early retirement of their employees. Not surprisingly, once company size was controlled for, the sector-specific effects of the financial and energy supply sectors on early retirement are clearly reduced, suggesting that much of their positive impact on early retirement is due to a dominance of large companies in these sectors.

The fourth extension of the basic model included three variables referring to income: the imputed annual wage, the imputed squared wage, and a dummy variable denoting whether a person has an annual asset income of more than 1,000 CHF. Of the variables used to calculate the imputed wages, only the gender and sector variables are included in the regression. The life-cycle model postulates that workers' financial situations have an important impact on their retirement decisions. However, whereas greater wealth is supposed to lead to earlier retirement, the effect of higher income is ambiguous.

Table 12 shows that income is indeed a significant determinant of early retirement. The hypothesis of a positive causality between income and early retirement is confirmed: the higher the imputed annual wage, the higher the probability of an early retirement. The negative coefficient of the squared income, however, implies that this wage effect weakens as income grows. For high income levels, the probability of early retirement even diminishes with a further increase in income. Figure 2 displays these effects. If the annual wage increases from 40,000 to 70,000 CHF, the probability of an early retirement doubles, and it triples when it increases to 120,000 CHF. However, at a threshold of about 120,000 CHF, the probability of retirement starts to fall at an increasing rate. For an income of 200,000 CHF, it is just as low as for 40,000 CHF. This finding might explain why a high level of education has not been found to have a significant positive effect on early retirement; individuals with higher educational levels often have incomes beyond this threshold. The probability of their early retirement is hence similar to that of people with an intermediate level of education who possibly have an income in the ascending branch of the curve. Figure 2 also shows a

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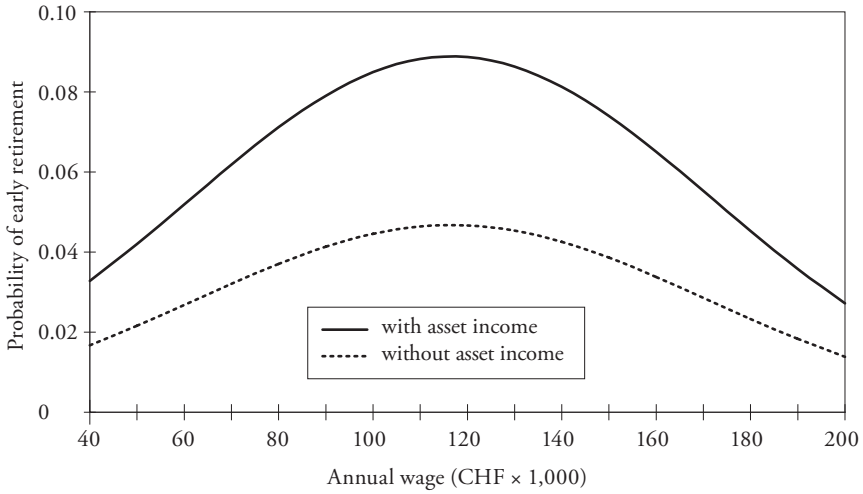
of retirement and the gender-specific legal retirement ages. However, in contrast to the later study of Balthasar et al. (2003), who found a significantly higher probability of retirement for men, she had also included variables for both tenure and experience in her models.

Table 12: Socio-demographic, Employment-related, and Socio-economic Determinants of Early Retirement

	Coefficient	S.E.	Odds ratio
Constant	–3.453**	(0.806)	0.032
Socio-demographic characteristics			
Years until legal retirement age (in years)	–0.360**	(0.047)	0.698
Male	–0.223	(0.327)	0.800
Lives with labor-force active partner	–0.405	(0.328)	0.667
Lives with non-active partner	0.337	(0.270)	1.401
German-speaking region	–0.294	(0.246)	0.745
Foreigner	0.181	(0.312)	1.199
Employment-related characteristics			
Self-employed	–2.372**	(0.754)	0.093
Unemployed within last 10 years	–1.016	(0.539)	0.333
Company size			
Up to 10 employees	0.292	(0.323)	1.340
11 to 100 employees	Reference		
More than 100 employees	0.698**	(0.272)	2.009
Sectors of economic activity			
Agriculture and construction	–2.341*	(1.069)	0.096
Manufacturing	–1.100*	(0.442)	0.333
Energy and water supply	0.613	(0.755)	1.847
Wholesale and retail trade	–0.415	(0.417)	0.660
Hotels and restaurants	0.048	(0.827)	1.050
Transport and communication	–0.027	(0.547)	0.974
Financial sector	–0.062	(0.482)	0.940
Real estate, renting, business activities	–0.921	(0.510)	0.398
Public administration	Reference		
Education	–0.443	(0.486)	0.642
Health and social work	–0.541	(0.477)	0.582
Other activities	–0.419	(0.512)	0.658
Socio-economic characteristics			
Imputed annual wage (in 10K CHF)	0.420**	(0.158)	1.522
Imputed annual wage squared (in 10K CHF)	–0.018*	(0.008)	0.982
Annual asset income > 1,000 CHF	0.688**	(0.244)	1.989
Number of observations	2897		
Log likelihood	–328.03		
McFadden pseudo-R^2	0.196		

All variables are dummies if not otherwise indicated in brackets.
Note that agriculture and construction have been summarized in one variable.
*/** denotes significance at the 5%/1% level.

Figure 2: Impact of Wage and Asset Income on Probability of Early Retirement



Note: The example refers to a 62-year-old single Swiss man from the German-speaking region who is an employee of a medium-sized trade company.

strong impact of asset income on the probability of early retirement. An annual asset income of more than 1,000 CHF doubles this probability, a finding that is in line with the life-cycle model of retirement.

6. Conclusions

This empirical analysis of early retirement confirms that early retirement has become an important issue in Switzerland. In the sixteen-month period from January 2001 to April 2002, more than 36,000 older individuals, representing 8% of all workers within nine years of the legal retirement age, went into early retirement.

Analysis of single results combined into a coherent whole reveals two types of employee exhibiting distinctly different early retirement behaviors:

– White-collar workers with an intermediate or high level of education frequently go into early retirement. These workers, often found in the public or financial sectors, have a relatively high income and may also have accumulated some

wealth. Their favorable financial situation, and possibly early retirement-pension support by their employers, allows them to retire before reaching the legal retirement age.
– Blue-collar workers with low levels of education, who tend to be employed in sectors like agriculture, construction, or manufacturing, seldom go into early retirement. Because of their low income and an absence of personal wealth, they do not have the financial resources to conveniently bridge the gap between early retirement and the beginning of entitlement to old-age pensions.

While a worker's financial situation has an important impact on the probability of early retirement, our results also suggest that retirement behavior is – in accordance with microeconomic theory – also influenced by worker preferences for leisure. For instance, the probability of early retirement is high for people who anticipate spending more time with a partner who is no longer economically active. In contrast, a low probability of early retirement is found for people with very high wages, despite the obvious financial prerequisites for an early retirement. It seems probable that these persons have a strong personal identification with their jobs. A positive attitude toward the job is also one of several explanations for the low probability of early retirement among self-employed workers.

Early retirees often desire a slow transition to full retirement. More than 30% of the people who went into early retirement in 2001/02 continued working after retirement. Moreover, the analysis suggests that an estimated two-thirds of these workers were still employed by their former employers. Thus, some companies seem to allow their employees a more gradual transition to early retirement, which includes the possibility of working part-time as three out of four working early retirees surveyed were doing.

The primary implication of these results for public policy is that it should aim at facilitating more flexible and individualized retirement options. The rejected 11th revision of the old-age insurance law would have responded to this need for flexibility by allowing the early drawing of old-age pensions at a lower age. Moreover, the possibility of claiming half the amount of a normal pension in the case of part-time employment would have been attractive for the large portion of early retirees who do part-time work. Given the apparent demand for flexible retirement options, it can be expected that such options will again be incorporated into future demands for a revision of the old-age insurance. If a full actuarial adjustment of the pension were to take place, in the case of an early pension claim, flexibility options would only allow for, but would not financially promote, early retirement. However, as shown in our empirical analysis, people with lower incomes are often unable to finance early retirement. Whether or

not to financially support the early retirement of these workers through reduced pension adjustments at the cost of creating an undesirable incentive for early retirement is a question of political judgement. Alternative measures to facilitate early retirement for low-income workers should also be taken into consideration. Possibilities include an extension of second-pillar coverage to people with lower incomes, or sector-specific early retirement agreements between employers and unions as in the construction sector.[15]

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15 For a description see Hammer et al. (2003).

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Appendix

Table A1: Definitions of SLFS Explanatory Variables

Variable name or variable group	Values and description
Socio-demographic variables and professions	
Male	1, if respondent is a man / 0, otherwise.
Married	1, if respondent is married / 0, otherwise.
Lives with labor-force active partner	1, if respondent lives with a partner who is (economically) active[16] / 0, otherwise.
Lives with non-active partner	1, if respondent lives with a partner who is not (economically) active / 0, otherwise.
German-speaking region	1, if respondent lives in the German-speaking region of Switzerland / 0, otherwise.
Foreigner	1, if respondent is a foreigner / 0, otherwise.
Low educational level	1, if respondent has a low educational level (school not completed, completed mandatory school, short apprenticeship, household school) / 0, otherwise.
Intermediate educational level	1, if respondent has an intermediate educational level (apprenticeship, vocational school) / 0, otherwise.
High educational level	1, if respondent has a high educational level (completed higher secondary level school, technical college, university) / 0, otherwise.
Years until legal retirement age	Number of years until reaching legal retirement age.
Professions[17]	Dummy variables for managers and legislators / academic professionals / technicians and associate professionals / clerks / service and sales people / skilled agricultural workers / craftsmen / machine operators and assemblers / workers in elementary occupations.
Socio-economic variables	
Household income	Total annual household income in CHF; and dummy variables for income classes less than 75K CHF / between 75K and 150K / more than 150K CHF.
Labor income	Total annual labor income in CHF; and dummy variables for income classes less than 50K CHF / between 50K and 100K / more than 100K CHF.

16 The ILO definition for being (economically) active is discussed in section 3.
17 Defined according to the International Standard Classification of Occupations (ISCO).

Variable name or variable group	Values and description
Imputed wage	Variables for estimated annual wage and squared annual wage in 10K CHF.
Annual asset income > 1,000 CHF	1, if respondent has an annual asset income exceeding 1000 CHF / 0, otherwise.
Early drawing of public pension	1, if respondent receives a public old-age insurance prior to reaching the legal retirement age / 0, otherwise.
Any form of 2nd pillar benefit	1, if respondent receives any sort of 2nd pillar benefit / 0, otherwise.
Pension fund pension	Monthly amount of pension in CHF; and dummy variable for presence of pension.
Bridge pension	Monthly amount of pension in CHF; and dummy variable for presence of pension.
One-time pension fund payment	1, if respondent received a one-time payment of a pension fund / 0, otherwise.
Any form of 3rd pillar benefit	1, if respondent receives any sort of 3rd pillar benefit / 0, otherwise.
3rd pillar pension	1, if respondent receives a pension from his 3rd pillar / 0, otherwise.
One-time 3rd pillar payment	1, if respondent received a one-time payment from his 3rd pillar / 0, otherwise.
Any of the above old-age benefits	1, if respondent receives any of the above mentioned old-age benefits / 0, otherwise.
Income situation after retirement	Dummy variables for improved income situation / unchanged income situation / worse income situation.
Perceived financial restrictions	Dummy variables for perceived financial restrictions regarding consumption goods / food / clothing / leisure and hobbies / vacation and trips / making invitations / going out / medical and dental treatment / continued education.
Employment-related variables	
Unemployed within last 10 years	1, if respondent has been registered as unemployed within last 10 years / 0, otherwise.
Part-time job	1, if respondent is/was employed in a part-time job / 0, otherwise.
Employment rate	Employment rate (in % of full-time equivalency).
Temporary job	1, if respondent is/was employed in a temporary job / 0, otherwise.
Working on call	1, if respondent is/was working on call / 0, otherwise.
Self-employed	1, if respondent is/was self employed / 0, otherwise.
Supervisory position	1, if respondent is/was an employee in a supervisory position / 0, otherwise.

Variable name or variable group	Values and description
Work experience	Work experience in years (without major interruptions).
Tenure	Tenure in years; and dummy variables for tenure below 10 years / between 10 and 20 years / more than 20 years.
Company size	Dummy variables for company size of 1 to 10 employees / 11 to 100 employees / 101 or more employees.
Sector of economic activity[18]	Dummy variables for agriculture / manufacturing / energy and water supply / construction / wholesale and retail trade / hotels and restaurants / transport and communication / financial sector / real estate, renting and business activities / public administration / education / health and social work / other activities.

SUMMARY

In the past decade, Switzerland has experienced a large increase in the number of individuals going into early retirement. This paper examines the determinants of such early retirement using data from the newly implemented social-security module of the 2002 Swiss Labor Force Survey. In the sixteen-month period from January 2001 to April 2002, more than 36,000 older individuals, representing 8% of all workers within nine years of legal retirement age, became early retirees. One of the most important determinants of early retirement is the wage rate, yet its effect is not linear: both high and low wages reduce the probability. Other factors that play an important role include partner's employment status, education, industry, occupation, and coverage in the three social-security pillars. A major finding of this study is that about 30% of all early retirees continue working after retirement – and mostly for the same employer.

ZUSAMMENFASSUNG

Im letzten Jahrzehnt hat die Zahl der Frühpensionierungen in der Schweiz deutlich zugenommen. Dieser Beitrag untersucht die Determinanten der Frühpensionierung unter Verwendung von Daten der Schweizerischen Arbeitskräfte-

18 Defined according to the Nomenclature Générale des Activités Economiques (NOGA).

erhebung 2002, die ein spezielles Modul zur Sozialen Sicherheit umfasst. In den sechzehn Monaten von Januar 2001 bis April 2002 wurden mehr als 36,000 ältere Menschen frühpensioniert. Dies sind rund 8% aller Erwerbstätigen im Alter von 57 bis 65 Jahren (Männer) bzw. 55 bis 63 Jahren (Frauen). Eine der wichtigsten Determinanten der Frühpensionierung ist der Lohn, dessen Wirkung jedoch nicht linear ist: Sowohl hohe als auch niedrige Löhne reduzieren die Wahrscheinlichkeit der Frühpensionierung. Weitere bedeutende Einflussfaktoren sind Bildungsniveau, Beschäftigungsstatus des Partners, Branche, Beruf und die Deckung durch die drei Säulen der Altersvorsorge. Ein zentrales Ergebnis dieser Studie ist ausserdem, dass rund 30% aller Frühpensionierten auch nach der Pensionierung erwerbstätig bleiben, wobei sie zumeist für den bisherigen Arbeitgeber arbeiten.

RÉSUMÉ

Lors de la dernière décennie, la Suisse a enregistré une forte augmentation du nombre de départs anticipés à la retraite. Cet article analyse les déterminants de la retraite anticipée en se basant sur les données de l'enquête suisse sur la population active de 2002 qui inclut un module sur la sécurité sociale. Durant la période de 16 mois entre janvier 2001 et avril 2002, plus de 36 000 personnes ont pris une retraite anticipée. Ceci représente le 8% de tous les actifs de 57 à 65 ans chez les hommes et de 55 à 63 ans chez les femmes. Un des déterminants les plus importants de la retraite anticipée est le salaire dont l'effet n'est cependant pas linéaire: salaires élevés comme salaires bas en diminuent la probabilité. D'autres facteurs importants sont le niveau de formation, le fait que le partenaire travaille ou non, le secteur d'activité, la profession et la couverture par les trois piliers de la prévoyance vieillesse. Un résultat central de cette étude est en outre qu'environ 30% des personnes parties en retraite anticipée continuent ensuite à travailler, le plus souvent pour le même employeur.