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ARILD AAKVIK, SVENN-ÅGE DAHL AND KJELL VAAGE

# LATE CAREERS AND CAREER EXITS IN NORWAY

Department of Economics

UNIVERSITY OF BERGEN

# Late careers and career exits in Norway[1]

by

Arild Aakvik[a]
University of Bergen

Svenn-Åge Dahl[b]
Institute for Research in Economics and Business Administration (SNF)

Kjell Vaage[c]
University of Bergen

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[a] Department of Economics, University of Bergen, Herman Fossgt. 6, N-5007 Bergen, Norway. E-mail: espen.bratberg@econ.uib.no
[b] Institute for Research in Economics and Business Administration (SNF), Breiviksveien 40, N-5045 Bergen, Norway. E-mail: svennaage.dahl@snf.no.
[c] Department of Economics, University of Bergen, Herman Fossgt. 6, N-5007 Bergen, Norway. E-mail: kjell.vaage@econ.uib.no

**Abstract**

We used matched employer-employee data for the period 1992-1997 to analyse the transition from work to early retirement in Norway. We focus on the effect of a new early retirement scheme ("AFP") of which some 60 percent of the population is eligible. We thus observe individuals in two different incentive systems and estimate the reallocation effect between employment and different early retirement, notably AFP and disability pension. There is a substantial drop in employment for the group entitled to AFP. However, while AFP has an increasingly negative effect on the labour supply, there seem to be almost no corresponding reduction in the incidence of disability pension during the period of investigation.

Our data includes a broad range of individual, workplace and industry characteristics. We report a relatively high degree of heterogeneity in the retirement behaviour, notably between genders, but also between industries and sectors. Push as well as pull factors are identified. The former appears to be more relevant for the disability pathway, while the latter turns out to be significant when retiring to AFP.

## 1. Introduction

Early retirement affects the age structure of the work force, reduces the supply of labor and contributes significantly to financial pressure on the welfare state. In a pay-as-you-go social security system, which is the most common form in Western countries, large-scale early retirement exacerbates the already large crisis in how benefits for the retired are to be financed in steadily aging populations (Van Dalen 1996; Börsch-Supan 2000). Even though Norway has substantial petroleum revenues and possesses extensive financial assets, mostly accumulated in the Government Petroleum Fund, the country faces economic challenges arising from demographic shifts (NOU 2004: 1). The average retirement age is falling, while the proportion of elderly people is rising, a trend that will continue in the next few decades. By 2050, almost 25 percent of the population is projected to be 65 and over; it currently stands at 14 percent (OECD 2004).

Even though labor force participation rates have fallen around 20 percent the last 30 years, in particular for men, the employment rates are high in Norway compared with other EU countries. Around 50 percent of the population aged 60 to 64 is employed. The average for the 15 EU countries in 2001 was 24 percent (33 percent for men and 16 percent for women).

During the last 30 years the Norwegian economy (together with the other Western economies) has gone through a major restructuring process. Key elements behind the restructuring are the liberalization of international trade, deregulation, and new technology, notably within the information and communication sector. These are the major ingredients in the globalization process. Globalization implies increased competition, increased degree of out-sourcing, and privatization, which in turn leads to changes in the demand for labor. High-skilled labor replaces low-skilled, and short-term employment

contracts replace long-term contracts, the rotation between jobs increases, and wages are increasingly determined by incentive contracts and profit-sharing instead of (centralized) negotiations.

Increased national and international competition may have a different effect on older workers than the rest of the workforce. Even in industries and sectors characterized by expansion, older persons seeking work often may find it difficult to get a new job because employers are worried that the costs connected to hiring and investing in them is higher than the benefit, and question their training potential, adaptability, and health. On the other hand, downsizing companies may encourage older workers to take early retirement. For example Norway's second largest industrial company, Norsk Hydro, laid off more than 5000 employees in 2002 using severance packages and early retirement arrangements that offering 70 percent of the former salary (Økonomisk Rapport 16/2002). Using such arrangements, the company avoided normal seniority rules. Early retirement arrangements are often otherwise in demand by employees who wish to retire, without any pressure from the employer (Dahl and Nesheim 1998).

This article is based on a dataset containing merged employer-employee data. In addition to controlling for a broad range of individual characteristics, we will study the effect of firm heterogeneity on early retirement and exit from the labor force. More specifically, we control for sector and industry indicators, allowing us to look for different retirement behaviors like in sheltered versus competitive industries or in the public versus the private sector. Furthermore, the nature of our data allows us to construct (group) data on firm characteristics, like size, age and educational profile, share of the different genders, and share of part-time workers. In addition, our sample consists of a panel of individuals covering the period 1992 to 1997 during which a major retirement reform was enacted that opened an additional pathway to retirement for workers over 62. Notably, the reform

covers only 60 percent of the firms, allowing us to compare the effect of this additional (privately negotiated) early retirement scheme, called AFP, with the control group of firms without entitlement to this form of early retirement. Combined with our individual and firm information, we are able to test whether the introduction of a more generous pension system has a homogeneous effect across the selected characteristics, or whether the effect differs across gender, income, expected pension, industry, firm characteristics, or other factors. Following Dahl, Nilsen and Vaage (2003), we conduct separate analyses of males and females, as we expect to find significant differences due to the high degree of gender segregation in the Norwegian labor market.

We use data from several Norwegian administrative registers that combine individual characteristics and information on the firm in which each individual works. Our sample consists of all individuals born in the period from 1929-32, employed at age 63, where each cohort consists of around 10,000 workers. These individuals are followed from January 1992 until they make a transition from work to one of the three transition states we analyze, or until the end of the observation period in December 1997. We use a discrete choice model with three destination states: Early retirement (AFP), disability pension (DP), and out of the labor force (OLF). The base category is employment. Our study allows us to analyze the effect on labor supply of giving the option of early retirement (AFP) to all workers, and the effect on labor supply of removing that option.

In the following section we briefly review some recent and relevant national literature on retirement. Then we describe institutional features of the Norwegian retirement system in an international context. This is followed by a description of the sample together with modeling and explanatory variables. In the subsequent section we comment on the development in the probabilities of ending up in various end-states, and on the empirical results. The last section provides a more general discussion of the results.

## 2. National Research

The last years, several micro econometric analyses based on Norwegian data have been published (for further studies using Nordic data, see Wadensjö 1996), two of which are of a privately negotiated early retirement scheme (AFP). Hernæs, Sollie and Strøm's (2000) prime motivation was to model the likely effects of changing the eligibility criteria in the AFP scheme. Using a competing risks framework, they found that the AFP to some degree relieves the pressure on disability pension and unemployment benefits.

Dahl, Nilsen and Vaage (2000) analyze early retirement pathways for Norwegian male and female workers. Family characteristics, expected income in different end-states, and push factors, such as industry attachment and local unemployment, are found to be important for the early retirement process. The gender difference in early retirement is given attention in Dahl, Nilsen and Vaage (2003). The competing risks model indicated that women are less likely to take early retirement compared with men and that these differences are due to both different characteristics and different behavior.

Bratberg, Holmås and Thøgersen (2004) investigate induced retirement effects of the AFP scheme and emphasize effects caused by moving some individuals from disability pension and unemployment to the AFP. Using Norwegian register data from 1994-96, they find that economic incentives influence the retirement decision, that there is a significant net induced retirement effect, and that at least 50 percent of the AFP retirees would have stayed in the labor force without the scheme.

Two studies use almost the same data set as we are using. Tysse (2001) finds that many employees leave their employer in order to receive AFP benefits at the first possible opportunity. Enterprise characteristics contribute significantly to explaining early retirement. The effect of each enterprise characteristic varies strongly according to which exit is being analyzed, whether men or women are being considered, and whether they are

entitled to AFP or not. Røed and Haugen (2003) consider the introduction of AFP as a 'quasi-natural' experiment and use this to evaluate how economic incentives affect retirement behavior. The results show that the new retirement option reduced employment substantially, and this effect has escalated over time. Economic incentives and family situation play key roles. AFP is not found to substitute for disability pension or long-term unemployment, and this contradicts Bratberg, Holmås and Thøgersen (2004), who found large substitution effects between various exit routes. Retirement through AFP is found to primarily be voluntary, but there is some evidence that employers took advantage of the program and pushed out excess workers.

There are also qualitatively oriented studies that have analyzed early retirement with a focus on practices by enterprises. Using data from interviews with personnel managers, trade union representatives, and medical officers in 23 Norwegian firms, Dahl and Nesheim (1998) showed that companies, at least during downsizing and reorganization, actively put older employees under pressure to retire early instead of laying off younger employees. Older workers are both pushed and pulled into different (early retirement) schemes like unemployment insurance, AFP, company paid early retirement and disability pension. Older workers are for example encouraged or told by their employer to go to the doctor to get sickness benefits to begin with, and disability pension later on (Bjørndal, Johnsen and Clementsen 1990). The employees usually have some kind of disease, but typically not of a kind that would prevent them from working. The encouragement comes when firms downsize and reorganize.

Our study differs from most of the studies just noted. First, we pay special attention to female retirement and gender differences in the retirement decision. Second, our data make it possible to distinguish between different pathways. This is important, as it captures the forces behind the choice of various early retirement options. Third, our data

contains important information both on individual characteristics and about the company in which the individual works. Thus, we can test which variables are important for explaining employment and early retirement.

## 3. Institutional Background

Norwegian labor force participation rates among older workers are high by OECD standards, particularly among women.[2] Among women aged 50-64, that participation has increased from 46 percent in 1972 to just over 70 percent in 2002, though in the same time period it declined from 30 to 18 percent among the oldest (65-69 year old) women. The participation rate for men aged 50-54 and 55-59 has more or less remained at the 1972 level, but the decline for men over 60 has been steep until 2002: for the 60-64 year olds, it dropped from 80 to 60 percent, but among the 65-69 year olds, it plummeted from three-fourths (76 percent) to one-fourth (24 percent).

The number of jobs held by individuals aged 50 to 64 has increased by 168,000 (42 percent) since 1993. 86 percent of older workers in Norway are classified as employees, of whom only 3 percent are in temporary jobs, while the remaining 14 percent are self-employed. By industry, older workers are underrepresented in “construction”, “wholesale and retail”, “transport, storage and communication” and “financial, real estate and business services”, but overrepresented in “agriculture, hunting and fishing” and “public administration, education, health and social work.” The latter sector accounts for over 40 percent of all jobs for older persons and more than 60 percent in the case of older women. By occupation, older women are concentrated in professional-related and,

2 When comparing Norway with other OECD countries the information in this section is collected from OECD (2004) if no other references are given.

especially for women, service-oriented occupations, and are over-represented in the category of legislators, managers, and senior officials. However, more than a third of older men in employment still work in manual occupations.

As in other OECD countries, there has been a shift away from the production of goods to the production of services. Since 1995 the number of hours worked has declined at least five hours per week for older and prime aged workers. The drop has been most severe for men and women aged 60-64 whose hours per week have dropped nearly nine hours and seven hours, respectively. In 2001 men and women in this age group on average worked less than 30 and 20 hours per week. Older men in Norway work the fewest hours in the OECD and Norwegian women have the second lowest hours of work. The major reasons are a relatively high incidence of part-time work[3], and absence from work (illness, holidays, variable hours). Taking actual hours worked into account reduces employment rates substantially.

The unemployment rates for older workers in Norway have tracked those of prime-aged workers, though at a lower level. In the last years, it has been between 1 and 2 percent, among the lowest rates in the OECD-area. There is no significant difference in unemployment rates by level of education for older workers. The educational level for older people is relatively high in comparison with other OECD countries: 22 percent of those aged 50-64 have a tertiary education. 40 percent of older workers received job-related training in Norway, but that is still 13 percentage points lower than for prime-aged workers. The high incidence can be ascribed to a growing emphasis on training in

3 Part-time work refers to persons who usually work less than 30 hours per week in their main job.

collective bargaining agreements as well as a number of governmental measures to encourage greater participation in training. Working conditions for those over 55 are reportedly better than for those who are younger, and fewer older workers want to change jobs than do prime-age workers. They seem to occupy more independent jobs and value the social aspects of their jobs more highly. The mobility of older workers is low, and Schøne (2001) and Hunnes, Møen and Salvanes (2004) found that job mobility between firms decreases with age and work experience. Huttunen, Møen and Salvanes (2004) also found that older workers are less likely to get a job after lay offs compared with younger workers. The substantial drop in labor market participation starts at age 59-60 for both men and women. At this age the share of persons outside the labor market more than doubles, as compared with those who are in their early 50s. In contrast to many other countries, Norway has only two major exit paths before the statutory pension age of 67 – the disability pension and the early retirement scheme (AFP). In 2000, more than 85 percent of the men and 66 percent of the women in the 50-59 age group who left the labor market did so because of illness and disability. The share is a bit lower in the 60-64 age group. By the end of 2003, 10.4 percent (301,214 persons) of the population aged 18-67 were receiving disability pensions, a 3.1 percent increase from the year before (RTV 2004). The number is expected to rise to 355,000 by 2010. Of those receiving disability pensions, 57.4 percent were women; 57.3 percent were 55 or older, and 35.1 percent were over 60.

In addition, there has been a steady increase in the number of those with long-term illness (defined as lasting more than 16 days). On average, about 1.5 weeks of full-time work per year per person (equaling seven working days) are lost because of illness. There is a clear connection between days on sick leave and both gender and age. In general, women are more absent than men, and older people are more absent than younger. The

route to a disability pension usually goes through sickness insurance, and thus sickness insurance has become a major exit path for older workers.[4]

The standard retirement age in Norway is 67, conditional on a person giving up the right to keep a specific job. However, some professions and occupations have a lower pension age and some ages are fixed by law. The compulsory retirement age is 70.[5] Expenditures on public pensions in Norway account for about 5 percent of GDP. However, due to the aging of the population and the maturing of the supplementary pension scheme, this is projected to reach 13 percent by 2050 – at which point there will be an expected 1.3 million pensioners, more than double the current number (NOU 2004: 1). These worrying prospects led to the appointment of a pension commission that in January 2004 recommended strengthening the link between earned income and entitlements, and introducing a flexible retirement age starting at 62 that would carry no restrictions for combining work and pension income.

There is no public early retirement scheme in Norway. However, as in several other countries, institutional arrangements that were originally constructed for other purposes, notably unemployment benefits and disability pension, have been used as pathways to early retirement. Until the early 1990s, the entitlement conditions for disability pension in Norway were liberal, and labor market conditions (a low chance of finding a new job) were a factor in the disability assessment and determination. Before receiving a disability pension, sickness insurance is usually paid for one year, and a subsequent period in a rehabilitation program is required. To qualify for a disability pension, a person must

4 Before receiving a disability pension, sickness insurance is usually paid for one year, and a subsequent period in a rehabilitation programme is required. To qualify for a disability pension, a person must demonstrate that his/her ability to earn an income has been permanently reduced by at least 50 per cent.

5 After reaching the age of 70 a person receive full pension even if s/he continue to work. A person who retire between the age of 67 and 70 will receive full pension if they stop working or earn less than twice the basic unit used in the pension system (G). If the earn more than 2 G (in 2004 NOK 117,556, appr. € 14,200) their pension will be reduced proportionally.

demonstrate their ability to earn an income has been permanently reduced by at least 50 percent.

Older people are entitled to unemployment insurance for an extended period. Persons who are unemployed at 64 are entitled to unemployment insurance without limitations until they reach the standard retirement age of 67. Before reaching age 64, it is possible to be unemployed for 186 weeks which means it is possible to receive unemployment benefits starting at age 60.5. It is also the case that labor requirements associated with an active labor market policy (occupational and geographic mobility, nature of the job search) are relaxed for those over 60, so unemployment becomes a genuine exit route.

There are several early retirement pathways with private provisions in Norway, though they are not commonly used. The most important, the AFP scheme, came into effect in 1989. The question about flexible retirement came up as part of the wage negations between the Norwegian Confederation of Trade Unions (LO) and the Confederation of Norwegian Business and Industry (NHO) in 1988. Increasing inflation, unemployment (also long-term) and disability rates were important reasons behind the introduction of the AFP scheme. Downsizing became more common in the second half of the 1980s, and both LO and NHO found the existing early retirement options – unemployment benefits and disability pension – unsuitable and unworthy exits for older workers. The government's financial support, which covers 40 per cent of the expenses of the scheme (the rest is covered by the employers), was made conditional on a wage increase not higher than 5 percent in 1988, and not higher than in the most important trading partners in 1989. The retirement age in the scheme has gradually been reduced from 66 year in 1989, 65 years in 1990, 64 years in 1993, 63 years in 1997 and to 62 years in 1998. As the retirement age has dropped the use of the scheme has increased. The

replacement rate was also improved in 1992, and the scheme now covers about 60 percent of all employees. Its introduction appears to be a major reason for the drop in labor market participation among older workers.

The replacement rate is different for the various types of retirement schemes, and this may result in economic incentives that depend on the retirement pathway used.[6] The replacement rate varies between 60 and 90 percent for the private retirement schemes.

- For disability pensions, the replacement rate is about 62 percent. In order to increase employee incentives to apply, employers in many firms pay a small company pension in addition to the state paid disability pension, thereby increasing the replacement rate up to 80 percent.
- For unemployment, the standard replacement rate is 63 percent. Several firms pay an additional amount for the benefit of those employees who agreed to be ”voluntarily” laid off, which can increase the replacement rate substantially.
- For the AFP, the replacement rate varies between 50 and 60 percent. There is a new tendency on the part of some firms to provide an additional pension former employees on top of the AFP pension.

Employers’ hiring and firing decisions with respect to older workers depend on factors such as their perceptions of the adaptability and productivity of older workers, and the wages they will have to pay them relative to younger workers. Norway currently has no legislation forbidding age discrimination, though the government has decided to adopt the relevant provisions of an EU anti-discrimination directive (2000/78/EC). A new study by

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[6] The replacement rate is commonly defined as the benefits-to-income ratio, or in other words the fraction of the previous earnings which the benefits replace. The replacement rate we use here is the before-tax (gross) replacement rate. The after-tax replacement rate (net) is higher due to the tax laws, particularly for disability pension.

Büsch, Dahl and Dittrich (2004) shows that age plays a small role in hiring decisions in Norway, and that little age discrimination exists. On the other hand, there is evidence that older workers often are given less important jobs when firms invest in new technologies (Lahn et al. 1999).

Employers are often worried about the labor costs of older workers – including the necessary social security contributions. Compared with other OECD countries, the age-earnings profiles in Norway are relatively flat for both men and women, but flatter for women than men. This suggests that seniority wages that do not correspond to changes in productivity may be a smaller problem in Norway than in other countries. This could account for the higher employment rates for older persons in Norway than elsewhere as well.

Overall, the wage structure in Norway is very compressed, both between age groups and between different occupations. The social security contribution rate is also low, at nearly 13 percent, while in France, for example, it is over 41 percent. As of 2002, social security contribution rate for those over 62 are close to 9 percent.[7] Together with the absence of a steep seniority-based wage system, the low contribution rate works in favor of older workers' employment.

Norway was ranked 16th (of 30) OECD countries in the strictness of employment protection with respect to individual dismissals (OECD 1999). In general, employees in Norway cannot be dismissed just because they reach the statutory retirement age of 67, and they remain protected even beyond that age. Rights, and length of giving

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[7] For most countries the social security contribution rate is a fixed percentage of an employee's salary.

notice, increase both with age and tenure, which could explain the relatively high participation rates. But it can also be a reason why employers are keen to encourage older worker to withdraw from employment after the age of 62 via the AFP or a disability pension. Strict employment protection can also make it less likely that companies will want to hire older workers. Unlike the policies in several other countries, no wage subsidies are targeted specifically at older workers. Instead, employers can receive a wage subsidy for hiring an unemployed person, a subsidy targeted at groups at high risk for long-term unemployment: immigrants, the disabled, youths, and those over 60.

## 4. Empirical analysis

### 4.1 *Sample construction*

The analysis is based on several of Statistics Norway's administrative registers, the most important of which is the "Duration Data – Social Insurance" database (Forløpsdata-trygd or FD-trygd), containing information on the entire working age population from 1992 to 1997, as well as data on the labor market, social insurance states and a broad range of background information on individual earnings, education, experience, and family status. The registers are then merged with firm and enterprise data from the Register for Legal Units and Statistics Norway's Business Register. Based on the employer-employee identification, several firm characteristics have been generated, including age and gender composition, share of part-time workers, and composition of the firm's labor force by educational attainment level.

The major exit routes from work to early retirement for Norwegian worker are AFP or disability pension (DP). In addition, we collect other exits (such as unemployment benefits, private or firm-provided early retirement schemes, or being financially provided for by a spouse) in a third category: out of labor force (OLF). By construction, the three

states are mutually exclusive and absorbing, though unlike for a disability pension or being out of labor force, a worker needs to be of a certain age to be eligible for the AFP. The sample is constructed in accordance with these eligibility requirements.

We use data for individuals born between 1929 and 1932 during an observation period from 1992 to 1997. For most of the period, the eligibility age was 63: individuals born in 1929 turned 63 in 1992 and 68 in 1997, for example. For this cohort we may, in principle, observe their transitions out of the labor market until they reach the standard age for obtaining a pension (67). On the other hand, individuals of the youngest cohort in our sample were born in 1932, and became 65 years in 1997 **(**our final year of observation**)**. Accordingly, our point of departure is the sample of workers employed at age 63, and we observe them for a period of 24 months, at which point their transition, if any, into early retirement, disability pension, or out of the labor force is registered. Employment is the base category and the state the workers stay in, if there is no transition into other states. The period of observation is thus truncated at age 65, since this allows us to include the youngest birth cohort in our sample.

### 4.2 *Observed shares in different states*

Before we turn to the regression analysis, we explore some empirical regularities as they appear from the observed transitions during the period from 63 to 65 years of age.

[Table 1 about here]

Table 1 reveals an increased influx to AFP, which most likely is an effect of the maturing of this newly introduced early retirement option. For males with AFP eligibility, the employment share has decreased from 58 percent for the 1929 cohort to 46 percent for the 1932 cohort, while the share is about 70 percent for all cohorts outside the AFP area. Note that even though there is a growth in AFP of 17 percentage points, there is almost no

reduction in the other early retirement options: the percentage on disability pensions or out of the labor force have dropped by only 2-3 percentage points. Hence, AFP has had a direct effect on the employment rates, rather than having a substitution effect on disability. For males outside the AFP area, the share of those on disability (13 percent) or out of the labor force (18 percent) remain stable across cohorts.

Compared with women, the most striking difference is the high rate of employment for those with AFP entitlement. The decrease is about the same as for males, but the employment rate is 6-9 percentage points higher across the cohorts. A likely explanation is that women on average have acquired less pension rights than men, implying that the reduced pension rights conferred by the AFP scheme is a stronger disincentive for early retirement for women than men. This accords with the findings in Dahl, Nilsen and Vaage (2003), who report that the early retirement propensity for females in this age group is lower than for males. There is, however, a disturbing relationship between AFP and DP, as there is absolutely no sign of substitution between the two exit routes.

## 5. Regression analyses

In this section we present the results from regression analyses based on multinomial logit models. The results are reported as marginal effects together with corresponding *z*-values (see Tables 2-5). Our model allows us to condition retirement choices on a rich array of information about individual and firm characteristics, permitting a comparison of retirement behavior in sheltered versus competing industries, and in the public versus the private sector. Furthermore, the AFP, inasmuch as it introduced a new exit route, constitutes a natural experiment and gives us the opportunity to model the effect on retirement behavior of a more generous set of pension options . Hence, we compare the regression results for the employees with and without AFP eligibility, while maintaining

the focus on differences between sheltered vs. competing industries. As Table 1 indicates distinct gender differences in retirement behavior, we report separate regressions for males and females. We restrict the sample to the 1932 cohort, as eligibility criteria vary somewhat from cohort to cohort. For instance, banking and insurance was not included in the earliest age cohorts) but was added in the agreement in 1995.

[Table 2 and 3 (non-AFP, males and females) about here]

Tables 2 and 3 report the coefficients of early retirement determinants for the sub-sample without AFP eligibility, the group that serves as our control group in the natural experiment. We report marginal effects for the probability of two exit routs: disability pension and out of the labor force. Because the latter is a residual group and thus hard to furnish with a priori interpretations, we focus primarily on the former. All estimated marginal regression coefficients are interpreted using employment as our basis category. Individual characteristics appear to have no significant impact on the probability of early retirement in the form of a disability pension; the exception is the positive impact from the indicator for full-time workers. This finding hold for both genders.

Next we present the influence from earnings and expected pensions. Income in different states gives incentives to choose between different states since the financial reward varies. Implicitly we assume that the individuals choose among expected income streams. Of course, we can only observe the income in the actual state. However, by using the relevant rules for the disability pension (and AFP in the next table), we are able to construct potential incomes in these end-states. All the various income variables are based on the income prior to the retirement year. Since earnings are the alternative cost of leaving the labor force, we expect it to have a negative impact on the disability pension. This is confirmed for both genders. Increased expected pension, on the other hand, is expected to increase the probability of early retirement, but the coefficient for males is negative and

significant. This variable is, however, highly correlated with earnings, and the two effects may therefore be hard to disentangle.

'Unemployment' is a variable measuring the unemployment ratio at the municipality level. The coefficient turns out to be positive and significant. This might support the argument that unemployment and disability are substitutable pathways to early retirement, but Dahl, Nilsen and Vaage (2000) and Riphahn (1997) offer a more careful interpretation.[8]

We now turn to the sector and industry indicators. First, we note that there is no significant difference in the probability of receiving a disability pension in the public compared with the private sector. Hence, there seems to be no support for the popular view that the private sector in itself encourages this retirement option – though there is a reduced probability of entering the out of labor force state for public sector employees. Nor do the industry indicators turn out to be strong predictors for early retirement. Among men, there is a (barely) significantly positive impact of working in wholesale and retail trade, and in building and construction on the probability of retirement through a disability pension. Among women, working in the health and social sector has a significant positive impact on their probability of disability pension retirement. As the health and social sector consists mostly of workers in the public sector, and to the degree that the public sector is a shelter against competition and downsizing, this is hard to interpret as a result of globalization.

[8] A more general way of addressing the question of whether disability pension and unemployment benefits are exchangeable pathways into early retirement, is to test whether the explanatory variables have identical effects on the probability of entering the different states. Dahl, Nilsen and Vaage (2000) and Riphahn (1997) both find that most of the explanatory variables have significantly different effect on the two forms of exits (although the importance of the local unemployment rate is the same for both states in Dahl, Nilsen and Vaage (2000)).

Finally, the table brings the results from including several workplace characteristics. Since this requires data on employers to be merged with data from their firms, such information is quite rare, at least in large public databases. This type of data allows us to test for the effects on early retirement of *group effects* such as number of employed, share of male workers, average education, etc. We find that there is a negative impact of firm size on the male probability of a disability pension, but the second-order effect is positive, indicating a diminishing negative effect. A tentative explanation is that large firms have better opportunities to internally replace the labor force, thereby reducing the employers' push-incentives as compared with smaller firms. Moving down the table we find in both genders that working in firms with high mean age appears to be a protection against disability pension. Of course, this may be a result of selection, and the estimate should be interpreted with care.

As mentioned, the AFP reform may be regarded as a natural experiment. Even though the firms have had a certain opportunity of choosing themselves into the reform, it represents a possibility for researchers to exploit the effects of a reform that represent an introduction of increased generosity into the pension system. The inclusion of AFP together with disability pension and out of the labor force as different end-states in a competing risks framework permits the identification of potential differences in the transitions from work to early retirement. This may shed light on the discussion whether disability pension and AFP are substitutable retirement pathways or not. We can also analyse changes in sector/industry effects, i.e. whether there are less push-effects now that employees themselves can choose to quit, and not only be able to retire when they fulfil the eligibility criteria in the disability and unemployment insurance schemes.

[Table 4 and 5 (AFP, males and females) about here]

The results from this part of the analysis show that the effects of individual characteristics are by large the same as in Table 2 for transitions to disability pension. For the AFP, there are several significant coefficients, and both for males and females, education and full-time work are positive and significant. Highly educated persons choose AFP as their retirement option. The strong effect among women of being married is noteworthy, possibly to be explained as an assortative mating effect, inasmuch as spouses have common preferences. Since women generally are married to men older than themselves who therefore already have retired, they will have a preference to retire to spend more time together with their spouses (see also Dahl, Nilsen and Vaage 2003). Unmarried women will often not have the same preference for early retirement, as the workplace is a more important arena for social contact for them than for married persons. Married women have a substantially higher probability (26 percentage points) of taking AFP than do unmarried women.

For both genders, high income remains a strong determinant for staying in the labor force. In particular, there is a highly significant reduction in the probability of entering AFP. Increased earning reduces the probability of retirement to any form of early retirement, except for exit to out of labor force for males. Increasing expected pension is still negative for the male transition to a disability pension. For females, on the other hand, the coefficient now becomes positive, as we expected a priori, both for AFP and for disability pension.

Local unemployment has a positive effect on the transition to disability pension and out of the labor force, but we find no significant effect on the transition to AFP. This supports the argument that unemployment and disability are substitutable pathways to early retirement, and that there is an over-utilization in the form of the unemployed ending up on

disability pensions without being truly disabled. This may indicate, ceteris paribus**,** a push effect for persons ending in these states, while a transition to AFP is more pull-oriented.

Work in the public sector is a strong negative predictor for transition to AFP. The reason for this may be that it is more common to pay a small company pension in addition to the AFP pension in the private sector. Collective pension schemes also have a different effect, as public employees who work until 65 receive a substantial increase in their pension. Working in the public sector is no protection for ending up on disability pension for females. This finding may be due to the high disability rates found among women employees in the public sector (e.g. in social insurance offices and the Norwegian State Railways; Stokke 1993). We can also observe a positive effect of working in the public sector on being out of the labor force for males, possibly due to a lower pension age that is fixed by law in some male-dominated professions (such as the police or the military), and some special early retirement schemes ("ventelønn") for those over 60 in some public companies when they downsize or reorganize (NOU 1998: 19).

Turning to industrial characteristics, we observe a positive effect on the transition to disability pensions for males working in building and construction compared with all other sectors. For the transition to AFP, there are several significant results, and while working in the retail sector has a negative effect, work in building and construction, the manufacturing industry, as well as in banking and insurance, has a positive effect on the probability of using AFP (compared with employment). The strongest increase in transition rates to AFP is for employees in the banking and insurance industry, and industry that saw sharp downsizing during the 1990s. All effects for the transition to out of labor force are negative, but the significant ones are the transitions from health and social work, transportation, building and construction, and the manufacturing industry. There are only three significant effects for females, a positive one for the transition to AFP, and negative

ones for the transition to out of labor force from wholesale and retail trade, and from the manufacturing industry.

The workplace characteristics show no significant effect on disability pension, except for a negative effect of mean age in the company for females. Full-time working males in male-dominated firms postpone their retirement to AFP. Females in large firms have a high transition rate to AFP, but the effect is diminishing. Lastly, females working in male dominated companies have a higher transition rate to the out of the labor force state.

## 6. Discussion and conclusion

The results from our study show relatively large sex differences in early retirement behavior. Furthermore, it appears that the introduction of the AFP has had hardly any effect on the disability pension incidence. We also find differences between public and private sectors, and heterogeneity between industries. Downsizing sectors, such as banking and insurance, have significantly higher transition rates to AFP compared with other sectors. The variation in early retirement behavior between industries probably has to be explained both by push and pull factors: Some types of work are exposed to competition and subject to continuous change. This type of company specific knowledge has to be updated all the time to keep pace with the competition in the market. One can therefore surmise that employees working at companies particularly exposed to marketplace competition are more inclined to retire early than those working in companies more protected against competition and re-organization.

Surprisingly, there are few signs of push-effects in disability pension retirement, but the effect of unemployment is strong and significant. There are also likely push-effects in building and construction, manufacturing industries and banking and insurance. On the other hand, there are strong signs of pull-effects in AFP: It is the well-educated who expect

to receive high pensions who take AFP. And while the public sector appears to indicate push factors are significant (a less competitive environment, hence less push), this interpretation is most likely spurious. Instead, there is a pull-effect through the differences in rewards: public employees who work until 65 will receive a substantially increased pension.

If economic globalization were to have a large effect on early retirement behavior, we would expect the push mechanisms to dominate, but this is not the case. In the period for which we have data social norms connected to early retirement have changed (Dahl and Nesheim 1998). It has become more accepted and less stigmatizing to retire early, and at the same time the incentives to retire have changed through the introduction of the AFP. These aspects appear to be more important than globalization in explaining early retirement behavior in Norway.

Finally, the introduction of AFP in 1989 and the foregoing debate was inspired and influenced by international social and economic developments and trends. Indeed, a more flexible retirement processes was seen as a necessary consequence of the increasing degree of globalization. In this respect it might be argued that globalization has played a role in retirement process in Norway, even though the means have been pull rather than push factors.

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Table 1. Observed states at age 65 for individuals that were employed when they turned 63. By sex and AFP eligibility.

| | Cohort | | | |
|---|---|---|---|---|
| | 1929 | 1930 | 1931 | 1932 |
| MEN | | | | |
| *NON-AFP AREA:* | | | | |
| Employed | 69 % | 70 % | 68 % | 69 % |
| DP | 13 % | 13 % | 13 % | 13 % |
| AFP | - | - | - | - |
| OLF | 18 % | 17 % | 19 % | 18 % |
| *AFP AREA:* | | | | |
| Employed | 58 % | 53 % | 52 % | 46 % |
| DP | 11 % | 8 % | 8 % | 9 % |
| AFP | 22 % | 31 % | 34 % | 39 % |
| OLF | 9 % | 8 % | 6 % | 6 % |
| WOMEN | | | | |
| *NON-AFP AREA:* | | | | |
| Employed | 70 % | 71 % | 69 % | 68 % |
| DP | 11 % | 12 % | 12 % | 12 % |
| AFP | - | - | - | - |
| OLF | 19 % | 17 % | 19 % | 20 % |
| *AFP AREA:* | | | | |
| Employed | 67 % | 60 % | 58 % | 52 % |
| DP | 9 % | 8 % | 10 % | 10 % |
| AFP | 18 % | 27 % | 27 % | 33 % |
| OLF | 6 % | 5 % | 5 % | 5 % |

Table 2. Marginal effects from multinomial regression. 1932 cohort, males.

| *Variable names* | *DP* | | | *OLF* | |
|---|---|---|---|---|---|
| | *Coeff.* | *Z-value* | | *Coeff.* | *Z-value* |
| Education (years) | .0016 | 0.63 | | .0098 | 2.81 |
| Married (yes=1) | .0085 | 0.62 | | .0063 | 0.31 |
| Experience (years) | .0023 | 1.60 | | -.0161 | -6.79 |
| Fulltime work (yes=1) | .0481 | 2.57 | | -.0328 | -1.25 |
| Earnings (100 NOK) | -.0060 | -13.05 | | .0002 | 0.33 |
| Expected pension | -.0091 | -3.50 | | -.0189 | -4.85 |
| Local unemployment | .0118 | 2.36 | | .0429 | 5.81 |
| Public sector (yes=1) | -.0172 | -0.76 | | -.0874 | -2.14 |
| *Industry dummies* | | | | | |
| Health & social | .0285 | 1.03 | | .0084 | 0.18 |
| Transportation | .0294 | 1.18 | | .1005 | 3.19 |
| Retail | .0396 | 1.93 | | -.0753 | -1.92 |
| Construction | .0390 | 1.92 | | .0164 | 0.52 |
| Manufacturing | .0113 | 0.70 | | -.0842 | -2.99 |
| Bank & insurance | -.0358 | -1.11 | | .0470 | 1.28 |
| *Firm characteristics* | | | | | |
| # employed | -.0123 | -4.00 | | .0131 | 3.39 |
| (# employed)$^2$ | .0003 | 3.60 | | -.0002 | -2.19 |
| Share male empl. | -.0287 | -1.78 | | .0342 | 1.36 |
| Share fulltime work | -.0047 | -0.26 | | -.0037 | -0.13 |
| Mean age (years) | -.0018 | -2.20 | | .0005 | 0.44 |
| Mean educat. (years) | -.0034 | -0.76 | | .0070 | 1.16 |
| Constant term | .0958 | 1.37 | | -.2168 | -2.23 |
| Number of observat. | 2 533 | | | | |
| Chi$^2$(42) | 510.52 | | | | |
| Prob > Chi$^2$ | 0.0000 | | | | |
| Pseudo R$^2$ | 0.1281 | | | | |
| Log Likelihood | -1847.8757 | | | | |

Table 3. Marginal effects from multinomial regression. 1932 cohort, females.

| *Variable names* | *DP* | | | *OLF* | |
|---|---|---|---|---|---|
| | *Coeff.* | *Z-value* | | *Coeff.* | *Z-value* |
| Education (years) | -.0016 | -0.55 | | .0033 | 0.72 |
| Married (yes=1) | .0077 | 0.57 | | .0209 | 0.98 |
| Experience (years) | .0010 | 0.55 | | -.0140 | -5.15 |
| Fulltime work (yes=1) | .0570 | 4.14 | | .0003 | 0.01 |
| Earnings (100 NOK) | -.0080 | -9.37 | | -.0032 | -2.53 |
| Expected pension | -.0006 | -0.14 | | -.0089 | -1.49 |
| Local unemployment | .0207 | 4.08 | | .0175 | 2.17 |
| Public sector (yes=1) | .0242 | 1.38 | | -.0752 | -2.46 |
| *Industry dummies* | | | | | |
| Health & social | .0521 | 3.56 | | -.0605 | -2.22 |
| Transportation | -.0241 | -0.39 | | .0426 | 0.61 |
| Retail | .0181 | 1.05 | | -.0238 | -0.93 |
| Construction | -.0107 | -0.21 | | -.0328 | -0.48 |
| Manufacturing | .0394 | 1.65 | | -.0094 | -0.25 |
| Bank & insurance | -.0125 | -0.39 | | .03023 | 0.76 |
| *Firm characteristics* | | | | | |
| # employed | -.0024 | -0.91 | | .00943 | 1.97 |
| (# employed)$^2$ | .0000 | 0.65 | | -.0003 | -2.07 |
| Share male empl. | -.0405 | -2.49 | | .0045 | 0.20 |
| Share fulltime work | .0135 | 1.05 | | .0041 | 0.19 |
| Mean age (years) | -.0028 | -2.98 | | .0037 | 2.97 |
| Mean educat. (years) | .0022 | 0.42 | | .0081 | 1.04 |
| Constant term | -.0804 | -0.98 | | -.3336 | -2.95 |
| Number of observat. | 2 334 | | | | |
| $Chi^2(42)$ | 358.42 | | | | |
| Prob > $Chi^2$ | 0.0000 | | | | |
| Pseudo $R^2$ | 0.0860 | | | | |
| Log Likelihood | -1794.7887 | | | | |

Table 4. Marginal effects from multinomial regression. 1932 cohort, males

| *Variable names* | *DP* | | *AFP* | | *OLF* | |
|---|---|---|---|---|---|---|
| | *Coeff.* | *Z-value* | *Coeff.* | *Z-value* | *Coeff.* | *Z-value* |
| Education (years) | .0011 | 0.73 | .0135 | 4.08 | -.0017 | -1.25 |
| Married (yes=1) | -.0025 | -0.29 | .0308 | 1.53 | -.0106 | -1.27 |
| Experience (years) | .0006 | 0.43 | .0057 | 2.00 | -.0006 | -0.45 |
| Fulltime work (yes=1) | .0318 | 1.73 | .3092 | 6.74 | -.0435 | -3.24 |
| Earnings (100 NOK) | -.0051 | -12.24 | -.0207 | -20.53 | .0002 | 0.35 |
| Expected pension | -.0075 | -3.35 | -.0009 | -0.17 | -.0037 | -1.68 |
| Local unemployment | .0247 | 7.50 | -.0041 | -0.55 | .0161 | 4.96 |
| Public sector (yes=1) | .0221 | 1.60 | -.2468 | -7.97 | .0327 | 2.64 |
| *Industry dummies* | | | | | | |
| Health & social | -.0034 | -0.31 | .0279 | 1.05 | -.0334 | -3.06 |
| Transportation | -.0115 | -0.48 | .0679 | 1.44 | -.1499 | -2.87 |
| Retail | -.0209 | -0.73 | -.1428 | -2.42 | -.0209 | -0.78 |
| Construction | .0494 | 3.61 | .0904 | 2.70 | -.0383 | -2.46 |
| Manufacturing | .0157 | 1.45 | .0664 | 2.94 | -.0405 | -4.02 |
| Bank & insurance | .0121 | 0.30 | .3847 | 5.36 | -.0276 | -0.68 |
| *Firm characteristics* | | | | | | |
| # employed | -.0016 | -0.93 | .0050 | 1.28 | .0001 | 0.07 |
| (# employed)$^2$ | .0001 | 1.56 | -.0001 | -0.91 | -.0000 | -0.20 |
| Share male empl. | -.0023 | -0.19 | -.0533 | -1.94 | .0207 | 1.85 |
| Share fulltime work | -.0081 | -0.66 | -.0763 | -2.66 | -.0021 | -0.19 |
| Mean age (years) | -.0022 | -1.98 | .0024 | 0.97 | -.0015 | -1.42 |
| Mean educat. (years) | .0022 | 0.55 | .0066 | 0.77 | -.0014 | -0.41 |
| Constant term | .0080 | 0.12 | -.0182 | -0.12 | .0309 | 0.50 |
| Number of observat. | 5 069 | | | | | |
| Chi$^2$(42) | 1263.11 | | | | | |
| Prob > Chi$^2$ | 0.0000 | | | | | |
| Pseudo R$^2$ | 0.1464 | | | | | |
| Log Likelihood | -4790.7175 | | | | | |

Table 5. Marginal effects from multinomial regression. 1932 cohort, females.

| *Variable* | *DP* | | *AFP* | | *OLF* | |
|---|---|---|---|---|---|---|
| *names* | *Coeff.* | *Z-value* | *Coeff.* | *Z-value* | *Coeff.* | *Z-value* |
| Education (years) | -.0015 | -0.77 | .0071 | 2.14 | .0043 | 2.95 |
| Married (yes=1) | .0084 | 0.80 | .2644 | 13.70 | -.0373 | -4.88 |
| Experience (years) | -.0032 | -1.24 | -.0002 | -0.04 | .0034 | 1.78 |
| Fulltime work (yes=1) | .0514 | 4.57 | .0620 | 3.17 | .0075 | 0.86 |
| Earnings (100 NOK) | -.0092 | -11.45 | -.0320 | -21.35 | -.0015 | -2.26 |
| Expected pension | .0074 | 2.43 | .0361 | 6.82 | -.0088 | -3.69 |
| Local unemployment | .0092 | 2.30 | .0014 | 0.20 | .0089 | 2.96 |
| Public sector (yes=1) | .0842 | 4.13 | -.1687 | -5.72 | .0250 | 1.85 |
| *Industry dummies* | | | | | | |
| Health & social | -.0012 | -0.12 | -.0220 | -1.22 | .0017 | 0.22 |
| Transportation | .0560 | 0.60 | .1887 | 1.31 | .0316 | 0.71 |
| Retail | .0404 | 1.59 | -.0104 | -0.27 | -.0707 | -2.81 |
| Construction | -.0135 | -0.28 | .0233 | 0.32 | -.0974 | -1.87 |
| Manufacturing | -.0049 | -0.19 | .0533 | 1.50 | -.0459 | -2.50 |
| Bank & insurance | -.0845 | -0.98 | .2802 | 3.95 | .0480 | 1.79 |
| *Firm characteristics* | | | | | | |
| # employed | -.0012 | -0.74 | .0151 | 5.06 | -.0027 | -1.93 |
| (# employed)$^2$ | .0000 | 0.52 | -.0004 | -5.04 | .0000 | 1.70 |
| Share male empl. | .0067 | 0.37 | -.0097 | -0.35 | .0392 | 3.27 |
| Share fulltime work | .0187 | 1.61 | -.0191 | -0.95 | -.0062 | -0.70 |
| Mean age (years) | -.0044 | -2.42 | .0025 | 0.92 | -.0043 | -3.01 |
| Mean educat. (years) | -.0105 | -1.96 | .0035 | 0.41 | -.0043 | -1.06 |
| Constant term | .1492 | 1.65 | -.2134 | -1.48 | .1422 | 2.07 |
| Number of observat. | 4 550 | | | | | |
| Chi$^2$(42) | 1039.35 | | | | | |
| Prob > Chi$^2$ | 0.0000 | | | | | |
| Pseudo R$^2$ | 0.1345 | | | | | |
| Log Likelihood | -4292.6813 | | | | | |

Fosswinckels gate 6
N-5007 Bergen, Norway
Phone: +47 55 58 92 00
Telefax: +47 55 58 92 10
http://www.svf.uib.no/econ