

Tone Ingrid Tysse

Effects of Enterprise Characteristics on Early Retirement

Rapporter

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Abstract

Tone Ingrid Tysse

Effects of Enterprise Characteristics on Early Retirement

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The main objective of this report is to study early retirement behaviour among older workers. Frequently used economic and demographic characteristics are included, but the effect of the working environment on early retirement is the foremost issue. We make use of register data from the years 1992-1997, and uniquely combine individual characteristics and information of the enterprise in which each individual works. Based on a discrete hazard rate model, three competing risk exits are estimated. Our particular concern is exits to the early retirement scheme, AFP, but also considered as early retirement transitions are disability pension and other exits, i.e. unemployment, occupational pension, private pension or other private provision.

The results indicate that quite a number of employees leave their employer in order to receive AFP benefits at the first possible opportunity. Furthermore, the relative risk of exiting to "other exits" at the age of 65 is quite pronounced, even among persons who are entitled to AFP. The effects of the individual characteristics are very much in concordance with previous research. As to the enterprise characteristics, the overall conclusion is that they contribute significantly to the explanation of early retirement. However, the effect of each enterprise characteristic varies strongly according to which exit is being analysed, whether men or women are being considered, and whether they are entitled to AFP or not. For instance, early retirement behaviour among women is on the whole less influenced by industry than among men. Also, enterprise characteristics are more important for transitions to disability pension among women who are not entitled to AFP than among those who are. The same contrast does not apply to men.

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Sammendrag (Summary in Norwegian)

Formålet med denne rapporten er å analysere tidligpensjonering blant eldre arbeidstakere når valg av pensjonerings-tidspunkt blir betraktet både som et resultat av rasjonelle vurderinger knyttet til det gjeldende pensjons-system og som en følge av forhold knyttet til arbeidsstedet. Problemstillingen er interessant av flere grunner. Yrkesdeltakelsen blant eldre arbeidstakere synker, gjennomsnittlig pensjonsalder blir stadig lavere, og antallet alderspensjonister forventes å øke betydelig de nærmeste tyve årene. Isolert sett vil dette skape et sterkt press på offentlige budsjetter og vil kunne føre til en høyere forsørgerbyrde blant fremtidens yrkesaktive.

Uførepensjon er den klart mest brukte tidligpensjonsordningen i Norge. I tillegg har enkelte yrkesgrupper lovfestet rett til å gå av med tjenstepensjon før ordinær pensjonsalder som er 67 år. Det eksisterer ingen universell førtids-pensjonsordning, men en ordning om avtalefestet førtids-pensjon, AFP, ble introdusert i 1989. Over en tiårsperiode er ordningen blitt modifisert med hensyn til hvem som omfattes av ordningen, og alderskriteriet er redusert fra 66 til 62 år. Disse endringene har skjedd selv om arbeidsmarkedet har vært preget av oppgangskonjunktur siden 1993, og til tross for at den demografiske utviklingen vi står overfor gjør det nødvendig å stimulere eldre arbeidstakere til å forbli yrkesaktive så lenge som mulig. Den personalpolitikk som føres overfor eldre arbeidstakere vil være avgjørende for denne gruppens ønske om og muligheter til å stå i arbeid i årene som kommer. Vi ønsker derfor å studere hvordan eldre arbeidstakere tilpasser seg de ulike tidligpensjonsordningene og hvilke kjennetegn ved arbeidsplassen som er av betydning for om man velger å førtidspensjonere seg eller ikke, når det blir tatt hensyn til at ikke alle har rett til AFP.

Den foreliggende analysen er utelukkende basert på bruk av registerdata. De viktigste datakildene er Arbeidstaker/Arbeidsgiverregisteret, SOFA-registeret og Statistisk sentralbyrås nyetablerte database FD-Trygd. Basert på register-opplysninger for årene 1992-1997 har vi utarbeidet et datamateriale som følger personer over tid, og som inneholder både individuelle karakteristika og kjennetegn ved arbeidsstedet. Kvaliteten på den variabelen som identifiserer arbeidstakernes arbeidssted er for de aktuelle årene av en slik karakter at det kun er forsvarlig å generere opplysninger knyttet til arbeidssted på foretaksnivå. Foretaksvariablene er fremkommet ved at vi, basert på informasjon om samtlige arbeidstakere i Norge, har aggregert opplysninger om de ansatte innenfor samme foretak.

Analyseutvalget består av personer som er født i årene 1929-1934, og som er yrkesaktive på starttidspunktet som er den måneden de fyller 63 år. Personene blir fulgt til de går over på en førtidspensjonsordning, eller til de fyller 67 år, eller til observasjonsperiodens slutt, avhengig av hva som inntreffer først. Studien omhandler alternative veier ut av arbeidslivet. Størst interesse er knyttet til overgangen til avtalefestet førtidspensjon (AFP), men både uførepensjon (DP) og det å forlate arbeidsstyrken av andre årsaker (OLF; f.eks. dagpenger, tjenstepensjon, bli forsørget av ektefelle o.l.) er overganger som inngår i analysen.

Siden personer som ikke har rett til AFP ikke vil ha mulighet til å velge denne pensjoneringsmåten, skiller vi mellom personer som er berettiget AFP (dvs. de som oppfyller de individuelle vilkårene for ordningen, inklusive det å jobbe i et AFP-foretak) og personer som ikke er det. Innen hver slik gruppe gjør vi separate analyser for menn og kvinner, fordi vi forventer at menn og kvinner har forskjellig pensjonsatferd på grunn av ulik yrkestilknytning over livsløpet.

Det å forlate arbeidsstyrken for å bli pensjonist kan betraktes som et resultat av en beslutningsprosess hvor det å pensjonere seg, løpende blir vurdert opp mot fortsatt arbeid. Varigheten av denne prosessen vil variere fra person til person, og analyser som tar hensyn til selve tidsforløpet, kalles nettopp varighets-analyser eller forløpsanalyser. Disse analysene baserer seg på en såkalt hasardratemodell, der hasardraten i vår problemstilling er den betingete sannsynligheten for at en person går fra arbeid til f.eks. førtids-pensjon på et bestemt tidspunkt, gitt at han eller hun ikke har gjort det tidligere. Siden pensjoner utbetales månedsvis, kan vi ikke bestemme tidspunktet mer nøyaktig enn på månedsbasis. Dette gjør det naturlig å bruke en såkalt diskret hasardratemodell, i motsetning til en modell der tidsforløpet er en kontinuerlig variabel.

Analyseutvalget er innrettet slik at alle får en viss "ventetid" fra vi begynner å observere dem og til de eventuelt oppfyller vilkårene for AFP. Fordi alderskriteriet for å motta AFP ble endret tre ganger i perioden fra 1992 til 1997, vil minimum ventetid avhenge av når arbeidstakeren ble født. De eldste vil ha en minimum ventetid på 21 måneder, mens de som fyller 63 år etter oktober 1997, kun vil måtte vente i én måned. Det store flertallet av dem som er berettiget, må vente i 13 måneder.

Vi finner en markant økning i tilbøyeligheten til å gå over til AFP akkurat i måned 13, noe som tyder på at mange som har rett til AFP, velger å benytte seg av ordningen umiddelbart, men til tross for at ingen i utvalget må vente i mer enn 21 måneder før de blir berettiget AFP, finner vi også en klar, men mindre markant, økning i måned 25. En mulig tolkning er at personer som var innstilt på å forlate arbeidsstyrken når de fylte 65 år, ikke endret sine planer selv om de på grunn av regelendringen fikk muligheten til å gå noen måneder før. En annen tolkning er at vi her ser effekten av at det tok noen år før AFP-ordningen ble kjent og allment akseptert. Også når det gjelder overgang til OLF finner vi en markant økning i måned 25. Svært mange yrkesgrupper både i privat og offentlig sektor får rett til tjenstepensjon den første måneden etter at de fyller 65 år, og det er trolig hovedårsaken til den markante økningen. Det er naturlig at personer som ikke har rett til AFP går over på tjenstepensjon når denne begynner å gjelde ved 65 års alder. Mer overraskende er det at personer som har rett til AFP ikke benytter seg av ordningen, men i stedet venter inntil 12 måneder ekstra for så å gå over på tjenstepensjon. For personer i offentlig sektor med midlere eller høy inntekt kan utsettelse av pensjoneringstidspunktet begrunnes med at inntekten deres, relativt sett, vil bli betydelig redusert når arbeidstakere i disse inntektsgruppene går over på AFP. Det skyldes at denne pensjonen blir beregnet som en folketrygdpensjon, som så blir supplert med et månedlig, skattepliktig AFP-tillegg fram til fylte 65 år. Pensjonen blir deretter beregnet som en tjenstepensjon, noe som vil medføre en betydelig pensjonsøkning for AFP-pensjonister i omtalte inntektsgrupper. Begrenset tid fram til tjenstepensjonsalder og en betydelig, midlertidig inntektsnedgang i dette tidsrommet ved bruk av AFP, kan dermed forklare hvorfor ansatte i offentlig sektor velger å ikke benytte seg av retten til AFP. Arbeidstakere i privat sektor kan tenkes å velge tjenstepensjon framfor AFP fordi lovverket ikke forplikter arbeidsgiver til å fortsette å betale inn premie til tjenstepensjon for arbeidstakere som er gått over på AFP. Usikkerhet knyttet til arbeidsgivers forpliktelser vil derfor kunne medføre at enkelte arbeidstakere velger å utsette tidspunktet for pensjonering og ergo ikke benytter seg av retten til AFP.

Når det gjelder effekten av individuelle kjennetegn, finner vi i tråd med andre studier at det å være gift øker tilbøyeligheten til å gå over på AFP. Høyt utdannede kvinner som er berettiget AFP har en høyere sannsynlighet for å gå over til AFP og OLF enn kvinner som har lavere utdanning. En mulig forklaring er at høyt utdannede kvinner har hatt en mer kontinuerlig yrkestilknytning med mindre deltidsarbeid enn kvinner med lavere utdanning, slik at de har opparbeidet seg bedre pensjonsrettigheter og større muligheter for å pensjonere seg tidlig. Utdanning viser seg å være av liten betydning for menns pensjonsatferd. Ikke uventet finner vi at deltidsarbeidende eldre arbeidstakere er mindre tilbøyelige til å pensjonere seg tidlig enn arbeidstakere som jobber full tid.

Siden det økonomisk sett er mer attraktivt å være i arbeid for personer med høy lønn, forventes høyere egeninntekt å føre til redusert sannsynlighet for tidligpensjonering. En slik negativ sammenheng mellom inntekt og pensjonering gjelder i de fleste tilfeller i vår analyse. Unntakene er menn som går til OLF og menn som ikke har rett på AFP og som blir uførepensjonert. Vi har beregnet hva den enkelte kan forventes å motta i pensjon fra folketrygden når vedkommende fyller 67 år. Det er rimelig å forvente at økt pensjon vil øke tilbøyeligheten til å ville pensjonere seg. Vi finner også en slik positiv sammenheng i vår analyse, unntatt for menn som ikke har rett til AFP. I tillegg til forventet pensjon har vi beregnet forventet arbeidsledighetstrygd, og finner som antatt at økt arbeidsledighets-trygd reduserer sannsynligheten for å pensjonere seg tidlig i form av AFP og DP. Noe mer overraskende er det at økt ledighetstrygd også reduserer sannsynligheten for en overgang til OLF, siden arbeidsledighet inngår som én av flere tilstander i OLF. Hovedårsaken til dette er antakelig at kun 20 prosent av overgangene til OLF, er overganger til ledighetstrygd. De resterende overgangene kan ikke identifiseres nærmere, men vil bestå både av mottakere av tjenstepensjon eller tilsvarende fra arbeidsgiver, og de som blir forsørget av ektefellen eller på annen måte lever av oppsparte midler. Tidsforløpet før en overgang til OLF med en tydelig topp ved 65 års alder tyder imidlertid på at svært mange eldre arbeidstakere som forlater arbeidsstyrken på denne måten, mottar en eller annen form for tjenstepensjon.

Analysen viser videre at foretakskjennetegnene helt klart bidrar til å forklare valg av pensjoneringstidspunkt. Alderssammensetningen til de ansatte innen foretaket er viktig, og jo høyere andelen ansatte over 50 år er, desto mindre sannsynlig er det at eldre arbeidstakere går til AFP eller DP. En mulig tolkning er at eldre arbeidstakere blir værende på grunn av gode, kollegiale relasjoner. En annen tolkning er at foretaket driver en aktiv og god seniorpolitikk. Vi klarer dessverre ikke å skille disse to effektene. Et tredje alternativ er at arbeidstakerne blir værende utelukkende fordi de har et godt oppsigelsesvern. Personer som jobber i foretak med en høy andel eldre arbeidstakere, har imidlertid også en lavere tilbøyelighet til å bli uførepensjonert, selv blant dem som ikke har rett til AFP. Det skulle tilsi at arbeiderne blir værende fordi de faktisk ønsker det. Størrelsen på foretaket er av liten betydning, og en grunn kan være at tilbudet av førtidspensjonsordninger i større grad er regulert i Norge sammenlignet med andre land. Arbeidstakere som jobber i foretak hvor det er gode muligheter for deltidsarbeid, har muligheten til å velge redusert arbeidstid framfor førtidspensjon. Analysen viser også at slike arbeidstakere har en lavere sannsynlighet for å pensjonere seg tidlig. Effekten er sterkest blant personer som ikke har rett til AFP.

Menn som jobber i foretak hvor de ansatte har middels høy utdanning (10-14 år i gjennomsnitt), har en betydelig høyere tilbøyelighet til å gå over på AFP enn arbeidstakere som jobber i foretak hvor de ansatte i snitt har lav utdanning (under 10 år), mens menn i utdanningsintensive foretak (over 14 års utdanning) har en betydelig lavere tilbøyelighet til å gå over på AFP enn menn i foretak med en lav utdanningsprofil. Eksempler på utdanningsintensive foretak er universitetene, private forskningsinstitusjoner og lignende foretak. Det er ingen overraskelse at arbeidstakere i slike foretak ikke er de flittigste brukerne av AFP.

AFP-ordningen var i utgangspunktet ment for personer som var slitne etter mange år i yrkeslivet. Tradisjonelt sett har mannsdominerte yrker vært forbundet med høy grad av tungt, manuelt arbeid, og selv om ny teknologi i de senere år har redusert bruken av manuell arbeidskraft, er det viktig å huske på at de arbeidstakerne som har jobbet i mannsdominerte yrker og som i dag nærmer seg pensjonsalder, har tilbrakt de fleste av sine yrkesaktive år med å utføre tungt, manuelt arbeid. Av den grunn forventet vi at det å arbeide i et mannsdominert foretak skulle øke sannsynligheten for å pensjonere seg tidlig. Det vi finner er at kvinner som har rett til AFP, har en høyere tilbøyelighet til å gå til OLF dersom de jobber i et mannsdominert foretak. Menn som ikke er berettiget AFP, viser tilsvarende å ha en høyere sannsynlighet for å bli uførepensjonert (DP) dersom de har jobbet i mannsdominerte foretak.

Det å arbeide i foretak hvor de ansattes gjennomsnittlige totale arbeidserfaring er høy, viser seg derimot å øke sannsynligheten for at menn som har rett til AFP går av før ordinær pensjonsalder. Vi tolker dette slik at "slitasjefaktoren" i større grad kommer til uttrykk gjennom de ansattes gjennomsnittlige yrkeserfaring enn det å være ansatt i et mannsdominert foretak. Også for kvinnene er sammenhengen mellom lengden på de ansattes yrkeserfaring og tidlig pensjonering positiv, både for overgang til AFP og for overgang til DP. I tillegg til total arbeidserfaring har vi generert en variabel som angir gjennomsnittlig, bedriftsspesifikk arbeidserfaring innen hvert foretak. Blant personer som ikke har rett til AFP, finner vi at menn og kvinner som arbeider i foretak med en svært stabil arbeidsstokk, har en betydelig lavere sannsynlighet for å gå til OLF sammenlignet med personer som jobber i foretak med større grad av utskiftninger. Blant personer som har rett til AFP, har imidlertid det å jobbe i et stabilt foretak kun betydning for kvinner, og på den måten at det reduserer sannsynligheten for å gå til både AFP og OLF.

Personer som jobber i konkurranseutsatt sektor, har en høyere tilbøyelighet til å gå over på AFP enn personer i skjermet sektor. Det kan tolkes som at AFP i enkelte næringer blir brukt i forbindelse med nedbemanning eller omorganisering av arbeidsstokken. Det kan også bety at de ansatte i konkurranseutsatte næringer har et større behov for å pensjonere seg tidlig. Selv om ledigheten på nasjonalt nivå har vært fallende i den perioden vi ser på, vil det kunne være lokale variasjoner. De foretak som har vært utsatt for stigende, lokal ledighet, synes til en viss grad å benytte DP og OLF i forbindelse med nedbemanning eller omorganisering dersom de ansatte ikke er berettiget AFP. Blant personer som har rett til AFP, finner vi imidlertid at overgangssannsynligheten er fallende ved stigende, lokal ledighet.

Menn i industrinæringen har en lavere tilbøyelighet til å gå over på AFP enn menn i de fleste øvrige næringer. Unntakene er menn som jobber i "Jordbruk, skogbruk og fiske", "Olje- og gassutvinning", "Transport og telekommunikasjon" og "Andre offentlige og private tjenester". Den relativt lave overgangstilbøyeligheten til AFP blant industriarbeidere er noe overraskende siden AFP-ordningen opprinnelig ble etablert spesielt med tanke på nettopp denne typen arbeidstakere. Menn som jobber i olje- og gassnæringen er betydelig mindre tilbøyelige til å gå over på AFP enn menn i industrinæringen og det har en klar sammenheng med at ansatte innen "Olje- og gassutvinning" blir tilbudt pensjonsordninger som er bedre enn AFP. Det er derfor heller ikke uventet at både menn og kvinner i denne næringen er mer tilbøyelige til å gå til OLF, selv om de har rett til AFP, sammenlignet med ansatte i industrien. Blant menn som ikke har rett til AFP, finner vi at menn i samtlige næringer unntatt "Utdanning og forskning" har en betydelig lavere tilbøyelighet for å bli uførepensjonert enn menn i industrinæringen.

Tilbøyeligheten til å pensjoneres tidlig via OLF blant menn som ikke har rett til AFP, er positiv og signifikant for næringskategoriene "Elektrisitet, gass og vann", "Transport" og "Post og telekommunikasjon". Dette gjelder i stor grad foretak som er statseide, men som ikke (lenger) er innbefattet i offentlig sektor, som f.eks. Telenor, Jernbaneverket, Luftfartsverket, energiverkene, transportselskaper etc. Enkelte av de foretakene det her er snakk om, har siden 1997 vært med i AFP-ordningen for virksomheter med offentlig tilknytning (NAVO), mens andre foretak fortsatt ikke kan tilby sine ansatte en AFP-ordning. Siden vår analyse kun går frem til og med 1997, er disse arbeidstakerne registrert å være uberettiget til AFP i det foreliggende materialet. En medvirkende årsak til den positive effekten på OLF kan skyldes at enkelte av disse statseide virksomhetene i løpet av vår observasjonsperiode fikk en midlertidig tillatelse av Stortinget til å førtidspensjonere arbeidstakere helt ned til 60 år dersom foretaket hadde behov for nedbemanning som følge av omstilling.

Pensjoneringsatferden til kvinner blir i påfallende liten grad påvirket av hvilken næring de jobber innenfor. Blant personer som ikke er berettiget AFP finner vi at kvinner som arbeider i foretak hvor en høy andel av arbeidstakerne jobber lang deltid, er lite tilbøyelige til å pensjonere seg tidlig. En tilsvarende effekt er ikke observerbar hos menn. Videre finner vi at foretakskjennetegn er av større betydning ved overgang til DP blant kvinner som ikke er berettiget AFP sammenlignet med kvinner som har rett til AFP. Igjen er dette en forskjell som ikke er observerbar hos menn. Bortsett fra dette ser det ikke ut til at menns og kvinners pensjoneringsatferd påvirkes svært forskjellig av de foretakskjennetegn som her er analysert.

Beslutningen om å pensjonere seg avhenger således av hva som kjennetegner det foretaket man er ansatt i. Så langt vi kjenner til er det ikke gjennomført studier tilsvarende denne, men vi ser et klart behov for ytterligere slike analyser. For eksempel vil etableringen av Enhetsregisteret gjøre det mulig å generere kjennetegn ved arbeidsstedet på bedriftsnivå. Etableringen av FD-Trygd vil i tillegg åpne for analyser av særskilte grupper blant eldre arbeidstakere, som for eksempel arbeidstakere innen en bestemt næring. Begge disse alternativene vil kunne øke forståelsen av hvordan pensjoneringsatferd påvirkes av foretakskjennetegn.

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1. Introduction

Most OECD-countries experience an increasing amount of early retirement, while Norway so far is experiencing a relatively high employment rate even among the old aged. Nevertheless, the employment rate of Norwegian male workers above the age of fifty is decreasing. Together with the fact that there will be a sharp increase in retirees with full pension coverage, this will be of severe consequence to the economy in the not too distant future. Hence, it is increasingly important that older workers are encouraged to prolong their labour force participation, even beyond the ordinary pension age of 67. Still, in most countries the authorities, often in collaboration with the labour unions and the employer's federation, have introduced early retirement schemes which strongly encourage older workers to leave their job before the ordinary retirement age. The Norwegian early retirement scheme, AFP, was introduced in 1989. Over the years it has gradually become more universal. Still, 40 per cent of Norwegian employees are not entitled to AFP, and this group is expected to make different choices regarding early retirement than those who are entitled to AFP.

The labour force participation rate has increased dramatically over the last 25 years, from 61 per cent in 1972 to 73 per cent in 1997. Increased female labour force participation is the overall explanation. Still, in a life course perspective, female labour force participation seems to be very different compared to men's rather constant labour supply. This also seems to be the case when retirement is approaching. In contrast to men, the labour force participation rate among women 50-59 years of age has increased more or less continuously since 1972. Among older women it has kept fairly steady and has not taken the sharp turn downwards, as is the case for men, aged 60-66. However, the labour force participation rate for older women is well below that for older men. Finally, women work part time to a much larger extent than men and this trend also keeps for older workers.¹ All in all, differences in labour force participation over the

life course makes it important to take into account that men and women may behave differently also when early retirement is approaching.

In this report we are particularly interested in the importance of the working environment on retirement behaviour among older workers. To address this issue a unique data set of the whole population of older workers from six birth cohorts has been carefully prepared, and in addition to the register information available, a number of enterprise characteristics have been generated. Men and women tend to choose differently when it comes to career matters. The greater part of employees in the manufacturing industry, construction and electricity, gas and water supply are men. Furthermore, men in the public sector occupy most professions with a low mandatory retirement age. Female workers tend to be the majority among the local government employees since many women work in the nursing, cleaning and teaching professions. Therefore, since enterprise characteristics are an issue in this report, it seems even more important that we run separate regressions for men and women.

Female labour force participation has increased for all cohorts the past 30 years and one may question how well the behaviour of old female employees of today will explain retirement behaviour of future generations of female employees with a different working career. It is our belief that women also in the future will be inclined to carry out the main responsibility within the domestic household. Increasing labour force participation does not necessarily mean that a higher proportion of female employees will work full time. Nor does it imply a change in the distribution of career choices among professional women. Although the share of gainfully employed women above the age of 60 today may not be representative of the statistics of tomorrow, the explanations as to why they retire early may hold also for future female employees above the age of 60.

¹ For further details see the Norwegian government white paper, NOU 98:19, chapter 4.2 and in particular Figure 4.8.

2. Early retirement and the institutional settings

In Norway the membership in the National Insurance Scheme is compulsory. This membership allows older workers to retire at the age of 67. There is no universal early retirement scheme in Norway. However, in 1989 the Confederation of Norwegian Business and Industry, NHO, and the Norwegian Federation of Trade Unions, LO, agreed that their 525 000 members should be allowed to retire early.² This agreement is known as the AFP scheme and has since 1989 also included employees in the public sector. In 1995 financial corporations entered into the AFP scheme (25 000 members) and in 1997 enterprises which to a great extent are state owned were included (25 000 members). Hence, the AFP scheme has gradually become more of a universal scheme, but 40 per cent of the economically active persons in Norway are still not able to retire early through AFP.

It took a few years for the employees to become familiar with the possibility of retiring early, but recent figures show that AFP is the most frequently used exit from the labour force among older workers. Financially the scheme is rather generous in the sense that the AFP benefit is calculated as the pension benefit the pensioner would have received at the age of 67 had he or she decided not to retire early. The disability pension scheme and the ordinary retirement scheme are both part of the National Insurance Scheme. The AFP scheme is not, but the same formula is used to calculate all three pensions and pre tax the pension amounts to approximately 50 per cent of the average income. After tax, the compensation is approximately 66 per cent on average.

Another way to leave the labour force is through long term illness, rehabilitation and disability. Sickness payment is limited to a period of 12 months and therefore cannot be considered a permanent way out. For older workers, long-term illnesses quite frequently entail rehabilitation, which more often than not result

in a state of disability. When the worker permanently leaves the work force for medical reasons, he receives a total lump sum in addition to the disability pension.

A third option is to leave the labour force through unemployment. From the age of 61.5, unemployed persons are favoured with separate rules, which extend their entitlement period to the age of ordinary retirement. Hence, it is reasonable to interpret unemployment as some kind of early retirement for older workers. The unemployment benefit amounts to the maximum of 62.4 per cent of the all income up to six times the statutory basic pension or 2.5 times the statutory basic pension.

In addition to the presently mentioned pensions many employers offer an occupational pension scheme (also called statutory employment pension). This scheme applies in the public as well as in the private sector. Some occupations are considered to be unsuitable for workers above a certain age, and older workers are therefore prohibited from working in particular professions beyond this age, i.e. pilots at the age of 55, and policemen and military workers at the age of 60. Approximately 30 per cent of all state government employees face a lower mandatory age of retirement, whereas every second local government employee will have to retire at the age of 65. AFP has reduced the effect of this low mandatory retirement age, but in some cases workers are allowed to leave three years prior to the regular, low mandatory retirement age. This means that some state workers may retire already at the age of 57.

² NHO is the main organisation for Norwegian employers in manufacturing industries, services and crafts. The number of memberships amounts to 15 700 enterprises ranging from small family businesses to large industrial enterprises.

3. Previous studies

The literature concerned with pension systems and transitions from work to retirement is endless. Gruber and Wise (1999) present a comparative study of social security systems and labour force participation in 11 industrialised countries. Wadensjø (1996) gives a similar presentation for the Nordic countries. Johnson and Zimmermann (1993) summarise the theoretical views of the pension system over the years. Empirical studies of retirement behaviour generally focus on the influence of economic factors such as pensions, social security benefits, wages and wealth, see e.g. Bratberg et al. (2000) and Hernæs et al. (2000). These factors are often referred to as pull factors, in the sense that they make it attractive for older workers to pull out of the labour force. Push factors are the contrast to pull factors. Dahl et al. (2000) comment on the importance of push factors, in their analysis represented by a broad classification of occupational activities and the local unemployment rate. The literature on pensions and early retirement in the US is very rich, see Mitchell and Fields (1982) and Gustman et al. (1994) for reviews. Not many of them relate pension to occupational characteristics, though. An exception is Hurd and McGarry (1993). They use the Health and Retirement Survey to analyse the relationship between job characteristics and the prospect of retirement. In their survey workers are asked questions about retirement plans, including the expected age of retirement, the workload and the work hours. Pedersen's (1997) survey on a sub population of approximately 2000 individuals is the Norwegian equivalent. The analysis at hand makes use of register information only. Thus, it is not possible to verify if any of the physical or mental requirements, which go with a job, influence on the decision to retire early. Furthermore, it is not possible to check whether the actual time of retirement matches a prediction stipulated by an older worker or whether the worker leaves voluntarily or not. What we do observe is when the older workers actually leave the workforce and which state of early retirement they exit to. The main difference between this study and the studies previously mentioned is the inclusion of the new set of variables, which describe different elements of the working environment. By introducing such enterprise characteristics this study aims at taking the

combination of push and pull factors one step further, examining *if* and *how* these characteristics may influence the decision to retire early.

4. Data

The analysis is based on data from several Norwegian administrative registers. The main register sources are the Register of Employers and Employees, the Register of Unemployed Persons and Statistics Norway's newly developed database, FD-Trygd, which contains information on social security obtained from the National Insurance Administration. Additional information is collected from the Register of Legal Units and Statistics Norway's Business Register. The analysis covers the years 1992 - 1997.

4.1. The employment histories

From the Register of Employers and Employees we know the start of every ongoing work spell and the expected work hours for every individual from 1992 onwards. Since every employer is given a unique identification number, EID, we also know in which enterprise(s) every individual works at any point in time, and we know if and when they start to work in a different enterprise during our six-year period. The quality of the variable which indicates the *start* of any spell, is considered to be good. Unfortunately this cannot be said about the *end* dates of every work spell. The poor quality of this variable is due to the fact that there are no incentives run by the employers to close work records of former employees in the Register of Employers and Employees. In the cases of unknown end dates, we therefore presume a work spell to end at the start of a new work spell or at the start of receiving some kind of benefit. If an actual end date is recorded and if the gap between the work spell and any next spell has a duration of twelve months or more, then the worker is assumed to have left the labour force. If the gap between the two is less than twelve months, the next destination is regarded as the actual exit and the duration of the gap is added to the duration of the work spell. Based on this information, individual employment histories have been created.

4.2. The employer

The statistical units employed by Statistics Norway are legal units, enterprises and local units. The term "legal unit" refers to legal persons whose existence is recognised by law, independently of the individuals or the institutions to which they are owned or to which

they are members, or to natural persons who are engaged in an economic activity in their own right. Examples of legal units are limited companies, general partnerships, sole proprietorships, etc. In principle, an enterprise is defined as the smallest combination of legal units that is an organisational unit producing goods or services, which benefits from a certain degree of autonomy in decision making. In most cases, an enterprise will be identical to a single, legal unit, e.g. a limited company. It is reasonable to think that decisions regarding a company's retirement policy are made at the enterprise level. Hence, it makes sense to generate firm characteristics at the enterprise level. Since our main objective is to capture the effects of the place of work on early retirement, however, it can be argued that employees do not work in *enterprises*, but in the local units often referred to as *establishment*. Therefore, it would be preferable if these characteristics were generated at the establishment level. Unfortunately, this is not possible to accomplish with the register data available, for reasons explained below.

Prior to 1995, the employer used to be identified through an identification number of 11 digits. The first eight identified the enterprise, EID, and the additional last three identified the local unit. Unfortunately, in some cases the identification number of an establishment appeared to cover more than just one single establishment. In other cases only certain parts of an establishment were covered by the same identification number. Furthermore, when a merging of two companies took place, it appeared to be rather arbitrarily whether just one or both companies changed their identification number. Finally, the first eight digits in the identification number did not always reflect the legal unit. In order to improve the effect of institutional and legal changes on the identification numbers, the Register of Legal Units were introduced in 1995. In this register, enterprises and establishments are given separate number series, ONR2 and ONR, respectively. Every legal unit is obliged to report to the authorities on a regular basis, and since 1995 this flow of information is channelled through the Register of Legal Units. In consequence, the identification numbers in

the Register of Employers and Employees were replaced by the number series in the Register of Legal Units. This change makes it difficult to link employment histories before and after 1995 since the enterprises are identified exclusively by EID the first three years of our observation window, whereas in 1996 they are identified by ONR2, only. Based on the 1995 edition of the employment records, which includes both EID and ONR2, we have been able to extend the EID identification. Doing it the other way and replacing the old number series with the series in the Register of Legal Units from 1995 backwards was also considered, but dropped as it proved too complicated. Since it was decided to use the old number series, the quality of the local unit identification number was considered too poor to be used. The firm characteristics therefore had to be generated at the enterprise level.

4.3. The population

A transition from work to unemployment, or from work to disability, are events which may occur at any age. A transition to the early retirement scheme, AFP, is not. One key requirement is that the worker needs to be of a certain age to be eligible for AFP. At the offset in 1992 the required age was 65. From October 1st 1993 and then again from October 1st 1997 the entitlement age was reduced to 64 and 63, respectively. The time span of our data is from January 1992 to December 1997, hence covering three different adjustments in the AFP scheme. When selecting our sample there were several considerations to make. On the one hand we wanted everyone in the sample to have a theoretical opportunity to make a transition to AFP, but on the other hand we also wanted a certain time of observation prior to a possible AFP transition. An absolute condition was for the individuals to actually be employed at the start of their observation period. When all these elements are taken into consideration along with the limited length of our calendar period and the changes of the age requirements in the AFP scheme, we ended up with a sample which comprises all employed individuals born from 1929 until 1935. The individuals are under observation from the month in which they reach the age of 63 and are followed until they make a first transition to one of three destination states or, if no transition takes place, to the end of the observation period.

4.4. States of destination

We focus on the relationship between early retirement and the working environment in a competing risk framework, when standard economic and demographic factors are taken into consideration. The states of destination are i) early retirement (AFP), ii) disability pension (DP) and iii) out of the labour force (OLF). All states are considered to be mutually exclusive and absorbing. An employee who is on sick leave is considered to be still working in this context. If a

person is known to be on a rehabilitation program or on some kind of re-employment, this person is categorised as a disability pensioner. Data show that the time older workers spend in this state of destination very often is of short duration. Furthermore, the state of rehabilitation is quite frequently followed by a state of disability. A competing risk analysis requires independence between the different end states. Therefore, it was not possible to include both rehabilitation and disability pension as separate exits and we decided to pool the two. It was our intention to make unemployment a separate exit path, but the events were too few for this transition to be modelled separately. The main explanation is probably that our particular sample is too old to consider unemployment a natural exit path. Thus, OLF comprises of persons who are unemployed, persons with occupational pension schemes, persons with private retirement schemes, persons who are provided for by their spouse and persons who for some other reason leave the Register of Employers and Employees without appearing in any other register available. What we do know is that these people no longer work and that they do not receive any social security insurance. Finally, persons who die while still employed are being censored at the time of death as are persons who go straight from work to ordinary retirement at the age of 67.

5. Explanatory variables

As will be explained in greater detail below we make use of a flexible model, which allows the variables to change over time. The economic variables are reported annually and will therefore change accordingly, as will all the enterprise characteristics. For incidents which may occur at any point in time, e.g. a new job or a change in marital status, the variables will change values at the time of the actual event.

5.1. Individual characteristics

In the economic literature there is a growing body of retirement research in which the decision to retire early is considered to be made by two persons with a shared economy. However, due to data limitations the individual is the decision-maker in our framework. Since both married and non-married employees are included in the model, marital status is one of the control variables. Number of years of education and expected, weekly working hours are assumed to influence the retirement decision. Full time workers are the ones who spend 30 hours or more per week at work. Furthermore, we make a distinction between part time workers who work 20 - 29 hours per week and the workers who put in 4 - 19 hours per week. This variable indicates well how many hours the workers are expected to do when they start to work in a company but the variable does not appear to change during a work spell even though it may seem likely that the work hours have been changed. However, if the workers start to work elsewhere and the expected work hours in the new work place are different, then a change in the working hours is recorded.

Three different income variables are employed in this analysis. In addition to the observed, annual gross earnings, potential pensions and potential unemployment benefits are calculated.³ The annual gross earnings are the opportunity cost of not working, i.e. leisure or retirement. Potential pensions and unemployment benefits are ways to express the opportunity costs of still working. Unfortunately we are unable to estimate the occupational pension or an otherwise

appropriate income measure for any other exit which is included in OLF, except the unemployment benefit. All the economic variables are pre tax and measured in NOK 1000. In the AFP program a monthly tax-free lump sum is given to retirees who used to work in the private sector, whereas former public employees receive a higher, but taxable monthly lump sum payment. The total sum of these monthly payments is expected to equal the total lump sum given to disability pensioners when leaving the work force. For the sake of comparability, these lump sums are not included in the pre tax pensions calculations.

5.2. Enterprise characteristics

Access to register data covering the whole labour force enables us to generate a number of characteristics by aggregating up individual information to the level of the enterprise. Thus, we are able to establish the size of the enterprise, the age and educational profile, the share of part time workers and so forth. Additionally, variables such as industry, location and local unemployment rate are included. This aggregated information is then merged with register information on individual characteristics. The aggregates will reflect the working environment which the older workers face the years prior to their mandatory retirement. The values of the enterprise characteristics may only be upgraded annually.

The age profile in each enterprise is expressed as the share of workers above the age of fifty. The average of the total work experience of employees within an enterprise is of course correlated with the age profile. Still, there is evidence that the two characteristics reflect different elements of the retirement behaviour and both variables are therefore included in the analysis. Furthermore, a tenure variable is included. By tenure we understand the number of years the average employee has worked in the same enterprise. Since an enterprise may have establishments in more than one municipality, the local rate of unemployment is weighted by the ratio of workers (within each enterprise) in each municipality when calculating the unemployment rate faced by the enterprise. The average number of employees is calculated as the

³ The variables are calculated according to the regulations in force. For details, see the Norwegian government white paper, NOU 1998: 19.

average number of employees in January and December of each year.⁴ The proportion of men and the proportion of part time workers within each enterprise are measured correspondingly and included in the analysis. Education at the enterprise level is a variable in three categories: 1) Low education profile, i.e. an average educational level of less than ten years, 2) medium education profile, i.e. an average level of more than nine and less than fifteen years of education and 3) high education profile, i.e. an average level of more than fourteen years of education.

The industrial activity variable is based on the International Standard Industrial Classification of all Economic Activities, ISIC. The standard has a five-level hierarchical structure, where the levels are designated as follows: Major division, division, major group, group and subgroup. A sample of approximately 85 000 persons allows a rather detailed list of categories, but a closer analysis reveals no differences of any significance between divisions or groups within each major division. The only exception is the division "Personal, social and cultural services", into which public sector employees are included along with teachers, health workers, librarians, artists and actors and so forth. From this division the effect of employees from the two major groups "Education" and "Research activity" is extracted.

In addition to the industrial classification, we have generated a variable which measures how the probability of early retirement is affected by working in a competitive industry compared to working in more protected sectors. The competitive industry includes forestry, mining and quarrying, oil and gas extraction, manufacturing, air transport and foreign trade, whereas the sheltered industries are the public sector and other personal, social and cultural services, domestic trade, construction, domestic transport, real estate, business activities, electricity and water supply, financial intermediation and agriculture.⁵

To capture regional differences, Norway is divided into seven regions.⁶ They are Oslo and Akershus, Hedmark and Oppland, South Eastern Norway, Agder and Rogaland, Western Norway, Trøndelag and Northern Norway.

5.3. Summary statistics

Due to the fact that we use register information, the number of observations is huge. There are 83 000 persons who meet our sample requirements and the employees may have up to 36 records each, one for

each month they are still at work. Table 5.1 shows that approximately 50 per cent of the sample population leave the labour force through one of the exits, whereas the other half is being censored. As previously mentioned, persons with no employment exits are censored the month in which they turn 67 or if they die during our time of observation.

The high share of censored observations may be explained in two ways, at least. Firstly, we start to follow workers from their 63rd birthday onwards. This means that these persons are not likely to be entitled to an occupational pension scheme which permit retirement already at the age of 57 or 60, since occupational pension usually has a mandatory age requirement. Nor are they likely to have become unemployed around the age of 60.5, which would have entitled them to unemployment benefits until the age of 67. In fact, Table 5.1 shows that 41 per cent of the male employees and 46 per cent of the females employees who are entitled to AFP choose not to retire early through AFP, DP or OLF. One reason for the high share of censored observations may thus be a large degree of work persistency, i.e. several persons who are still employed at the age of 63 have decided not to retire early, either because they are not at liberty to do so financially, or because they do not wish to do so.

The second explanation is of a more technical nature. As mentioned above, employees are not always excluded from the Register of Employers and Employees when they end their employment. Therefore, information from other register sources has been taken into consideration, see section 4. However, it is not possible to correctly identify those who start to receive occupational pension, for instance at the age of 65, unless the employer actually reports when each employee leaves the enterprise. These persons will appear to be working until they retire at the age of 67, whereas they should have been recorded with an OLF exit. As a consequence, our probability of exiting to OLF in chapter 7 may be underestimated. The only way to improve this matter is to develop a register of occupational pensioners, but this information is not yet available.

Not surprisingly, the best part of the employees who are entitled to AFP and leave the labour force early do so to receive the AFP benefit, Table 5.1. In addition to the frequencies, the average employment duration from the age of 63 is summarised, and only minor differences are to be found across entitlements. The only exception is male workers who exit to OLF. Men who are not entitled to AFP spend 5 months longer in the labour force, on average, in comparison to men who are entitled to AFP. Furthermore, among persons who are entitled to AFP and exit to OLF we find that male workers tend to have a shorter duration than the female workers do.

⁴ If, during an observation year, a company has been established, i.e. the number of employees in January is zero, or closed down, i.e. the number of employees in December is zero, only the value different from zero is used in these calculations.

⁵ This definition coincides with the one in Norman (1992).

⁶ With reference to the Regional Nomenclature for Norway, this is REGIN 2 level.

Table 5.1. Transition frequencies and average duration by AFP entitlement and sex

States of destination	All	Entitled to AFP						Not entitled to AFP					
		Males			Females			Males			Females		
		Fre- quencies	Per cent	Mean duration	Fre- quencies	Per cent	Mean duration	Fre- quencies	Per cent	Mean duration	Fre- quencies	Per cent	Mean duration
AFP	20 514	11 763	69,1 %	20 months	8 751	64,7 %	20 months	2 281	42,0 %	18 months	2 121	39,6 %	19 months
DP	10 156	2 942	17,3 %	18 months	2 812	20,8 %	19 months	3 146	58,0 %	21 months	3 236	60,4 %	22 months
OLF	10 664	2 321	13,6 %	16 months	1 961	14,5 %	20 months						
Total number of transitions	41 334	17 026	59,1 %		13 524	53,8 %		5 427	35,9 %		5 357	38,2 %	
Censored observations	41 760	11 798	40,9 %	25 months	11 598	46,2 %	26 months	9 695	64,1 %	30 months	8 669	61,8 %	31 months
Total number of observations	83 094	28 824	100,0 %		25 122	100,0 %		15 122	100,0 %		14 026	100,0 %	

Table 5.2 and 5.3 summarise the independent variables for AFP entitled and AFP not entitled persons, respectively. The distributions of the categorical variables are shown both in per cent and as frequencies. The remaining variables are shown as an average or a share of the total number of persons. Note that if we look exclusively on males who are entitled to AFP, only minor variations across destinations are to be found. A similar finding appears if we exclusively consider females who are entitled to AFP. The only exception worth mentioning is that the share that is married among women who exit to AFP is considerably higher than the share that is married among women who exits to DP and OLF, respectively.⁷ In fact, women who retire early through AFP show a distribution of marital status which is surprisingly similar to that of men whose state of destination is AFP. If comparisons are made by destinations, but separately for males and females who are not entitled to AFP, once more we see that there are little variations across destinations. A more fruitful approach is to compare the descriptive characteristics of males and females within the two entitlement categories and we begin by looking at the sub sample in which the persons who are entitled to AFP are included. Table 5.2 confirms that male workers on average have greater earnings than female workers do, also at the age of 63 and onwards. The potential pension variable is a way of summarising the individual income profile over the years. On average, we find that men will receive a higher pension from the National Insurance Scheme than women will. This reflects the common fact that men tend to spend more years in full time employment than women do. Also among older workers, there is a pronounced difference in the labour supply of men and women. The share of males working full time is well above 90 per cent, whereas the share of females working full time averages up to 50.9 per cent within this sample. If we move on to the enterprise characteristics we also find that female workers are more likely to work in enterprises with a high proportion of part time work than men are. Furthermore, we find that female

workers are less likely to work in enterprises with a high proportion of male workers than men are, which indicates a rather segregated labour market. This signals that within our sample, men and women have chosen different career paths. The share of female workers in "Other public and private services", in which the public sector is included, is 44,6 per cent on average, whereas the equivalent for men is 22.5 per cent. This in mind, it seems reasonable that only 10 per cent (approximately) of the female employees work in the competitive sector, whereas 35 per cent (approximately) of the male employees work in the competitive sector. A high proportion of female employees works in the health sector and as teachers of secondary education. Hospitals, health institutions and secondary schools are all run by an administration within each county.⁸ Although it would have been preferable in our context, each hospital and school is unfortunately not given a unique identification number. In stead, county workers within each county are all given the same enterprise identification number and, hence, characteristics. The size of the county administration depends on the number of inhabitants within each county and may vary from approximately 3000 (Sogn og Fjordane) till 14000 (Hordaland) employees. This explains why women work in enterprises with a higher number of employees than men do, on average.

If we turn to Table 5.3 we find to a great extent that the same pattern emerges for the non entitled men and women, but we would like to pinpoint some of the differences between the two entitlement samples. For instance, we find that men and women who are not entitled to AFP are more equally distributed across marital status than the sample of entitled men and women. Furthermore, we find that persons, who are entitled to AFP, although they leave the labour force through other channels, have higher earnings in comparison to persons who are not entitled to AFP and exit through DP and OLF. In particular the difference in average earnings for women with and without entitlement is quite pronounced. Note also that in the

⁷ In the case of OLF, the difference is totally absorbed by the widow category, whereas in the case of DP, the difference is equally split between widowers and divorcees.

⁸ Norway is divided into seven regions, nineteen counties and 435 municipalities.

case of persons who are not entitled to AFP, of whom exit to OLF, men earn more than twice as much as women on average. Approximately half of the female employees who are entitled to AFP work full time. Among female employees who are not entitled to AFP, part time work is much more widespread. Only 37.3 per cent work full time. Although the proportion of full time workers is slightly less among men who are not entitled to AFP compared to men who are entitled to AFP, we still find that 87.5 per cent of the men in the former sample work full time. The average proportion of employees above the age of 50 is 26.4 per cent in

the sample of entitled persons, whereas it is 34.1 per cent among the not entitled. Finally, in this latter sample, there is a higher proportion of employees who work in enterprises in which the average worker has more than 14 years of education. We also find that there is a higher concentration of OLF workers in this sample who are from the Oslo and Akershus region compared to how this variable is distributed within the other destinations.

Table 5.2. Summary statistics for males and females who are entitled to AFP. Reference groups are indicated in bold

	Early retirement scheme (AFP)				Disability pension (DP)				Out of the labour force (OLF)				
	Males		Females		Males		Females		Males		Females		
	Fre- quency	Percent	Fre- quency	Percent	Fre- quency	Percent	Fre- quency	Percent	Fre- quency	Percent	Fre- quency	Percent	
Individual characteristics:													
Marital status:													
	Married	9 900	84,2 %	7 017	80,2 %	2 448	83,3 %	1 837	65,4 %	1 874	81,3 %	1 154	59,1 %
	Unmarried	749	6,4 %	589	6,7 %	156	5,3 %	160	5,7 %	115	5,0 %	108	5,5 %
	Widow(er)	399	3,4 %	612	7,0 %	125	4,3 %	481	17,1 %	121	5,2 %	562	28,8 %
	Divorced	715	6,1 %	533	6,1 %	211	7,2 %	332	11,8 %	195	8,5 %	127	6,5 %
Education (number of years)		10,5		10,1		10,1		9,9		10,7		10,1	
Expected work hours:	Short part time	158	1,3 %	1 793	20,5 %	63	2,1 %	503	17,9 %	113	4,9 %	473	24,2 %
	Long part time	188	1,6 %	2 626	30,0 %	63	2,1 %	730	26,0 %	63	2,7 %	507	26,0 %
	Full time	11 417	97,1 %	4 332	49,5 %	2 814	95,7 %	1 577	56,1 %	2 129	92,4 %	971	49,8 %
Income (Nok 1000)		232,1		151,5		204,4		147,2		222,3		146,9	
Potential pension (Nok 1000)		110,5		71,7		106,1		73,1		112,2		73,1	
Potential unemployment benefit (Nok 1000)		140,6		103,4		130,7		102,0		128,0		101,2	
Enterprise characteristics:													
Number of employees		2 719		4973		3 384		5 719		2 593		4 888	
Proportion of male employees			63,2 %		35,2 %		58,2 %		33,3 %		62,8 %		36,0 %
Proportion of employees above the age of 50			27,3 %		26,2 %		26,2 %		25,0 %		27,6 %		25,9 %
Proportion of long part time employees			7,9 %		15,3 %		9,2 %		15,7 %		7,8 %		14,8 %
Proportion of short part time employees			12,2 %		22,6 %		14,3 %		23,5 %		12,3 %		22,8 %
Total work experience on average		16,2		13,8		15,5		13,6		16,1		13,8	
Enterprise specific work experience on average		6,1		5,3		5,9		5,3		6,0		5,3	
Education on average :	Low educated	407	3,5 %	338	3,9 %	86	2,9 %	97	3,5 %	109	4,7 %	93	4,8 %
	Medium educated	10 096	85,8 %	7 810	89,2 %	2 524	85,9 %	2 547	90,6 %	2 025	87,9 %	1 739	89,1 %
	High educated	1 260	10,7 %	603	6,9 %	332	11,3 %	166	5,9 %	171	7,4 %	119	6,1 %
Unemployment rate			5,1 %		5,0 %		5,1 %		5,2 %		5,2 %		5,1 %
Competitive sector:	No	7 704	65,5 %	7 822	89,4 %	2 024	68,8 %	2 609	92,8 %	1 444	62,6 %	1 742	89,3 %
	Yes	4 059	34,5 %	929	10,6 %	916	31,2 %	201	7,2 %	861	37,4 %	209	10,7 %
Industry categories:													
	Agriculture, forestry and hunting	99	0,8 %	24	0,3 %	18	0,6 %	4	0,1 %	19	0,8 %	14	0,7 %
	Oil and gas extraction	97	0,8 %	14	0,2 %	31	1,1 %	4	0,1 %	82	3,6 %	18	0,9 %
	Manufacturing	3 706	31,5 %	874	10,0 %	860	29,3 %	191	6,8 %	726	31,5 %	185	9,5 %
	Electricity, gas and water supply	390	3,3 %	39	0,4 %	5	0,2 %	1	0,0 %	33	1,4 %	4	0,2 %
	Construction	856	7,3 %	93	1,1 %	273	9,3 %	31	1,1 %	128	5,6 %	18	0,9 %
	Domestic trade, hotel and restaurants	927	7,9 %	926	10,6 %	220	7,5 %	274	9,8 %	204	8,9 %	150	7,7 %
	Transport	951	8,1 %	106	1,2 %	152	5,2 %	20	0,7 %	103	4,5 %	26	1,3 %
	Post and telecommunication	180	1,5 %	229	2,6 %	61	2,1 %	93	3,3 %	40	1,7 %	49	2,5 %
	Financial intermediation, insurance, real estate	420	3,6 %	302	3,5 %	50	1,7 %	38	1,4 %	76	3,3 %	34	1,7 %
	Education and research	1 437	12,2 %	2 313	26,4 %	434	14,8 %	789	28,1 %	328	14,2 %	589	30,2 %
	Other public and private services	2 668	22,7 %	3 810	43,5 %	831	28,3 %	1 360	48,4 %	555	24,1 %	851	43,6 %
	Unknown industry	32	0,3 %	21	0,2 %	5	0,2 %	5	0,2 %	11	0,5 %	13	0,7 %
Region													
	Oslo and Akershus	3 298	28,0 %	2 627	30,0 %	658	22,4 %	687	24,4 %	678	29,4 %	510	26,1 %
	Hedmark and Oppland	1 169	9,9 %	840	9,6 %	220	7,5 %	211	7,5 %	154	6,7 %	172	8,8 %
	South Eastern Norway	1 905	16,2 %	1 312	15,0 %	482	16,4 %	406	14,4 %	440	19,1 %	289	14,8 %
	Agder and Rogaland	1 581	13,4 %	1 043	11,9 %	409	13,9 %	319	11,4 %	243	10,5 %	250	12,8 %
	Western Norway	2 114	18,0 %	1 612	18,4 %	509	17,3 %	479	17,0 %	455	19,7 %	423	21,7 %
	Trøndelag	917	7,8 %	685	7,8 %	282	9,6 %	318	11,3 %	167	7,2 %	166	8,5 %
	Northern Norway	779	6,6 %	632	7,2 %	380	12,9 %	390	13,9 %	168	7,3 %	141	7,2 %
Number of observations		11 763		8 751		2 940		2 810		2 305		1 951	

Table 5.3. Summary statistics for males and females who are not entitled to AFP. Reference groups are indicated in bold

		Disability pension (DP)				Out of the labour force (OLF)			
		Males		Females		Males		Females	
		Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Individual characteristics:									
Marital status:	Married	1 906	83,5 %	1 528	72,0 %	2 605	82,4 %	2 309	71,1 %
	Unmarried	137	6,0 %	79	3,7 %	190	6,0 %	156	4,8 %
	Widow(er)	73	3,2 %	334	15,7 %	120	3,8 %	603	18,6 %
	Divorced	167	7,3 %	182	8,6 %	247	7,8 %	178	5,5 %
	Education	9,7		9,1		10,8		9,4	
Expected work hours:	Short part time	179	7,8 %	700	33,0 %	308	9,7 %	1 397	43,0 %
	Long part time	70	3,1 %	560	26,4 %	126	4,0 %	710	21,9 %
	Full time	2 034	89,1 %	863	40,7 %	2 728	86,3 %	1 139	35,1 %
Income (Nok 1000)		176,7		113,7		215,7		100,9	
Potential pension (Nok 1000)		105,3		69,3		113,0		64,5	
Potential unemployment benefit (Nok 1000)		117,0		93,4		122,3		84,8	
Enterprise characteristics:									
Number of employees		1 471		2 097		2 189		2 085	
Proportion of male employees			71,6 %		35,9 %		70,9 %		35,9 %
Proportion of employees above the age of 50			33,4 %		31,0 %		35,5 %		36,5 %
Proportion of long part time employees			6,7 %		16,7 %		6,4 %		15,3 %
Proportion of short part time employees			13,8 %		24,2 %		13,2 %		27,0 %
Total work experience on average		16,4		13,2		17,0		13,3	
Enterprise specific work experience on average		5,9		5,5		5,7		5,4	
Education on average :	Low educated	65	2,8 %	67	3,2 %	147	4,6 %	85	2,6 %
	Medium educated	1 734	76,0 %	1 628	76,7 %	2 541	80,4 %	2 425	74,7 %
	High educated	484	21,2 %	428	20,2 %	474	15,0 %	736	22,7 %
Unemployment rate			5,2 %		5,2 %		5,2 %		5,2 %
Competitive sector:	No	1 758	77,0 %	1 930	90,9 %	2 551	80,7 %	2 985	92,0 %
	Yes	525	23,0 %	193	9,1 %	611	19,3 %	261	8,0 %
Industry categories:									
	Agriculture, forestry and hunting	123	5,4 %	42	2,0 %	146	4,6 %	182	5,6 %
	Oil and gas extraction	13	0,6 %	2	0,1 %	26	0,8 %	5	0,2 %
	Manufacturing	456	20,0 %	181	8,5 %	414	13,1 %	214	6,6 %
	Electricity, gas and water supply	90	3,9 %	20	0,9 %	180	5,7 %	37	1,1 %
	Construction	205	9,0 %	23	1,1 %	169	5,3 %	46	1,4 %
	Domestic trade, hotel and restaurants	461	20,2 %	588	27,7 %	519	16,4 %	873	26,9 %
	Transport	242	10,6 %	34	1,6 %	488	15,4 %	81	2,5 %
	Post and telecommunication	36	1,6 %	36	1,7 %	162	5,1 %	177	5,5 %
Financial intermediation, insurance, real estate		182	8,0 %	151	7,1 %	464	14,7 %	403	12,4 %
Education and research		120	5,3 %	309	14,6 %	130	4,1 %	390	12,0 %
Other public and private services		335	14,7 %	718	33,8 %	390	12,3 %	784	24,2 %
Unknown industry		20	0,9 %	19	0,9 %	74	2,3 %	54	1,7 %
Region									
	Oslo and Akershus	751	32,9 %	665	31,3 %	1 426	45,1 %	1 199	36,9 %
	Hedmark and Oppland	181	7,9 %	177	8,3 %	167	5,3 %	253	7,8 %
	South Eastern Norway	379	16,6 %	347	16,3 %	437	13,8 %	475	14,6 %
	Agder and Rogaland	286	12,5 %	251	11,8 %	326	10,3 %	338	10,4 %
	Western Norway	319	14,0 %	324	15,3 %	484	15,3 %	589	18,1 %
	Trøndelag	192	8,4 %	168	7,9 %	163	5,2 %	212	6,5 %
	Northern Norway	175	7,7 %	191	9,0 %	159	5,0 %	180	5,5 %
Number of observations		2 283		2 123		3 162		3 246	

6. The model

A transition from work to retirement is the result of a process of decision making between retirement now and continued labour force participation. The length of time of this process from a starting point, e.g. a certain age, till the outcome of the process, the actual transition, will differ from one person to the next. The most suitable tool for studying this kind of process is known as duration analysis, also called event history analysis or survival analysis.⁹ The underlying model in duration analysis is the hazard rate model. The hazard rate is the conditional probability that an event will occur at a particular point in time to a particular individual, given that it has not already happened. In our case, the state of origin is employment at the age of 63, the event is retirement at some time, t , and the state space, Y , is defined as $\{Y_j; j = \text{AFP}, \text{DP}, \text{OLF}\}$. Since all pensions are paid on a monthly basis, register data only tells in which month an older worker starts to receive some kind of pension. It therefore seems most appropriate to make use of a *discrete* hazard rate model. The issue under study strongly influences the particular choice of model. We expect there to be a positive time dependency simply because individuals are more likely to retire as they grow older, but in the case of AFP, for instance, we expect that many older workers will take the first opportunity to leave the labour force. Hence, we expect there to be spikes in the AFP hazard. Therefore, we make use of a flexible hazard rate model in which an intercept, α_t , is included that may change monthly. Let x be the vector of covariates, β_k be the coefficient estimate for variable k and let P_{it} be the conditional probability that individual, i , has an event at time t , given that an event has not already occurred to that individual. Then, the discrete hazard of experiencing event j , r_j , can be expressed as

(6.1)

$$r_j(t_i, Y = j | x_i) = \ln\left(\frac{P_{it}}{1 - P_{it}}\right) = \alpha_{jt} + \beta_{j1}x_{it1} + \dots + \beta_{jk}x_{itk},$$

$$t = 1, 2, 3, \dots, 36$$

$$j = \text{AFP}, \text{DP}, \text{OLF}$$

⁹ For further details, see Blossfeld and Rohwer (1995).

7. Results

In order to receive AFP benefits certain individual conditions related to previous work experience need to be met in addition to the minimum age requirement. Workers with a number of years outside the labour force or an employment history predominated by part time work may not be entitled to AFP benefits, while workers with a regular employment history quite easily meet the requirements. Nevertheless, employees who do not work in enterprises which partake in the AFP scheme, will not be able to retire early through AFP. Persons who are not entitled to AFP for whatever reason will never be at risk of exiting to all the three states of destination described above. Therefore, separate regressions are run for persons who are entitled to AFP and persons who are not entitled to AFP. Furthermore, for each sub sample separate analyses are made for men and women based on the findings in Tables 5.2 and 5.3.

7.1 The time dependency

We start to follow our sample from the month in which the workers turn 63 years. A person born in January 1929 will turn 63 in January 1992. In 1992 AFP was not an option unless you had become 65 years of age, which implies a minimum waiting time of 24 months. Since the age of eligibility was reduced in October 1993, however, a person born in January 1929 could actually start to receive AFP in October 1993. This person will, henceforth, experience a minimum waiting time of 21 months in stead of 24, see Table 7.1. Every person born earlier than October 1929 are eligible for AFP in October 1993 and for everyone the minimum waiting time will be no more than 21 and no less than 13 months. Persons born between October 1929 and September 1933 will all experience a minimum waiting time of 13 months since they may start to receive the AFP pension the first month after their 64th birthday. Due to another adjustment in the eligibility age in October 1997, this time from age 64 to age 63, persons in our sample who are born after September 1933 will have less than 13 months to wait before they may start to receive the AFP pension. The youngest of them all will have to wait one month only.

Table 7.1. Minimum waiting time to AFP by year and month of birth

Year and month of birth		63 years in:		Entitled to AFP in:		Minimum waiting time
1929	01	1992	01	1993	10	21 months
1929	02	1992	02	1993	10	20 months
1929	08	1992	08	1993	10	14 months
1929	09	1992	09	1993	10	13 months
1929	10	1992	10	1933	11	13 months
1929	11	1992	11	1993	12	13 months
1929	12	1992	12	1994	01	13 months
1933	08	1996	08	1997	9	13 months
1933	09	1996	09	1997	10	13 months
1933	10	1996	10	1997	10	12 months
1933	11	1996	11	1997	10	11 months
1933	12	1996	12	1997	10	10 months
1934	01	1997	01	1997	10	9 months
1934	09	1997	09	1997	10	1 month
1934	10	1997	10	1997	11	1 month
1934	11	1997	11	1997	12	1 month
1934	12	1997	12	1998	01	1 month

The figures 7.1 to 7.5 picture the time dependency for each state of destination, separately for men and women and with respect to whether or not one is entitled to AFP.¹⁰ A very small proportion of the workers is at risk of leaving the labour force due to AFP within the first twelve months of observation and there is no significant difference in the probability of receiving AFP in the months 1 to 12 relative to month 36, see Figure 7.1. In month 13, however, there is a pronounced spike. This spike indicates that quite a number of employees leave their employer in order to receive the AFP benefits at the first possible opportunity. Although no one in our sample has a minimum waiting time of more than 21 months, we note that there is a sharp, but less pronounced spike in the 25th month of duration. This probably reflects that some of

¹⁰ The picture of the time dependency is normally referred to as the baseline hazard. Since the figures 7.1 to 7.5 show the $\exp(\alpha_t)$, which is a transformation of the time coefficient estimates, the time dependency is more correctly interpreted as the risk of leaving work in month t , relatively to leaving in the month of reference. Due to a standard procedure in SAS the last month, which in our case is month thirty-six, is made the month of reference.

Figure 7.1. The relative risk of exiting to AFP by time exposure among persons who are entitled to AFP

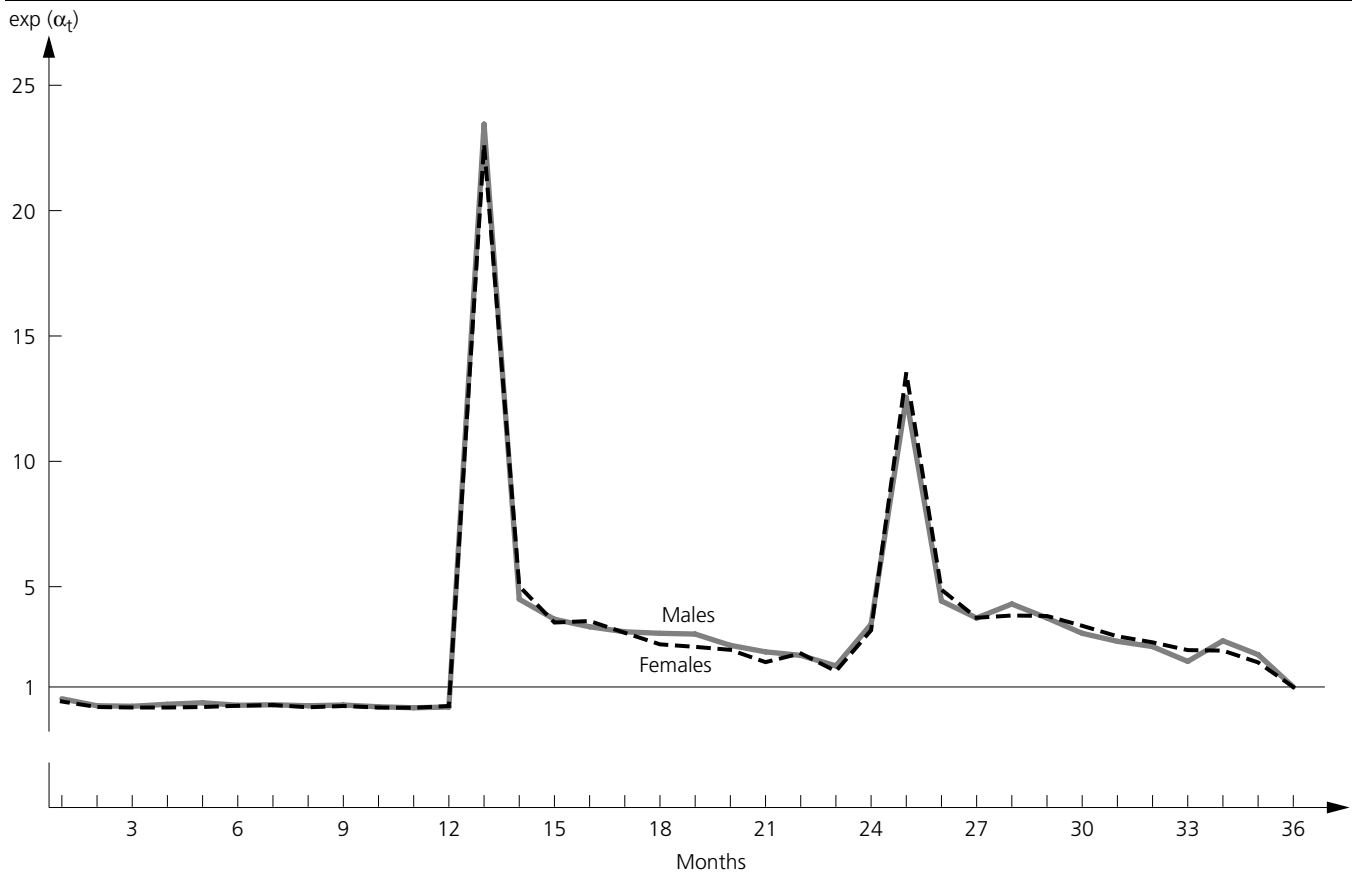


Figure 7.2. The relative risk of exiting to DP by time exposure among persons who are entitled to AFP

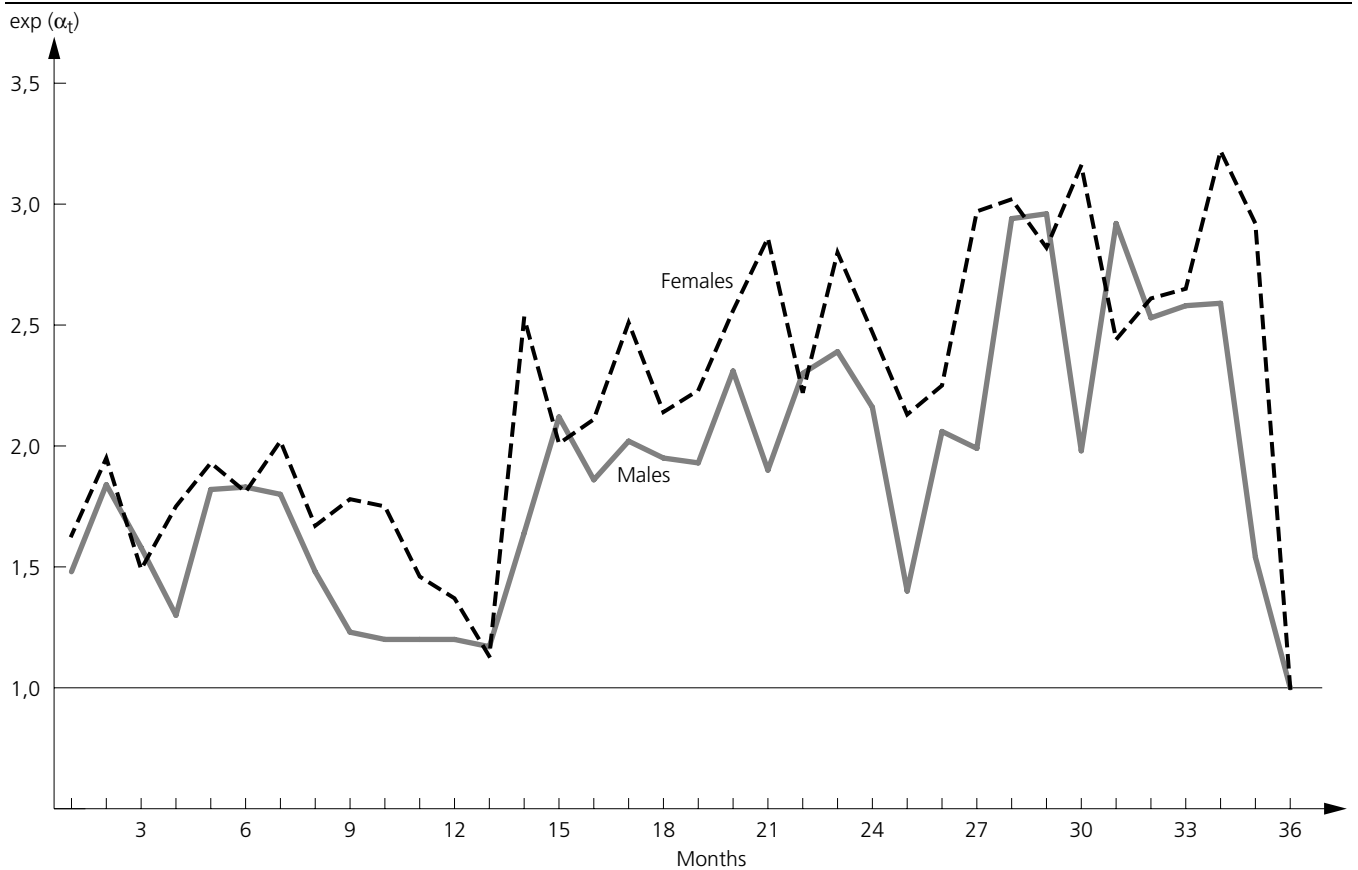
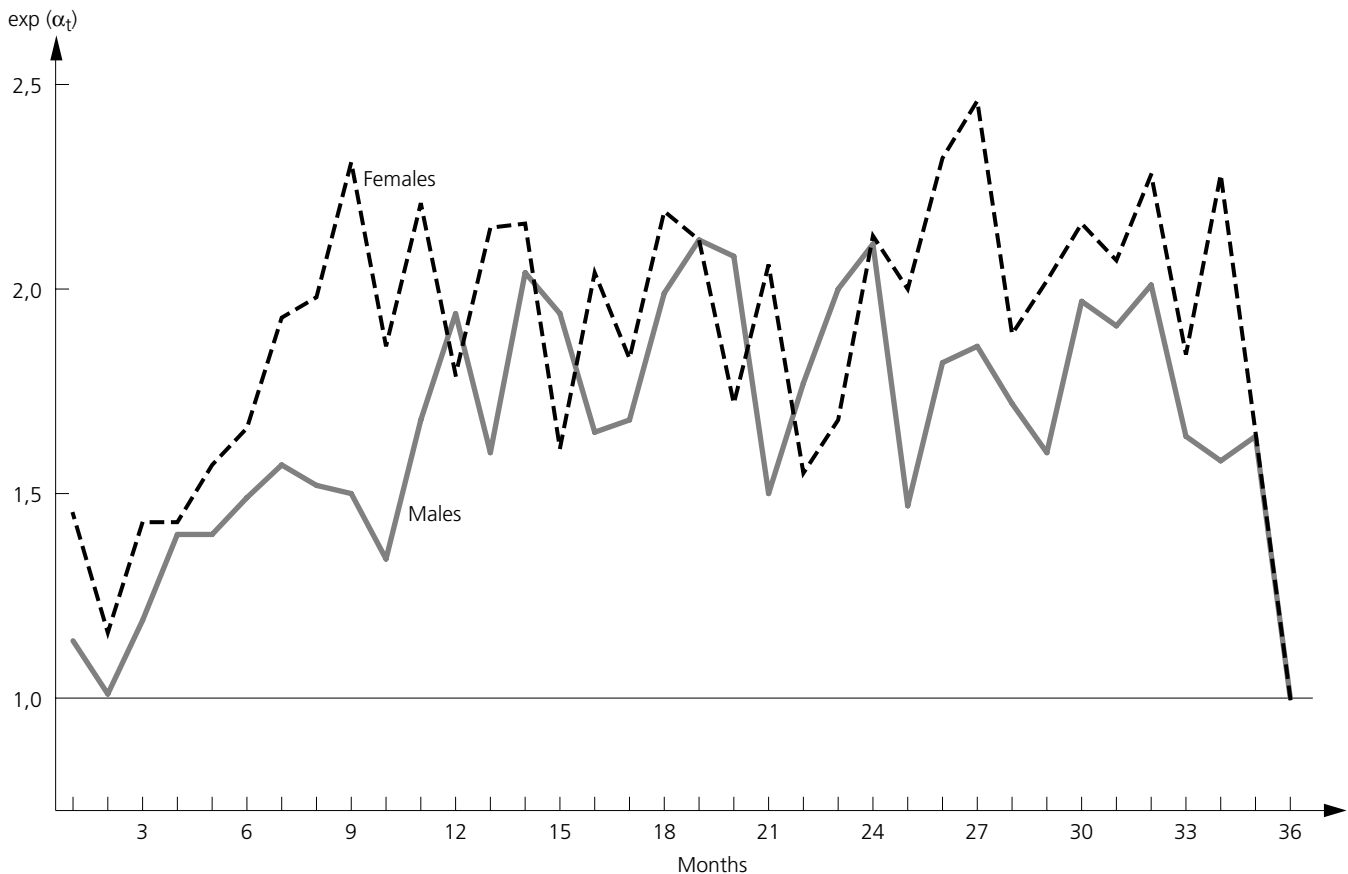


Figure 7.3. The relative risk of exiting to DP by time exposure among persons who are not entitled to AFP



the older workers initially had prepared to leave for AFP at the age of 65 and, hence, act according to plan even though they could have left a couple of months earlier due to a lowering of the entitlement age. It may also be that this reflects what we already know from the statistics, that it took a few years for the AFP scheme to take effect. In our sample, most of the persons who leave for AFP after two years do so earlier in the history of AFP than most of the persons who leave after 13 months. Finally, we note that the time profile of men and women are quite similar with respect to exits to AFP.

In the case of DP, no real pattern emerges, which is as expected. All in all, women seem to have a slightly higher inclination towards disability pension than men do, see Figures 7.2 and 7.3. Furthermore, there seem to be a faint increase in the risk of becoming disabled with age, i.e. with duration of time.

Figures 7.4 and 7.5 show the relative risks of exiting to OLF by time exposure. Since this state of destination comprises a mixture of reasons for leaving the labour force, interpretations should be made with caution. Still, there are a few points we would like to make. In the two figures we see that both men and women have a relative risk which is declining the first nine to twelve months. This may be due to the high proportion of unemployment incidents the first year after becoming

63 years of age. These incidents cease to occur after the first twelve months. If we bear in mind that every individual is followed from the month he or she turns 63 years old, we know that 25 months later they are all 65 years and a month. This is the first month in which quite a number of workers are allowed an occupational pension. In both figures there is a pronounced spike in this particular month. For persons who never will be entitled to AFP, Figure 7.5, this kind of behaviour is rather straightforward. It is somewhat more at odds with our expectations that persons who actually are entitled to AFP choose to wait an extra 12 months in order to receive an occupational pension in stead of receiving the AFP pension, Figure 7.4. For employees in the public sector with medium or high earnings their net income is significantly reduced as long as they receive the AFP pension. Many professions within the public sector are entitled to an occupational pension scheme at the age of 65 which in relative terms is considerably higher than the AFP pension.¹¹ This may explain why public employees, although entitled to AFP, choose to postpone their retirement till the age of 65. Approximately 40 per cent of the workers in the private sector are entitled to an occupational pension.¹²

¹¹ Nurses, drivers, railway workers, cleaning workers, prison workers and aviation workers and 40 per cent of the council workers.

¹² At the age of 65: nurses, miners, crane operators, digger drivers, salesmen, driving instructors and North Sea workers.

Figure 7.4. The relative risk of exiting to OLF by time exposure among persons who are entitled to AFP

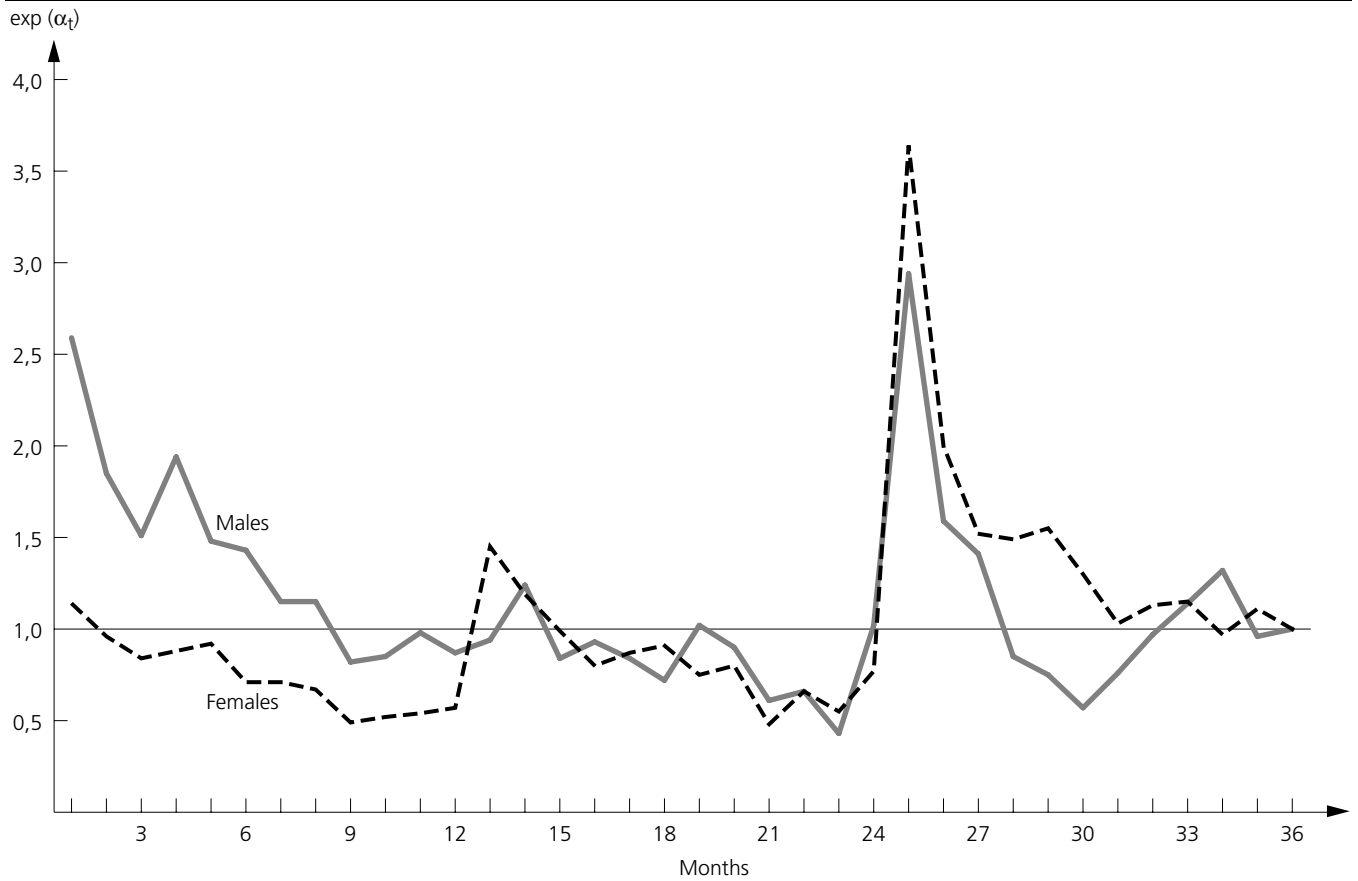
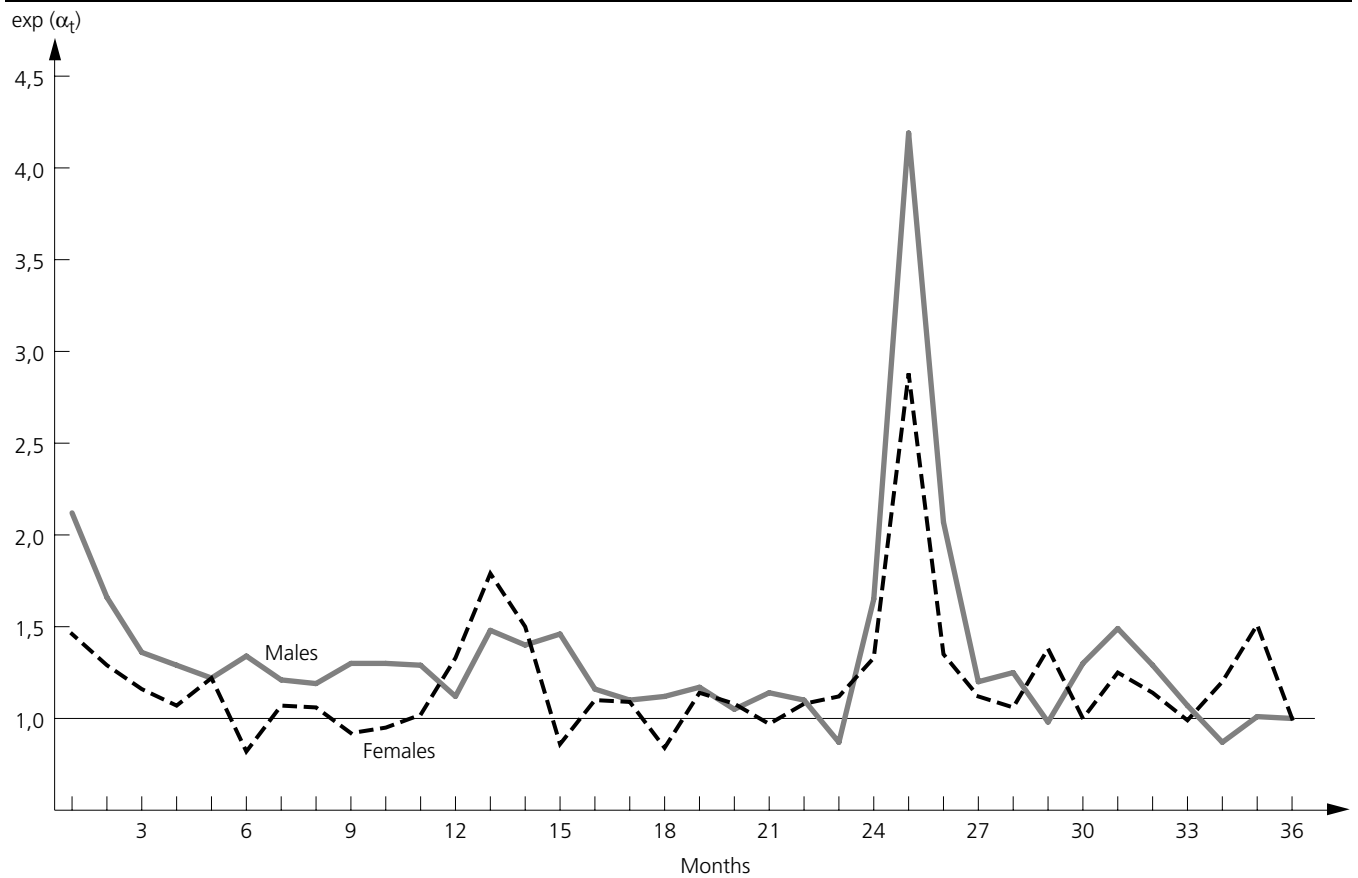


Figure 7.5. The relative risk of exiting to OLF by time exposure among persons who are not entitled to AFP



Employees in the private sector may choose not to accept AFP in fear of receiving a reduced occupational pension at the age of 67 since employers are not committed by law to continue to pay the premium to secure the occupational pension of former employees who has become AFP pensioners. Although many employers do continue to pay the premium, this element of uncertainty may explain why an occupational pension is given preference to an AFP pension among persons who are entitled to AFP. Once again we notice the similar behaviour of men and women.

7.2. The effects of individual and enterprise characteristics

Table 7.2 depicts coefficient estimates and standard errors for each state of destination for men and women who are entitled to AFP. For men and women with no AFP entitlements, the results are reported in Table 7.3 accordingly.

The pronounced effect of marital status is that married men and women are more likely than the presently not married, older workers to retire early. One explanation is that men and women who are married have a greater appreciation for leisure relative to work in comparison to those who are not married. The more underlying explanation is probably that persons in a two household economy are in a better position, financially, to retire early than workers who are single. Separated/divorced women are, on the other hand, at greater risk of receiving DP than the married ones, whereas unmarried women and widows are at a lesser risk. This is the case whether the female workers are entitled to AFP or not. For persons who are not entitled to AFP, marital status is not of any significance for the propensity towards OLF. Unmarried women who are entitled to AFP are less likely to exit to OLF compared to married women. Unmarried men, when entitled to AFP, have a reduced probability for receiving DP and leaving the labour force (OLF), whereas previously married men have a reduced propensity towards AFP compared to married men. Widows and widowers in this sub sample, however, are more likely to go to OLF than persons who are married are.¹³ Marital status is a time varying covariate and one interpretation is therefore that this positive effect may be explained by the economic incentive for surviving spouses to stop working in order to receive a full pension, at least for women this might be the case. Approximately 5 per cent of the women who transit to OLF has entered widowhood during our time of observation, but we do

not know if the death of their husband coincide with them leaving the labour force.

Well educated women, who are entitled to AFP, are more likely to retire early through AFP and OLF than women who are less educated. Education has no relevance to men who are entitled to AFP. The AFP scheme was originally intended for long, hard working and weary employees in the manufacturing industry, but has gradually become more of a universal scheme. The positive effect of education on AFP among women seems to confirm that the scheme not only attracts workers who might have had to leave the labour force for medical reasons anyway, but also workers who otherwise would have had to remain in the labour force. One way of explaining the positive effect of education on AFP and OLF for women is that higher educated women have had a more continuous working career compared to less educated women. Hence, higher educated women might to a greater extent have the needs and the means to retire early. Higher educated employees are normally less exposed to physical strains at work. This may explain the negative effect on DP for men and women who are not entitled to AFP.

Part time work makes people less likely to retire early. The effect applies to all workers except men who exit to OLF and women who are not entitled to AFP¹⁴. It seems reasonable that fewer working hours makes it less necessary to leave the work force early.

According to economic theory, the earnings effect on early retirement is expected to be negative for all exits since an increase in earnings will make it more attractive to work than to retire early, relatively speaking. Furthermore, theory predicts that an increase in the potential pension will increase the probability of transitions to any pension scheme and decrease the probability of unemployment and further labour. Accordingly, an increase in the potential unemployment benefit is expected to increase the probability of unemployment and decrease the probability of transitions to any pension scheme.

If we look at our states of destination one by one, we discover that in the case of AFP, all the hypotheses are confirmed. When we turn to the state of disability pension we find the effects to be according to theory when the persons are entitled to AFP or the persons are female workers and not entitled to AFP. Male workers in this latter category, on the other hand, have an insignificant income effect and an effect of the potential pension, which is negative and strongly significant. The effect of the unemployment benefit is negative, as expected. In the case of OLF, an increase in the potential unemployment benefit significantly reduces the probability of transitions to this particular destination.

¹³ If the spouse was a retiree or a member of National Insurance Scheme at least three years prior to the time of death, the widower/widow is entitled to a pension for surviving relatives. It may also be that the surviving spouse is entitled to some other pension scheme or insurance policy, which do not take effect until the late spouse would have reached a certain age had he/she been alive.

¹⁴ Long part time work, only.

Correspondingly, we find the effect of the potential pension on OLF to be positive, the only exception being male workers who are not entitled to AFP. At first these findings appear to be at odds with our expectations since unemployment is one of the possibilities within the OLF category. The key explanation is probably the composition of the approximately 10 000 individuals who exit to OLF, among whom the number of unemployed persons is just below 2000. Approximately 500 persons receive a pension for surviving relatives. We cannot separate the number of retirees on occupational pension from the number of individuals who are provided for by their spouse or on some kind of private pension scheme, but in total they amount to around 8000 persons. The marked spike in Figures 7.4 and 7.5 clearly suggests that a large amount of these persons start to receive some kind of occupational pension at the age of 65 and these pensions are calculated in very much the same way as the pensions within the National Insurance Scheme. If a transition to OLF is to be interpreted as a transition to an occupational pension, the negative effect of the unemployment benefit and the positive effect of the potential pension are as should be expected. An increase in earnings among men who are not entitled to AFP will significantly increase the probability of OLF, but the value of this coefficient is very small.

To our knowledge, a study of the relationship between early retirement and the working environment, based on register data, has not been undertaken before. The interpretation of the enterprise characteristics is therefore so far rather explorative. The overall conclusion is, however, that enterprise characteristics do contribute significantly to the explanation of early retirement.

In general, the size of the company is expected to have a positive effect on early retirement based on the hypothesis that bigger companies are in a better financial position to offer proper pension schemes than very small companies, measured in number of employees. Since the framing of pension schemes is largely regulated in Norway, this line of argument has a limited applicability. The disability pension, for instance, is a universal pension and we therefore do not expect the size of the enterprise to effect this state of destination at all. In the case of AFP it is actually the employees themselves who decide whether or not the AFP scheme is being offered. As long as one employee is organised in the labour union, the enterprise is obliged to pay the AFP premium, which equals the number of heads, and all employees are allowed to retire early as long as the individual criteria to AFP are met. Hence, we expect the size of the enterprise not to be of any significance in the case of transitions to AFP. The OLF category, on the other hand, is a mixture of reasons for early retirement: unemployment, occupational pension schemes and privately financed early retirement schemes. From the Figures 7.4 and 7.5

we know that a great number of this particular group of employees leave the labour force in order to receive an occupational pension. In this respect we expect the size of the company to positively effect the probability of retiring early through OLF. Once more the argument is that a small private enterprise is neither obliged nor able to offer an occupational pension scheme or a similar kind of pension agreement. A bigger enterprise will have the means to offer a pension scheme, either because they are obliged to or as a fringe benefit. Our finding is that if this variable is significant, the effect is negative. One explanation as to why employees who work in big enterprises are less likely to retire early than employees in smaller enterprises is that bigger enterprises may be more flexible when it comes to reduced work hours and job rotation. We correctly assumed transitions to DP not to be affected by the size of the company. Furthermore, in the case of AFP only women are effected by this characteristic.

The higher the proportion of employees above the age of 50 in an enterprise, the less likely the older workers are to retire early through AFP and DP. One interpretation of this negative effect is that older workers appreciate the company of other older workers, hence, they decide not to retire early. Another explanation is that the management in these enterprises have made some tactical moves which makes it desirable for older employees to continue to work there as they grow older. Unfortunately, we cannot distinguish whether this significant, negative effect is due to a successful senior policy or to collegiate spirit. Quite a different interpretation, however, is to say that regardless of how the employer looks upon older employees, the older workers remain in the labour force because their position is protected by law. Since the employees who are entitled to AFP show a reduced probability for both AFP and DP, this imply that they keep working because they want to, which clearly indicate that they are reasonably happy with their working conditions. In the case of OLF, only female workers who are not entitled to AFP are effected by the age profile of the enterprise and in this case the effect is positive.

Employees who are not entitled to AFP and who work in enterprises with a high proportion of part time work have a reduced probability of exiting to OLF. This is also the case for women who become disabled. The proportion of part time work in enterprises is less important among employees who are entitled to AFP. We find that men who work in enterprises with a high proportion of short part time work are negatively affected by this characteristic. These effects are very much as one would expect. Employees who work in enterprises with a high proportion of part time work have the opportunity to reduce their work hours in stead of retiring early. This option is much more valuable to employees who are not entitled to AFP than to the workers who are entitled to AFP.

Table 7.2. Coefficient estimates and standard errors for males and females who are entitled to AFP¹

	Early retirement scheme (AFP)				Disability pension (DP)				Out of the labour force (OLF)			
	Males		Females		Males		Females		Males		Females	
	Coefficients	Standard error	Coefficients	Standard error	Coefficients	Standard error	Coefficients	Standard error	Coefficients	Standard error	Coefficients	Standard error
Intercept	-3,1787	0,1431	-3,3592	0,1654	-1,0715	0,2498	-2,9824	0,2815	-5,0748	0,2923	-4,8357	0,3258
<i>Individual characteristics:</i>												
Marital status:												
Unmarried	-0,0579	0,0424	-0,5547	0,0507	-0,3796	0,0846	-0,3761	0,0901	-0,2561	0,0979	-0,2619	0,1105
Widow(er)	-0,2999	0,0519	-1,5307	0,0422	-0,0527	0,0873	-0,3444	0,0530	0,2191	0,0905	0,4948	0,0537
Divorced	-0,2528	0,0420	-0,6800	0,0504	-0,0429	0,0727	0,3282	0,0658	0,0831	0,0774	-0,1512	0,0999
Education	0,0039	0,0042	0,0291	0,0051	-0,0051	0,0079	0,0117	0,0086	-0,0103	0,0087	0,0560	0,0101
Expected work hours:												
Short part time	-1,5593	0,0832	-0,7232	0,0370	-1,3604	0,1278	-1,4260	0,0655	-0,1586	0,1048	-0,4107	0,0716
Long part time	-0,9190	0,0787	-0,3420	0,0322	-0,8972	0,1310	-0,7030	0,0525	-0,1624	0,1305	-0,3847	0,0664
Income (Nok 1000)	-0,0026	0,0002	-0,0096	0,0005	-0,0024	0,0005	-0,0151	0,0008	0,0009	0,0003	-0,0066	0,0009
Potential pension (Nok 1000)	0,0120	0,0007	0,0241	0,0008	0,0029	0,0012	0,0184	0,0013	0,0092	0,0013	0,0165	0,0016
Potential unemployment benefit (Nok 1000)	-0,0248	0,0006	-0,0220	0,0011	-0,0340	0,0013	-0,0156	0,0018	-0,0307	0,0010	-0,0177	0,0022
<i>Enterprise characteristics:</i>												
Number of employees	0,0029	0,0017	-0,0053	0,0014	0,0060	0,0029	-0,0030	0,0024	-0,0130	0,0041	-0,0096	0,0030
Proportion of male employees	-0,1204	0,0853	-0,1130	0,1133	-0,6555	0,1603	-0,2652	0,2023	0,1986	0,1755	0,7944	0,2224
Proportion of employees above the age of 50	-0,5843	0,1485	-0,4567	0,1893	-0,8890	0,2911	-0,9345	0,3699	0,1492	0,2996	0,6850	0,3724
Proportion of long part time employees	-0,0725	0,1929	-0,0346	0,1681	-0,1782	0,3474	-0,3824	0,2944	-0,5785	0,4123	-0,5673	0,3547
Proportion of short part time employees	-0,3643	0,1188	0,0860	0,1296	-0,1848	0,2159	-0,2127	0,2280	-0,5346	0,2386	-0,3687	0,2539
Total work experience on average	0,0662	0,0067	0,0744	0,0085	0,0335	0,0120	0,0174	0,0151	0,0407	0,0135	0,0009	0,0167
Enterprise specific work experience on average	0,0002	0,0039	-0,0237	0,0064	0,0037	0,0078	-0,0010	0,0119	-0,0099	0,0080	-0,0575	0,0129
Education on average :												
Medium	0,1941	0,0410	-0,1262	0,0594	0,1075	0,0744	0,0056	0,1074	0,5711	0,0958	-0,1147	0,1226
High	-0,1718	0,0730	-0,1022	0,0903	-0,0845	0,1468	-0,1119	0,1634	0,1682	0,1474	-0,3377	0,1756
Unemployment rate	-0,0629	0,0089	-0,0610	0,0099	0,0110	0,0158	-0,0145	0,0158	0,1536	0,0177	-0,0027	0,0191
Not in the competitive sector	-0,3620	0,0871	-0,4096	0,2128	0,1595	0,2310	-0,2554	0,4847	-0,1522	0,2341	0,4988	0,4524
Industry categories:												
Agriculture, forestry and hunting	-0,1056	0,1164	0,2167	0,2518	-0,6431	0,2717	-0,2670	0,5927	-0,3390	0,2586	0,3420	0,4614
Oil and gas extraction	-0,8599	0,1115	-0,5491	0,2960	-0,3979	0,1889	0,0360	0,5143	1,0739	0,1228	1,6509	0,2617
Electricity, gas and water supply	0,5846	0,1061	1,3636	0,2839	-2,5469	0,4719	-0,8832	1,1166	-0,3016	0,2931	-0,5774	0,6852
Construction	0,3008	0,0975	0,0485	0,2448	0,2336	0,2427	0,4646	0,5259	-0,2738	0,2559	-0,8542	0,5189
Domestic trade, hotel and restaurants	0,2535	0,0985	0,2791	0,2198	-0,3332	0,2472	0,3026	0,4956	0,1135	0,2519	-0,7583	0,4661
Transport	0,3267	0,0824	0,2054	0,1931	-0,4705	0,2242	-0,0529	0,4450	-0,3736	0,2232	-0,2108	0,4504
Post and telecommunication	0,0937	0,1317	0,3576	0,2335	-0,2737	0,2853	1,0618	0,5101	0,3954	0,3136	-0,1554	0,4919
Financial intermediation, insurance, real	0,4193	0,1081	0,5223	0,2291	-0,6914	0,2783	0,0104	0,5221	0,1049	0,2690	-0,6420	0,4929
Education and research	0,3462	0,1014	0,0871	0,2200	-0,2269	0,2486	0,5202	0,4952	0,4447	0,2549	-0,3804	0,4646
Other public and private services	0,2237	0,0973	0,1062	0,2194	-0,1594	0,2439	0,5398	0,4942	0,3374	0,2487	-0,3767	0,4637
Unknown industry	0,2762	0,2656	0,0900	0,3302	-0,4552	0,5595	1,0451	0,6094	1,1499	0,4021	0,6563	0,5349
Region												
Oslo and Akershus	0,1415	0,0454	0,1020	0,0513	-0,5189	0,0736	-0,6751	0,0754	0,3278	0,0939	0,1976	0,1058
Hedmark and Oppland	0,3405	0,0512	0,1578	0,0574	-0,5514	0,0885	-0,5729	0,0900	-0,0099	0,1149	0,1972	0,1196
South Eastern Norway	0,1636	0,0469	0,1299	0,0525	-0,3368	0,0727	-0,4556	0,0751	0,3173	0,0951	<i>0,2339</i>	0,1077
Agder and Rogaland	0,3466	0,0486	0,1884	0,0550	-0,0597	0,0754	-0,3703	0,0799	0,0910	0,1050	0,3375	0,1112
Western Norway	0,0838	0,0462	0,0504	0,0517	-0,4193	0,0723	-0,5635	0,0741	0,3282	0,0948	0,3935	0,1037
Trøndelag	0,1897	0,0531	0,1194	0,0596	-0,2458	0,0820	-0,0373	0,0801	-0,0158	0,1134	0,3168	0,1194
Number of observations	11 763		8 751		2 940		2 810		2 305		1 951	

¹ Numbers in bold are significant at the 2 % level or less.

Table 7.3. Coefficient estimates and standard errors for males and females who are not entitled to AFP¹

	Disability pension (DP)				Out of the labour force (OLF)				
	Males		Females		Males		Females		
	Coefficients	Standard error	Coefficients	Standard error	Coefficients	Standard error	Coefficients	Standard error	
Intercept	-1,4461	0,2331	-3,0950	0,2623	-4,1693	0,2006	-4,3340	0,2095	
Individual characteristics:									
Marital status:									
	Unmarried	-0,3879	0,0919	-0,4891	0,1244	0,0522	0,0788	-0,0733	0,0918
	Widow(er)	-0,2349	0,1151	-0,3474	0,0616	0,1547	0,0858	0,0020	0,0463
	Divorced	-0,0440	0,0820	0,4741	0,0851	0,0553	0,0669	-0,0171	0,0836
Education		-0,0624	0,0100	-0,0652	0,0113	0,0085	0,0081	0,0214	0,0093
Expected work hours:									
	Short part time work	-0,9863	0,0958	-1,4973	0,0698	0,0143	0,0736	-0,1221	0,0563
	Long part time work	-0,6663	0,1261	-0,0224	0,0630	0,0296	0,1043	-0,0310	0,0595
Income (Nok 1000)		0,0007	0,0004	-0,0122	0,0007	0,0009	0,0002	-0,0020	0,0006
Potential pension (Nok 1000)		-0,0038	0,0011	0,0100	0,0016	-0,0007	0,0010	0,0070	0,0014
Potential unemployment benefit (Nok 1000)		-0,0301	0,0013	-0,0087	0,0023	-0,0144	0,0007	-0,0144	0,0017
Enterprise characteristics:									
Number of employees		-0,0124	0,0056	-0,0040	0,0029	-0,0006	0,0039	-0,0188	0,0034
Proportion of male employees		0,4571	0,1260	-0,5568	0,1313	0,0087	0,1067	0,0653	0,1020
Proportion of employees above the age of 50		-1,0906	0,1356	-1,0439	0,1467	-0,1440	0,1135	0,5762	0,0997
Proportion of long part time employees		-0,1475	0,2110	-0,6325	0,1671	-0,3297	0,1753	-0,3158	0,1287
Proportion of short part time employees		-0,1032	0,1256	-0,1738	0,1299	-0,5246	0,1098	-0,4751	0,0995
Total work experience on average		0,0159	0,0069	0,0307	0,0075	0,0140	0,0062	0,0041	0,0054
Enterprise specific work experience on average		0,0031	0,0058	-0,0012	0,0077	-0,0390	0,0051	-0,0576	0,0059
Education on average :									
	Medium	-0,0953	0,0636	-0,0887	0,0701	0,0993	0,0616	0,0303	0,0571
	High	0,0188	0,1511	0,0332	0,1506	-0,1501	0,1140	-0,2659	0,1291
Local unemployment rate		0,0802	0,0173	0,0464	0,0180	0,0956	0,0155	0,0547	0,0145
Not in the competitive sector		0,3579	0,1568	-0,6408	0,3497	-0,0693	0,0953	-0,6707	0,1875
Industry categories:									
	Agriculture, forestry and hunting	-0,7635	0,1660	-0,0645	0,3656	-0,1159	0,1262	0,6042	0,2033
	Oil and gas extraction	-1,2172	0,2888	-1,2657	0,7167	-0,2777	0,2235	-0,1100	0,4173
	Electricity, gas and water supply	-0,8607	0,1982	0,4641	0,4255	0,4043	0,1331	0,7722	0,2617
	Construction	-0,4759	0,1796	0,1701	0,4182	0,0380	0,1330	0,6194	0,2459
	Domestic trade, hotel and restaurants	-0,4532	0,1723	0,5808	0,3611	-0,1375	0,1188	0,7111	0,2034
	Transport	-0,8152	0,1608	-0,0903	0,3392	0,3624	0,0994	0,5413	0,1815
	Post and telecommunication	-1,7727	0,2447	-1,2860	0,4058	0,4066	0,1430	0,9921	0,2230
	Financial intermediation, insurance, real estate	-0,9643	0,1859	-0,0024	0,3708	0,0466	0,1235	0,8080	0,2092
	Education and research	-0,1558	0,1977	0,8705	0,3650	0,0739	0,1487	0,7045	0,2094
	Other public and private services	-0,4342	0,1750	0,8196	0,3620	-0,0603	0,1221	0,6020	0,2052
	Unknown industry	-0,4207	0,3037	0,6538	0,4833	1,3699	0,1639	1,6702	0,2415
Region									
	Oslo and Akershus	-0,0510	0,0903	-0,3005	0,0911	0,2909	0,0891	0,3596	0,0873
	Hedmark and Oppland	0,1066	0,1085	-0,1225	0,1075	0,1292	0,1127	0,0909	0,1005
	South Eastern Norway	0,0819	0,0934	-0,1959	0,0929	0,2774	0,0939	0,1228	0,0902
	Agder and Rogaland	0,1375	0,0994	-0,2227	0,1011	0,1301	0,0995	0,0500	0,0962
	Western Norway	-0,1473	0,0970	-0,3313	0,0956	0,1977	0,0938	0,2270	0,0894
	Trøndelag	0,0118	0,1069	-0,1042	0,1078	-0,0532	0,1137	0,0474	0,1039
Number of observations		2 283		2 123		3 162		3 246	

¹ Numbers in bold are significant at the 2 % level or less.

One expressed reason for introducing the AFP scheme was that tired workers should be allowed to retire earlier than the ordinary retirement age.¹⁵

Traditionally, male dominated professions have to a great extent been related to heavy, manual labour. New technology has reduced the need of manual input in most professions in recent years, even in the typically male dominated industries such as manufacturing, agriculture and forestry. Nevertheless,

workers in male dominated professions whose retirement is approaching will have spent the best part of their professional years doing manual labour.

Therefore, we expect the proportion of male employees to have a positive effect on early retirement. Females who are entitled to AFP turn out to be more likely to exit to OLF if they work in a male dominant enterprise. In the case of DP, male workers who are not entitled to AFP do also respond as expected, but the females in this sub sample have a reduced probability of exiting to DP if they work in a male dominated enterprise. This

¹⁵ See for instance the Norwegian government white paper, NOU 1998:19.

effect is more difficult to explain, but one reasoning may be that females who continue to work in male dominated enterprises beyond the age of 63 is a selective group of women in terms of health.

A different way to approach the tired worker effect is to argue that retirees of today, whose working careers have been dominated by heavy, manual labour, started off at a very young age which means that they have a longer record of work experience than most workers. Furthermore, this generation of workers has not been as willing as younger generations to change jobs, and that is why we expect the covariate, "Total work experience on average", to be of significance at the enterprise level. This time, the tired worker hypothesis is confirmed since an increase in the average total work experience within a company increases the probability of early retirement towards all three states of destination for men who are entitled to AFP. The same effect occurs among women who exit to AFP and among women who are not entitled to AFP and exit to DP. It is reasonable to believe that the total work experience within an enterprise is correlated with the age profile of the enterprise, but the two variables appear to be telling different stories since the two have opposite signs whenever significant. If we leave one of the variables out, the other one does not change sign which could have been expected if there were a strong correlation between the two.

The score on the enterprise specific work experience characteristic is a strong indication as to whether or not an enterprise is capable of holding on to its employees or not. Therefore, we expect the effect of this particular characteristic to be negative. We find that female workers who are entitled to AFP are less likely to exit to AFP and OLF the higher the average enterprise specific work experience. Also, we find that the effect on OLF among men and women who are not entitled to AFP is as expected.

Male employees who work in enterprises with a medium level of education are significantly more likely to retire through AFP than employees who work in enterprises with a low education profile. This effect does also apply to male workers who are entitled to AFP and exit to OLF. Male employees who work in educational intensive enterprises are less likely to retire through AFP compared to employees in enterprises with a low education profile. Examples of enterprises where the average employee have more than 14 years of education are the Universities, private research institutions and the like. It should come as no surprise that this particular group of employees is the one to use the AFP scheme the least.

Employees who work in the sheltered sector are less likely to retire through AFP than employees in the competitive sector are. This may signal that AFP in the

competitive sector is used as a means of reorganising or downsizing the work force. A different approach is to say that employees in the competitive sector are in greater need of early retirement due to more stressful workdays. This latter explanation does also apply to female workers, given that they are not entitled to AFP and exit to OLF.

The national unemployment rate reached its peak in 1992 and 1993 (5.4 and 5.5 per cent, respectively) and then gradually declined (3.3 per cent in 1997). However, variations may occur within each industry, and since we make use of a local unemployment rate faced by the enterprise, it may be interpreted as a way of measuring the company's need to downsize or reorganise its workforce. Older workers are in general more exposed to redundancies than their younger colleagues, but the employer's need for a different composition of the workforce does not necessarily coincide with the individual preferences for more leisure among the employees. Thus, this variable is an example of the above mentioned push factors. Independent of the state of destination the need for reorganising is expected to increase the probability for early retirement. In situations like this it is a growing tradition among employers to offer employees who are made redundant a supplementary allowance in addition to any benefits or pensions to which they are entitled. In the case of disability pension and unemployment benefits, however, the amount of this allowance entails an equivalent reduction in the payments from the National Insurance Administration. Since this curtailment does not occur to AFP pensioners one would expect the effect of this push variable to be more pronounced on retirements to AFP. On the other hand, if downsizing becomes necessary it is not always enough only to encourage workers who already are eligible for AFP to use this opportunity and redundancies are called for. Furthermore, only 43 per cent of all enterprises in the private sector are part of the AFP agreement and the need for downsizing may strike any enterprise. For men and women who are not entitled to AFP, the effect of the local unemployment rate on early retirement is positive both what DP and OLF is concerned. Among persons who are entitled to AFP this same effect only applies to men who exit to OLF. Hence, it appears as if disability pensions, unemployment benefits and other pension schemes are functioning as substitute exit paths for AFP among persons who are not entitled to the AFP scheme when unemployment increases. To our surprise, the effect of an increase in the unemployment rate is negative on transitions to AFP for both men and women. This effect we find hard to explain, but one probable explanation is as follows: When we start to follow our sample, they are all too young to be eligible for AFP. If the older workers accept to leave the workforce due to downsizing or reorganising some time before they become eligible for AFP, there are of course less need for this

scheme in industries which are more exposed. The effect of the local unemployment rate on AFP is therefore negative, as the older workers have already left the enterprise.

The need for downsizing or reorganising within one particular division of industry may also be explained by technological changes, increased competition or decreased demand, elements of which register data will reveal no certain knowledge. It is possible, however, that the impact of these factors on early retirement is picked up by the industry variable. A different interpretation is that this variable explains something about the physical and mental strain that the job conveys. It is not possible to disentangle these effects, and the effect of this variable should therefore be interpreted with care.

Except for "Agriculture, hunting and forestry", "Post and telecommunication" and "Other public and private services", men in all other industries are more likely to enter into AFP than men in the manufacturing industry are. This is somewhat surprising since the manufacturing industry is one of the industries that the AFP scheme was particularly aiming at. We find that men who work in the oil and gas industry are less likely to choose AFP as a way out of the labour force compared to men in the manufacturing industry. The explanation is that men and women in the "Oil and gas extraction" are being offered better pension schemes than the AFP scheme, hence, they leave the labour force through OLF and not through AFP.

In contrast to men who are entitled to AFP, men who are *not* entitled to AFP have, regardless of industry, a reduced probability of exiting to DP relative to a manufacturing worker. One interpretation of this is that male manufacturing workers who are not entitled to AFP, demand disability pensions to a greater extent than other workers do, in which case disability pension may be understood as a substitute for AFP. Furthermore, it also indicates that manufacturing workers who are about to approach retirement have had a more physically demanding job over the years than older workers whose career patch has been a different one. The only exception is men in "Education and research" which is not significantly different from men in the manufacturing industry.

Finally, the propensity to retire early through OLF among men who are not entitled to AFP, is positive and significant for men in the following industries: "Electricity, gas and water supply", "Transport" and "Post and telecommunication". Among enterprises within the three industries are the state controlled enterprises, such as The Norwegian Telecom, The Directorate of Civil Aviation, energy suppliers, transport companies etc. Prior to 1997 none of these enterprises were obliged to offer any AFP-scheme,

some of them still do not. However, some of these enterprises were temporarily permitted by the Government to offer an early retirement scheme to their employees, 60 years or older, due to reorganising, during our observation period. That is probably why we find quite a number of exits to OLF among men who are not entitled to AFP and who worked in these particular industries.

Early retirement behaviour among women is all together less influenced by industry with comparison to the above discussion concerning men and industry. One pronounced finding, however, is that female workers who are not entitled to AFP in every industry, except "Oil and gas", are more likely to retire early by entering into OLF than a female industry worker.

Finally, we have included information on the regional location of the enterprise. Among employees who are entitled to AFP we find that employees who work in Northern Norway are less likely to make use of the AFP scheme and more likely to become disable compared to employees elsewhere. Among the employees who are not entitled to AFP, the effect of the location of the enterprise is not that clear.

8. Summary and conclusions

The objective of this report has been to study early retirement behaviour among older workers. This approach is interesting for several reasons. The employment rate of older Norwegian workers is decreasing, as is the average age of retirement. Also, the number of old age retirees is expected to increase quite dramatically the next twenty years. This makes it important to encourage older workers to prolong their labour force participation. Hence, the foremost issue of this report has been to study the effect of the working environment on early retirement, when at the same time controlling for frequently used individual characteristics.

To address this issue we make use of register data only, and our main sources are the Register of Employers and Employees, the Register of Unemployed Persons and Statistics Norway's newly developed database FD-Trygd. Based on register information from the years 1992 – 1997 a carefully prepared data set follow individuals over time, and uniquely combine individual characteristics and information of the enterprise in which each individual works. Although it would have been preferable if the latter were generated at the establishment level, unfortunately this has not been possible since the quality of the variable that identifies the establishment is rather poor for the best part of our observation period.

The sample comprises employees born between 1929 – 1934. The individuals are under observation from the month in which they turn 63 and until they make a transition to early retirement, turn 67 or to the end of the observation period, whatever happens first. Three alternative ways of leaving the labour force are being modelled. Our particular concern is transitions to the early retirement scheme, AFP, which were introduced in 1989 and over the years has become almost universal, but also considered as early retirement transitions are disability pension (DP) and other exits, i.e. unemployment, occupational pension, private pension or private provision (OLF).

Persons who are not entitled to AFP will for obvious reasons never experience a transition to AFP.

Therefore, separate regressions are run for persons who are entitled to AFP and persons who are not entitled to AFP. Furthermore, for each sub sample separate analyses are made for men and women since we expect men and women to behave differently when retirement is approaching as a result of different labour force participation over the life course.

A transition from work to retirement is the result of a process of decision making between retirement now and continued labour force participation. The most suitable tool for studying this kind of processes is known as duration analysis or event history analysis. The underlying model in duration analyses is the hazard rate model. The hazard rate is the conditional probability that a transition from work to retirement, for instance, will occur at a particular point in time to a particular individual, given that this event has not already happened. Since all pensions are received on a monthly basis, register data only tells within which month an older worker starts to receive a particular pension. It therefore seems most appropriate to make use of a discrete hazard rate model.

The results indicate that quite a number of employees leave their employer in order to receive AFP benefits at the first possible opportunity. Furthermore, the lowering of the eligible age does not seem to have taken immediate effect among the oldest workers in our sample. At the age of 65 quite a number of workers are allowed an occupational pension. Accordingly, the probability of exiting to OLF has a pronounced peak at age 65. It is somewhat surprising that individuals entitled to AFP choose occupational pension in preference to AFP since it implies a possible twelve-month postponement. We believe this kind of behaviour to be more common among public employees with medium or higher income and privately employed persons with occupational pension schemes. The calculation of the occupational pension is more dependent on previous income than the calculation of the AFP pension, since the AFP pension also includes a lump sum element. Hence, in relative terms, the occupational pension is more favourable than the AFP pension to employees with medium or high income than to low-income

employees. A temporarily strong income reduction may explain why public employees with medium or higher income choose to postpone their early retirement as long as possible. Employees in the private sector may choose not to accept AFP in fear of receiving a reduced occupational pension at the age of 67 since employers are not committed by law to continue to pay the premium to secure the occupational pension of former employees who has become AFP pensioners.

The effects of the individual characteristics are very much in concordance with previous research, and will not be elaborated on here. As to the enterprise characteristics, the overall conclusion is that they contribute significantly to the explanation of early retirement, but the effect of each enterprise characteristic varies strongly according to which sub sample and transition is being analysed.

The proportion of employees above the age of fifty within an enterprise significantly reduces the probability of transitions to AFP and DP, whereas transitions to OLF is less influenced by the age profile within the enterprise. The size of the enterprise is of little consequence to older male workers, whereas female workers tend to reduce their propensity to retire early through AFP and OLF if they work in relatively large enterprises. Transitions to AFP appear to be more common in enterprises in which the employees have an average education between 10 to 14 years than in both more and less educational intensive enterprises. Transitions to DP and OLF, however, are not influenced by the education profile of the enterprise.

One expressed reason for introducing the AFP scheme was that tired workers should be allowed to retire earlier than at the ordinary retirement age.¹⁶ Although new technology has reduced the need of manual input in most professions in later years, we expected employees in male dominated enterprises to show a higher probability of retiring early than employees in other enterprises do. Our expectations were not met. However, for men who are entitled to AFP it appears that the "tired worker effect" is more adequately expressed through the variable called "Total work experience on average" than the "Proportion of male employees".

Except for "Agriculture, hunting and forestry", "Post and telecommunication" and "Other public and private services" men in all other industries are more likely to enter into AFP than men in the manufacturing industry do. This is somewhat surprising since the manufacturing industry is one of the industries that the AFP scheme was particularly aiming at. In contrast to men who are entitled to AFP, men who are *not* entitled to

AFP show, regardless of industry, a reduced probability of exiting to DP relative to a manufacturing worker. The propensity to retire early through OLF among men who are not entitled to AFP, is positive and significant for men in "Electricity, gas and water supply", "Transport" and "Post and telecommunication". Among enterprises within the three industries are the stately controlled enterprises, some of which were temporarily permitted by the Government to offer an early retirement scheme to their employees, 60 years or older, due to reorganising, during our observation period. These enterprises, although few, have a large number of employees and this explains why a temporarily early retirement scheme induces an increase in the probability of early retirement within these particular industries.

Early retirement behaviour among women is on the whole less influenced by industry than among men. Among persons who are not entitled to AFP, we find that women who work in enterprises with a high proportion of long part time contracts are less inclined to retire early, whereas a similar effect is not observed among men. Furthermore, enterprise characteristics are more important for transitions to DP among women who are *not* entitled to AFP than among those who are. The same contrast does not apply to the male population. Apart from this, men and women do not seem to be affected very differently by the enterprise characteristics analysed.

It is worth noticing that the relative risk of exiting to OLF by the age of 65 among persons who are entitled to AFP is more pronounced for females than for males, whereas the opposite is true among persons who are not entitled to AFP. This is probably due to the fact that approximately 45 per cent of the female population in this sample work in the public sector, from which they will receive an occupational pension from the age of 65. In comparison, only 25 per cent (approximately) of the male population in this sample are employed in the public sector. In the case of transitions to AFP there is no difference in the spikes for men and women.

Early retirement behaviour is thus clearly influenced by the environment in which one works. To our knowledge, a study of the relationship between early retirement and enterprise characteristics based on register data has not been undertaken before, and it is our opinion that this relationship needs to be studied further. For instance, the introduction of the Register of Legal Units will make it possible to generate workplace characteristics at the establishment level. Also, the introduction of Statistics Norway's database FD-Trygd presents the opportunity for closer studies of minor groups within the sample of older workers, i.e. workers within certain industries. Both alternatives may improve the understanding of how early retirement behaviour is affected by the working environment.

¹⁶ See for instance the Norwegian government white paper, NOU 1998:19.

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