DISCUSSION PAPER SERIES

IZA DP No. 522

Gender Differences in Early Retirement Behaviour

Svenn-Åge Dahl
Øivind Anti Nilsen
Kjell Vaage

June 2002

Forschungsinstitut
zur Zukunft der Arbeit
Institute for the Study
of Labor

Gender Differences in Early Retirement Behaviour

Svenn-Åge Dahl
Foundation for Research in Economics and Business Administration (SNF), Bergen

Øivind Anti Nilsen
University of Bergen and IZA Bonn

Kjell Vaage
University of Bergen

Discussion Paper No. 522
June 2002

IZA

P.O. Box 7240
D-53072 Bonn
Germany

Tel.: +49-228-3894-0
Fax: +49-228-3894-210
Email: iza@iza.org

IZA Discussion Paper No. 522
June 2002

ABSTRACT

Gender Differences in Early Retirement Behaviour*

In this paper we analyse early retirement for men and women focusing on family characteristics such as marital status, spouse income and wealth, and spouses' labour market status. The female participation rate is high in Norway, implying that the country is particularly suitable for the study of gender differences in the early retirement behaviour. At our disposal we have administrative data that include information on individuals aged between 55 and 61 years in 1989. The individuals are followed until the end of 1995, with the aim of determining the predictors of different early retirement states. The results of a competing risk model indicate that women are less likely to take early retirement compared to men and that these differences are due to both different characteristics and different behaviour.

JEL Classification: J26, C23, C25

Keywords: early retirement, gender differences, labour force participation

Øivind Anti Nilsen
Department of Economics
University of Bergen
Fosswinckelgate 6
N-5007 Bergen
Norway
Tel.: +47 55 58 92 00
Fax: +47 55 58 92 10
Email: Oivind.Nilsen@econ.uib.no

* We would like to thank two anonymous referees for useful and constructive comments. Financial support from the Research Council of Norway (The Programme on Welfare Research) is gratefully acknowledged. The data for this analysis were provided by the Norwegian Social Science Data Services (NSD). NSD is not responsible for the authors' analyses. We have also benefited from the comments of seminar participants on several occasions. The usual disclaimer applies.

Introduction

The age at which people retire from the labour market has been drifting downwards in most OECD countries. More than a quarter of the OECD countries have an average retirement age below 60 for males, and more than half of the countries have an average age of retirement below 60 females (Blöndal and Scarpetta, 1998). The number of years in employment for men is decreasing, and retirement now begins so early that they spend only half their life in work (The Economist, 1999). At the same time the proportion of elderly in the population is increasing and will continue to grow in the years to come. The decline in the labour force participation of older persons is described by Gruber and Wise (1998: 158) as: ". . . the most dramatic feature of labor force change over the past several decades". As a consequence, early retirement causes great concern for the financing of the welfare states in the immediate future, and already has led to changes in the pension systems and rise in the official retirement age in countries like USA, Greece, Italy, New Zealand, Japan and, recently, Germany.

In this article, we study the use of various early retirement pathways for men and women, where pathways refer to different institutional arrangements that are sequentially linked to manage the transition from work into old-age retirement (Kohli and Rein, 1991). Gender differences in the exit probability may be due to differences in the background characteristics, and/or to various responses to changes in these characteristics. For each individual we have detailed information on age, education, income, etc. In addition, we pay particular attention to family characteristics such as marital status, spouse income and wealth, and spouses' labour market status. For married individuals there are several sources of joint retirement behaviour, "added-worker" vs. "assortative mating" effects, and/or correlation in unobserved tastes.[1] Among the older cohorts, men generally have higher education and

normally better paid jobs than women. We also know that women generally marry men with higher social status than themselves. Furthermore, men are often the breadwinners of the family. These are examples of issues that may induce gender differences in the use of various retirement pathways. Thus, it is crucial not to restrict the retirement paths of the two genders to being identical. The contribution of this paper is a comparison of male and female retirement behaviour.

Previous research on female retirement behaviour, as compared to male, is limited mainly because of lack of data. The labour force participation rates for elderly are high in Norway compared to most other OECD countries. In particular this is evident for older females. The labour force participation for Norwegian women aged 55-66 years has increased from 40.1% in 1972 to 54.1% in 1997, while the corresponding numbers for men has been reduced from 81.0% to 68.8%. The average retirement age is falling, and for new pensioners it is now 59 years while the standard age of entitlement to public old-age pension is 67 years.[2] As for most of the OECD countries, the proportion of elderly is rising also in Norway, and this trend will continue in the next few decades. Given the significant participation rates for older females, Norwegian data may be particularly suitable for the analysis of joint exit from the labour force. We have utilised the very rich KIRUT database; a database that contains detailed individual information for a random 10% sample of the Norwegian population aged 16-67. We have collected data on more than 10,000 individuals aged 55-61 years in 1989. These individuals are followed until they transit from work or until the end of 1995. In our analysis we use a discrete choice model with several destinations or pathways: disability pension, unemployment benefits, and out of the labour force. Both the disability and unemployment insurance have functioned as informal early retirement pensions in Norway, while no fully public early retirement scheme exists.

The remainder of the paper is organised as follows. In the next section we briefly review the relevant literature on retirement and position ourselves relative to the various perspectives. Then we describe institutional features of the Norwegian retirement system. This is followed by a description of the sample together with modelling and explanatory variables. In the subsequent section we comment on the development in the probabilities of ending up in various end-states, and on the empirical results. The last section provides a more general discussion of the gender differences in early retirement and what policy implication these might have.

Lessons from the Retirement Literature

Research on the labour market shows that there are gender differences in several important areas. Women's wages and earnings are lower than men's and so are their labour force participation rates, as well as their likelihood of receiving a pension and getting promotion (e.g. Even and Macpherson, 1990, 1994; Altonji and Blank, 1999; Spilerman and Petersen, 1999). The differences have been persistent over time although the nature and magnitude of differences have changed as men's and women's work histories are becoming more similar (Hayward, Hardy, and Grady, 1989; Altonji and Blank, 1999).

Despite the important gender differences, most of the research on early retirement is studies of men (e.g. Haveman, Wolfe, and Warlick, 1988; Berkovec and Stern, 1991; Blau, 1994; Meghir and Whitehouse, 1997; Riphahn, 1997).[3] The analyses of gender differences in early retirement are more limited. Talaga and Beehr (1995) study gender differences in retirement decisions in a large Midwestern manufacturing organisation (US). Their results show that the retirement decisions differed between men and women primarily when

dependants lived in the household, when the health of one's spouse was a consideration, and when one's spouse was retired.[4] A great number of studies document that husbands and wives co-ordinate work and retirement decisions, but there is no clear evidence as to who is leading who. Since women typically marry older men, co-ordination of retirement implies that wives are likely to retire at a younger age than their husbands (Ruhm, 1996). Furthermore, the presence of children in the family appears to have only small effects for women, while it significantly reduces the probability of leaving the labour force for men (Perrachi and Welch, 1994; see also Reitzes, Mutran, and Fernandez, 1998).

Differences in the retirement behaviour between married and unmarried individuals are also found for example by Perrachi and Welch (1994). Men who are not married have a higher probability of leaving the labour force and a lower probability of exiting retirement. On the other hand, women who are not married have a significantly lower probability of leaving the labour force, and a higher probability of exiting retirement. Ruhm (1996) finds that unmarried men and women with work experience after the age of 50 have identical probabilities of working or holding full time jobs. Marriage, on the other hand, is associated with elevated labour supply for men and reduced employment for women. Yabiku's (2000) analyses indicate that family history has opposite effects for men and women. Compared to men that stay married, single and divorced men have lower odds of private pension receipt, while having a child is associated with higher odds. For women, being single or divorced is associated with higher odds of pension receipt, and having children decreases their odds.

There are some studies of early retirement using data from the Nordic countries, and several of these are found in Wadensjö (1996). Pedersen and Smith (1996), using a competing-risk model with three different end-states, find that there are significant gender differences in the decision to retire early in Denmark. These results may be contrasted with those of Lilja (1996), based on Finnish data and using a competing-risk model with four

destination states, who finds that the propensity for early exits does not differ significantly between males and females. Her study also shows that the presence of a retired spouse at home encourages the other spouse to consider early retirement. Furthermore, women are less likely than men to take early retirement or to retire due to unemployment, and more likely to exit without an immediate pension.

As already pointed out, using Norwegian data to investigate the early retirement process is of great interest since the female participation rate is rather high in Norway. To our knowledge there are only a few microeconometric analyses based on Norwegian data. Two of these are primarily studies of the privately negotiated early retirement scheme, denoted AFP. Hernæs, Sollie, and Strøm's (2000) prime motivation is to model the likely effects of changing the eligibility criteria of the AFP-scheme. In this study, gender differences are restricted to a gender dummy only. This is also the case in the study by Bratberg, Holmås and Thøgersen (2000). They use a competing risk framework and find that AFP to some degree relieves the pressure on disability pension and unemployment benefits. The gender difference in early retirement is given more attention in Dahl, Nilsen and Vaage (2000). However, they do not utilise their data fully satisfactorily. They have annual data, but in general only use information at the beginning and the end of the seven year time interval. In our study, the data used by Dahl, Nilsen and Vaage (2000) are extended somewhat and, more importantly, the fact that the data contain yearly information is utilised.

Our study differs from most of the studies cited above in the following respects. First, our study pays special attention to female retirement and gender differences in the retirement decision. Second, our data make it possible to distinguish between different pathways, which is important to capture the forces behind the choice of various pathways. This is especially important since both the behaviour and the characteristics of men and women may induce variation in the preference for or choice of various pathways. Third, our data include a broad

range of information on family characteristics, which in our opinion are important both for the study of gender differences and the choice of pathways, and largely neglected in the retirement literature. Neglecting family characteristics leads to a major loss of fit in the case of women, especially in the case of exit from full-time work (Peracchi and Welch, 1994).

Institutional Background

The standard retirement age in Norway is 67 years on the condition that a person gives up the right to keep a specific job. However, some professions and occupations have a lower pension age and some are fixed by law. The compulsory retirement age is 70.

As in several other countries, institutional arrangements that were originally constructed for other purposes, notably unemployment benefits and disability pension, have been used as pathways to early retirement. Until the early 1990s the entitlement conditions for disability pension in Norway were liberal, and labour market conditions were a factor in the disability assessment. Before receiving disability pension, sickness insurance is usually paid for one year, and a subsequent period in a rehabilitation program is required. To qualify for a disability pension, a person must demonstrate that his/her ability to earn an income has been permanently reduced by at least 50%.

Older people are entitled to unemployment insurance for an extended period. Persons who are unemployed when they are 64 years are entitled to unemployment insurance without time limitation until they reach the standard retirement age of 67 years. In addition it is possible to be unemployed 186 weeks previous to 64 years making it in reality possible to receive unemployment benefits from the age of 60.5 years.[5]

There are several early retirement pathways with private provisions in Norway, even though the use of these is in general not very common. The most important non-public early retirement scheme in Norway is AFP ("Early Retirement Pension Agreement - AFP"). This scheme came into effect as from 1 January 1989. The use of the scheme has increased as the retirement age has been reduced (62 as of 1 March 1998), as the replacement rate has been improved (in 1992) and as knowledge of the scheme has increased.

The replacement rate is different for the various types of retirement schemes, and this may give different economic incentives conditional on the retirement pathway that is used.[6] The replacement rate varies between 60 and 90% for the private/non-public retirement schemes. The replacement rate for disability pension is about 62%, but in order to increase the employees' incentives to apply, employers in many firms pay a small company pension in addition to the state paid disability pension, thereby increasing the replacement rate up to 80%. The standard replacement rate for unemployment is 63%. Also for this retirement scheme, several firms pay a small company pension to employees who agree to be "voluntarily" laid off, which increases the replacement rate substantially. The replacement rate for AFP varies between 50 and 60%. Moreover, a new trend is that some firms pay a company pension to former employees in addition to the AFP pension.

Data and Modelling

Sample Construction and Early Retirement States

The analysis is based on data from the KIRUT database. The base contains detailed individual information on socio-economic background, labour market participation, and

social insurance payments for a random 10% sample of the Norwegian population aged 16-67 (the total sample exceeds 300,000 individuals).

Our sample includes observations of individuals born between 1929 and 1934 who occupied a job on 1 January 1989.[7] Initially we utilised only observations for the individuals for which we have information in all the years from 1989 until 1995. After excluding individuals with missing variables, we end up with a balanced sample of 10,315 individuals, 5,383 males and 4,932 females. The labour market status of the sampled individuals is registered in 1995, where after we track their year of *permanent* transition (if any) into either *disability*, *unemployment*, or *out of work*. In this way, we assure that we are actually dealing with absorbing states, and we avoided the problems of round-tripping, i.e. individuals moving in and out of the different states in the interim period. The sampled individuals were followed from 1989 until they transited into the respective end-states. Thus if an individual experienced a transition in, for example, 1993, he/she is represented with five observations. If they do not experience a transit before 1995, we follow them every year until 1995. All the observations from 1989 until the year of transition are pooled. The pooled sample consists of 29,162 observations of men, and 26,946 observations of women.

Individuals that become disabled go through a period with sickness insurance and a subsequent rehabilitation program. We therefore classify the disabled as *disabled* from the beginning of the sickness period, given that the individuals were more than 50% disabled as at 31 December 1995. If the individuals have a *temporary* spell with either sickness absence or rehabilitation, we consider them to still be working. The second end-state is *unemployment*. We are only interested in individuals with long-term unemployment, who stay unemployed throughout our period of observation. Hence, we ignore interim unemployment spells as long as the individuals are employed as at 31 December 1995.[8] We organise data so that disability "overrules" both unemployment and employment.[9] For instance, an individual

with an unemployment spell starting before a period of disability is classified as disabled. Hence, this individual's transition from work to disability was at the starting point of the disability spell. Finally, individuals who were not registered as either worker, disabled or unemployed were defined as *out of work*. The latter group includes individuals who have retired due to private or firm-provided early retirement schemes, and individuals who have dropped out of the labour force for other reasons, i.e. those who have ended their job without being entitled to any public or private pensions. As a consequence, this is a rather heterogeneous group, and care should be taken when interpreting the empirical results for these individuals.[10] The point of transition for the individuals in the *out of work* group is the last day in the employers' register.

Modelling

Males and females are likely to respond differently to variations in relevant characteristics and variables. Thus, we ask the question separately for the two genders, what factors affect the probability of being observed in different end-states in a given year *t*, conditional on being in the state of *work* in the previous year, *t*-1? As pointed out by several authors, individuals are either pushed into or choose different early retirement pathways (see for instance Haveman, Wolfe, and Warlick, 1988; Kohli and Rein, 1991; Riphahn, 1997). The underlying hypothesis is that the determinants of the transitions from work into different states are identical, even though the importance of these determinants is different for each of the various transitions.

Formally, we assume that individual *i* chooses alternative *j* at time *t* if the associated utility, U_{ijt}, is the highest of all *J* alternatives. For each individual we define a latent variable, Y_{ijt}^{*}, which denotes the change in utility of moving from the state *work* in year *t*-1 to early

retirement in year *t*. The (change in) utility is determined by a vector of observable variables, $\mathbf{x}_{it}$, including expected income in the different states, personal characteristics, labour market conditions, etc., and a stochastic error term, ε_{ijt}:

$$Y_{ijt}^{*} = U_{ijt} - U_{i,work,t-1} = \mathbf{b}_{j}^{'}\mathbf{x}_{it} + \varepsilon_{ijt} \quad \text{with} \quad j = 0,1,2,3 \quad t = 1989 .. T_i \tag{1}$$

where T_i is the year individual *i* is exiting work. What we observe, however, are the discrete choices,

$$Y_{ijt} = \begin{cases} 1 \text{ if } Y_{ijt}^{*} > 0 \\ 0 \text{ if } Y_{ijt}^{*} \le 0 \end{cases}$$

Thus, the probability of choosing state *j* can be expressed as:

$$Prob(Y_{ijt} = 1) = Prob(Y_{ijt}^{*} > 0) = Prob(\varepsilon_{ijt} > -\mathbf{b}_{j}^{'}\mathbf{x}_{it}) . \tag{2}$$

We assume that ε_{ijt} is type I extreme-value and independently and identically distributed across alternatives and individuals. The estimations can then be implemented through the multinomial logit model:

$$P_{ijt} \equiv Prob\left(Y_{ijt} = j\right) = \frac{e^{\boldsymbol{b}_j' \boldsymbol{x}_{it}}}{\sum_{j=0}^{3} e^{\boldsymbol{b}_j' \boldsymbol{x}_{it}}} \tag{3}$$

We focus on competing risks, and report the marginal effects found by differentiating equation (3):

$$\frac{\partial P_{ijt}}{\partial \boldsymbol{x}_{it}} = P_{ijt}\left[\boldsymbol{b}_j - \sum_{k=0}^{3} P_{ikt}\boldsymbol{b}_k\right] \tag{4}$$

Thus, the marginal effects are to be interpreted as the change in the probability of ending in a particular state *j* given a change in an explanatory variable $\mathbf{x}_{it}$. We allow all the covariates to have various impacts on the flow to different states for the two genders by carrying out the analysis separately for males and females.

Explanatory Variables

KIRUT allows us to control for a broad range of individual characteristics. Marital status is defined as *married*, *unmarried*, *widow* (or *widower*), or *divorced*.[11] We include a dummy if the individual has dependent *children* (1 if children are under age 18, and 0 otherwise). In addition to each person's *age* we measure any potential effect of the *age difference* between spouses. As measures on human capital we have access to *educational level*, measured in number of years, and *experience*, measured as number of years with earnings above 1G.[12] Being a *civil servant* may also be of importance for the choice of retirement pathways, due to significant job protection in the governmental sector.

Income in different states varies and will give incentives to choose between different early retirement pathways. Thus, implicitly we assume that the individuals choose among expected income streams in different states. Of course, we can only observe the income in the actual state. However, by using the relevant rules for the benefits and pensions in different states, we are able to construct potential incomes in the various end-states. All the various

income variables are based on income previous to the retirement year. *Income as employed* is equal to the income when an individual was working. *Income as unemployed* in Norway is 62.4% of income the previous year up to approximately NOK 240,000 (in 1990 prices). For income higher than NOK 240,000, unemployment benefits are constant. The last income variable, *income as disabled*, is based on age and pension points earned. *Income as disabled* is approximately 62% of work income.[13] Ideally, a corresponding income variable for the fourth state, *out of work,* would be desirable. But due to the heterogeneity of this group, such a measure is hard to construct. We have only access to pension giving incomes, which excludes interests on savings or other wealth, private pensions, and AFP. We do, however, have some variables that hopefully control for (some of) the income variation in this state, notably (taxable) *own wealth* and (taxable) *spouse wealth*. *Spouse income* is also included together with a dummy variable indicating whether the spouse is eligible for old-age pension, or whether s/he receives rehabilitation and/or disability pensions (1 = *old-age pensioner or benefit receiver*). By including these two variables, together with the *spouse wealth*, we intend to test whether the "added worker" effect or "assortative mating" is present. All income variables (income as employed, unemployed and as disabled, and spouse income) and wealth (own and spouse wealth) are measured in NOK 10,000 (1990 prices).[14]

The overall tendency of utilising different forms of early retirement may vary over the business cycle, either due to push or pull factors. Moreover, the timing and magnitude of business cycles may vary between industries. Thus, we have included *year dummies* and six *industry dummies* in our empirical model. We have also included some characteristics of the local municipality in which an individual resides.[15] *Residence density* measures the share of the population in a local municipality that lives in urban areas (0 – 9 (dense)). *Distance to centre* is a categorical variable that takes account of distance to larger central areas or cities (categories 1-7 (close)). These two variables are meant to measure the cost of living and

service level in the municipalities which increases with centrality. The hypothesis being that higher cost of living will reduce the probability of early retirement, while a higher service level will increase the probability of early retirement. The *unemployment ratio* is the ratio between unemployed and unemployed plus employed in the local municipality.

Descriptive statistics for the explanatory variables may be found in Table A1 in the Appendix.

Empirical Results

The Probabilities of Ending in Various End States

In Table 1, we have calculated the probabilities of transition to different states for each gender, conditional that the individuals were working at the end of the previous year.

(Table 1 about here)

Ignoring the gender differences for a moment, we see that the probabilities of staying employed are decreasing over time. At the same time, the probability of ending in the states *disabled* or *unemployed*, together with *out of work* is increasing over time. The driving force behind this tendency is, of course, the fact that the individuals in our sample are getting older over time. Note also that there seemed to be a relative large increase in the probability of ending up as *out of work* in 1994 and 1995. This is evident for both genders and may be due to reductions in the retirement age in AFP from 66 years in 1989 to 64 in 1993 (October 1).[16] Moreover, for those who had access to AFP, the tendency to utilise it increased in this period.

Aggregate numbers state that AFP is more common in the public sector than in the private sector and that the propensity to use AFP is higher for men than for women.

Turning to the gender differences, there seems to be a tendency that females are more likely to end up as disabled, rather than as unemployed, while the opposite is true for males. We also see that there is a slight tendency for women to retire later than men (i.e. they are working longer). Even though care should be taken with regard to the *out of work* group since it is rather heterogeneous, we see in Table 1 that males are slightly more likely to use this pathway than females.

Multinomial Logit Model Results

The results from the multinomial logit model, reported as marginal effects together with the corresponding *z*-values, are given in Tables 2 and 3 (males and females, respectively).

(Tables 2 and 3 about here)

The first three variables compare the effects of being single (unmarried, widow(er), or divorced) to that of being married. Overall, there is a tendency of increased probability of early retirement for males, even if divorcés' exit to unemployment is the only effect that is statistically significant at the 5% level. This appears not to be the case for females; rather, being unmarried significantly reduces the probability of exiting to disability, and being a widow or divorced reduces the probability of exiting to unemployment.

Since husbands generally are older than their wives, there are more males (5-10%, depending on states) than females (2-5%) with dependent children (younger than 18 years) in our sample. Having dependent children tends to reduce the probability of early retirement for

males, while the opposite is the case for females. As for the negative marginal effects for the males, this might have to do with the obligations following the role of being principal earner. There is, however, at least one other possible explanation. When having children to some degree prevent males from becoming disabled, it might be due to some selection mechanism where men with children have some unobserved attractive characteristic. Thus, in our reduced form model it is not possible to decide whether having children is a pure exogenous indicator, or, alternatively, if it is plagued by some endogeneity problems.

Age has the expected effect that it increases the probability of early retirement. For both genders, the effect is strongest for the exit to disability and out of the labour force. The effects are marginally stronger for males compared to females.

We expect individuals with high human capital investment to be less inclined to early exit from the labour force. Education and experience both seem to represent insurance against disability and unemployment. The strongest effect is the females' (reduced) probability of exiting to disability.

Being a civil servant does not affect the probability of entering disability. It is, on the other hand, a remarkably good predictor for not becoming unemployed. This is probably due to few layoffs and the high degree of job protection for this occupational group. The variable in addition correlates positively with the probability of leaving the labour force for other reasons than disability and unemployment. The reason may be the higher use of AFP in the public sector than in the private sector.

The next section of Tables 2 and 3 presents the influence on early retirement from the income and wealth variables, which contain the main information on pecuniary relations of the individuals in our sample. We expect the own-effects to be positive (for example, high earnings reduce the probability of leaving a job), and the cross-effects to be negative (for example, high disability pension makes it less attractive to finance early retirement with

unemployment benefits). As for earnings, our data clearly support our hypothesis. Increased earnings significantly reduce the probability of exit to any form of early retirement.[17] Note that the response is approximately twice as strong for women compared to men. Furthermore, an increase in the unemployment benefits significantly reduces the males' probability of leaving to disability, and also has the expected positive own-effect on the females' probability of entering unemployment. For the remaining states there are no sizeable effects. Finally, increased disability pension significantly increases the probability of entering disability. But in addition, we estimate a counter-intuitive positive effect on both genders' propensity to exit to unemployment as well as out of the labour force.

The influence of (own) wealth on the retirement decision is not obvious, *a priori*. On the one hand, increased wealth will improve the possibility of early retirement through increased ability of self-support. There is a certain support for this effect in our data, in that the probability of exiting to out of the labour force increases, particularly for females. On the other hand, wealth may be a proxy for both ability and social status. In that case we would expect reduced probability of exit to early retirement to disability and unemployment. The negative reported marginal effect on males' propensity of exiting to disability is consistent with this view, but the positive effect on females' propensity of exiting to unemployment is not.

Turning to the spouse characteristics, we find that difference in age between the individuals and their spouses has no sizeable effect on the retirement behaviour. Two competing hypotheses are the added worker-effect versus assortative mating. If the added worker-effect dominates, we would expect compensating behaviour in the cases where the spouses have small resources. For example, if the spouse has low income and wealth, and/or is a pension receiver, this correlates with a low probability of early retirement, since it means that the other spouse must compensate by working extra hard and long. Our evidence is not

clear-cut, but there seems to be rather weak support for the added worker-effect in our sample. High spouse income implies a significant reduction in the probability of early retirement for both males and females.[18] Furthermore, having a spouse who is a pension receiver increases the probability of early retirement. Both findings clearly are consistent with the assortative mating hypothesis. As for spouse wealth, the picture is unclear, with insignificant effects in most of the cases.

We control for employment in six different industries, with manufacturing as the base category. The most striking finding is that being employed in the manufacturing sector strongly increases the probability of unemployment retirement for males, and also has a significant effect on the probability of ending up as disabled. The number of females employed in this sector is relatively low, which probably explains the lack of such a finding for this group. Furthermore, working in the education and health sectors represents strong protection against unemployment, the explanation probably being the same as for civil servants.

The year dummies (1989=0) are meant to take care of the timing and magnitude of business cycles, as well as structural changes in the form of modifications and adjustments of the rules in force. For men there are mostly positive and significant effects on the transitions to disability and unemployment, and negative effects on the probability of staying in work, especially for the years 1992, 1993 and 1994. The pattern is the opposite for women, with negative effects for disability, unemployment, and out of work, and positive effects for work. This lack of gender coincidence is somewhat puzzling. Business cycles and institutional changes relevant for early retirement (changes in eligibility criteria, introduction of AFP, etc.) are in general gender neutral. The explanation is probably the fact that males and females work in different sectors. Institutional changes and the business cycles hit the sectors

differently, more so than we are able to pick up with the rather crude sector dummies previously referred to.

Finally, we control for some local municipality characteristics. With the two first variables we test whether the behaviour differs systematically in urban compared to rural areas. Our data hardly support this hypothesis. Most of the marginal effects are insignificant, and in the cases where we report sizeable effects (out of labour force for males, disability for females), the variables point in opposite directions. As for the local unemployment rate, this turns out to be an important predictor for the probability of early retirement in the form of unemployment.[19] Interestingly, local unemployment rate also correlates positively with the state of disability. This is, in itself, a support to the argument that unemployment and disability are substitutable pathways to early retirement, and that there is an over-utilisation going on in the form of unemployed individuals ending up in disability retirement without being truly disabled.[20]

To visualise our findings, we present some simulations where we predict the probability of exiting to disability and unemployment as we change the values of certain variables, while all other variables are kept fixed at their (sample) mean values. Among the continuous and categorical variables (for obvious reasons the dichotomous variables are not usable for this purpose), we have chosen two variables with relevance for policy purposes; education and earnings. Following the order of presentation from Tables 2 and 3, we start with the education variable.

(Figure 1 about here)

In Figure 1, the zero point on the horizontal axis represents the mean education for the two genders. Since the simulations are performed with all the other covariates kept fixed at

their mean level, this point corresponds to the yearly mean exit probability. The marginal effects on disability as well as unemployment are strongest for females (-. 005 and -. 002, vs. -. 002 and -. 0003 for males, respectively), which explains the steeper curves for women. According to our figures a three year increase, say, in the average level of education will reduce the probability of disability by more than one percentage point for the females (from 4.8 to 3.6), while the corresponding reduction for males is only 0.8 percentage point. While there is practically no effect of increased education on the hazard to unemployment for males, the probability of unemployment for females falls from 2.3 to 1.7 for the example in question.

(Figure 2 about here)

Also the effects of earnings on disability and unemployment exits are much higher for females compared to males (-. 008 and -. 003 vs. -. 004 and -. 001, respectively). In Figure 2 we illustrate the effects of equal increases in *amounts* for each gender. Hence, since average yearly earnings for males are about NOK 221,000 and about 131,000 for females, each step represents a relatively larger increase for the latter. In this respect Figure 2 illustrates the effect of a policy where the relative gender gap in earnings is reduced successively. Based on the estimated marginal effects an increase of NOK 10,000 will bring the females' probability of exiting to disability down to the males' level. Another increase of the same amount will lead to a stipulated reduction in disability probability of 0.65 percentage points, while the corresponding effect for males is 0.4 percentage points only. The figure reflects the same pattern for the probability of exiting to unemployment, albeit with a smaller effect for both genders. Thus, our findings of stronger responses to education and income for females relative to males are consistent with findings in the economic literature (see for instance Killingsworth and Heckman, 1986; Altonji and Blank, 1999).

As will always be the case in regression analysis, the reported gender differences in the predicted exit probabilities are a mix of differences in the values of the explanatory variables and in the values of the estimated parameters, respectively. One way of disentangling the two sources, is to calculate the females' (counterfactual) probabilities of ending in the various states using the *female* sample-characteristics together with the estimated coefficients-vector from the multinomial logit model estimation for *males*. The same procedure is performed on males, and both experiments are reported in Table 4.

(Table 4 about here)

The new probabilities for females are 82.0%, 11.0%, 4.9%, and 2.1% (work, disability, unemployment, and out of work, respectively). Note that the probabilities of ending in the states disability and unemployment are more than doubled if the females (with their given characteristics) respond similarly to males. Interestingly, there seems to be no parallel effect when we substitute the females' coefficients with the male characteristics (right half of Table 4).

Discussion

The labour attachment for males and females may, at first glance, seem to be growing more and more equal in Norway. The participation rates for females are increasing, particularly for the youngest. The participation rates for older males are, on the other hand, falling. Therefore, it is important that we ask whether younger women will adopt men's retirement pattern, as

they grow older. Our micro evidence suggests that there may be several reasons why this will not be the case.

The family structure is changing in the Western countries. A dramatic increase in the dissolution of marriages and cohabitation steadily increases the number of single-person households. While being single appears to increase the probability of early exit for males, there is some evidence that the opposite seems to be the case for females. Secondly, a relatively safe prediction is that females will acquire relatively more education in the years to come.[21] Increased human capital in the form of education will probably reduce the earnings gender gap. Our findings indicate that females are responding more strongly to changes in education as well as earnings. The higher (expected) levels and the higher (estimated) responses both point in the direction of reduced probability of early retirement. Thirdly, while males tend to work in sectors with relatively high exit rates to disability and unemployment, manufacturing and construction, females far more often work in sectors with a relatively low occurrence of disability and unemployment, such as health and education. Moreover, these are sectors that are expected to grow in the coming decades. All these findings indicate that the propensity to retire early will be lower for females than for males for the cohorts to come.

Some reservations have to be made, however. Our results are based on a sample of people that have selected themselves; first, into employment, and thereafter into the different states we evaluate. There are, of course, lots of unobservable phenomena involved in the individual choices. A particularly relevant example is the selection of women in our sample. When we propose that future female cohorts will have lower propensity of early retirement, it builds on the assumption that they will behave and respond equivalently to the women we include in our analysis, namely the 1929-1934 cohorts. We do not know that the younger female cohorts in today's work force respond equally strongly to increased earnings, education, experience, etc. On the contrary, even if Norway has a relatively high participation

rate for older female cohorts, it is reasonable to assume that they are a selection with stronger abilities and/or motivation for participation in the work force than the ones that comprise the younger female labour force. The selection problem will be at the core of our future research.

Notes

[1] The "added worker" effect describes behaviour where the labour supply increases when the spouse's income is reduced or disappears. The "assortative mating" effect describes behaviour where the partners have the same preferences , i.e. the labour supply of the two spouses are positively correlated.
[2] Included in this average retirement age is retirement through disability pension, special retirement ages for some professions and retirement through AFP (explained in the main-text).
[3] There are several reasons for this, among these are data limitations, but it has also been argued that a prominent reason is that the work role for women has been viewed as a secondary role (Fox, 1977; Villani and Roberto, 1997). There are notable exceptions, however, and some studies focus only on females (e.g. Farkas and O'Rand, 1998; Feuerbach and Erdwins, 1994; Vistnes, 1994).
[4] A positive relationship between the labour market status of partners is also found for married couples receiving disability benefits (Henkens, Kraaykamp, and Siegers, 1993) and unemployment insurance (Ultee, Dessens, and Jansen, 1988).
[5] Job search requirements, and demands of occupational and geographical mobility are practised less strictly for persons older than 60 years. This makes unemployment a genuine exit route.
[6] The replacement rate is commonly defined as the benefits-to-income ratio (*B/W*), i.e. the fraction of the previous earnings which the benefits replace. The replacement rate we use here is the before-tax (gross) replacement rate. The after-tax replacement rate (net) is higher, especially for disability pension, because of the tax laws.
[7] We have chosen the oldest cohort to be the 1929 cohort. These individuals will be between 65 and 66 years old in our last sample year; they are thus not entitled to an old-age pension.
[8] The unemployed was defined as those who were registered as job seekers as at 31 December 1995 and whose unemployment spell started before July 1995.
[9] This ranking was chosen since we consider the quality of the disability data to be more reliable than that of the unemployment data.
[10] Ideally, private early retirement schemes and AFP, would be included as additional pathways in our study. However, data on private schemes are not available. Note, however, that during most of the period we are studying, disability pension and unemployment insurance were the most important early retirement schemes. In 1995 there were 134.000 disability pensioners between 55 and 67 years, 7,000 received unemployment insurance while 9,000 received an AFP-pension (increased from 2,500 in 1990).
[11] Note that for all individuals we have access to marital status in the original registers and, if married, their corresponding spouse characteristics. This eliminates possible selection biases that might arise in samples with post-identified spouses.
[12] G is the basic unit used in the pension system, NOK 32,275 in 1989 (€4,000).
[13] The function for calculating income as disabled includes an individual's age, aggregate pension points, marital status and whether one's spouse is benefit receiver or not as arguments. See Bratberg (1996) for details.
[14] NOK 8 ≈ €1.
[15] The local municipality data are collected from the Norwegian Municipality Database.
[16] There have also been changes in the AFP retirement in the years after the end of the sample period (see Institutional Background).
[17] The only exception is the males' probability of exiting to "out of labour force", which is reduced, but not significantly.
[18] There are examples of positive effects, but they are never statistically significant.
[19] There is a potential simultaneity problem here if, for a given municipality, the number of unemployed in our sample is large enough to contribute significantly to our measure of local unemployment rate. Since our sample only consists of 7 cohorts, and — not least—since we only register long-term unemployment, we believe this to be a minor problem.
[20] Note, however, that the question of unemployment and disability being exchangeable pathways to early retirement is a more complex one than what can be seen from the marginal effects of the local unemployment ratio. Based on a battery of Wald tests Dahl, Nilsen and Vaage (2000) reject the substitutability hypothesis, as does Riphahn (1997) on German data.
[21] For younger Norwegian cohorts women have already passed men when it comes to length of education.

References

Altonji, J. G. and Blank, R. M. (1999) Race and gender in the labor market. In: Ashenfelter, O. and Card, D. (eds.) *Handbook of Labor Economics Volume 3C* (pp. 3143-3259). Amsterdam, North Holland, Elsevier Science.

Berkovec, J. and Stern, S. (1991) Job exit behavior of older men. *Econometrica,* **59**, 189-210.

Blau, D. M. (1994) Labour force dynamics of older men. *Econometrica,* **62**, 117-156.

Blöndal, S. and Scarpetta, S. (1998) *The Retirement Decision in OECD Countries.* Working Paper AWP 1.4. OECD, Paris.

Bratberg, E., Holmås, T. H. and Thøgersen, Ø. (2000) Assessing the effects of early retirement programs. Mimeo. Department of Economics, University of Bergen.

Bratberg, E. (1996) Short run exits from long term sickness. In: Bratberg, E.: *Incentives in Social Insurance.* Dissertations in Economics, No. 11. Department of Economics, University of Bergen.

Dahl, S. Å., Nilsen, Ø. A. and Vaage, K. (2000) Work or retirement? Exit routes for Norwegian elderly. *Applied Economics*, **32**, 1865-1876.

Even, W. E. and Macpherson, D. A. (1990) The gender-gap in pensions and wages. *Review of Economics and Statistic,* **72**, 259-265.

Even, W. E. and Macpherson, D. A. (1994) Gender differences in pensions. *Journal of Human Resources,* **29**, 555-587.

Farkas, J. I. and O'Rand, A. M. (1998) The pension mix for women in middle and late life: The changing employment relationship. *Social Forces*, **76**, 1007-1032.

Feuerbach, E. J. and Erdwins, C. J. (1994) Women's retirement: The influence of work history. *Journal of Women & Aging*, **6**, 69-85.

Fox, J. (1977) Effects of retirement and former work life on women's adaptation in old age. *Journal of Gerontology*, **32**, 232-240.

Gruber, J. and Wise, D. (1998) Social security and retirement: An international comparison. *American Economic Review***, 88** (Papers and Proceedings), 158-163.

Haveman, R., Wolfe, B., and Warlick, J. (1988) Labor market behavior of older men. Estimates from a trichotomous choice model. *Journal of Public Economics,* **36**, 153-175.

Hayward, M. D., Hardy, M. A., and Grady, W. R. (1989) Labor force withdrawal patterns among older men in the United States. *Social Science Quarterly,* **70**, 425-448.

Henkens, K., Kraaykamp, G. and Siegers, J. (1993) Married couples and their labour market status. *European Sociological Review*, **9**, 67-79.

Hernæs, E., Sollie, M. and Strøm, S. (2000) Early retirement and economic incentives. *Scandinavian Journal of Economics,* **102**, 481-502.

Killingsworth, M. R. and Heckman, J. J. (1986) Female labor supply: A survey. In: Ashenfelter, O. and Layard, R. (eds.) *Handbook of Labor Economics Volume 1* (pp. 103-204). Amsterdam, North Holland, Elsevier Science.

Kohli, M. and Rein, M. (1991) The changing balance of work and retirement. In: Kohli, M., Rein, M., Guillemard, A.M. and van Gunstern, H. (eds.) (pp. 1-35) *Time for Retirement. Comparative Studies of Early Exit from the Labour Force.* Cambridge, Cambridge University Press.

Lilja, R. (1996) Microeconomic analysis of early retirement in Finland. In: Wadensjö, E. (ed.) *Leaving the Labour Market Early in the Welfare State* (pp. 157-173). Amsterdam, Elsevier Science Publishers.

Meghir, C. and Whitehouse, E. (1997) Labour market transitions and retirement of men in the UK. *Journal of Econometrics*, **79**, 327-354.

Pedersen, P. J. and Smith, N. (1996) A duration analysis of the decision to retire early. In: Wadensjö, E. (ed.) *Leaving the Labour Market Early in the Welfare State* (pp. 131-155). Amsterdam, Elsevier Science Publishers.

Peracchi, F. and Welch, F. (1994) Trends in labour force transitions of older men and women. *Journal of Labour Economics,* **12**, 210-242.

Reitzes, D. C., Mutran, E. J. and Fernandes, M. E. (1998) The decision to retire: A career perspective. *Social Science Quarterly,* **79**, 607-619.

Riphahn, R. T. (1997) Disability retirement and unemployment - substitute pathways for labour force exit? An empirical test for the case of Germany. *Applied Economics,* **29**, 551-561.

Ruhm, C. J. (1996) Gender differences in employment behaviour during late middle age. *Journal of Gerontology,* **51B**, S11-S17.

Spilerman, S. and Petersen, T. (1999) Organizational structure, determinants of promotion, and gender differences in attainment. *Social Science Research,* **28**, 203-227.

Talaga, J. A. and Behr, T. A. (1995) Are there gender differences in predicting retirement decisions? *Journal of Applied Psychology*, **80**, 16-28.

The Economist (1999) A full life. September 4th, **352**, 75-77.

Ultee, W., Dessens, J. and Jansen, W. (1988) Why does unemployment come in couples? *European Sociological Review,* **4**, 111-112.

Villani, P. J. and Roberto, K. A. (1997) Retirement decision-making: Gender issues and policy implications. *Journal of Women & Aging,* **9**, 151-163.

Vistnes, J. P. (1994) An empirical analysis of married women's retirement decisions. *National Tax Journal,* **47**, 135-164.

Wadensjö, E. (1996) *The Nordic Labour Markets in the 1990s*. Amsterdam, Elsevier Science Publications.

Yabiku, S. T. (2000) Family history and pensions: The relationships between marriage, divorce, children, and private pension coverage. *Journal of Aging Studies,* **14**, 293-312.

Table 1. Exit probabilities (percentage)

Females

Year	**Disability**	**Unemploy.**	**Out of work**	**Work**	Total
1989	4.4	3.0	0.9	91.7	4932
1990	4.8	1.7	1.0	92.6	4523
1991	4.9	2.0	1.3	91.7	4188
1992	5.1	2.5	1.1	91.3	3842
1993	4.2	2.1	2.2	91.5	3506
1994	5.5	2.4	6.4	85.6	3208
1995	5.1	2.3	6.4	86.2	2747
Weighted prob.	4.8	2.3	2.4	90.5	26946

Males

Year	**Disability**	**Unemploy.**	**Out of work**	**Work**	Total
1989	3.3	2.1	0.8	93.7	5383
1990	4.1	1.5	1.1	93.3	5045
1991	4.3	2.5	1.7	91.4	4707
1992	5.7	4.1	2.9	87.3	4303
1993	4.5	4.6	3.7	87.2	3757
1994	6.0	3.8	8.0	82.1	3276
1995	4.2	3.1	7.1	85.6	2691
Weighted prob.	4.5	3.0	3.1	89.4	29162

Common notes: All the probabilities are calculated conditional on the number of individuals working at the beginning of each year.

Table 2. Marginal effects. Multinomial logit model, females

	Disability		Unemplov.		Out of work		Work	
Personal characteristics	coeff.	*z*-value	coeff.	*z*-value	coeff.	*z*-value	coeff.	*z*-value
Unmarried	-0.0191	-2.766	-0.0036	-1.034	0.0011	0.432	0.0217	2.684
Widow/widower	-0.0071	-1.397	-0.0066	-2.573	-0.0007	-0.333	0.0143	2.401
Divorced	0.0066	1.216	-0.0055	-1.705	-0.0041	-1.504	0.0030	0.438
Children (1=yes)	0.0036	0.518	0.0061	2.018	0.0008	0.200	-0.0105	-1.236
Age	0.0039	5.399	0.0009	2.175	0.0052	14.577	-0.0100	-11.160
Education	-0.0045	-7.403	-0.0015	-4.451	0.0001	0.573	0.0059	8.054
Experience	-0.0010	-3.025	-0.0006	-3.570	0.0003	1.836	0.0014	3.326
Civil servant (1=yes)	-0.0036	-0.925	-0.0198	-6.079	0.0072	5.135	0.0162	3.124
Income (as) and wealth								
Employed (10.000 NOK)	-0.0077	-9.320	-0.0025	-5.775	-0.0011	-3.134	0.0113	11.005
Unemplov. (10.000 NOK)	0.0007	0.693	0.0026	4.754	-0.0006	-1.422	-0.0027	-2.155
Disabled (10.000 NOK)	0.0189	8.383	0.0027	2.148	0.0021	2.014	-0.0236	-8.474
Wealth (10.000 NOK)	-0.0001	-1.248	0.0001	2.777	0.0000	2.614	0.0000	-0.136
Spouse characteristics								
Spouse age difference	0.0004	1.033	0.0002	0.784	-0.0002	-0.909	-0.0004	-0.876
Income (10.000 NOK)	-0.0005	-2.956	0.0001	1.249	-0.0001	-0.932	0.0005	2.447
Wealth (10.000 NOK)	-0.0001	-1.505	-0.0001	-2.520	0.0000	1.231	0.0001	2.229
Benefit receiver (1=yes)	0.0236	5.180	0.0017	0.706	0.0031	1.588	-0.0283	-5.196
Industries								
Agricult.+ Fisheries	0.0034	0.270	-0.0012	-0.200	0.0038	0.628	-0.0060	-0.391
Private services	-0.0023	-0.624	0.0012	0.726	-0.0014	-0.802	0.0025	0.584
Transport and commu.	-0.0281	-3.675	-0.0048	-1.175	0.0049	2.078	0.0280	3.164
Real estate + Finance	-0.0152	-2.418	-0.0053	-1.822	0.0051	2.211	0.0154	2.123
Education + Health	-0.0040	-1.311	-0.0154	-9.111	-0.0013	-0.930	0.0208	5.524
Year dummies								
1990	-0.0008	-0.201	-0.0100	-4.491	-0.0042	-1.528	0.0151	2.805
1991	-0.0015	-0.337	-0.0074	-3.254	-0.0053	-1.943	0.0142	2.533
1992	-0.0015	-0.303	-0.0040	-1.656	-0.0123	-4.071	0.0178	2.875
1993	-0.0124	-2.220	-0.0069	-2.480	-0.0090	-3.077	0.0283	4.152
1994	-0.0020	-0.351	-0.0030	-1.020	0.0001	0.043	0.0049	0.700
1995	-0.0093	-1.456	-0.0038	-1.164	-0.0049	-1.648	0.0180	2.340
Local municipality								
Residence density	0.0011	1.825	-0.0001	-0.414	0.0003	1.207	-0.0012	-1.801
Distance to centre	-0.0016	-2.415	-0.0003	-0.862	0.0003	0.980	0.0016	1.974
Unemployment rate	0.1563	2.169	0.1461	4.074	-0.0080	-0.241	-0.2944	-3.388
Constant	-0.3160	-7.395	-0.0769	-3.325	-0.3581	-16.498	0.7510	14.280
Nbr. of observations	1300		617		648		24381	
Pseudo R2	0.0756							
Log Likelihood	-10285.0							

Table 3. Marginal effects. Multinomial logit model, males

	Disability		Unemplov.		Out of work		Work	
Personal characteristics	coeff.	*z*-value	coeff.	*z*-value	coeff.	*z*-value	coeff.	*z*-value
Unmarried	-0.0038	-0.862	0.0037	1.721	0.0042	1.459	-0.0041	-0.714
Widow/widower	-0.0041	-0.769	0.0002	0.064	0.0001	0.029	0.0038	0.566
Divorced	0.0028	0.746	0.0043	2.283	0.0021	0.875	-0.0092	-1.900
Children(1=yes)	-0.0092	-2.206	0.0015	0.814	-0.0049	-1.680	0.0126	2.355
Age	0.0045	7.724	0.0012	4.003	0.0059	15.229	-0.0116	-15.254
Education	-0.0024	-5.757	-0.0003	-1.631	-0.0013	-5.604	0.0041	7.773
Experience	-0.0027	-2.797	-0.0014	-2.978	0.0001	0.070	0.0040	2.583
Civil servant (1=yes)	-0.0015	-0.502	-0.0411	-14.913	0.0139	9.025	0.0288	6.680
Income (as) and wealth								
Employed (10.000 NOK)	-0.0038	-9.442	-0.0011	-5.499	-0.0002	-1.081	0.0051	10.698
Unemplov. (10.000 NOK)	-0.0036	-3.392	-0.0007	-1.360	0.0011	1.320	0.0033	2.232
Disabled (10.000 NOK)	0.0081	5.065	0.0031	3.900	0.0020	2.281	-0.0132	-6.670
Wealth (10.000 NOK)	-0.0001	-2.541	0.0000	1.261	0.0000	1.290	0.0001	2.463
Spouse characteristics								
Spouse age difference	0.0000	-0.039	0.0000	0.185	-0.0002	-0.972	0.0001	0.440
Income (10.000 NOK)	-0.0007	-3.860	0.0001	0.687	-0.0003	-2.862	0.0010	4.151
Wealth (10.000 NOK)	0.0000	-0.384	0.0000	-0.327	0.0001	2.081	0.0000	-0.157
Benefit receiver (1=yes)	0.0115	3.513	0.0034	1.945	0.0011	0.570	-0.0160	-3.794
Industries								
Agricult.+ Fisheries	-0.0231	-2.594	-0.0121	-2.464	-0.0053	-0.736	0.0404	3.243
Private services	-0.0106	-3.352	-0.0057	-3.784	-0.0063	-2.519	0.0227	5.281
Transport and commu.	-0.0167	-4.509	-0.0145	-5.449	0.0118	6.607	0.0194	3.993
Real estate + Finance	-0.0057	-1.246	-0.0083	-3.511	0.0038	1.473	0.0102	1.773
Education + Health	-0.0147	-5.198	-0.0136	-6.884	0.0025	1.501	0.0258	6.762
Year dummies								
1990	0.0032	0.873	-0.0050	-2.342	-0.0012	-0.340	0.0030	0.554
1991	0.0052	1.241	0.0022	1.051	0.0008	0.194	-0.0082	-1.351
1992	0.0160	3.306	0.0092	3.731	0.0044	0.958	-0.0295	-4.168
1993	0.0084	1.429	0.0116	3.994	0.0040	0.712	-0.0240	-2.792
1994	0.0208	3.116	0.0115	3.411	0.0129	1.985	-0.0452	-4.552
1995	0.0072	0.921	0.0097	2.509	0.0058	0.762	-0.0227	-1.953
Local municipality								
Residence density	0.0006	1.277	-0.0003	-1.183	-0.0008	-2.725	0.0005	0.817
Distance to centre	-0.0003	-0.627	-0.0001	-0.577	0.0012	3.371	-0.0007	-1.009
Unemployment rate	0.1860	3.219	0.1728	5.635	-0.0396	-1.047	-0.3192	-4.219
Constant	-0.2433	-6.201	-0.0873	-4.283	-0.4327	-13.073	0.7633	13.852
Nbr. of observations	1314		869		897		26082	
Pseudo R2	0.1002							
Log Likelihood	-11841.6							

Table 4. Exit probabilities (percentage). Original, and predicted with the opposite gender's vector of coefficients

	Females			*Males*		
States	**Original**	**w/male coeff's**	**Diff.**	**Original**	**w/female coeff's**	**Diff.**
Work	90.5	82.0	-8.5	89.4	89.9	0.5
Disability	4.8	11.0	6.2	4.5	5.5	1.0
Unempl.	2.3	4.9	2.6	3.0	2.6	-0.3
Out of lab.	2.4	2.1	-0.3	3.1	2.0	-1.1

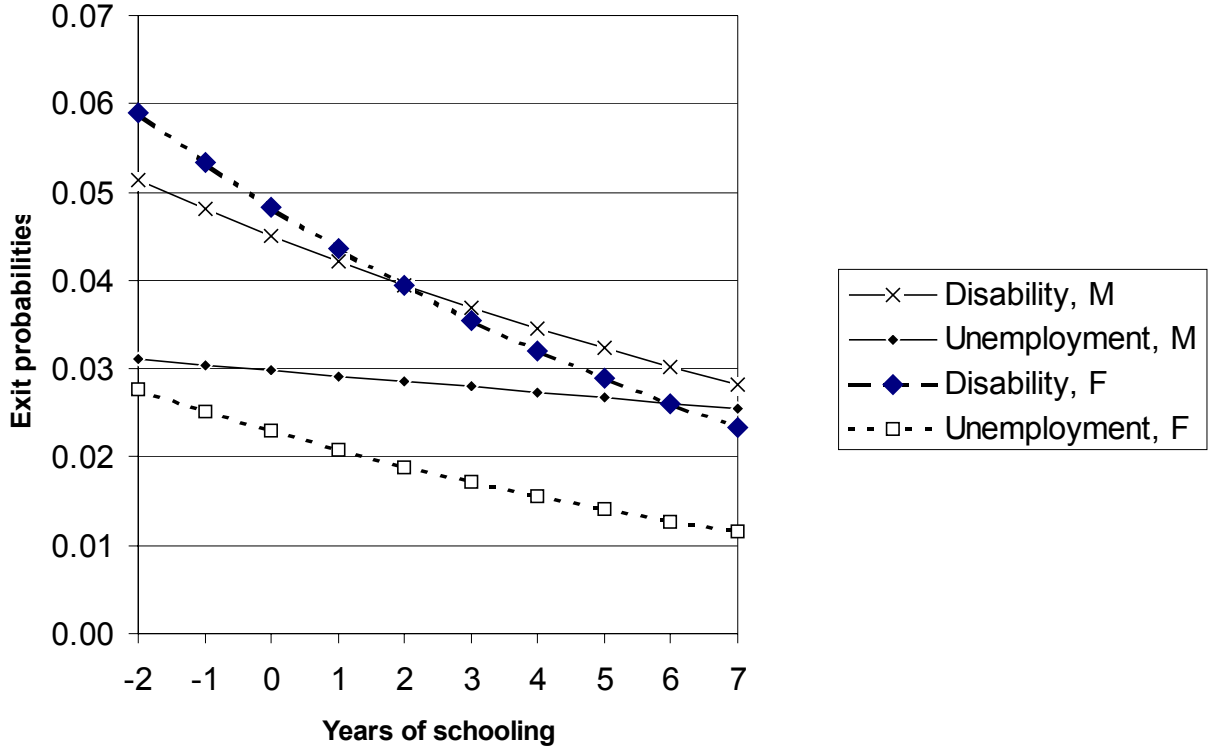

Figure 1. Education, males and females

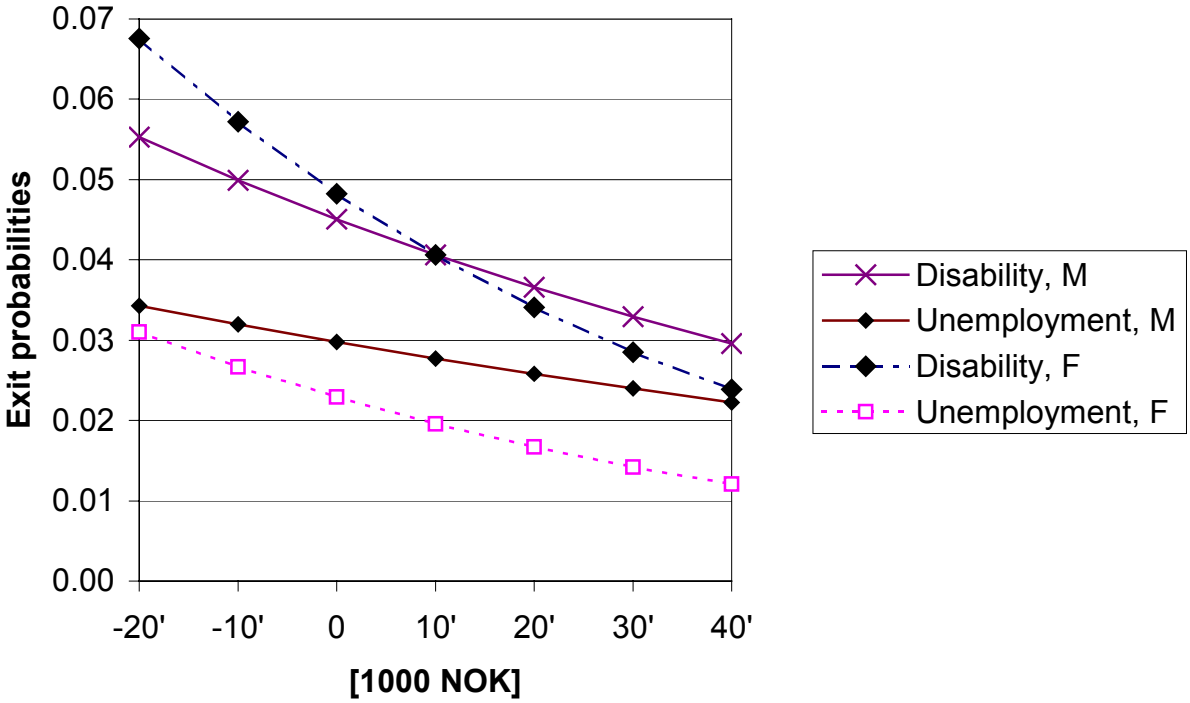

Figure 2. Earnings, males and females

Table A1. Descriptive statistics

	Females				Males			
	Dis-ability	Un-employ.	Out of work	Work	Dis-ability	Un-employ.	Out of work	Work
Personal characteristics								
Married	0.71	0.78	0.73	0.73	0.79	0.79	0.81	0.85
Unmarried	0.04	0.05	0.07	0.06	0.07	0.08	0.05	0.05
Widow/widower	0.14	0.12	0.15	0.13	0.04	0.04	0.05	0.03
Divorced	0.10	0.06	0.05	0.09	0.10	0.10	0.09	0.08
Children (1=yes)	0.03	0.05	0.02	0.03	0.06	0.08	0.04	0.09
Age	59.4	59.0	61.5	58.9	59.5	59.6	61.1	58.8
Education	9.1	8.8	9.9	9.9	9.5	9.7	10.8	10.8
Experience	18.6	17.2	20.9	18.6	24.6	24.8	25.9	24.3
Civil servant (1=yes)	0.1	0.0	0.3	0.2	0.1	0.0	0.4	0.2
Income (as) and wealth								
Employed (10.000 NOK)	11.9	11.2	12.5	13.1	18.5	19.6	22.3	22.1
Unemploy. (10.000 NOK)	7.6	7.2	7.9	8.1	11.6	11.7	12.3	12.1
Disabled (10.000 NOK)	6.3	6.0	6.5	6.7	9.6	9.9	10.5	10.5
Wealth (10.000 NOK)	12.0	14.4	20.5	13.9	22.6	29.1	66.7	29.6
Spouse characteristics								
Spouse age difference*)	-3.3	-3.5	-3.0	-3.5	3.3	3.2	3.5	3.2
Income (10.000 NOK)*)	14.4	11.1	14.1	10.5	8.8	6.9	8.0	7.8
Wealth (10.000 NOK)*)	31.9	26.3	26.3	39.7	7.3	6.1	7.0	24.3
Benefit receiver (1=yes)*)	0.3	0.4	0.3	0.5	0.1	0.2	0.2	0.2
Industries								
Agricult.+ Fisheries	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Manufac. + Construction	0.24	0.34	0.19	0.20	0.57	0.69	0.32	0.43
Private services	0.21	0.33	0.16	0.18	0.11	0.13	0.07	0.12
Transport and commu.	0.03	0.03	0.08	0.05	0.08	0.04	0.22	0.11
Real estate + Finance	0.04	0.06	0.07	0.06	0.05	0.05	0.06	0.07
Education + Health	0.46	0.24	0.49	0.50	0.18	0.09	0.32	0.27
Local municipality								
Residence density	6.9	6.6	7.2	7.0	6.9	6.9	7.1	7.2
Distance to centre	5.4	5.3	5.8	5.7	5.4	5.4	5.7	5.6
Unemployment rate	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Number of observations	1300	617	648	24381	1314	869	897	26082
Number of individuals at the end of 1995	1300	617	648	2367	1314	869	897	2303

The sampled means are calculated for all individuals' observations from 1989 to the year of exit.

*) Means calculated conditional on being married.

IZA Discussion Papers

No.	Author(s)	Title	Area	Date
05	T. K. Bauer	Migration, Sozialstaat und Zuwanderungspolitik	1	05/02
506	P. Díaz-Vázquez D. Snower	Can Insider Power Affect Employment?	3	05/02
507	E. Fehr A. Falk	Psychological Foundations of Incentives	5	05/02
508	C. Belzil J. Hansen	Unobserved Ability and the Return to Schooling	6	05/02
509	A. Kunze	The Timing of Careers and Human Capital Depreciation	1	06/02
510	E. S. Prasad	Wage Inequality in the United Kingdom, 1975-99	2	06/02
511	F. Büchel H. Battu	The Theory of Differential Overqualification: Does it Work?	1	06/02
512	C. Belzil J. Hansen	A Structural Analysis of the Correlated Random Coefficient Wage Regression Model	6	06/02
513	C. Belzil J. Hansen	Earnings Dispersion, Risk Aversion and Education	6	06/02
514	F. Schneider	The Size and Development of the Shadow Economies of 22 Transition and 21 OECD Countries	4	06/02
515	J. Hurley R. Vaithianathan T. F. Crossley D. Cobb-Clark	Parallel Private Health Insurance in Australia: A Cautionary Tale and Lessons for Canada	3	06/02
516	H. Bonin	Eine fiskalische Gesamtbilanz der Zuwanderung nach Deutschland	7	06/02
517	E. Tekin	Child Care Subsidies, Wages, and Employment of Single Mothers	3	06/02
518	P. Carneiro J. J. Heckman	The Evidence on Credit Constraints in Post-Secondary Schooling	5	06/02
519	S. Cohen Z. Eckstein	Labor Mobility of Immigrants: Training, Experience, Language and Opportunities	1	06/02
520	U. Sunde	Unobserved Bilateral Search on the Labor Market: A Theory-Based Correction for a Common Flaw in Empirical Matching Studies	1	06/02
521	U. Sunde R. Fahr	Employment Status, Endogenous Regional Mobility, and Spatial Dependencies in Labor Markets	1	06/02
522	S.- Å. Dahl Ø. A. Nilsen K. Vaage	Gender Differences in Early Retirement Behaviour	3	06/02

An updated list of IZA Discussion Papers is available on the center‘s homepage www.iza.org.