# In transit – labour market transitions of the aged in Finland

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*Preliminary draft. Comments welcome.*

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** Financial support by the Yrjö Jahnsson Foundation is greatfully acknowledged. The paper is based on the earlier work by the author to the Ministry of Social Affairs, Finland.

## 1. Introduction

There has been an increase in the early withdrawals of the aged from the labour markets in recent years in the industrialised countries. For example, in Finland the employment share of the age group of 60 to 64 years fell from 46 per cent in 1970 to 19 per cent in 1996. The corresponding fall for the age group of 55 to 59 years, was from 67 per cent to 48.5 per cent. These changes in the labour market participation have been exacerbated by parallel changes in the underlying demographic structure of the population. The baby boom generations of the late 1940's and early 1950's are about to reach the retirement age. Together with the fallen birth rates, the Finnish working age population starts to fall in 2010.

As most of the pension systems are based mainly on a Pay-As-You-Go principle, falling employment rates with the demographic changes have raised concern on the financial feasibility of the pension systems. As reducing the existing pension benefits[1] is politically very difficult and raising pension contributions by the working population in a situation where they are considered to be already too high, can have undesirable consequences on the functioning of the labour markets, increasing focus has shifted on attempts to raise the age of the labour market withdrawal. Hence, there has been an increased effort to assess the determining causes of the timing of retirement.

From an econometric point of view retirement is a "messy process". Days, when people had one full-time, continuous career until a distinct date of the old-age retirement, are long gone. There are numerous ways to withdraw from the labour markets at the end of one's career. Yet, in most countries, retirements are classified into retirements due to disability, unemployment or/and the old-age. For example, the Finnish pension system recognises all of these three types of retirements. But retirement is not necessarily a "clean-cut" procedure, as there can be a number of altering employment and unemployment spells[2] prior to the final retirement. After the major recession in the early 1990s, it has become important to distinguish between the labour *market* and the labour *force* participation. Policy-makers are naturally more concerned of the former than the latter, even if the average retirement age is linked to the concept of the labour force.

[1] or commitments to future benefits

[2] and/or participation in the active labour market programs

Policy-makers are also concerned on the consequences of restricting the access to only one of the retirement channels. Would all of those who would have retired due to a disability, end up unemployed and eventually retire with the unemployment pension? In other words, is there channel substitutability between the existing labour market withdrawal channels?

Existing literature on all aspects of retirement is vast and rapidly growing. First papers on economic incentives and retirement date as far back as to the late 1970s (for example, Boskin 1977). Life-time incentive approach became incorporated into the models only a few years later (Burkhauser, 1980). Construction of new data sets (see e.g. Samwick 1998, for Finnish studies Hakola 1999 and Pyy-Martikainen 2000), improvements in the existing data sets (eg. Coile and Gruber 1999 and Hakola 2000a, 2000b) and estimation methodology (e.g. Stock and Wise 1980, Rust 1990, Coile and Gruber 1999) have kept the research area highly active already for two decades. Surveys on this literature are provided, for example, in Quinn et. al. (1990), Lumsdaine and Mitchell (2000) and Hakola (1999).

This paper is yet another addition to the burgeoning literature, seeking empirical evidence on the determining causes of the timing of retirement. It distinguishes itself from its predecessors by using a data set that was recently specially constructed for the study of the labour market behaviour of the aged. The data set is used with keeping in mind the difference between the labour market exit and the labour force exit. Moreover, the paper also tries to assess the possible channel substitutability between the major retirement channels. Finally, some preliminary attempts are made to show whether there is a difference between concepts of retirement and the desire to retire.

The structure of this paper is as follows: after this introduction, relevant aspects of the Finnish pension system and labour market/force participation trends are reviewed. The third chapter gives briefly the underlying theoretical and methodological framework that is used in the empirical section. The third chapter also includes a short description of the data set. The fourth chapter presents the empirical results. They are divided into results on the channel specific determinants, channel substitutability and the willingness to retire. The final chapter, the fifth, makes some concluding remarks.

## 2. Finnish pension system and the trends in the rates of retirement

Finnish pension system is an all-encompassing public pension system and the use of the voluntary pensions is still relatively limited[3]. The pension system divides itself into a number of distinct pension channels. These channels and the eligibility ages for each channel are given in the table 2.1.

*Table 2-1:Distinct pension channels and their eligibility ages for the private sector*

| **Retirement channel** | **Eligibility ages** | **Previous eligibility ages (years when in effect)** |
|---|---|---|
| Old-age pension | 65- | |
| Disability pension | 16-64 | |
| Unemployment pension | 60-64 | 55-64 (1980-1986)<br>58-64 (1978-1980)<br>60-64 (1971-1979) |
| Individual early retirement | 60-64 | 58-64 (1995-1999)<br>55-64 (1987-1994) |
| Early old age pension | 60-64 | |
| Part-time pension | 56-64 | 58-64 (1995-1999)<br>60-64 (1987-1994) |
| Special pensions for agricultural workers | 55-64 | |

The retirement channels can basically be classified under three governing causes of retirement: i) disability (this encompasses the disability pension and individual early retirement), ii) unemployment (unemployment pension) and iii) old-age (old-age pension, early old age pension, part-time pension and agricultural pensions). As the table shows, the key ages for retirement in recent years have been the age of 55 and above. Even if the old-age pension can be a first pension on its own, all other types of pensions which are received prior to the age of 65, are also converted to old age pensions.

Due to the fact that labour *market* separations have increasingly become different from the labour *force* separations, it is useful to extend the

[3] Total public pension accruals are registered nationally which is the information that exists in the data set that was used in the empirical section. Because there is essentially one public pension system with a limited use of the additional voluntary coverage, the total economic incentive to retire should be relatively well tractable with the existing data.

consideration of the distinct pension channels also to their grace periods. This grace period is a "qualifying period" which is required both for the disability pension and the unemployment pension. For the unemployment pension the grace period compensation is the unemployment benefit and for the disability pension it is the sick allowance. Table 2.2 gives the age limits for the start of the grace period as well as for the start of the major pension channels.

*Table 2.2: Minimum age for the grace period and the actual pension*

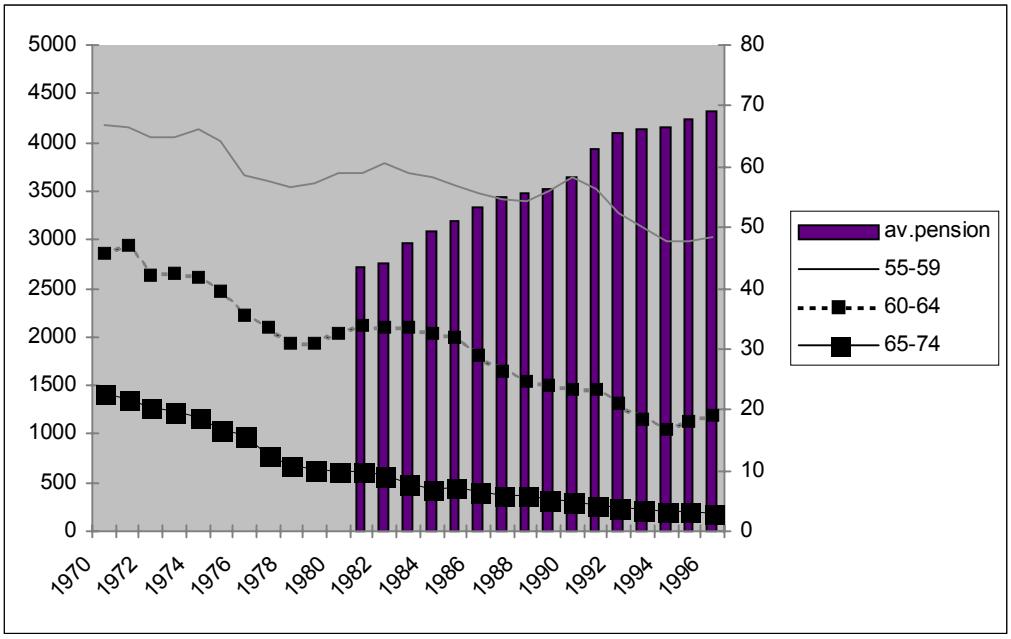
| **Retirement channel** | **Min age at the beginning of the grace period** | **Min age at the beginning of the actual pension** |
|---|---|---|
| Unemployment pension | 55 years, 1 month | 60 years |
| Disability pension | 15 years | 16 years |
| Individual early retirement | No grace period | 60 |
| Old-age pension | No grace period | 65 |

As the table shows unemployment benefit can currently extend to maximum of five years for the aged unemployed prior they receive the unemployment pension. Prior to 1997, this period could be up to seven years, as the grace period could start as early as at the age of 63. In order to obtain the disability pension, one needs to be on a sick allowance for one year.

As it was discussed in the introduction, rates of employment have been falling for the aged employees. The Finnish employment rates for the age groups of 55-59, 60-64 and 65-74 are given in figure 2.1. In order to contrast the employment rates to a crude financial incentive measure, the average pension level (indexed to 1990) was also plotted into the same figure.

*Figure 2.1: Employment rates for the aged and average pensions in Finland 1970-1996*[4]

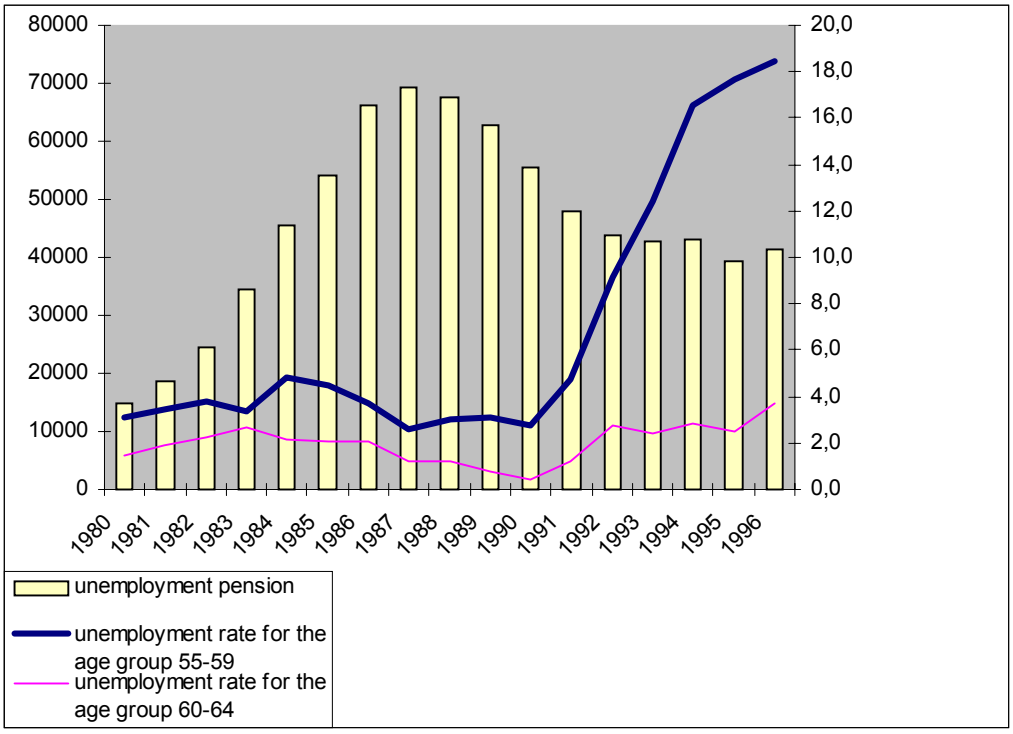
[4] Source: Statistics Finland Labour Force Survey and Joint yearbooks of the Central Pension Security Institute and the Social Insurance Institution, Finland.




The employment rate is almost continuously falling for all of the age groups. In the beginning of the 1970's, almost 67 per cent of the 55-59 year -olds were still working. In 1996, this figure was already under 50% of the age group. The fall in the 60-64 and 65-74 age groups were even more severe. The employment rate decreased from almost 46% to less than 20% of the age group of 60-64 year olds, and from almost 23% to less than 3% for the oldest age group. Average pension level has, in contrast, continuously risen.

Aggregate rates of employment naturally don't show what happens with the rates on other labour market statuses. Figure 2.2 contrasts rates of the aged unemployed to the number of the unemployment pensioners.

*Figure 2.2: Unemployment rates and number of the unemployment pensioners in Finland 1980-1996*[5]




The figure shows clearly two different developments. First, it demonstrates the effect of the change in the age limit for the unemployment pension system. This was 55 years in 1980-1986, and starting in 1986, gradually raised from 55 to 60. Moreover, the figure shows how Finland was hit by a severe recession in the beginning of the 1990s. The strong slump sent unemployment rates soaring practically for all age groups. A notable exception to this rule, is the rate for those over 60. They could apply for the unemployment pension after the above mentioned grace period.

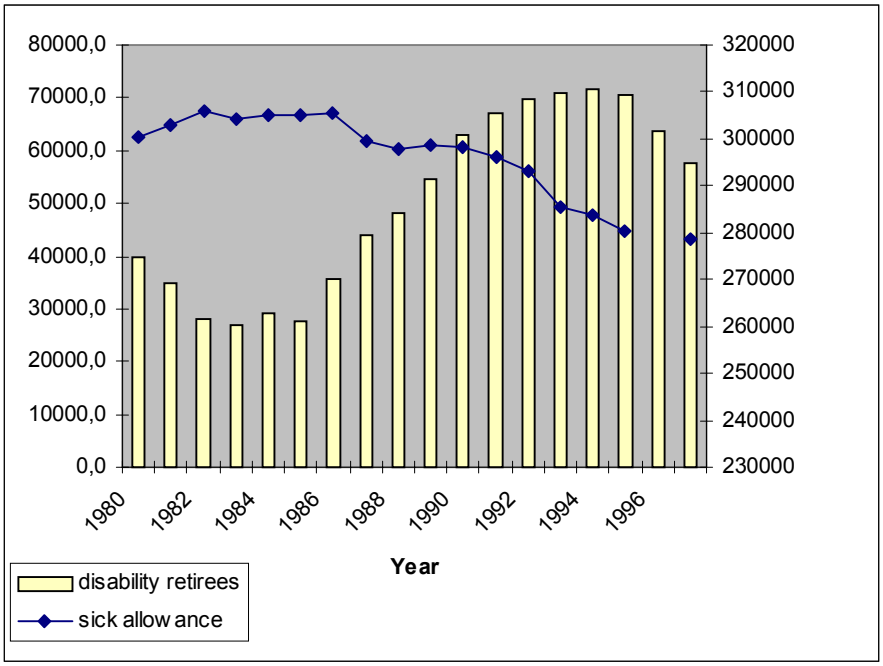
Comparable trends for the disability pensioners and those on sick allowance are given in figure 2.3. There have been a number of regulatory

[5] Source: Statistics Finland, Labour Force Surveys

changes governing the recipiency of the sick allowance or the entry to the disability pension. These changes also show up as relative shifts between the number of those receiving the grace period compensation (sick allowance) and those on the actual pension. For example, in 1982, recipiency of the disability pension was subjected to the recipiency of the maximum number of days of the sick allowance (300). Hence, the number of those receiving sick allowance was high, contrasting to a low amount of the disability pension recipients. In 1986, new disability pension, the individual early retirement, was introduced. It was targeted to those who didn't have as severe health problems as was required for the "normal" disability. Moreover, this scheme did not require the preceding period of sick allowance. Consequently, there was a growth in the number of the disability retirees, contrasted by the fall in the number of those on sick allowance. Due to the financing crisis of the early 1990s, the lower age limit to the individual early retirement, was raised from 55 to 58 years in 1994. Therefore there was a fall in the total number of the disability retirees.

*Figure 2.3: Number of the disability pensioners and those on a sick allowance in Finland 1980-1996*[6]

[6] Source: Statistics Finland, Statistical Yearbooks




## 3. Theory, methodology and data

### *3.1 Utility maximisation and economic incentives*

Most of the recent papers assessing the importance of the economic incentives on the retirement probability, take the lifetime utility view. The idea would then be to maximise the rest of the lifetime utility (consisting of consumption and leisure) subject to the budget constraint. Due to the problems in the use of the consumption data, it has become customary in the recent retirement literature to only consider the different income and leisure combinations. In other words, combinations of the value of the rest of the lifetime income and the expected years of "leisure", determined by the retirement decision, are assessed. This is also done in this paper. The incentive measure is modified to also take account of the multiple failures in the unemployment pension channel as well as the grace period for the channel.

The normal "rest of the lifetime" utility maximisation equation is given as:

$$V_t = \Sigma_{s=t}^{r-1} b^{s-t} * u(Y_s) + \Sigma_{s=r}^{T} b^{s-t} * u[kB_s(r, Y_{s-1})],$$

where $V_t$ is the lifetime utility evaluated at the time t, u(.) the period specific utility, t the current period, r the period of retirement, b the discount factor, Y the wage, B the pension benefit, and k the relative utility of the pension benefits to the wages. The amount of the pension benefits is a function of the period of retirement and the wage level prior to the retirement.

Equating utility with the income (wages and pension benefits) terms as appropriate and dropping out the structural parameters[7] simplifies the theoretical framework into lifetime assets. Accordingly, an individual can "earn" different wage and pension benefit combinations, depending on the timing of his retirement. Hence, the lifetime asset variable is the sum of the wages that the individual earns prior to his retirement and the pension benefits that he is entitled to with the corresponding career. Wages are discounted and added up over the years when the individual is working. Pension benefits are likewise discounted and added up over the rest of the expected lifetime. As the timing of retirement affects both the number of years that the individual will receive either wages or pension benefits, as well as the level of the two, the lifetime asset variable takes on different values corresponding to each year of the potential retirement. The lifetime asset value for the unemployment channel was also enhanced by the grace period unemployment benefits.

Finally each lifetime asset value was differenced with the maximum lifetime asset value for the remaining years when retirement was possible. This gives the current gain of continuing at work. The testable hypothesis was, therefore, whether this incentive affected negatively the probability of transition out of work.

Other "control variables" are usually thought to control for heterogeneity in tastes as well as the demand side. It is assumed that other factors (for example, health) can affect directly the probability of the labour market transition, not only through changing the incentive structure. The models in this paper consisted rather few control variables. Hakola (2000a)

[7] here relative utility comparison term (k)

assesses the importance of a number of other control variables that were not included in the regressions of this paper.

*3.2 Competing risks duration model with a piecewise constant hazard rate*

As the model that was used, competing risks duration model with a piecewise constant hazard rate, is in a rather common use, and it has been well documented elsewhere (see for example Lancaster 1990, Devine and Kiefer 1990, Hakola 2000b), the basis of the model are reviewed here only very briefly.

Duration model gives the transition probability, given that the person is in the "risk set"[8] at the specific time. In "single-failure" models where one explains only one transition for one individual, for example, the timing of retirement, the intuition of the model is very clear. The model gives the probability of retirement, given that the person has not retired prior to the time period under consideration. In this paper, this was done for all the other retirement routes except for the unemployment route. Unemployment channel is a channel where "multiple failures" can occur for a single individual. In other words, he can fall unemployed several times prior to finally withdrawing from the labour force with the unemployment pension. This required a modification of the independence assumption for the transitions that happened to the same individual[9].

The model is called a competing risks model because it considers a number of alternative exit channels (here unemployment, disability, old age or out of the labour force without a compensation). In the competing risks model, the presence of several exit channels has no effect on the probability of transiting into any of the other exit channels. It is only assumed that once an individual has exited through one of the channels, his probability of exit through any other channels cannot be assessed. Because this makes it impossible to assess, within the model, the substitutability between the channels, alternative methods were used to do this.

The explanatory variables enter the model through a proportionality assumption. This implies that there is a reference individual to whom the probability of transition of all other individuals at a specific time is compared[10]. Generally this individual has zero values for all of the explanatory variables. The interpretation of the dummy variables is

[8] that is, that he has the possibility to transit
[9] Can be done by modifying the error structure.
[10] In technical terms, the hazard function is multiplied a factor.

therefore straightforward. For example, for "a female dummy variable" (indicator variable that equals one if the individual is female, and zero if he is male), the coefficient gives the difference on the transition probability between men and women. If the coefficient value is negative, women have a lower probability of retirement than men, and if the value is positive, the result is naturally reverse.

Piecewise constant hazard rate refers to a situation where the probability of transition is constant within a year, but in no way restricted from one period to the next (here, a year). This is highly appropriate for the data that was available, as it was only available yearly. The fact that the model doesn't restrict the probability between the years is a great advantage, because the probability of a reference individual is allowed to increase or decrease from one year to the next. This was deemed necessary, because the probability of retirement in the sample years for the reference individual follows no specific pattern, and the model was therefore kept as flexible as possible.

### *3.3 Data*

The data that was used in the empirical analysis, is a sample from the Employment Statistics of the Statistics Finland. The Employment Statistics was created by the Statistics Finland in 1987. It combines information from a number of existing registries, from a variety of sources[11]. Altogether, about thirty different registries are brought together to provide wide-ranging information on economic activity and employment.

The specific sample consisted of 32,619 individuals in the age group of 51 years and above in 1996. There were more than 150 variables attached to each individual - containing information on socio-economic and employment status for the individual, as well as for the spouse. Most of the variables were reported from 1987 to 1996 (some to 1997). Because of an extra data match, the sample also contained detailed information[12] on the

[11] Data is gathered from the Population Census of the Finnish Bureau of Census; Tax Registries of the Finnish IRS; Employment Registries of the Central Pension Security Institute (ETK), the Municipal (Kunnallinen Eläkevakuutus) and Government Pension Institutes (Valtiokonttori); Registry of the job seekers by the Ministry of Labour; Pension registries of the Central Pension Security Institute (ETK) and the Social Insurance Institution (KELA); as well as numerous other registries held by the Statistics Finland.

[12] Data from the Central Pension Security Institute and from the registry of the Diseases Conferring Entitlement to Free or Nearly Free Medicines under National Health Insurance

accrued pension rights, rejected pension applications and use of refunded medication by the Social Insurance Institution.

In order to concentrate on the duration of employment spells, the analysis sample was restricted to those who were working at the beginning of the sample. Henceforth, most of the analysis was done with 17,579 individuals.

## 4. Results

This chapter gives the results of the estimations. It is divided into three sub-chapters which discuss first the general results, second the channel substitutability and, third, the difference between considering the retirement willingness and the actual transition.

### *4.1. Factors determining the timing of retirement*

Competing risks model was estimated considering the three most common routes of exit, unemployment, disability and the old-age. Out of the labour force without compensation was included in the table as the remainder category for those who were classified to be out of the labour force, but received at the time no pension according to their tax file information. The explanatory variables were classified into the economic incentive, individual specific variables and factors related to the previous job. These results are in the table 4.1. All of the reported models also contain age and yearly dummies. Second, full competing risks framework is given in the appendix. This model also adds the active labour market programmes as a distinct channel, but the data sample, which is used for the estimations, is shorter.

*Table 4.1: Competing risks model for labour market transitions (unemployment, disability, old age or transition into outside of the labour force without a pension) in 1988-1996*

| **Regressor** | **Coef (SE) Unempl** | **Coef (SE) Disability** | **Coef (SE) Old-Age** | **Coef (SE) OLF** |
|---|---|---|---|---|

(erityiskorvattavat lääkkeet) by the Social Insurance Institution were matched to this sample with the existing registry base of the Statistics Finland.

| Regressor | Coef (SE) Unempl | Coef (SE) Disability | Coef (SE) Old-Age | Coef (SE) OLF |
|---|---|---|---|---|
| Economic Incentive | | | | |
| Life cycle incentive | -4.73 (.66) | -5.78 (.39) | -4.60 (.73) | |
| Individual Specific | | | | |
| Bad Health (1/0) | -0.49 (.06) | 1.06 (.03) | 0.05 (.02) | -0.25 (.19) |
| Female (1/0) | -0.11 (.03) | -0.09 (.03) | 0.07 (.02) | 0.12 (.12) |
| Years of Education | -0.16 (.01) | -0.13 (.01) | 0.01 (.00) | 0.05 (.02) |
| Work Experience | -0.01 (.00) | -0.01 (.00) | 0.01 (.00) | -0.10 (.01) |
| *Job Related* | | | | |
| Public sector (1/0) | -0.21 (.04) | -0.03 (.04) | 0.37 (.02) | -0.99 (.16) |
| Self-empl. (1/0) | -0.81 (.06) | -0.17 (.06) | 0.15 (.04) | 0.46 (.15) |
| Industrial Field | | | | |
| Manufacturing (ref) | | | | |
| Agriculture (1/0) | -0.04 (.06) | -0.35 (.06) | -0.07 (.03) | -0.14 (.19) |
| Construction (1/0) | 0.72 (.04) | 0.07 (.05) | -0.05 (.03) | 0.40 (.17) |
| Commerce (1/0) | 0.38 (.04) | -0.11 (.04) | -0.07 (.03) | 0.43 (.14) |
| Transport (1/0) | -0.17 (.06) | -0.08 (.06) | 0.03 (.03) | -0.20 (.23) |
| Finance (1/0) | -0.15 (.10) | -0.12 (.10) | 0.11 (.07) | -1.51 (.58) |
| Services (1/0) | 0.07 (.04) | -0.17 (.04) | 0.09 (.03) | -0.22 (.16) |
| Log likelihood | -12,728.5 | -9,817.8 | -4,065.8 | -2,185.9 |
| Subjects | 21,688 | 17,579 | 17,579 | 17,581 |
| Failures | 4,731 | 3,634 | 4,326 | 445 |
| Time at risk | 140,598 | 140,598 | 140,598 | 158,229 |

Economic incentive variable was the one defined in the section 3.1. It measures the gain of continuing at work[13]. The coefficient for the incentive variable is statistically significant for all of the channels and it is of the expected sign. Accordingly, if the maximum value for the life-cycle incentive is higher in the future than currently, the probability of the transition is lower. Hence, retirement is postponed if it pays off to do so. The magnitude of the coefficient, however, is very small[14]. It seems, therefore, that only a large change in the incentive variable yields significant changes in the transition probabilities. There seems to be some

[13] Due to the fact that as the variable gets very high values for some individuals, the value of the life-cycle incentives was taken in 1/100,000 FIM.

[14] Coefficients need to be exponentiated to obtain the hazard ratios (for example, exp(-5)=0.007). The hazard ratio gives the proportional change in the retirement probability between the reference individual and the unit change in the continuous variable.

difference on the effectiveness of the incentive variable between the channels - disability channel being most affected. In Hakola (2000b) I show that if the incentive variable is defined as the short-run replacement ratio, the greatest effect is on the probability of a transition to the unemployment pension (not the unemployment transition that is considered here).

The indicator variable for the bad health was based on the medical re-imbursement received by an individual with a specific disease. The information on the re-imbursement by the Social Insurance Institution was classified into diseases that lower the work ability. This dummy variable also attracts the expected sign for the disability pension channel. It greatly increases the probability of a disability pension transition[15]. Bad health also seems to affect negatively the unemployment transition. Hence, it is more unlikely that a person with a health problem fall unemployed and ends up receiving the unemployment pension. This could be an indication of some degree of the channel substitutability between the disability and unemployment channels. If there were no, the health indicator should have no effect on the probability of the unemployment transition. Or if there was an effect, at least the deteriorated health should increase the probability of unemployment, not decrease it.

Women are somewhat less likely to fall unemployed or suffer from a disability. The hypothesis that women would be more likely to withdraw from the labour force without the pension, could not be confirmed, as the estimate for this is not statistically significant. In Hakola (2000a) I discussed also the "spousal effects". Retired spouse induces disability retirement for the other spouse also. As expected, this is not symmetric with the husbands and wives.

Education level is a rather strong determinant on the timing of retirement. Higher education seems to work as an insurance against unemployment as well as it helps to avoid disability. Even if the sample period contains very strong recessionary years when also the academic unemployment increased, it still seems that the labour market situation was bleaker for the less educated. This is shown by the decrease in the probability of the unemployment exit when the individual has more years of education. Higher education also often leads to physically less straining jobs. This can account for the lower probability of the disability transition for the higher educated. The education is also interpreted as a proxy for

[15] Exponentiating the coefficient, one notes that a health problem makes almost three times more likely for an individual to retire with the disability.

work motivation. It is possible that highly educated have more interesting jobs, and are therefore more motivated to continue working longer.

Work experience, in contrast, seems to have very little impact on the transition probabilities. This result seems to have been rather robust in a number of other studies (see Lilja 1990, Hakola 2000a, Hakola 2000b). It seems that the greatest impact of the experience variable is on the ”out of the labour force without the compensation” -channel. The probability of falling out of the labour force without a compensation is reduced for those with more work experience.

Job related variables contained indicator variables for the public sector employment, self-employment, and the industrial field dummies. Public sector variable behaves as expected. Public sector jobs seem to have been highly secure (low incidence of unemployment or falling out of the labour force without a compensation). Moreover, the public jobs had a lower minimum eligibility age for the old-age retirement during the sample years. This is reflected in the higher old-age retirement incidence. Self-employment is less likely to push people into unemployment or disability. This is also highly intuitive.

Results of the industrial field dummies demonstrate that labour force transitions out of agriculture were less likely to any of the given channels. This is because there are special agricultural retirement schemes that were not considered in the retirement channels that are given in the table. The second interesting industrial field result is obtained for the construction dummy. Construction work is known to be cyclically sensitive. This shows up as a higher unemployment incidence (and out of the labour force without compensation) of the construction workers.

### *4.2. Substitutability between the major retirement channels*

The first indicator of the channel substitutability was already given in the previous section. It was shown that the bad health variable affected negatively the unemployment propensity. This section gives two further tests on the channel substitutability. One is done within the framework of the previous regressions. Variables on whether the alternative channel was available (or how many years were left before it became available) when considering an alternative channel were put into the regression. The second test on the channel substitutability was done on examining the labour market transitions of those who had received a disability pension application rejection.

Table 4.2. gives the results of substitutability indicator coefficients that were added to the regressions of the table 4.1. Because some of these indicators were rather heavily correlated with the age variable, the results are given both when the age was included as a continuous variable, as well as when it was put in as dummies.

Individual early retirement is a form of a disability pension that becomes available at the age of sixty currently (58 during the sample years). If it were to be a substitute to the unemployment route, it is assumed that if an individual was eligible to the individual early retirement, the unemployment probability would be reduced. Or if there were more years left until the individual would be eligible to the individual early retirement, the use of the unemployment channel would be more likely.

The table shows that the indicator on the individual early retirement channel eligibility is highly sensitive to the age variable. If the age was included as dummies, the results confirm the substitutability hypothesis, but if the age was continuous, the hypothesis was rejected[16]. The same applies to the ”time-left-until-the-eligibility-to-the-alternative” variable.

The disability channel regression, in contrast, gives results considering the unemployment pension availability (available at the age of 60). Results are somewhat disappointing also in this case, because the indicator variable on the alternative channel availability rejects the substitutability hypothesis, and the ”time-left-until-the-eligibility-to-the-alternative” case gives a confirmation of the hypothesis only in the cases of the age dummies. Hence, the evidence on the channel substitutability hypothesis can, on the basis of these regressions, really be considered hardly any more than maybe a bit suggestive.

*Table 4.2: Substitutability indicator coefficients on the unemployment and disability transition channels*

| | | **Coef (SE) Unemployment** | **Coef (SE) Disability** |
|---|---|---|---|
| *1* | *Individual early retirement available (1/0)* | | |

[16] Results are actually reverse. This is naturally impossible because only one of the pensions can be obtained.

| | | **Coef (SE) Unemployment** | **Coef (SE) Disability** |
|---|---|---|---|
| | - age control continuous<br>- *age dummies as a control* | 0.54 (.04)<br>-0.22 (.10) | |
| 2 | Time left until individual early retirement available<br>- age control continuous<br>- age dummies as control | <br><br>-0.18 (.01)<br>0.08 (.03) | |
| 3 | Unemployment pension available (1/0)<br>- age control continuous<br>- age dummies as a control | | <br><br>0.11 (.04)<br>13.0 (.) |
| 4 | Time left until unemployment pension available<br>- *age control continuous*<br>- age dummies as a control | | <br><br><br>-0.65 (.01)<br>0.79 (.) |

The third test on the channel substitutability hypothesis takes the form of comparing the final labour market statuses of the rejected versus the non-rejected disability pension applicants during the sample period. This is done in the table 4.3.

*Table 4.3: Final labour market destinations within the sample years of those receiving a disability pension rejection in one of the sample years vs. those who don't receive a rejection*

| | Employment | Unemployment | UE pension | DI pension |
|---|---|---|---|---|
| Rejected all years | 27% | 14% | 9% | 51% |
| Non-rejected all years | 48% | 28% | 6% | 18% |

As it is shown, considerably fewer (27% versus 48%) of the rejected pension applicants continue at work throughout the whole sample than of

the non-rejected applicants. Even if a number of them (14%) fall unemployed, this is still less than the share of those who were not rejected (28%). A little bit greater share of the rejected disability pension applicants receives an unemployment pension (9% versus 6%), but an overwhelmingly greater proportion of them (51%) receives a disability pension despite at least one disability pension application rejection. In Finland there is no limit on the number of the pension applications that can be submitted, nor any limit on the timing of the second (or the third or…) pension application that can be submitted after a rejection. It seems, therefore, that a great majority of the applicants persist to apply on the same pension channel, and they do this actually successfully.

### *4.3. Retirement willingness vs. actual retirement*

The final section draws attention to the fact that the underlying theoretical framework (section 3.1) really refers to the willingness to retire, not the actual transition. Rejections of the applications make up for the difference between the willingness to retire and the actual transition.

As the data set did not contain information on the timing of the disability pension application, the variable for the willingness to retire had to be constructed on the basis of the transitions and rejections. Because of this construction, in essence, the difference between the two regression models, one for the willingness to retire and one for the actual disability retirement transition, is the disability rejection. So basically comparable results could have been obtained by regressing the explanatory variables on the rejections.

*Table 4.4: Duration models where dependent variable is the retirement willingness vs. actual disability transition*

| **Regressor** | **Coef (SE)**<br>**Willingness to retire** | **Coef (SE)**<br>**DI retirement** |
|---|---|---|
| *Economic Incentive* | | |
| Life cycle incentive | -5.44 (.39) | -5.78 (.39) |
| *Individual Specific* | | |
| Bad Health (1/0) | 0.96 (.03) | 1.06 (.03) |
| Female (1/0) | -0.02 (.03) | -0.09 (.03) |
| Years of Education | -0.13 (.01) | -0.13 (.01) |
| Work Experience | -0.01 (.00) | -0.01 (.00) |

| Regressor | Coef (SE)<br>Willingness to retire | Coef (SE)<br>DI retirement |
|---|---|---|
| *Job Related* | | |
| Public sector (1/0) | 0.00 (.03) | -0.03 (.04) |
| Self-empl. (1/0) | -0.14 (.05) | -0.17 (.06) |
| Industrial Field | | |
| Manufacturing (ref) | | |
| Agriculture (1/0) | -0.26 (.05) | -0.35 (.06) |
| Construction (1/0) | 0.08 (.04) | 0.07 (.05) |
| Commerce (1/0) | -0.06 (.04) | -0.11 (.04) |
| Transport (1/0) | -0.09 (.05) | -0.08 (.06) |
| Finance (1/0) | -0.21 (.09) | -0.12 (.10) |
| Services (1/0) | -0.16 (.04) | -0.17 (.04) |
| Log likelihood | -11,360.6 | -9,817.8 |
| Subjects | 17,579 | 17,579 |
| Failures | 4,311 | 3,634 |
| Time at risk | 140,598 | 140,598 |

The life cycle incentive seemed to show some difference between the two regressions. The economic incentive seems to affect the actual transition more than the willingness to transit (even if the difference is not significant in the standard significance levels). In other words, those who receive a disability pension application rejection have actually been less motivated by the economic factors than the others. This is clearly counter-intuitive, and it is difficult to find an economic justification for this empirical observation. Digging in deeper the economic incentive variable, rejected applicants seem to have, on average, both lower pension accruals as well as lower earnings than the others. This then affects also the final estimates.

The health effect seems to yield even a statistically significant difference between the two models. The bad health seems to have a smaller effect on the willingness to retire than on the actual transition. This is rather intuitive as it states that for somebody with a better health, there is a greater probability to become rejected than for somebody who "truly has a health problem".

Other than the fact than women seem to be more willing to seek disability retirement than they actually end up receiving it (women get a

greater proportion of rejections), there seems to be relatively little further interesting difference between the two regressions.

## 5. Conclusion

This paper attempted to provide evidence on the determining factors of the Finnish retirement behaviour. This was done within an empirical probability model, a competing risks framework. Unemployment with the extension of the unemployment pension, retirement due to disability, retirement due to old-age and withdrawal from the labour force without a pension (and participation in the active labour market programmes) were considered as alternative transition channels for the aged.

The paper also proceeded to assess the exchangeability of the disability and unemployment pension withdrawal mechanisms. As there were some differences in the eligibility ages for these two channels, these differences were used in order to examine the effect of the alternative channel availability on the use of the other channel. The channel substitutability was also examined by studying the labour market behaviour of those who had received a pension application rejection and contrasting this to the labour market behaviour of the non-applicants. Finally, the rejection information was also used to construct the retirement willingness variable. This willingness variable was used to assess whether there were differences in the determining causes for the probability to desire retirement to the actual retirement.

The results from the basic model indicate that the economic incentives seem to matter for the transitions to each of the channels where the incentive variable could be defined (this is unemployment, disability and old-age retirement, but not the "out of the labour force without pension"). Even if this effect is clearly statistically significant, economically, the incentive effect seems to be rather small. This result is in line with the option value variable findings in Hakola (1999). In Hakola (2000a, 2000b), I showed that considering the incentives with a shorter time perspective there seemed to be greater incentive effects for the transition to the unemployment pension. Yet, in Hakola (2000b) I also showed that the benefit level of the pension benefit always dominates the unemployment benefit level. Hence, there really should be an incentive effect for the unemployment pension once the unemployed person fulfils the eligibility criteria for the unemployment pension. The smallness of the

incentive effect that was found also in this study, therefore, seems to be somewhat persistent in a number of different studies. In the view of the falling employment rates and higher average pensions, I still find the result rather surprising. As the data on wages and social security benefits, even if it is obtained directly from the tax registries and national pension registries, produces a relatively large proportion of "too low" or "too high" observations to be credible, it is not clear whether the data could still be driving these results.

Other results indicate that health is not only a very strong determinant to direct people to the disability channel, but it also diminishes the likelihood to follow the other labour force withdrawal routes – most notably the unemployment route. Even if the pension channel substitutability between unemployment and disability cannot be ruled out on the basis of the evidence that was provided, there seemed to be actually more evidence on the persistence of applying several times to the same disability channel. Because in Finland there are no restrictions on the number of times one can apply for a disability pension, nor any time limit for the re-application, re-application seems natural. Moreover, in Hakola (2000a) I claimed that a previous rejection on the disability pension application actually enhances the transition probability. Therefore, persistence in applying to the same channel seems to actually pay off.

Even after concluding the estimations of the present essay, I still have a gnawing uncertainty about the smallness of the incentive effects on the labour market withdrawals. As this result has been now tested on several incentive specifications (option value variable in Hakola 1999, replacement ratios and life-cycle incentives in Hakola 2000b), several transition model specifications (random effects probit model in Hakola 1999 and duration models in Hakola 2000b and the present paper) and through some data improvements (registered pension accruals in the present paper and in Hakola 2000b, in contrast to the calculated pension entitlements in Hakola 1999), the most natural direction for the future research would be to seek a different data set to check whether the robustness holds even with the new data.

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## Appendix

As the data included active labour market participation classification only for the years from 1991 to 1996, the competing risks model was further run for these years defining another exit channel as participation in the active labour market programmes. These results are given in the table A.1.

Participation in the active labour market programmes seems more unlikely for individuals with a bad health status (despite a clear negative coefficient the estimate is, however, not statistically significant). This could also be reflection of the fact that individuals with a health problem are much more likely to follow the disability route, and, therefore, they are less likely to end up using the other options.

Moreover, women, more educated, self-employed and those with more work experience are less likely to end up in the active labour market programmes. The fact that public sector employees are more likely to end up in the non-market work programmes, is probably an artificial construct. As the public sector variable is invariant in time and many of the active labour market programmes are in the municipal sector (public sector accounts for almost 85% of the active labour market programme jobs), the causal relationship for this variable is reverse to a number of the variables.

Some of the variable coefficients for the other channels actually change in the magnitude, or even the sign, for this shorter time period. This is a reflection of a change in the weighting of the different economic cycles in the estimation sample. The end of the 1980s and very early 1990s was a period of strong expansion in Finland. From 1992 and 1993 onwards Finland underwent the most severe recession ever experienced. The results of the table 4.1 reflect the composition of people both in the boom and the bust, whereas the individuals in the estimation sample of the table A.1. only reflect the sample in the bust (and the start of the recovery in 1995). Interesting differences are the coefficients for the life cycle incentive for the unemployment channel, and the self-employment dummy for all of the channels. The incentive effect fell for the recessionary years, as the unemployment hit considerably more people. The difference in the propensities to retire for the self-employed and salary employees seemed to also grow during the years of recession.

*Figure A.1: Competing risks model for transitions in 1991-1996*

| **Regressor** | **Coef (SE) Unempl** | **Coef (SE) Disabil** | **Coef (SE) Old-Age** | **Coef (SE) ALP** | **Coef (SE) OLF** |
|---|---|---|---|---|---|

| Regressor | Coef (SE) Unempl | Coef (SE) Disabil | Coef (SE) Old-Age | Coef (SE) ALP | Coef (SE) OLF |
|---|---|---|---|---|---|
| Economic Incentive | | | | | |
| Life cycle incentive | -0.62 (1.2) | -5.00 (.50) | -5.13 (.70) | | |
| Individual Specific | | | | | |
| Bad Health (1/0) | -0.50 (.08) | 1.01 (.03) | 0.01 (.02) | -0.27 (.18) | -0.64 (.27) |
| Female (1/0) | -0.28 (.05) | -0.14 (.03) | 0.05 (.02) | -0.41 (.12) | 0.00 (.16) |
| Years of Education | -0.17 (.02) | -0.13 (.01) | 0.01 (.00) | -0.19 (.03) | 0.08 (.03) |
| Work Experience | -0.02 (.00) | -0.02 (.00) | 0.01 (.00) | -0.05 (.01) | -0.11 (.01) |
| *Job Related* | | | | | |
| Public sector (1/0) | -0.31 (.06) | -0.09 (.04) | 0.31 (.02) | 1.39 (.15) | -1.23 (.22) |
| Self-empl. (1/0) | -1.42 (.12) | -1.08 (.08) | -0.28 (.04) | -3.91 (1.0) | -0.15 (.21) |
| Industrial Field | | | | | |
| Manufacturing (ref) | | | | | |
| Agriculture (1/0) | 0.16 (.08) | -0.00 (.05) | -0.06 (.03) | 1.32 (.17) | 0.02 (.25) |
| Construction (1/0) | 0.69 (.05) | 0.06 (.05) | -0.03 (.03) | 0.73 (.15) | 0.56 (.21) |
| Commerce (1/0) | 0.27 (.06) | -0.07 (.04) | -0.07 (.03) | 1.32 (.12) | 0.48 (.17) |
| Transport (1/0) | -0.25 (.10) | -0.01 (.06) | 0.06 (.04) | 0.32 (.25) | 0.08 (.27) |
| Finance (1/0) | -0.41 (.17) | -0.12 (.11) | 0.04 (.07) | 1.17 (.27) | -1.44 (.72) |
| Services (1/0) | -0.01 (.06) | -0.19 (.04) | 0.11 (.03) | 1.20 (.15) | -0.24 (.21) |
| Log likelihood | -7,156.0 | -4813.5 | -2,493.9 | -1,167.1 | -1,056.4 |
| Subjects | 20,723 | 17,571 | 17,571 | 17,574 | 17,574 |
| Failures | 2,048 | 3,327 | 4,297 | 373 | 257 |
| Time at risk | 90,724 | 70,274 | 70,274 | 87,870 | 87,870 |