MEMORANDUM

No 33/2001

Labour Supply Effects of an Early Retirement Programme

By
Christian Brinch, Erik Hernæs and Steinar Strøm

ISSN: 0801-1117

Department of Economics
University of Oslo

This series is published by the
University of Oslo
Department of Economics

P. O.Box 1095 Blindern
N-0317 OSLO Norway
Telephone: + 47 22855127
Fax: + 47 22855035
Internet: http://www.oekonomi.uio.no/
e-mail: econdep@econ.uio.no

In co-operation with
The Frisch Centre for Economic Research

Gaustadalleén 21
N-0371 OSLO Norway
Telephone: +47 22 95 88 20
Fax: +47 22 95 88 25
Internet: http://www.frisch.uio.no/
e-mail: frisch@frisch.uio.no

List of the latest 10 Memoranda:

No 32	Tone Ognedal: Should the standard of evidence be lowered to reduce crime? 33 pp.
No 31	Jon Strand: Public- and private-good values of statistical lives: Results from a combined choice-experiment and contingent-valuation survey. 55 p.
No 30	Ove Wolfgang: Cost-effective Abatement of Ground-level Ozone in Cities and for Larger Regions: Implications of Non-monotonicity. 28 pp.
No 29	Svenn-Erik Mamelund: The Spanish Influenza among Norwegian ethnic minorities 1918-1919. 35 pp.
No 28	Erik Biørn: The Efficiency of Panel Data Estimators: GLS Versus Estimators Which Do Not Depend on Variance Components. 15 pp.
No 27	Qaisar Farooq Akram and Ragnar Nymoen: Employment behaviour in slack and tight labour markets. 34 pp.
No 26	Snorre Kverndokk, Knut Einar Rosendahl and Thomas F. Rutherford: Climate policies and induced technological change: Which to choose the carrot or the stick? 25 pp.
No 25	Olav Bjerkholt: Tracing Haavelmo's steps from Confluence Analysis to the Probability Approach. 33 pp.
No 24	Sverre A.C. Kittelsen, Guri Galtung Kjæserud and Odd Jarle Kvamme: Errors in Survey Based Quality Evaluation Variables in Efficiency Models of Primary Care Physicians. 23 pp.
No 23	Ove Wolfgang: Eco-Correlation in Acidification Scenarios. 52 pp.

A complete list of this memo-series is available in a PDF® format at:
http://www.oekonomi.uio.no/memo/

28. January 2002

Labour Supply Effects of an Early Retirement Programme*

By

Christian Brinch, Ragnar Frisch Centre for Economic Research, Gaustadalleen 21, 0349 Oslo, Norway, fax: + 47 22 95 88 25, email: c.n.brinch@econ.uio.no
Erik Hernæs, Ragnar Frisch Centre for Economic Research, Gaustadalleen 21, 0349 Oslo, Norway, fax: + 47 22 95 88 25, email: erik.hernas@frisch.uio.no
Steinar Strøm, Department of Economics, University of Oslo, Box 1095 Blindern, Norway, fax: +47 22 85 50 35, email: steinar.strom@econ.uio.no

Abstract

In 1989, an early retirement program (AFP) was introduced in Norway, with an eligibility age gradually decreasing from 66 to 62, and now covering about two thirds of the labour force. To assess the impact on the labour force we estimate a multinomial logit model for transitions between labour market states on quarterly panel data for 1988-II to 1999-IV. The estimated model tracks the development in transition rates and labour force quite well. Model simulations indicate that abolishing the AFP might increase the total labour force by almost two per cent in five years.

Keywords: Early retirement, panel data, econometric models
JEL classification: D10, H55, J26

* This paper is part of the project *The Ageing Population* financed by the *Economic and Social Research Institute, Cabinet Office, The Government of Japan.* The paper was finished while Steinar Strøm visited CES, Munich. The hospitality of CES is gratefully acknowledged. We are grateful to Knut Røed for comments and helpful suggestions. Correspondence to Erik Hernæs, the Ragnar Frisch Centre for Economic Research, Gaustadalleen 21, 0349 Oslo, Norway. Email: erik.hernas@frisch.uio.no, fax + 47 22 95 88 25

1. Introduction

The long-term decline observed in male labour force participation in industrialized countries is the result of interaction among several sets of factors. In most countries pension benefits depend on earnings prior to retirement. On the part of the individual participants in the labour market, increases real earnings will thus have an income effect inducing demand for more leisure and earlier retirement, but also a substitution effect inducing reduced demand for leisure and later retirement. On the part of the companies, implicit wage contracts may entail a need for mandatory retirement to ensure that older persons leave when their productivity has declined sufficiently for the life-cycle wage stream to be at the "right" level, Lazear (1986).

Institutional factors determine not only when pension will be available for the individuals and what the potential level will be, but also the availability of other exit routes from the labour market. Most important in Norway is disability benefit, which 34 per cent of the population aged 60-66 were receiving in 1997 (NOU, 1998: 19, p 138).

Standard micro based analyses typically model the choice of timing of transition from employment to retirement, see Lumsdaine and Mitchell (1999) for many references. These choice models usually include a precise description of the economic attributes of the options, that is potential pension and earnings in continued employment, see for instance Hernæs, Sollie and Strøm (2000). However, to the extent that early retirement schemes are substitutes for other exit routes, such as disability pensions, an assessment of the net impact on the labour force of an early retirement scheme needs to take into account also transitions into other states.

In Norway the standard retirement age is 67 years. However, an early retirement program (hereafter called AFP, which is the Norwegian abbreviation) came into effect in 1989 (see Hernæs and Strøm, 2000). The introduction of this program was the outcome of the wage settlement between the employers and employees association in 1988. To avoid high wage increases the employers association accepted the trade unions demand for a reduction in the retirement age. Since then the AFP has been gradually extended, and the eligibility age is now 62. To be eligible the worker also has to fulfil two sets of requirements. One is related to his or her working history. The other is to be working in a company that participates in the programme, which is often part on tariff agreement. Approximately two thirds of the labour force now works in companies participating, including the public sector.

The impact of the AFP has previously been assessed by Bratberg et al (2000). They estimated transition models for a 2.5-year period from employment into disability, unemployment and early retirement, separately for those who were eligible for early retirement and for the non-eligible. In a simulation, they applied the estimated non-AFP

coefficients to the AFP-sample. The result was a 50 percentage points reduction of the transition into AFP, replaced by an increase of 17 percentage points into employment, 14 percentage points into disability, 4 percentage points into unemployment and 15 percentage points into other states. The crucial assumption in that study is the applicability of the model that was estimated for the non-eligible, to the group of eligible. However, in another, rather detailed study of transitions among older workers in the Norwegian labour market, Haugen and Røed (2001) did not find that AFP served as a substitute for disability to any great extent. In that study, a hazard rate model was used, with the company's participation as the identifying instrument for the impact of individual AFP-eligibility. Hence, the magnitude of the impact of the AFP remains as yet unresolved.

In our paper the impact on the labour force of the AFP is studied by modelling the flows between employment, unemployment and out of the labour force (OLF). The latter group consists mainly of disabled and pensioners. The empirical basis is panel element of the Norwegian labour force surveys, covering the whole Norwegian population. A multinomial logit model is applied to give the transition probabilities. These probabilities are assumed to depend on a large number of observed characteristics of the individuals and of the labour market. Seasonal effects as well as a time-trend are also included. The coefficients entering the transition probabilities depend on the initial state as well as on the destination-state. The models are estimated on a quarterly basis over the period 1988-II to 1999-IV, separately for males and females. The long observation period allows us to estimate flows between all three states and to estimate the effects both of seasonal variation and of labour market tightness on transitions. In the present setting, the explanatory variables serve as control variables that help in identification of the impact of the AFP.

The price we pay for the long time-series and the large number of explanatory variables is crude states and missing variables. Neither earnings nor potential pensions are observed, but part of their effects is picked up by education, since they are both positively correlated with the level of education (Hernæs, Sollie and Strøm, 2000). Public pension is strongly re-distributive so that the variation is much less in pension than in earnings. Therefore education may have a stronger impact on earnings than on pensions. The negative effect of education on transition from employment to out of the labour force, support this hypothesis.

Among the variables we have included a dummy which capture AFP-eligibility only in terms of age, since other requirements for eligibility, mainly related to labour market history, are not available in the data set. The estimated coefficients for (age) eligibility will therefore depend on the share that fulfils also the other requirements for

eligibility and on the share of those who take out AFP. To the extent that education does not capture all aspects of earnings and pensions, the coefficient for eligibility will also depend on the composition with regard to current earnings and potential pension. In the observation period, the estimated coefficients related to age eligibility will thus capture the net impact of the availability of the AFP on labour force participation.

In contrast to the studies cited above, our way of modelling gives an estimate of the impact on labour force participation of the AFP, which does not depend on comparability between AFP-eligible and non-AFP-eligible. On the other hand, we cannot infer anything about the potential effect of extending eligibility or changing the economic incentives inherent in the programme. In order to do so, we have to use other approaches, for instance the structural modelling of Hernæs and Strøm (2000).

Simulations with the estimated models follow the observed transitions quite accurately, and out of sample predictions, excluding part of the observation period from the estimations and using it for comparison with predictions, are also quite accurate. The out-of sample predictions are not shown here, but they are available in Brinch (2000).

Assessment of the impact is done by comparing a baseline labour force projection up to 2005 to a projection in which the AFP dummy variables are all set to zero. It should be noted that this exercise can best be interpreted as an assessment of the situation by the end of 2005 following an abolishment of the AFP from the start of 2000, in the absence of any changes in social norm or other factor introducing asymmetries in retirement behaviour. In the case of such asymmetries, we will tend to overestimate the effect of an abolishment. Other factors, in particular increased pension rights of future cohorts of females, which we have not been able to incorporate, work in the opposite direction. With these reservations, we find that an abolishment of the early retirement programme (AFP) would have large impact, not only on the retirement pattern, but also on the magnitude of the whole labour force. In the simulation of an immediate abolishment of the AFP, labour force participation in 2005 will be 1.4 percentage points higher than in a baseline projection. In comparison, the baseline projection gives an increase of 3.4 percentage points in labour force participation from 1999 to 2005.

The paper is organised as follows. In section 2 we describe data and in section 3 the model is presented. Section 4 gives a brief summary of the estimation results while section 5 brings the main results of this paper, the simulated effects on the future labour force of abolishing the early retirement programme, AFP. Section 6 concludes.

2. Data

The data set used in the analysis is constructed from the panels of Norwegian labour force surveys (Statistics Norway, 1998) for the period 1988-II – 1999-IV. This data set is a rotating sample, increasing in size from 12 000 to 20 000 over the observation period. The labour force surveys contain information on demographic characteristics including attainment and place of residence, and labour market activity. In contrast to Hernæs, Sollie and Strøm (2000), in which register-data was used, no information on earnings or pensions, neither potential nor received, are observed in the labour force surveys.

The change in the panel structure over the period causes the numbers of persons in the flows from quarter to quarter to change. This is reflected in the varying precision of various estimates. There is also a potential problem from the change in response rates due to change in sampling procedure. However, most of the estimates are very precise. Details of the construction of the data set can be found in Brinch (2000).

In total the sample contains 481 371 observations. These observations are distributed across gender and initial states as described in Table 1.

Table 1. Number of observations across gender and initial states

Initial states	Men	Women	Total
Employment	176 803	152 237	329 040
Unemployment	8 130	6 706	14 836
Out of labour force	54 942	82 553	137 495
Total	239 875	241 496	481 371

3. Econometric Model

3.1 A multinomial logit model

The probability of transition from one quarter (t) to the next (t+1) is assumed to follow from a multinomial logit model, estimated separately for males and females

Let $[Y_j(t+1) \mid Y_i(t)]$ denote the event that an individual transit from state *i* in period t to state *j* in period t+1, i,j= 1,2,3.

1) State 1 is employment,
2) State 2 is unemployment
3) State 3 is out of labour force.

The probability of transiting from state *i* in period t to state *j* in period t+1, is given by

$$(1)\quad \Pr\left[Y_j(t+1) \mid Y_i(t)\right] = \frac{\exp(x(t)\beta_{ij}^*)}{\sum_{k=1}^{3}\exp(x(t)\beta_{ik}^*)} = \frac{x(t)(\beta_{ij}^* - \beta_{i3}^*))}{1+\sum_{k=1}^{2}x(t)(\beta_{ik}^* - \beta_{i3}^*))} \quad for\ i,j = 1,2,3 \quad (1)$$

By letting $\beta_{ij} = \beta_{ij}^* - \beta_{i3}^*$, we get

$$\Pr\left[Y_j(t+1) \mid Y_i(t)\right] \equiv \varphi_{ij}(t+1) = \frac{\exp(x(t+1)\beta_{ij})}{1+\sum_{k=1}^{2}\exp(x(t+1)\beta_{ik})};\ \ for\ \ i,j = 1,2,3 \quad (2)$$

We note that

1) all coefficients are normalised against the destination state j=3, which is out of the labour force,
2) coefficients vary across originating as well destination states,
3) x(t) is the vector of explanatory variables described in Table 2 below, including a constant to capture intercepts.

From the definitions of the β-s, we have

$$\varphi_{i3}(t+1) = \frac{1}{1+\sum_{k=1}^{2}\exp(x(t+1)\beta_{ik})}\ for\ i,j = 1,2,3 \quad (3)$$

3.2 Explanatory Variables

The explanatory variables are given in Table 2 and summary statistics in Table 3. Separate models are estimated for men and women. Apart from age and education, a time trend, aggregate stocks for the full population and for the relevant age groups, and some aggregate flows enter the model.

Aggregate stocks are included in the model to capture effects of heterogeneity. The effects of stocks means that e.g. the share of the population out of the labour force can affect the transition rate into the labour force. The aggregate flows between employment and unemployment are included in the model to capture the effects of changing labour market tightness over time. Thus, in simulations outside the sample period, results are conditional on which level of labour market tightness we assume.

Table 2. Explanatory variables

Variable	Definition
Age	Age at the end of the year
Age2	$0.1Age^2$
Age3	$0.01Age^3$
Edu	Highest completed education in number of years
N-Edu	=1, if no information on education, =0 otherwise
Edu2	$0.1Edu^2$
Edu3	$0.01Edu^3$
A-Edu	0.1Age*Edu
A-Edu2	$0.1Age*Edu^2$
OLF-Agg	Share of population out of labor force, this quarter
Unem-Agg	Share of population unemployed, this quarter
Dem1	Dummy for age group, 16-19
Dem2	Dummy for age group, 20-24
Dem3	Dummy for age group, 25-39
Dem4	Dummy for age group, 40-54
Dem5	Dummy for age group, 55-67
Dem6	Dummy for age group, 68-74
OLF-Agg-Dem_i, i=1,2,,,6	Share of population in age group i, OLF, gender-specific,
Unem-Agg-Dem_i, i=1,2,,,6	Share of population in age group i, unemployed, gender specific
Q-12	Dummy for transition from 1. quarter to 2.quarter
Q-23	Dummy for transition from 2. quarter to 3.quarter
Q-34	Dummy for transition from 3. quarter to 4.quarter
AQ-12	Q-12*Age
AQ-23	Q-23*Age
AQ-34	Q-34*Age
A-62,,,A-69	Dummies, if the person has turned 62, etc
APF-62,,,APF-66	Dummies for age and if AFP is available at that age
Tightness	Natural logarithm of the aggregate flow from unemployment to employment
Quit	Natural logarithm of the aggregate flow from employment to unemployment
Time	The year, two last numbers

Table 3. Summary statistics for the total samples (The number of observations is 481 371)

Variable	Mean	Std Dev	Minimum	Maximum
Age	41.85	16.1	16	74
Age2	20.10	14.3	2.6	54.8
Age3	10.68	10.6	0.4	40.5
Edu	11.22	2.5	0	15
N-Edu	0.01	0.1	0	1
Edu2	13.21	5.5	0	22.5
Edu3	16.13	9.9	0	33.8
A-Edu	4.64	1.9	0	11.1
A-Edu2	0.54	0.29	0	1.65
OLF-Agg	0.30	0.02	0.26	0.32
Unem-Agg	0.033	0.006	0.019	0.043
Dem1	0.074	0.261	0	1
Dem2	0.095	0.293	0	1
Dem3	0.311	0.463	0	1
Dem4	0.275	0.446	0	1
Dem5	0.163	0.370	0	1
Dem6	0.081	0.272	0	1
OLF-Agg-Dem1	0.043	0.152	0	0.714
OLF-Agg-Dem2	0.0271	0.085	0	0.408
OLF-Agg-Dem3	0.044	0.074	0	0.232
OLF-Agg-Dem4	0.0367	0.066	0	0.217
OLF-Agg-Dem5	0.071	0.164	0	0.555
OLF-Agg-Dem6	0.076	0.255	0	0.979
Unem-Agg-Dem1	0.005	0.019	0	0.117
Unem-Agg-Dem2	0.007	0.021	0	0.111
Unem-Agg-Dem3	0.013	0.021	0	0.076
Unem-Agg-Dem4	0.006	0.011	0	0.041
Unem-Agg-Dem5	0.002	0.005	0	0.030
Unem-Agg-Dem6	0.000	0.001	0	0.010
Q-12	0.244	0.430	0	1
Q-23	0.259	0.438	0	1
Q-34	0.251	0.433	0	1
AQ-12	10.26	19.74	0	74
AQ-23	10.88	20.15	0	74
AQ-34	10.51	19.86	0	74
A-62	0.012	0.110	0	1
A-63	0.012	0.111	0	1
A-64	0.013	0.111	0	1
A-65	0.013	0.113	0	1
A-66	0.013	0.112	0	1
A-67	0.013	0.111	0	1
A-68	0.013	0.113	0	1
A-69	0.013	0.114	0	1
AFP-62	0.001	0.035	0	1
AFP-63	0.002	0.043	0	1
AFP-64	0.007	0.084	0	1
AFP-65	0.017	0.108	0	1
AFP-66	0.012	0.111	0	1

Tightness	-1.005	0.226	-2.079	-0.223
Quit	-4.414	0.445	-6.235	-2970
Time	93.98	3.04	88	99

4. Estimation results

The main idea with this type of model is to have an empirical model that tracks the development over time in the transition structure, with the help of a large number of explanatory variables serving as controls. These variables are described in Chapter 3 and the estimates are given in Appendix 1. The focus is on the AFP-dummies. As an illustration, we will take a closer look at the marginal effect of AFP-64 which is quite representative of the dummy variables. AFP-64 is a dummy for the age 64 *and* if AFP was available for the individual when he turned 64. Furthermore we will solely focus on the transition from State 1: Employment. Because early retirement belongs to State 3: Out of labour force, we will expect that $\beta_{11,k}$ and $\beta_{12,k}$ both are negative. (The subscript k here denotes the variable AFP-64.) If this is so, the marginal effect of the availability of AFP at the age of 64 on the transition from employment to out of labour force is positive. From Tables 1 and 2 in Appendix 1, we observe that $\beta_{12,k}$ is not significantly different from zero (due to the small number of observations), neither for men nor women and that $\beta_{11,k}$ is negative. The resulting effect on the transition to state 3 is positive.

Since it is important that the model tracks the actual development of the transitions rates well, the results are presented here in the form of graphs, see Figures 1-6 below. The graphs show that we track the actual developments of the flow rates quite well over the period 1988-II - 1999-IV.

Figure 1 - Quarterly transition rates from employment, men

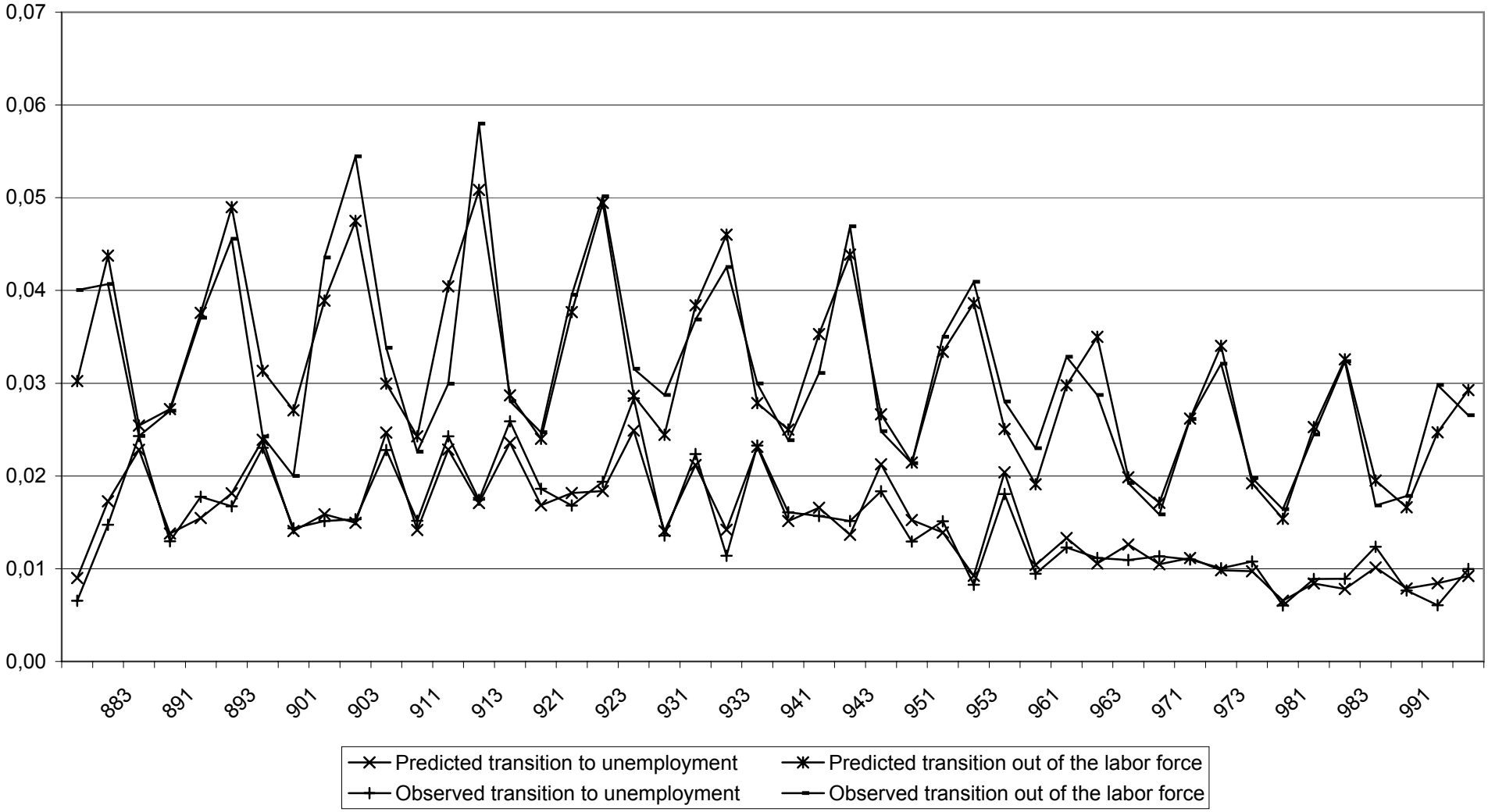


Figure 2 - Quarterly transition rates from employment, women

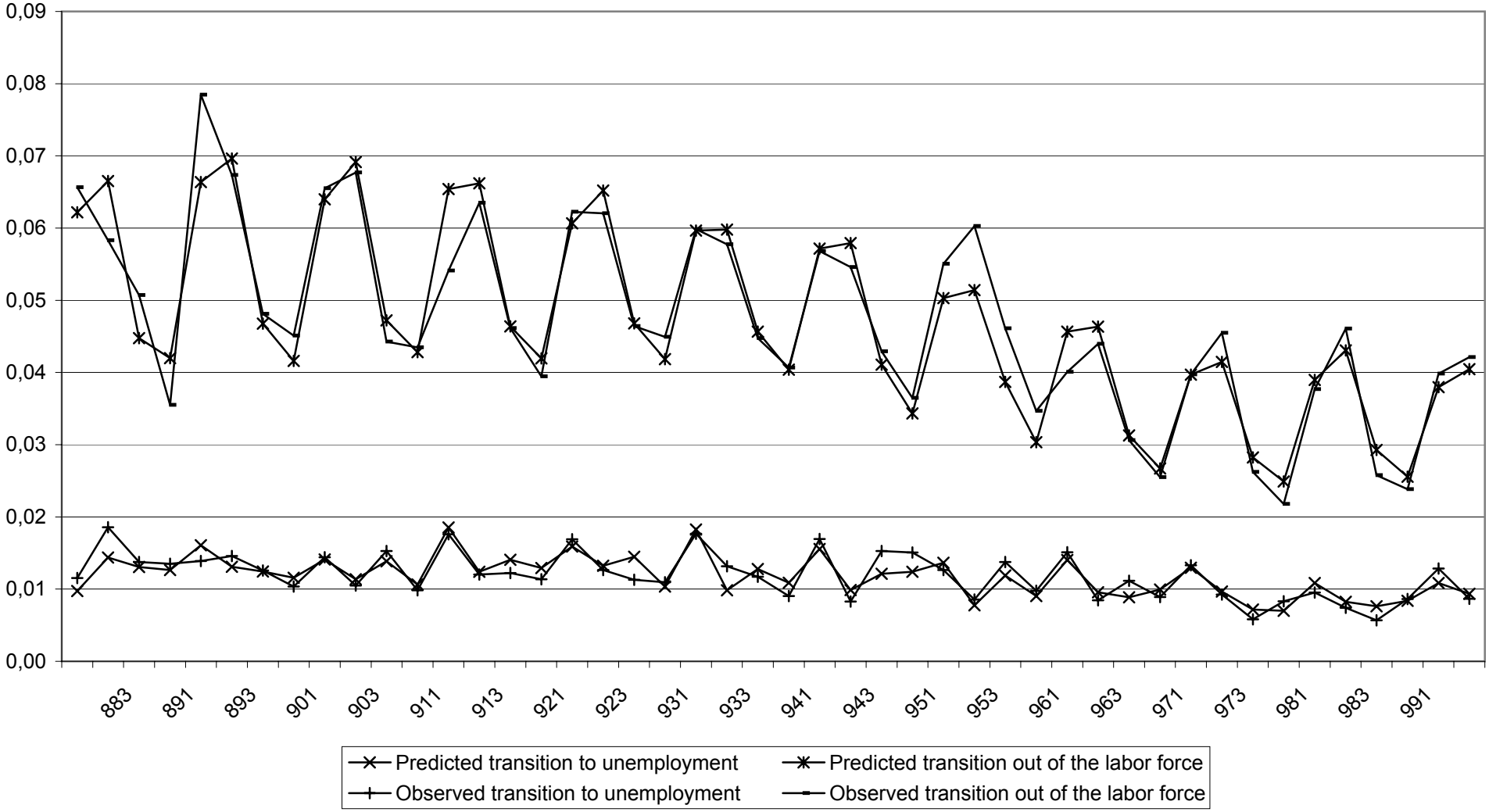


Figure 3 - Quarterly transition rates from unemployment, men

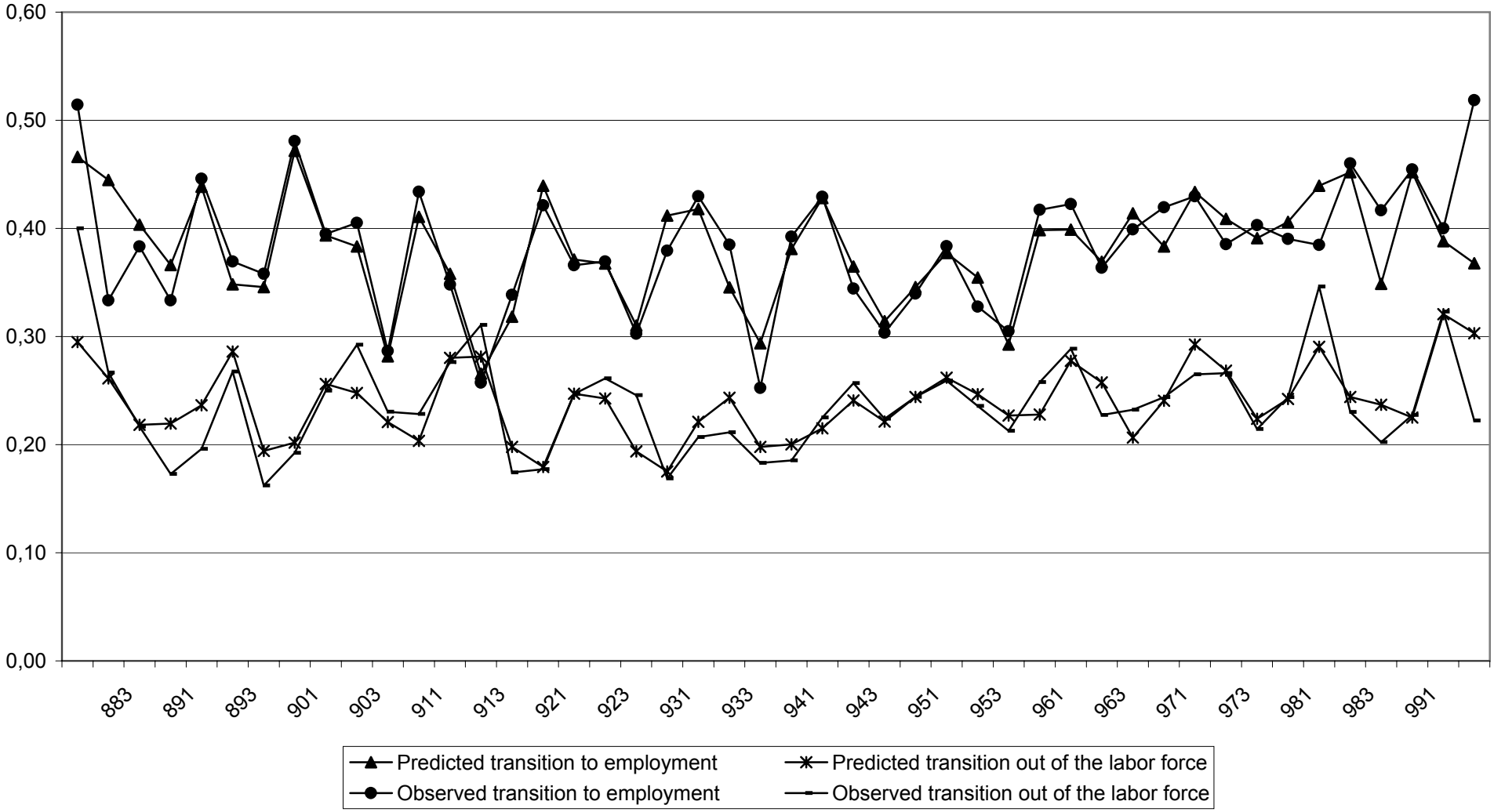


Figure 4 - Quarterly transition rates from unemployment, women

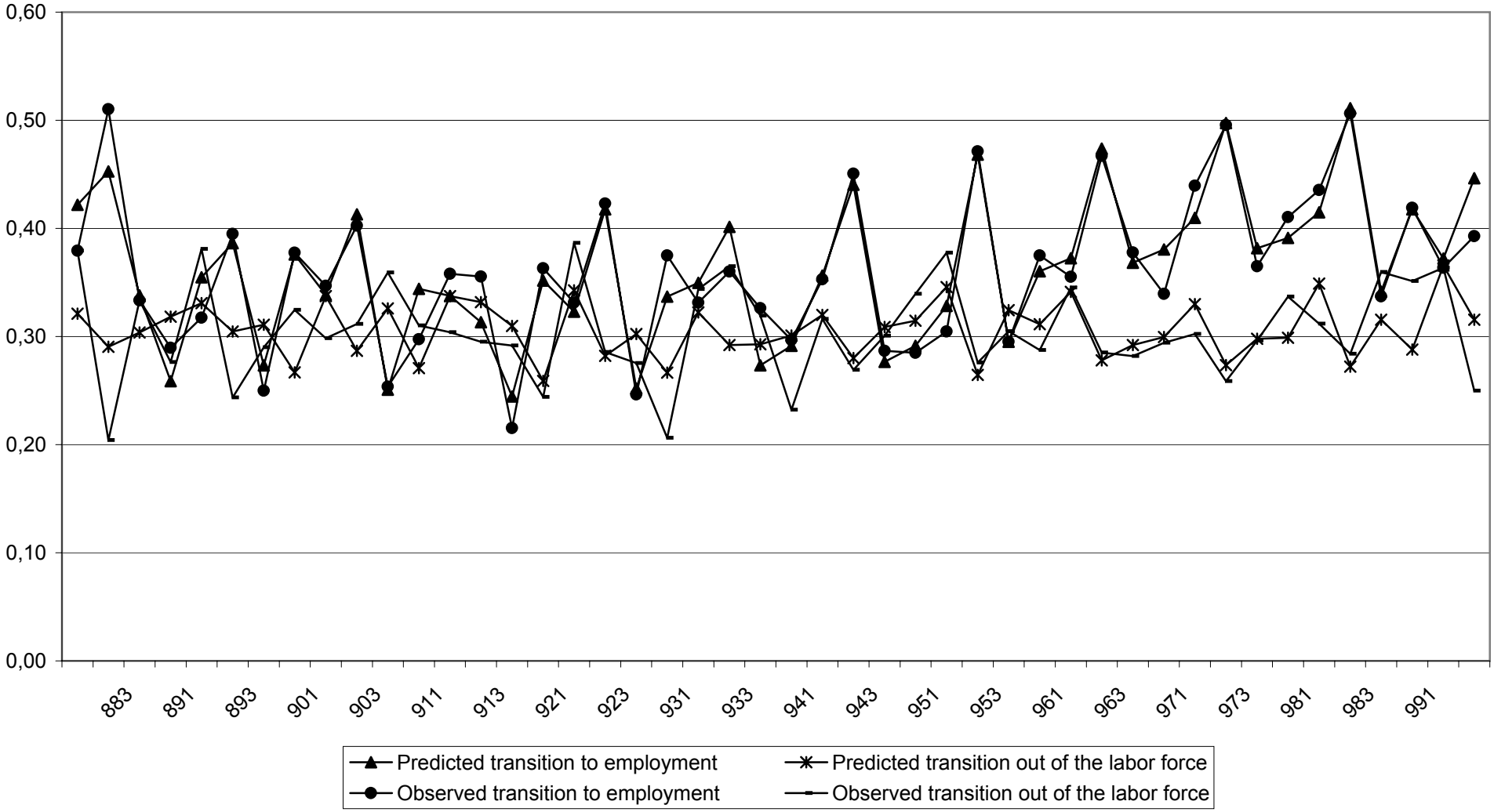


Figure 5 - Quartely transition rates from out of the labor force, men

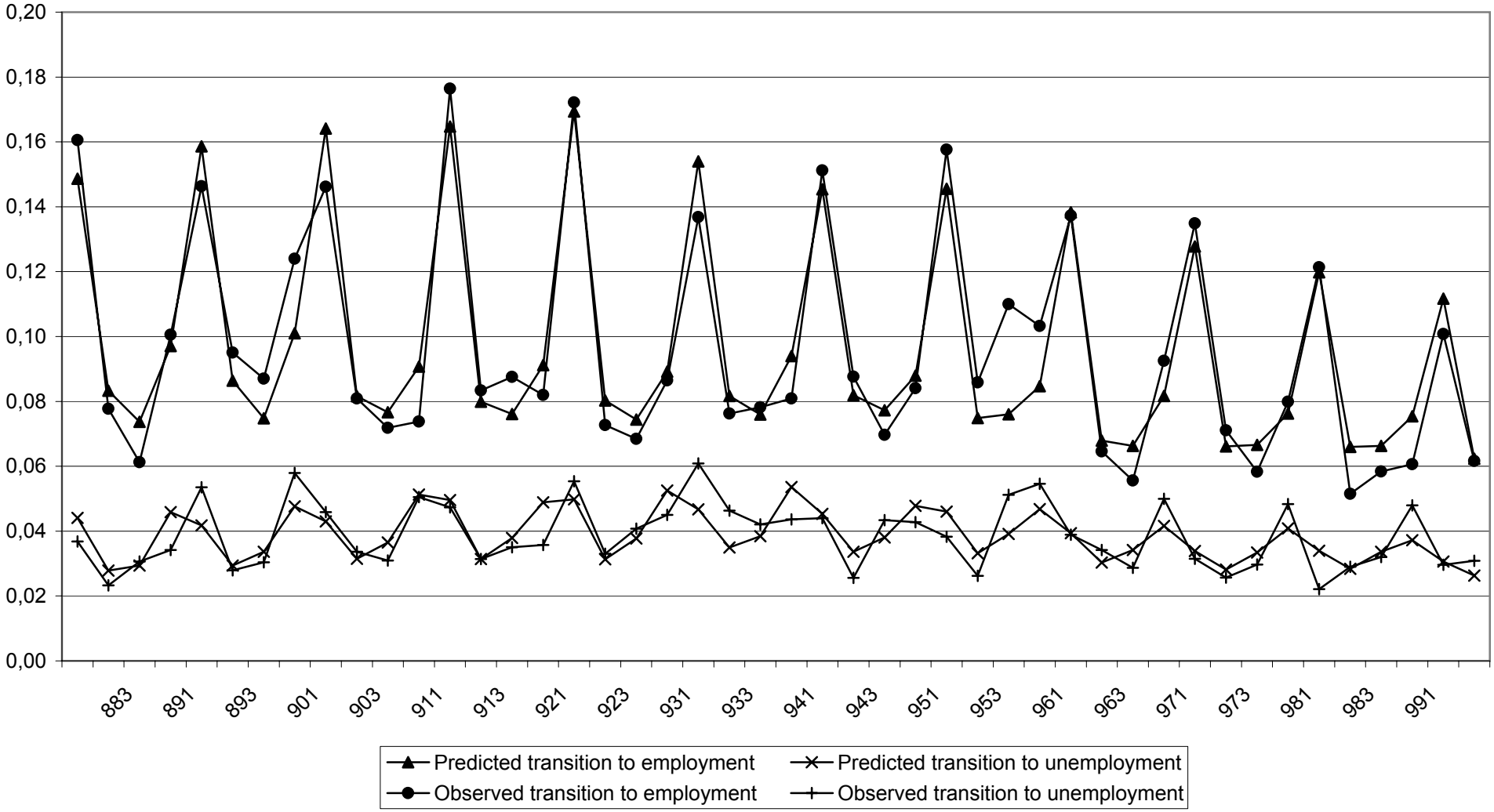
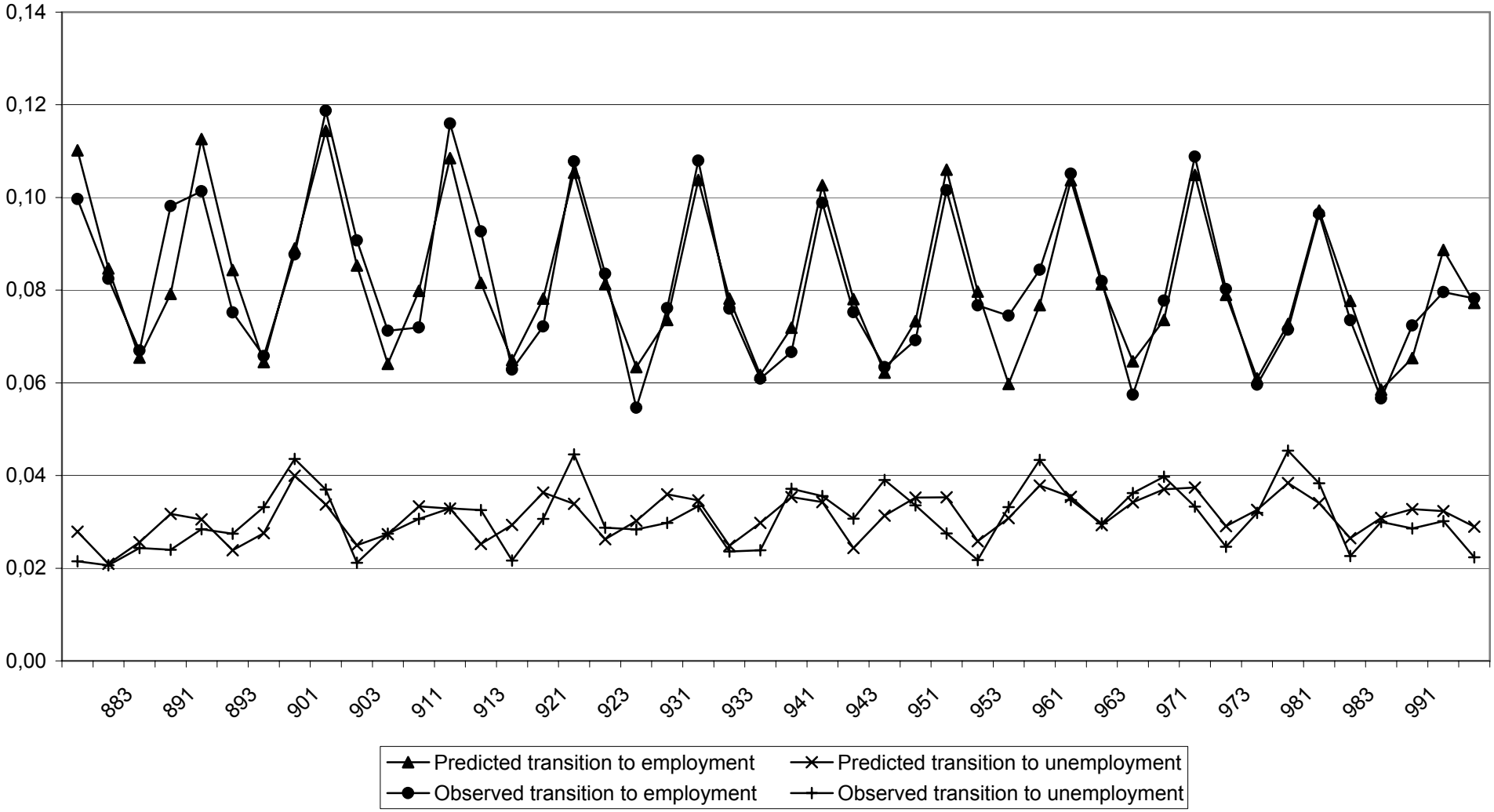


Figure 6 - Quartely transition rates from out of the labor force, women



5. Simulating the impact of the early retirement program, AFP

The impact of the early retirement programme (AFP) is studied by setting all the AFP-dummies equal to zero and projecting the labour force quarter by quarter from 1999-IV to 2005-IV with the resulting counterfactual transition rates. This projection is compared to a baseline projection using the transition rates predicted with AFP-dummies. The deviation between the two labour force projections is interpreted as the effect on the labour force of abolishing the AFP, effective from year 2000 and conditional on the status occupied at the end of 1999.

It should be noted that the impacts of abolishment and introduction of an early retirement programme might not in fact be symmetric. Changes in social norms, diffusion of information, and the way individuals plan for their retirement, may imply that an abolishment may not reverse behaviour to a pre-programme pattern. To simulate an abolishment in a realistic way would for these reasons be very difficult. Therefore, the exercise described here can best be interpreted as an assessment of the situation by the end of 2005 following an abolishment of the AFP from the start of 2000, in the absence of any changes in social norm or other factor introducing asymmetries in retirement behaviour.

5.1 The effect on transition rates of the AFP during the sample period

Counterfactual transition rates are calculated by setting the AFP-eligibility dummies equal to zero. The graphs in Figure 7-15 below show the estimated and the counterfactual rates for males and females and for single age groups 62-66, except for women aged 66, where there were too few observations. It should be remembered that the estimated transition rates are quite close to the observed, even for narrow age groups. Also, most of the estimates of the age effects are rather precise.

The transition rates from employment to out of the labour force are declining over time from the early 1990s, probably driven by the upswing in the labour market from 1993 and throughout the observation period. This shows the importance of controlling for other factors in assessing the effects on the labour force of abolishing the early retirement programme, AFP. Had we not done this, we would have underestimated the impact of AFP.

Figures 7-15 show that the effect of the AFP eligibility dummy is generally stronger for males than for females. This is as expected, since the estimated coefficients are applied to the whole age group, whereas in reality eligibility requires also a certain work history, as described by Hernæs, Sollie and Strøm (2000). Hence, the coefficients give the product of the share of the age group who is eligible, and the share of those

eligible that actually take out AFP. Because of the labour market history requirements and the historically lower labour force participation among females, the former component, the share of eligible in historical data, is smaller among females than among males. The latter component, the take-up rate, is dependent on a number of factors, among them the potential pension level, see Hernæs, Sollie and Strøm (2000). Potential pension is dependent on previous earnings, and this probably tends to give lower take-up and a smaller coefficient among females. In recent years an increasing number of women have been participating in the labour market. Thus it should be expected that an increasing share of the female population will qualify for AFP in the future. This will cause our simulations to underestimate the effect of abolishing the AFP.

Eligibility is estimated to increase the outflow rate for 62 years old males from employment to out the labour force (OLF) by 10 percentage points, and for 62 years old females by 4 percentage points. For 63 years old, the effect is similarly estimated at about 6 percentage points for males and 2.5 percentage points for females, which is similar to the level also for older persons. One interpretation of the stronger effect among 62 years old is that among older persons, potential retirees have to a greater extent already taken disability before AFP became available.

The AFP scheme was introduced at different points of time for different age groups. Coincidentally, AFP was actually introduced for the different age groups at points of time exactly between our quarters. AFP was introduced for persons aged 66 with effect from March 31, 1989, affecting our transition rates first in the transitions from the first to the second quarter in 1989 (1989.12). Similarly AFP first affected 65 years old first in 1990.12, 64 years old first in 1993.41, 63 years old first in 1997.41 and 62 years old in 1998.23. While age-specific dummies are included in the model throughout the estimation period, age-specific AFP-dummies are included for these age groups from the first transition where AFP was in effect and onwards. Thus, conditional on the effects of other covariates, the AFP effect simply captures the difference in transition rates in the period prior to and after AFP was introduced.

It is implicitly assumed that access to AFP has the same effect throughout the period with AFP access. This may seem like a questionable assumption, as it means that e.g. the effect of AFP for 64 years old is the same for those who had access to AFP at age 63 and those who did not. However, while formal testing of this assumption has not been undertaken, plots of transition rates do not indicate large changes in the transitions out of the labour force following changes of this kind.

Figure 7 - Predicted and counterfactually predicted transition rates from employment out of the labor force, men, 62 years

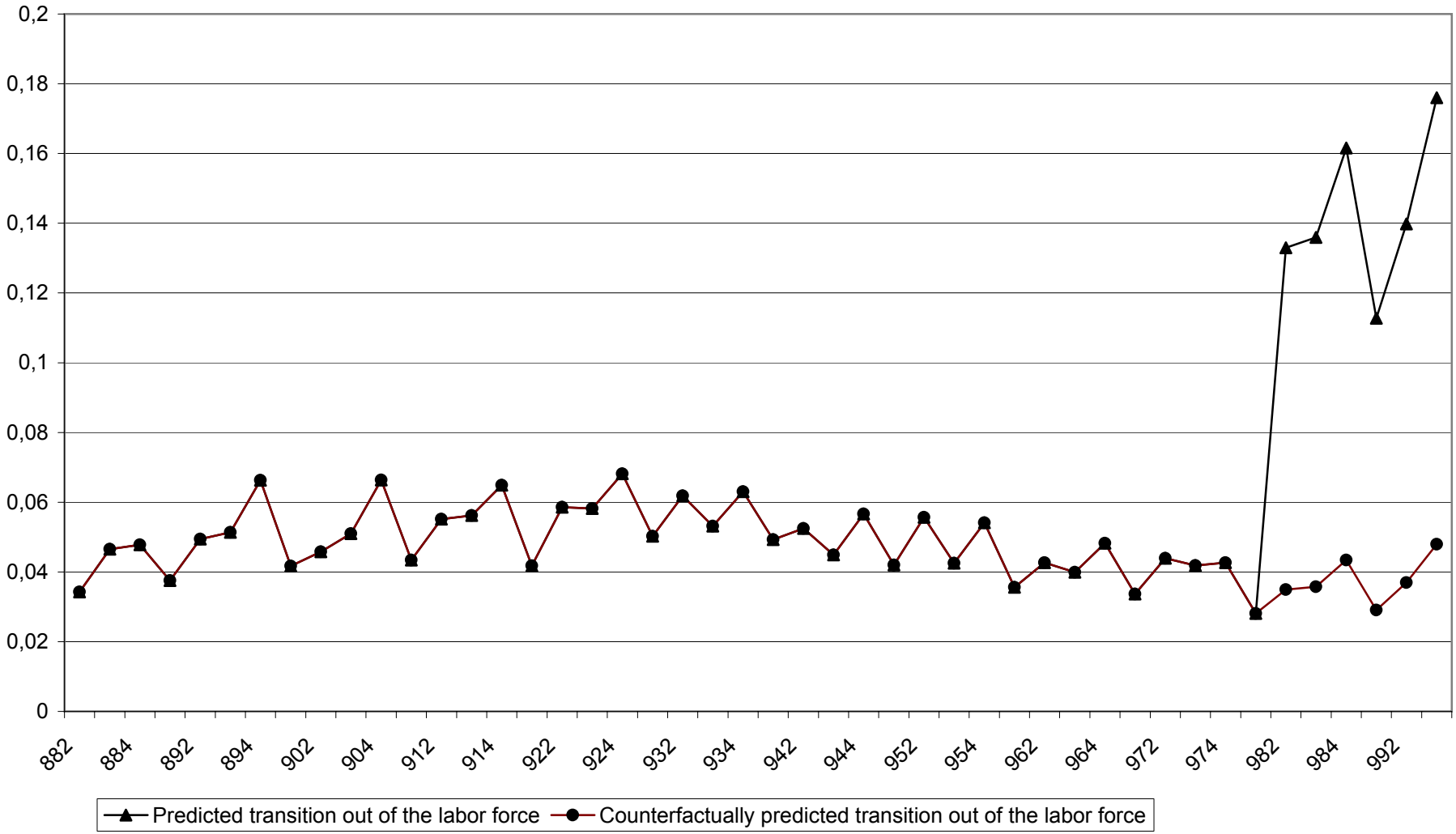


Figure 8 - Predicted and counterfactually predicted transition rates from employment out of the labor force, men, 63 years

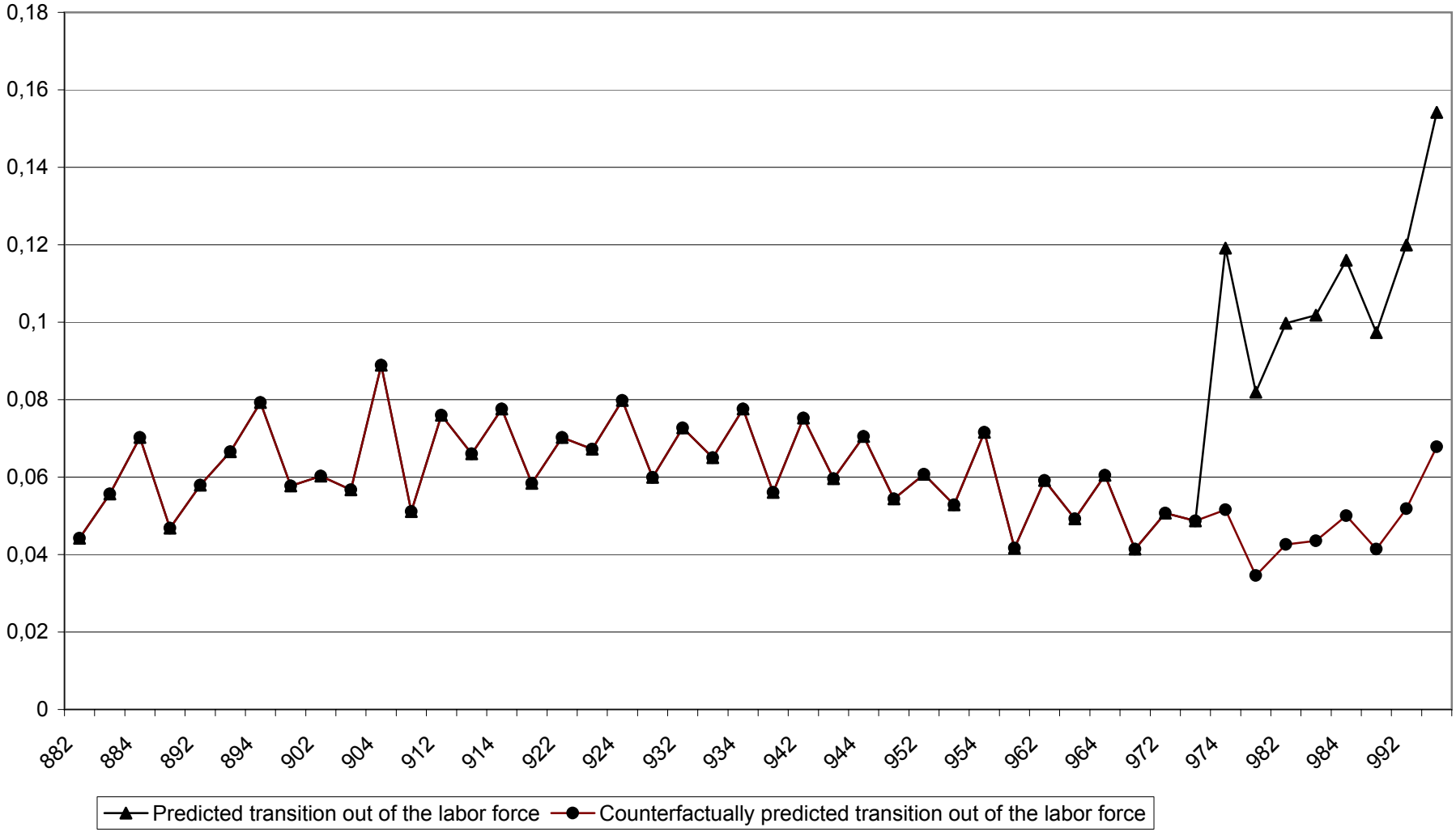


Figure 9 - Predicted and counterfactually predicted transition rates from employment out of the labor force, men, 64 years

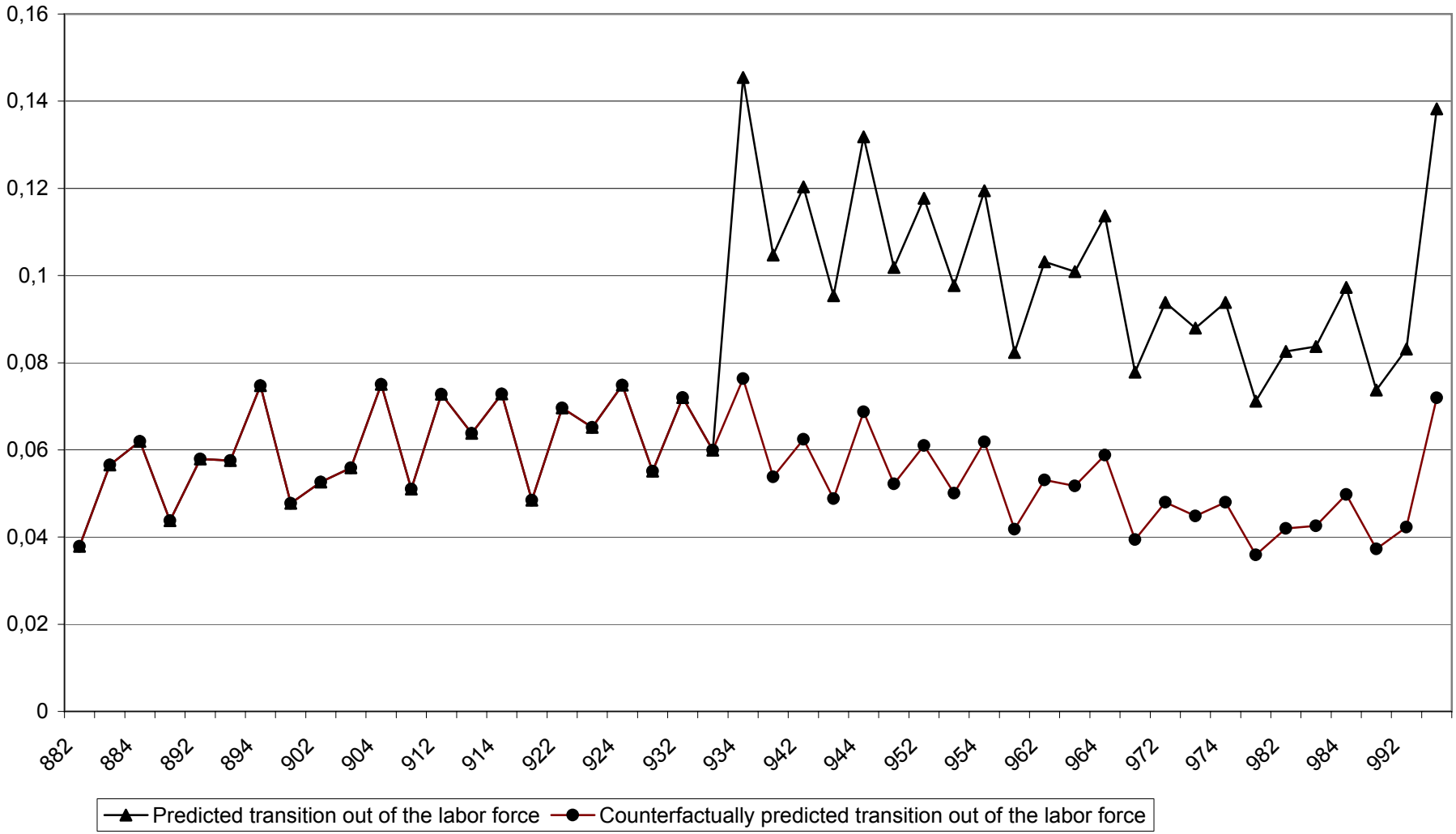


Figure 10 - Predicted and counterfactually predicted transition rates from employment out of the labor force, men, 65 years

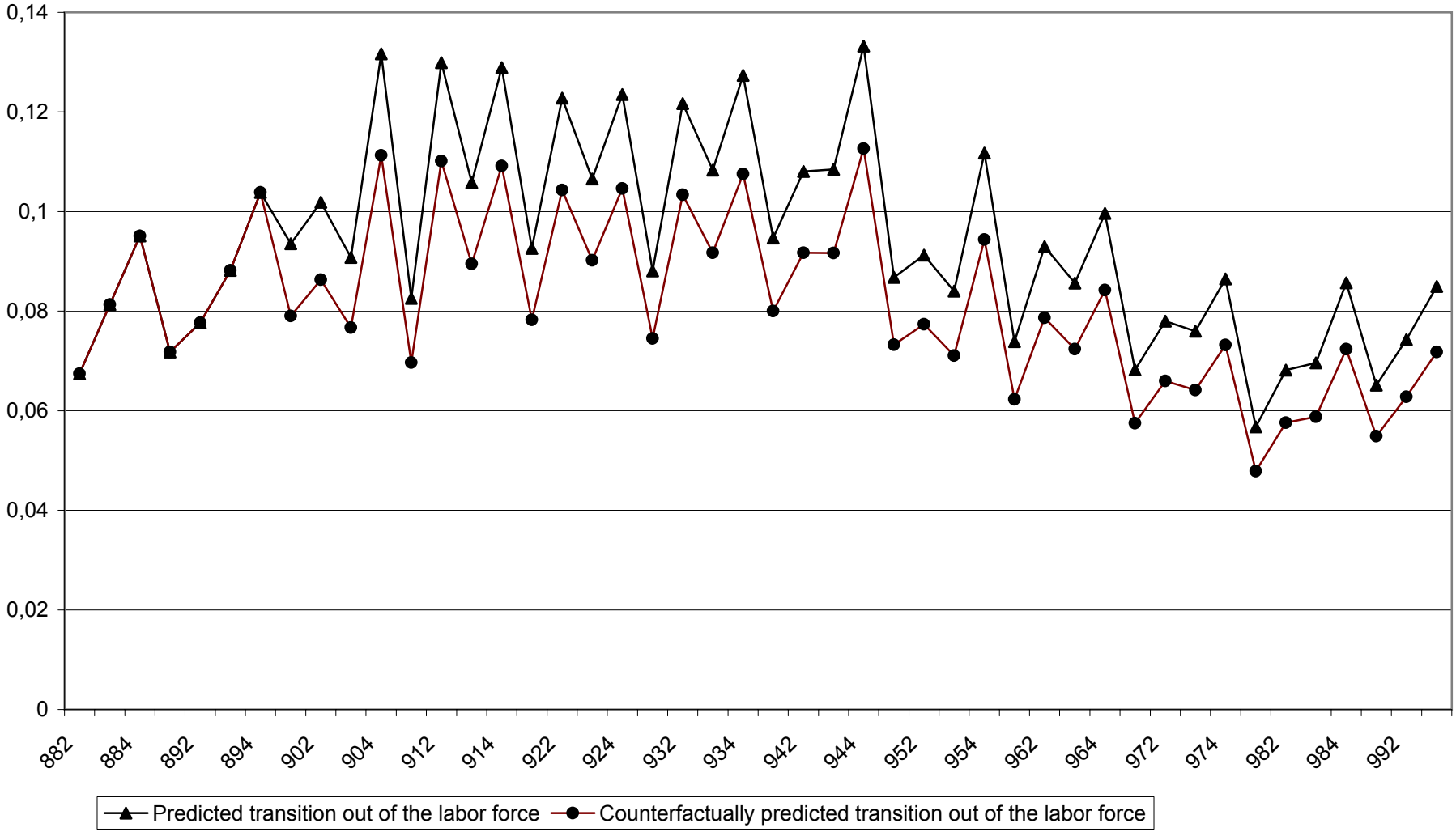


Figure 11 - Predicted and counterfactually predicted transition rates from employment out of the labor force, men, 66 years

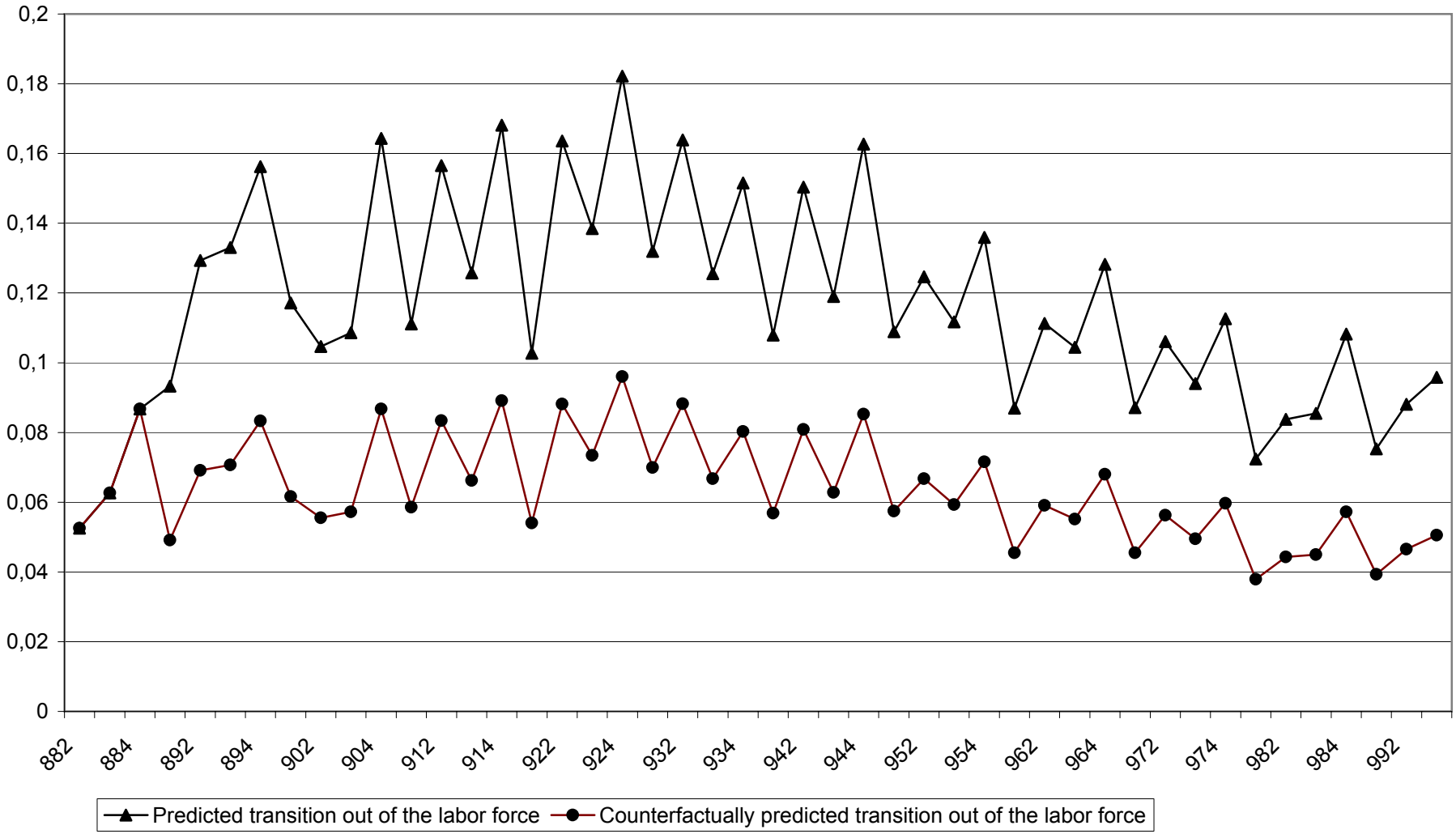


Figure 12 - Predicted and counterfactually predicted transition rates from employment out of the labor force, women, 62 years

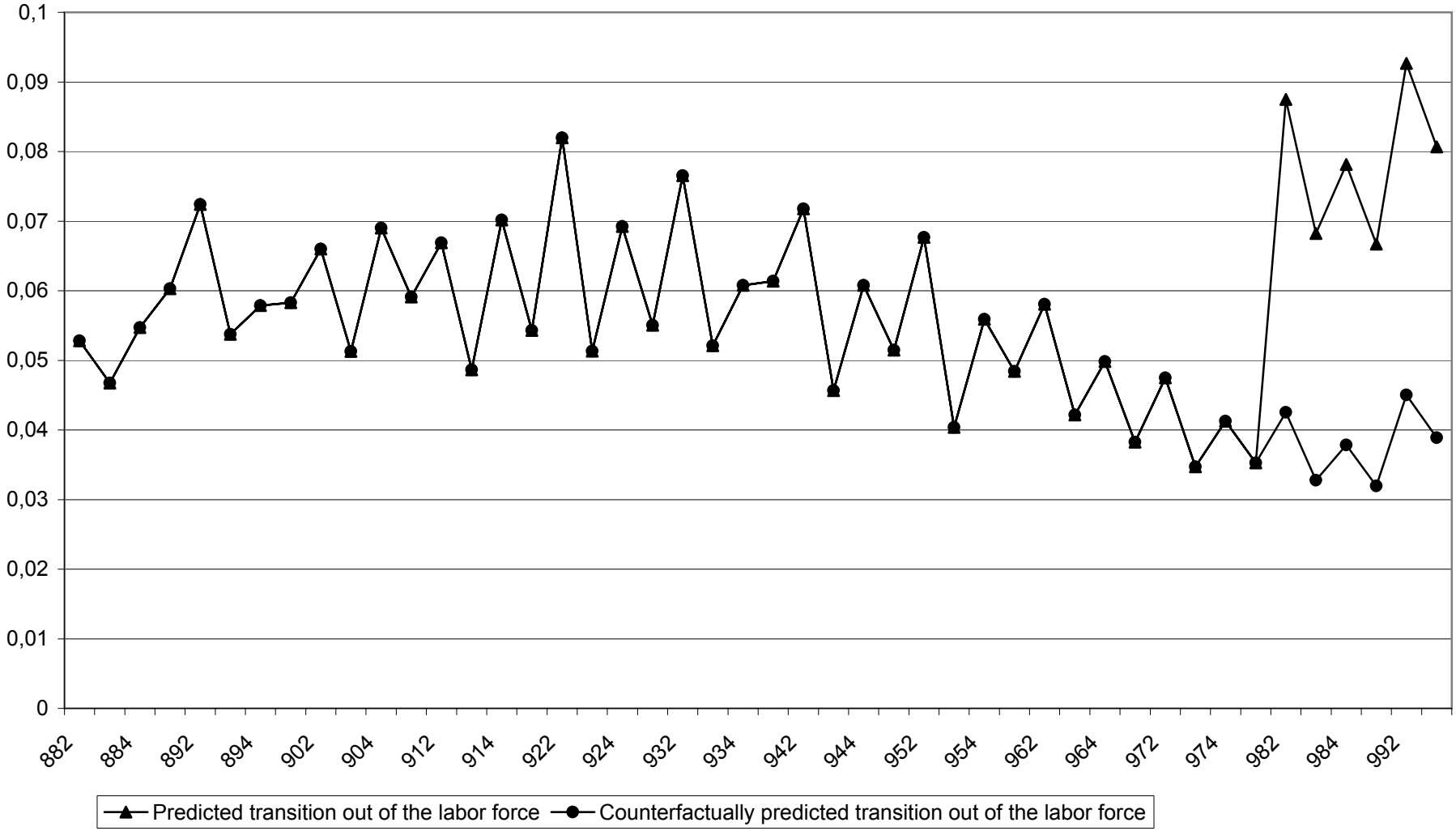


Figure 13 - Predicted and counterfactually predicted transition rates from employment out of the labor force, women, 63 years

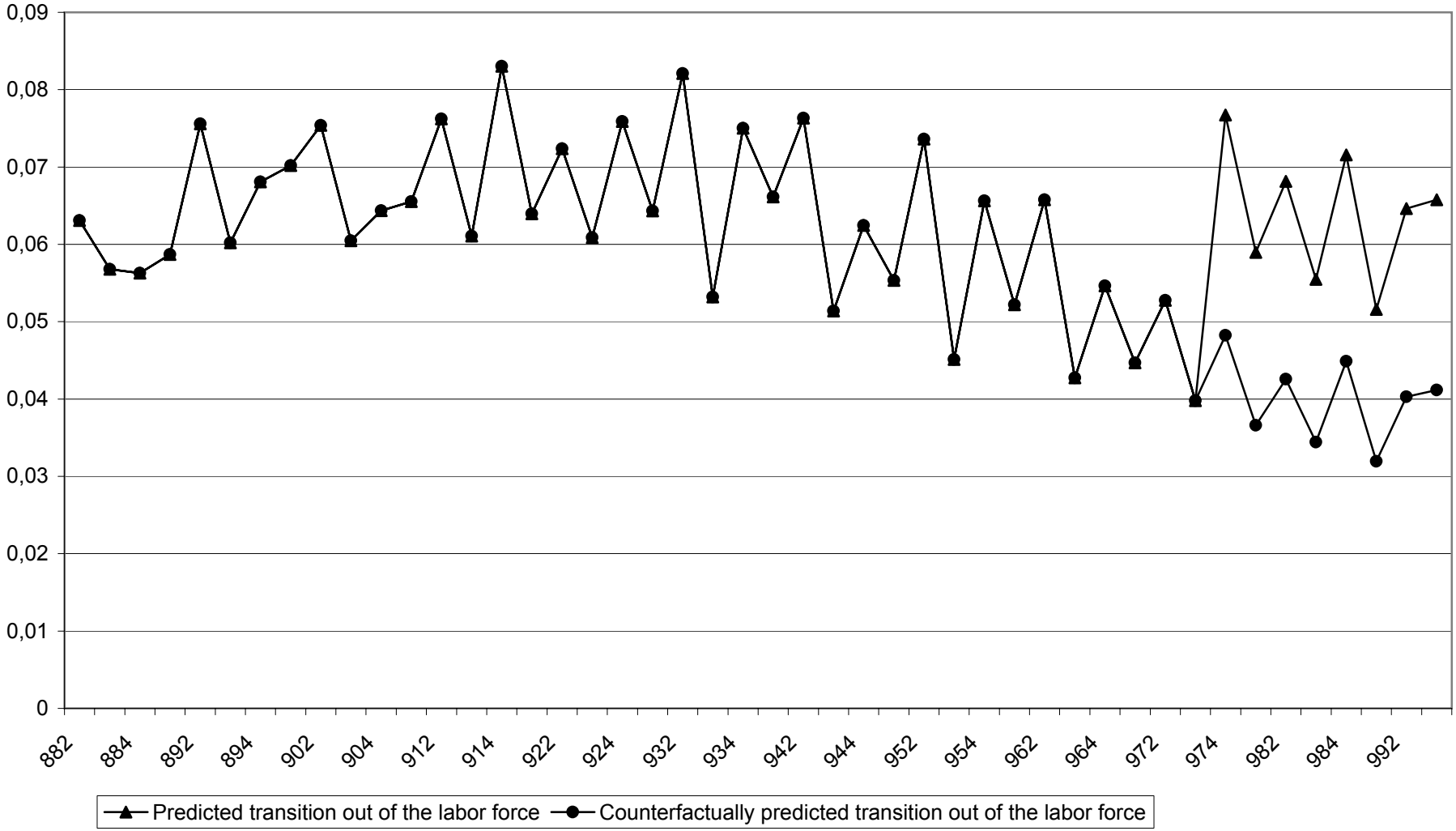


Figure 14 - Predicted and counterfactually predicted transition rates from employment out of the labor force, women, 64 years

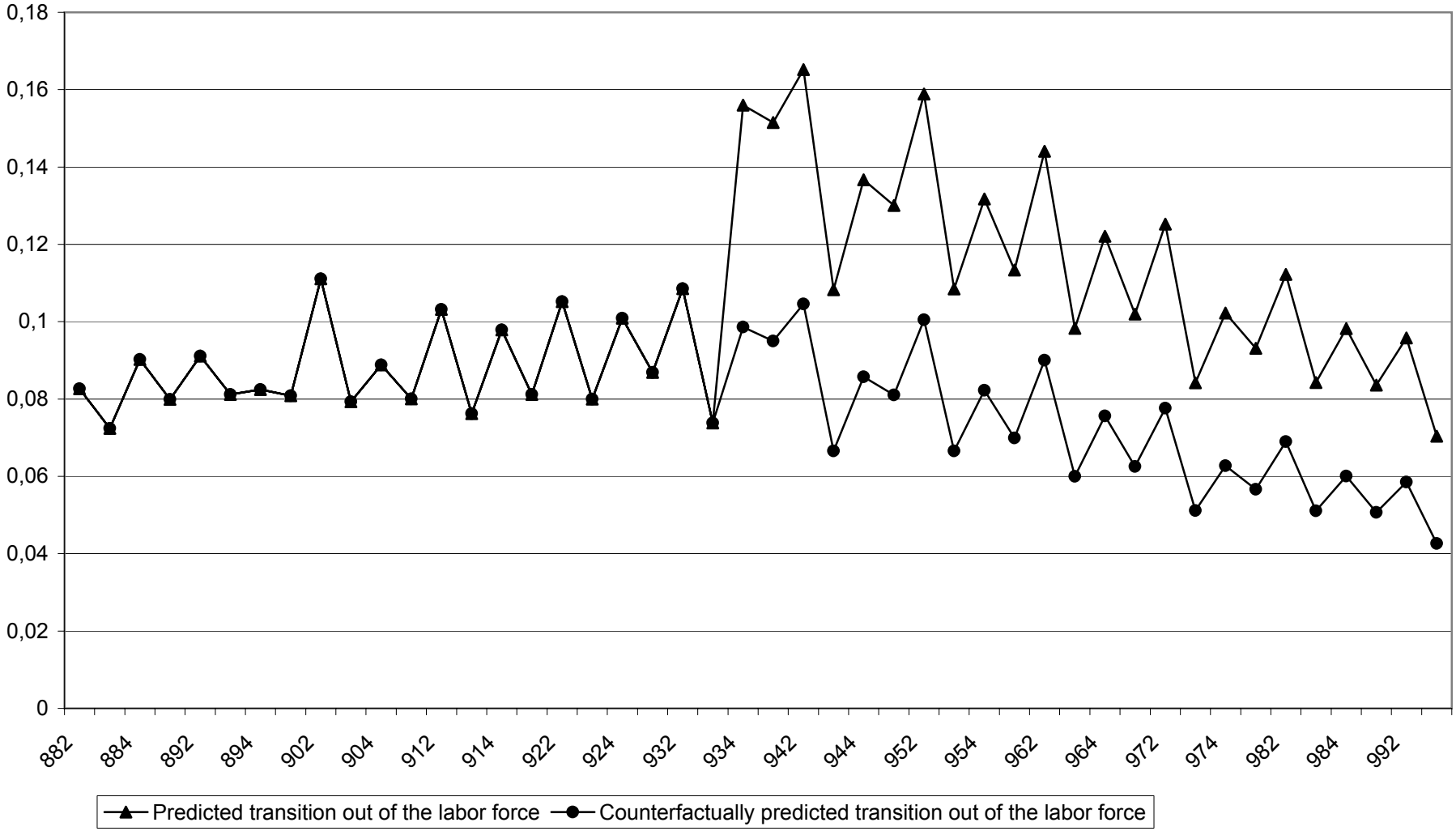
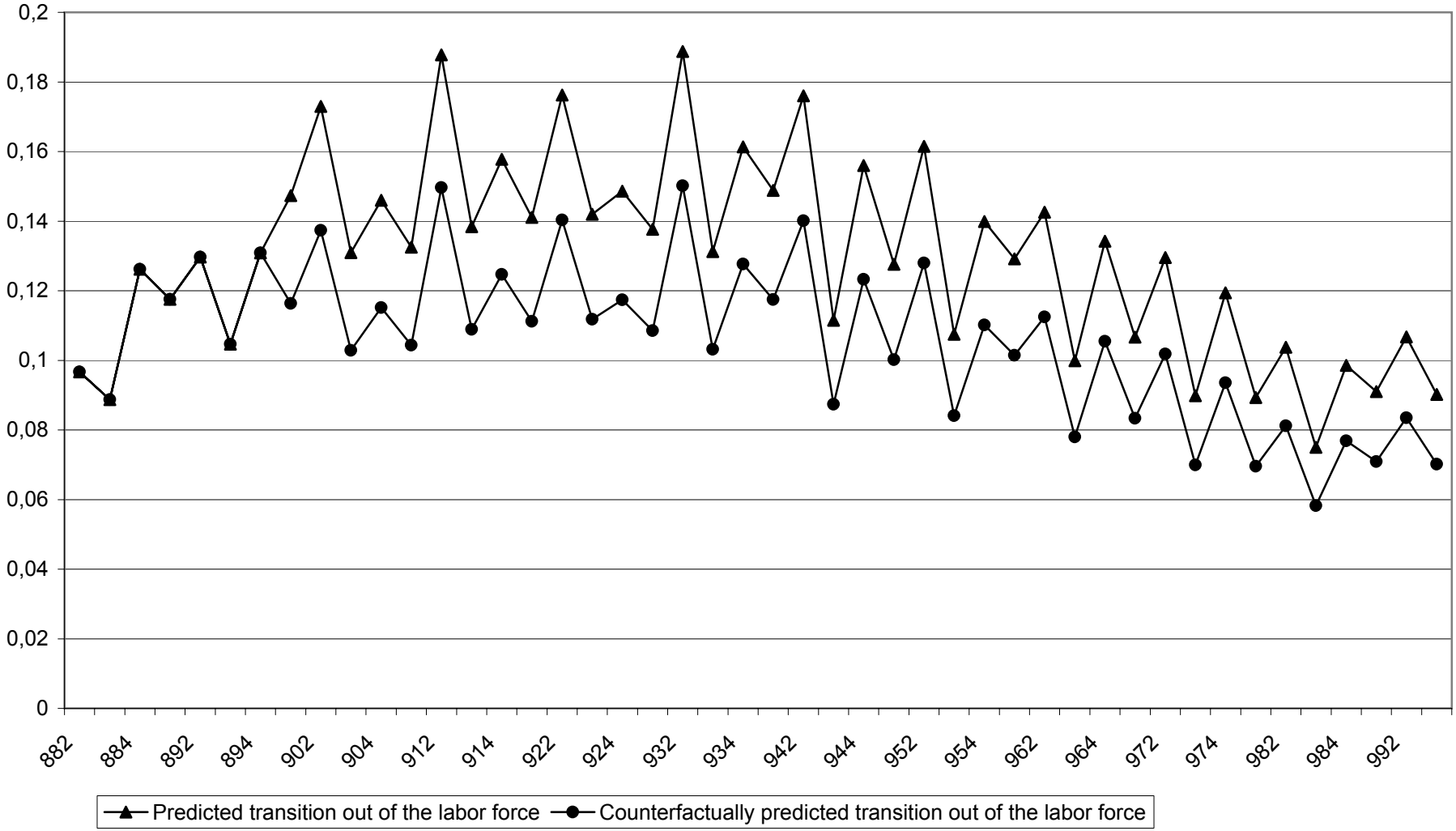


Figure 15 - Predicted and counterfactually predicted transition rates from employment out of the labor force, women, 65 years



5.2 Baseline simulation of the labour force 1999-2005

The starting point for assessing what would happen to the labour force if the AFP were abolished, is a baseline projection made with the estimated flow coefficients. This projection starts with the last observed sample, and predicts changes from quarter to quarter with the predicted transition probabilities. The projection is made in terms of expected states, so that we sum over the individual state probabilities each quarter.

The labour market state variables Tightness and Quit used in the projections are based on the two last observed values of 1999. These values appear to reflect an extremely tight labour market and are therefore somewhat moderated in the projections. The aggregate transition rate from unemployment to employment (Tightness) is kept constant at a level 20 per cent below the average of the two last observed values of 1999, and the aggregate transition rate from employment to unemployment (Quit) is similarly kept constant at a level 20 per cent above the average of the two last observed values of 1999. These assumptions imply that the total unemployment rate stabilises at about 4 per cent. In the retirement assessment setting, this mainly serves as controlling for other factors than the AFP.

We also take account of mortality. Mortality rates by age and gender are given in Brinch (2000). We add a new cohort at the lower age bracket (16) with the same characteristics as the last observed 16 years old cohort. Further, we increase EDU (highest completed education in number of years) each year, based on the expected increase in EDU, conditional on age, gender and the present level of EDU, from a regression in the sample, see Brinch (2000) for further details. The labour force projections start with the last quarter of 1999 and are conducted quarter by quarter throughout 2005.

The baseline projection gives an increase in labour force participation from 73.2 per cent of the total population aged 16-74 in the last quarter of 1999 to 76.6 per cent in the last quarter of 2005. This increase in labour force participation can be attributed to three important factors. First, there are changes in the demographic structure, and the cohorts that are most prone to leave the labour market are relatively small during this period. Second, there are long-term effects of the historical increase in the labour force participation of women, as the oldest cohorts of women still have lower participation rates than what is implied by the transition rates. Third, the outflow from employment is low because the labour market is relatively tight.

5.3 Abolishing the AFP and the effects on the future (post-sample) labour force

The effect of abolishing the AFP is assessed by setting all the AFP eligibility dummy variables equal to zero. All other coefficients are held constant, and we investigate deviation from the baseline projection described above. The starting point is the last quarter of 1999.

In the following, we will study the labour force participation probabilities of the population aged 62-74, which is the group directly affected by AFP eligibility. It is seen from Table 4 that the proportion of persons in the age group 62-74 is only slightly increasing during this period. The increases in the labour force participation rates in this group are higher both in absolute and relative terms than in the labour force participation rate for the population aged 16-74 in the baseline projection. This can to some extent be explained by changing age structure within this age group, but is also due to the tight labour market that induces older persons to postpone their retirement and gives higher labour force participation rates for those who enter the group.

The simulation of the abolishment of AFP increases the labour force participation rate among males aged 62-74 by 15.9 percentage points over the baseline projection, and among females by 5.2 percentage points. The large differences between males and females can be explained by the gender differences in the effects of AFP as discussed above. The total impact on the population aged 62-74 is an increase in the labour force participation rate by 10.3 percentage points. This implies an increase in the labour force participation rate of the whole age group 16-74 of 1.4 percentage points (or 1,8 percent).

In this simulation we have not included some secondary effects on labour force participation in the age group 16-61 years, which in the model follows from AFP abolishment. These effects work through aggregate stocks, which enter the transition rates for all age groups. We are not confident that these estimates hold for the rather large changes in the older groups, which follow the abolishment of the AFP. In Table 4, the labour force age 16-61 years in the abolishment simulation is the same as in the baseline projection, and the only difference that is included is the direct effect on the age group 62-74. The estimate of the impact is therefore a conservative one.

Due to data limitations, we do not project cohort changes in labour market history and accrued pension rights. If included, it would probably have increased eligibility among females. In our projections, the AFP coefficient for females should then have been increased. Also potential earnings and potential pension for females are likely to increase, with uncertain net effect on labour force participation. It seems likely that the net result of not including cohort changes in labour market history and accrued pension rights is to underestimate the AFP coefficient for females and thereby to underestimates the effect of abolishing the AFP.

The labour force results do not fully translate into the sum of hours worked, since average hours worked is lower among older persons. Moreover, one should also remember the reservations we made above with regard to the estimated coefficients used in the simulations and the underestimation of the impact on female labour force participation.

Table 4. The impact on labour force participation of abolishing the AFP. Percentages

	Labour force participation rate age 16-74	Labour force participation rate age 62-74	Proportion age 62-74
		Total	
Observation 1999-IV	73.2	17.9	13.9
Base projection 2005.4	76.6	23.9	14.0
Simulation of abolishing the AFP, 2005.4	78.0 *	34.2	As above
		Males	
Observation 1999-IV	78.0	21.5	13.0
Base projection 2005.4	79.7	26.3	13.2
Simulation of abolishing the AFP, 2005.4	81.8 *	42.2	As above
		Females	
Observation 1999-IV	68.3	14.7	14.7
Base projection 2005.4	73.5	21.7	14.8
Simulation of abolishing the AFP, 2005.4	74.3 *	26.9	As above

* - as implied by the increase in the participation rate for the old and the proportion of the population that is old.

6. Conclusions

In this paper, we have investigated the impact on the labour force of an early retirement programme. We use a sample that covers the whole population and model flows between a set of labour market states, which is complete, although aggregate. Thus, we are able to study the net impact on the labour force, implicitly taking account of the interaction between early retirement and other exit routes from the labour market, most notably disability.

The impact of the AFP has been assessed by comparing a simulation of abolishment of the programme to a baseline projection, over the period 2000-2005. The results indicate a major macroeconomic impact of the early retirement programme, , as the total work force would have been 1.8 per cent higher by 2005 had the programme been abolished after the last quarter of 1999. However, changes in social norms, diffusion of information and individuals' planning for retirement, which may imply that the effects of introduction and abolishment may not be symmetric, are not taken into account. This tends to overestimate the impact the impact of an abolishment. On the other hand, trends in female labour force participation and pension rights tend to underestimate the impact of abolishing the AFP presented in the study.

References

Bratberg, E., Holmås, T. H. and Thøgersen, Ø. (2000): *"Assessing the effects of early retirement programs"*, Discussion Paper 4/2000, Norwegian School of Economics and Business Administration, Bergen, Norway

Brinch, C. (2000): *"Arbeidstilbud i vedvarende gode tider"*, Report 7/2000 from the Ragnar Frisch Centre for Economic Research, Oslo (in Norwegian only), Norway

Brinch, C., Hernæs, E. and Strøm, S. (2001): "Labour supply effects of an early retirement programme", *CESifo Working paper series,* no 463, also available at www.SSRN.com, Munich, Germany

Haugen, F. and Røed, K. (2001): *"Early retirement and economic incentives: Evidence from a quasi-natural experiment in Norway"*, Interim Report for the Collaboration Projects in Spring 2001, Economic and Social Research Institute, Cabinet Office, Government of Japan

Hernæs, E. and Strøm, S. (2000): *"Family Labour Supply When the Husband is Eligible for Early Retirement"*, Memorandum 13/2000 from the Department of Economics, University of Oslo, Norway

Hernæs, E., Sollie, M. and Strøm, S. (2000): " Early Retirement and Economic Incentives", *Scandinavian Journal of Economics*, 102(3): 481-502

Lazear, E. (1986): " Retirement from the Labor Force", in O. Ashenfelter and R. Layard, Eds, *"Handbook of Labor Economics"*, North-Holland, Amsterdam: 305-355

Lumsdaine, R. L. and Mitchell, O. S. (1999): "New Developments in the Economic Analysis of Retirement" in Ashenfelter, Orley and Card, David (eds) *"Handbook of Labor Economics"*, volume 3, Elsevier Science B. V. 1999

NOU: " Fleksibel pensjonering" Norges offentlige utredninger 1998:19 (in Norwegian only), Oslo, Norway

Statistics Norway (1998) "Labour Market Statistics 1996-97": Official Statistics of Norway, C467, Oslo-Kongsvinger: 1998 (Dual Norwegian and English text), Norway

Appendix 1

Tables A1-A6 below give the estimates of the transition probabilities:

Tables A1 and A2 give the estimates of the probabilities of transiting from employment (state 1) in period t, to employment (state 1), unemployment (state 2) and out of labour force (state 3) in period t+1, for men and women, respectively. For each variable there are two estimates. The first line attached to each variable gives the estimate of β_{11} and the second line gives the estimate of β_{12}.

Tables A3 and A4 give the estimates of the probabilities of transiting from unemployment (state 2) in period t to employment (state 1), unemployment (state 2) and out of labour force (state 3) in period t+1, for men and women, respectively. For each variable there are two estimates. The first line attached to each variable gives the estimate of β_{21} and the second line gives the estimate of β_{22}.

Tables A5 and A6 give the estimates of the probabilities of transiting from out of labour force (state 3) in period t to employment (state 1), unemployment (state 2) and out of labour force (state 3) in period t+1, for men and women, respectively. For each variable there are two estimates. The first line attached to each variable gives the estimate of β_{31} and the second line gives the estimate of β_{32}.

Table A1. Transition from employment, men, N= 176 803

Variable	Estimate		t-value	
	Unemployment	OLF	Unemployment	OLF
Intercept	**-44.87**	**-92.60**	**-8.2**	**-4.5**
Age	**0.81**	**0.73**	**13.5**	**5.6**
Age2	**-1.61**	**-1.64**	**-9.8**	**-4.9**
Age3	**0.95**	**1.11**	**7.0**	**3.8**
N-Edu	**32.66**	**43.77**	**7.5**	**4.4**
Edu	**8.33**	**11.78**	**7.2**	**4.5**
Edu2	**-6.87**	**-10.02**	**-6.9**	**-4.4**
Edu3	**1.80**	**2.73**	**6.4**	**4.3**
A-Edu	**-0.33**	**-0.07**	**-2.0**	**-0.1**
A-Edu2	**3.69**	**0.96**	**5.0**	**0.4**
OLF-Agg	**-11.04**	**-2.33**	**-3.8**	**-0.5**
Unem-Agg	**-12.44**	**-14.08**	**-2.1**	**-1.3**
Dem1	**10.07**	**42.05**	**3.5**	**2.4**
Dem2	**9.16**	**43.02**	**3.2**	**2.5**
Dem3	**10.14**	**43.24**	**3.5**	**2.5**
Dem4	**8.60**	**41.84**	**3.0**	**2.4**
Dem5	**8.65**	**40.91**	**3.0**	**2.4**
OLF-Agg-Dem1	**0.55**	**0.75**	**0.8**	**0.5**
OLF-Agg-Dem2	**2.28**	**0.19**	**2.0**	**0.1**
OLF-Agg-Dem3	**-3.42**	**-5.25**	**-0.8**	**-0.8**
OLF-Agg-Dem4	**21.73**	**12.54**	**3.1**	**1.3**
OLF-Agg-Dem5	**4.30**	**6.41**	**1.8**	**1.3**
OLF-Agg-Dem6	**9.10**	**43.6**	**3.0**	**2.3**
Unem-Agg-Dem1	**-2.71**	**7.95**	**1.2**	**1.7**
Unem-Agg-Dem2	**4.77**	**3.69**	**1.9**	**0.8**
Unem-Agg-Dem3	**12.74**	**10.05**	**2.9**	**1.5**
Unem-Agg-Dem4	**3.98**	**15.03**	**0.6**	**1.4**
Unem-Agg-Dem5	**8.23**	**-15.25**	**1.0**	**-0.7**
Unem-Agg-Dem6	**-3.34**	**266.30**	**0.1**	**2.0**
Q-12	**-0.28**	**-0.37**	**-2.2**	**-1.6**
Q-23	**-0.99**	**-0.83**	**-8.8**	**-4.1**
Q-34	**-1.57**	**-1.47**	**-13.6**	**-6.8**
AQ-12	**0.01**	**0.01**	**4.5**	**2.0**
AQ-23	**0.02**	**0.01**	**7.8**	**1.8**
AQ-34	**0.03**	**0.02**	**11.1**	**4.1**
A-62	**-0.56**	**-0.57**	**-3.8**	**-1.7**
A-63	**-0.72**	**-1.17**	**-4.6**	**-2.8**
A-64	**-0.60**	**-0.89**	**-2.9**	**-1.7**
A-65	**-0.96**	**-0.74**	**-2.9**	**-0.8**
A-66	**-0.65**	**0.28**	**-0.9**	**0.2**
A-67	**-2.01**	**-3.90**	**-9.0**	**-3.6**
A-68	**0.20**	**1.63**	**1.1**	**2.2**
A-69	**-0.04**	**-0.04**	**-0.2**	**0.0**
AFP-62	**-1.44**	**0.00**	**-5.7**	**0.0**
AFP-63	**-0.91**	**..**	**-3.6**	
AFP-64	**-0.72**	**-1.21**	**-3.5**	**-1.6**
AFP-65	**-0.18**	**-0.88**	**-0.6**	**-1.0**
AFP-66	**-0.67**	**-3.26**	**-0.9**	**-2.3**
Tightness	**0.02**	**-0.01**	**0.2**	**0.0**

Quit	**-0.19**	**0.77**	**-4.5**	**10.2**
Time	**-0.03**	**0.01**	**-2.7**	**0.1**

Table 2. Transition from employment, women, N= 152 237

Variable	Estimate		t-value	
	Unemployment	OLF	Unemployment	OLF
Intercept	-41.47	-15.27	-5.3	-1.7
Age	0.60	0.43	9.5	2.9
Age2	-1.24	-1.01	-7.4	-2.5
Age3	0.82	0.75	5.7	2.1
N-Edu	24.96	6.93	5.7	0.8
Edu	6.65	2.08	5.8	0.9
Edu2	-5.59	-1.85	-5.6	-0.9
Edu3	1.50	0.50	5.4	0.9
A-Edu	-0.52	-0.31	-3.1	-0.7
A-Edu2	4.31	1.37	5.5	0.7
OLF-Agg	-6.69	-7.14	-3.3	-1.7
Unem-Agg	-5.05	-6.54	-0.9	-0.5
Dem1	11.55	0.00	2.5	0.0
Dem2	10.57	4.80	1.6	6.5
Dem3	11.19	0.00	1.7	0.0
Dem4	12.82	0.00	2.0	0.0
Dem5	11.74	3.30	1.8	1.4
OLF-Agg-Dem1	0.03	-0.20	0.0	-0.2
OLF-Agg-Dem2	2.91	1.71	3.3	1.0
OLF-Agg-Dem3	0.18	-5.34	0.1	-1.8
OLF-Agg-Dem4	-7.83	-8.98	-3.1	-2.3
OLF-Agg-Dem5	0.08	2.48	0.0	0.5
OLF-Agg-Dem6	8.93	2.11	1.3	1.2
Unem-Agg-Dem1	-1.22	-4.83	0.6	1.2
Unem-Agg-Dem2	-1.02	-1.40	-0.3	-0.2
Unem-Agg-Dem3	12.14	10.41	2.6	1.1
Unem-Agg-Dem4	28.11	41.10	2.8	2.2
Unem-Agg-Dem5	-10.49	19.47	-0.6	0.4
Unem-Agg-Dem6	53.9	0.00	0.6	0.0
Q-12	-0.04	0.65	-1.1	2.5
Q-23	-0.71	0.31	-7.0	1.4
Q-34	-1.18	-0.37	-10.9	-1.4
AQ-12	0.01	-0.01	1.4	-1.2
AQ-23	0.01	-0.01	4.1	-1.5
AQ-34	0.02	0.01	8.6	0.6
A-62	-0.51	-1.09	-3.3	-1.9
A-63	-0.59	-1.07	-3.5	-1.8
A-64	-0.92	-1.41	-4.5	-1.7
A-65	-1.25	-0.93	-3.7	-0.8
A-66	0.00	-2.51	0.0	0.0
A-67	-2.29	-2.51	-9.6	-2.8
A-68	0.85	0.00	3.7	0.0
A-69	0.62	1.22	2.8	0.8
AFP-62	-0.78	0.58	-2.5	0.5
AFP-63	-0.52	1.50	-1.7	1.8
AFP-64	-0.54	0.35	-2.7	0.4

AFP-65	-0.27	-0.70	-0.8	-0.6
AFP-66	-8.27	1.15	-38.6	0.0
Tightness	-0.05	-0.09	-0.8	-0.6
Quit	-0.09	0.90	-2,4	10.8
Time	0.01	0.03	1.3	2.2

Table 3. Transition from unemployment, men, N= 8 130

Variable	Estimate		t-value	
Intercept	-47.49	-57.00	-2.1	-2.5
Age	0.88	0.76	5.4	4.6
Age2	-2.11	-1.89	-4.7	-4.2
Age3	1.74	1.51	4.5	3.9
N-Edu	30.63	33.15	2.3	2.5
Edu	8.08	8.90	2.3	2.5
Edu2	-6.26	-7.58	-2.1	-2.5
Edu3	1.57	2.03	1.8	2.4
A-Edu	-1.65	-0.84	-3.0	-1.7
A-Edu2	7.31	6.69	3.0	3.0
OLF-Agg	-14.52	1.70	-2.2	0.3
Unem-Agg	1.95	-2.12	0.1	-0.1
Dem1	17.49	16.40	1.0	0.9
Dem2	18.01	16.30	1.0	0.9
Dem3	18.02	16.63	1.0	0.9
Dem4	17.11	14.87	1.0	0.8
Dem5	15.57	13.84	0.9	0.7
OLF-Agg-Dem1	2.79	-0.59	1.7	-0.4
OLF-Agg-Dem2	5.63	-0.29	2.2	-0.1
OLF-Agg-Dem3	14.64	-2.32	1.8	-0.3
OLF-Agg-Dem4	20.90	18.80	1.7	1.6
OLF-Agg-Dem5	6.09	6.02	0.8	0.9
OLF-Agg-Dem6	16.15	13.50	0.9	0.7
Unem-Agg-Dem1	-1.68	-2.61	-0.4	-0.5
Unem-Agg-Dem2	-1.04	2.87	-0.2	0.5
Unem-Agg-Dem3	0.30	1.63	0.0	0.2
Unem-Agg-Dem4	23.21	3.22	1.7	0.2
Unem-Agg-Dem5	68.96	16.78	2.4	0.6
Unem-Agg-Dem6	-201.10	-110.20	-0.8	-0.5
Q-12	-0.94	-0.69	-3.2	-2.4
Q-23	-0.85	-0.97	-3.2	-3.7
Q-34	-0.51	-0.56	-1.8	-2.0
AQ-12	0.02	0.02	2.8	2.0
AQ-23	0-02	0.02	2.2	2.7
AQ-34	0.00	0.01	0.1	1.4
A-62	-0.64	-0.95	-1.3	-2.0
A-63	-1.93	-0.77	-3.1	-1.6
A-64	-2.30	-1.58	-2.6	-2.2
A-65	-9.32	-1.62	-14.2	-1.0
A-66	-3.48	-1.92	-4.3	-2.9
A-67	-5.23	-4.16	-4.2	-4.2
A-68	3.29	2.48	2.4	1.8
A-69	1.98	-0.05	1.9	0.0
AFP-62	0.54	-7.52	0.4	0.0

AFP-63	-7.00	-1.14	-0.0	-0.9
AFP-64	-0.21	-0.24	-0.2	-0.3
AFP-65	6.73	-0.31	0.0	-0.2
AFP-66	0.00	0.00	0.0	0.0
Tightness	1.66	-0.23	9.9	-1.5
Quit	0.03	-0.05	0.4	-0.6
Time	-0.08	-0.01	-3.1	-0.6

Table 4. Transition from unemployment, women, N= 6 706

Variable	Estimate		t-value	
Intercept	-5.50	-43.04	-0.4	-3.4
Age	0.14	0.50	1.0	3.7
Age2	-0.22	-1.22	-0.6	-3.5
Age3	0.06	0.86	0.2	3.0
N-Edu	16.43	23.07	1.3	1.9
Edu	4.00	6.05	1.2	1.9
Edu2	-2.97	-5.07	-1.1	-1.8
Edu3	0.77	1.38	1.0	1.8
A-Edu	0.12	0.14	0.2	0.3
A-Edu2	-2.28	-0.02	-0.9	-0.0
OLF-Agg	3.44	3.11	0.7	0.6
Unem-Agg	-22.33	6.29	-1.6	0.4
Dem1	-13.11	-14.24	-0.0	-0.0
Dem2	13.06	14.11	0.0	0.0
Dem3	-10.93	12.64	-0.0	0.0
Dem4	-12.75	12.90	-0.0	0.0
Dem5	-16.09	13.20	-0.0	0.0
OLF-Agg-Dem1	2.09	-1.72	1.9	-1.5
OLF-Agg-Dem2	1.23	-2.38	0.7	-1.4
OLF-Agg-Dem3	-8.21	-0.30	-2.7	-0.1
OLF-Agg-Dem4	6.59	7.82	1.6	1.8
OLF-Agg-Dem5	7.34	0.31	4.3	0.2
OLF-Agg-Dem6	-9.38	14.32	-0.0	0.0
Unem-Agg-Dem1	5.03	-2.49	1.3	-0.6
Unem-Agg-Dem2	14.34	-3.99	2.1	-0.6
Unem-Agg-Dem3	19.95	9.94	1.9	0.9
Unem-Agg-Dem4	-5.79	-41.66	-0.3	-1.9
Unem-Agg-Dem5	44.18	22.36	0.7	0.4
Unem-Agg-Dem6	-1728.40	-1932.90	-2.0	1.6
Q-12	-0.24	0.25	-0.8	0.8
Q-23	-0.36	-0.75	-1.2	-2.6
Q-34	-0.14	-0.61	-0.5	-2.1
AQ-12	0.01	-0.01	1.0	-0.9
AQ-23	0.01	0.01	1.0	1.7
AQ-34	0.01	0.01	1.3	1.3
A-62	-0.63	0.32	-0.9	0.7
A-63	-0.43	-0.43	-0.7	-0.9
A-64	0.55	0.87	0.8	1.0
A-65	-6.75	-7.10	-0.0	-0.0
A-66	-6.84	-6.98	-0.0	-0.0

A-67	1.39	-8.23	1.4	-0.0
A-68	-6.24	-5.63	-0.0	-0.0
A-69	-0.61	-6.81	-0.5	-0.0
AFP-62	1.30	-7.46	0.8	-0.0
AFP-63	1.04	1.51	0.7	1.2
AFP-64	1.38	1.54	1.3	1.2
AFP-65	4.84	6.13	4.3	0.0
AFP-66	-5.06	6.71	-0.0	0.0
Tightness	1.29	-0.05	7.6	-0.3
Quit	-0.08	-0.02	-0.9	-0.2
Time	-0.02	-0.01	-1.2	-0.6

Table 5. Transition from out of labor force, men, N= 54 942

Variable	Estimate		t-value	
Intercept	-1.78	-42.13	-0.2	-2.7
Age	0.42	0.25	6.7	2.7
Age2	-1.14	-0.72	-7.0	-3.0
Age3	0.86	0.46	6.3	2.4
N-Edu	12.38	50.03	1.6	4.6
Edu	2.85	13.28	1.4	4.7
Edu2	-2.13	-11.49	-1.2	-4.7
Edu3	0.54	3.20	1.1	4.7
A-Edu	0.65	0.55	3.5	1.9
A-Edu2	-2.57	0.13	-3.1	0.1
OLF-Agg	13.47	7.67	4.3	1.6
Unem-Agg	-2.96	-19.22	-0.5	-2.0
Dem1	-21.97	-15.84	-6.7	-1.4
Dem2	-23.20	-16.25	-7.2	-1.4
Dem3	-24.13	-15.78	-7.5	-1.4
Dem4	-24.02	-16.02	-7.4	-1.4
Dem5	-21.30	-15.43	-6.5	-1.8
OLF-Agg-Dem1	-4.46	-0.42	-6.0	-0.4
OLF-Agg-Dem2	-4.35	0.78	-3.5	0.4
OLF-Agg-Dem3	-12.41	-6.33	-2.6	-1.0
OLF-Agg-Dem4	-14.13	-3.80	-1.8	-0.4
OLF-Agg-Dem5	-10.39	-2.46	-3.7	-0.5
OLF-Agg-Dem6	-29.88	-20.93	-8.6	-1.7
Unem-Agg-Dem1	-2.51	-1.03	-1.2	-0.3
Unem-Agg-Dem2	-8.59	-0.44	-3.2	-0.1
Unem-Agg-Dem3	-1.24	12.12	-0.3	2.1
Unem-Agg-Dem4	1.16	18.92	0.1	1.8
Unem-Agg-Dem5	-12.12	20.05	-1.1	1.0
Unem-Agg-Dem6	-147.50	90.93	-3.4	0.6
Q-12	0.71	0.98	5.8	4.7
Q-23	2.20	1.41	19.8	7.5
Q-34	0.18	0.19	1.4	1.0
AQ-12	-0.01	-0.02	-3.6	-3.5
AQ-23	-0.04	-0.03	-13.2	-5.3
AQ-34	-0.00	-0.00	-0.2	-0.6
A-62	-0.23	-0.28	-1.2	-0.9

A-63	-0.26	-0.61	-1.3	-1.7
A-64	-0.56	-0.82	-2.1	-1.6
A-65	-0.43	-8.87	-0.9	-0.0
A-66	-0.18	-6.77	-0.3	-0.0
A-67	-0.99	-2.48	-4.0	-4.0
A-68	0.66	0.14	3.1	0.2
A-69	0.37	-0.96	1.9	0.9
AFP-62	-1.04	-7.95	-1.4	-0.0
AFP-63	-0.16	-0.54	-0.4	-0.5
AFP-64	-0.30	-0.24	-0.9	-0.4
AFP-65	- 0.13	8.27	-0.3	0.0
AFP-66	-0.54	5.76	-0.7	0.0
Tightness	-0.01	-0.02	-0.0	-0.2
Quit	-0.02	-0.13	-0.4	-2.1
Time	0.03	0.01	2.6	0.1

Table 6. Transition from out of labor force, women, N= 82 553

Variable	Estimate		t-value	
Intercept	15.58	-10.96	1.8	-0.4
Age	0.05	-0.13	0.7	-0.1
Age2	-0.16	0.02	-1.0	0.1
Age3	0.06	-0.20	0.4	0.9
N-Edu	19.36	56.80	3.2	6.4
Edu	4.58	14.74	2.9	6.3
Edu2	-3.59	-12.47	-2.6	-6.2
Edu3	0.97	3.43	2.6	6.1
A-Edu	0.66	0.27	3.9	1.0
A-Edu2	-3.71	0.42	-4.6	0.3
OLF-Agg	-4.18	-5.83	-2.0	-1.8
Unem-Agg	3.20	11.96	0.5	1.2
Dem1	-33.48	-46.65	-5.3	-2.0
Dem2	-35.51	-49.13	-5.6	-2.1
Dem3	-36.04	-48.14	-5.7	-2.1
Dem4	-35.98	-48.34	-5.7	-2.1
Dem5	-38.38	-45.59	-6.0	-1.9
OLF-Agg-Dem1	-2.08	-1.29	-3.2	-1.3
OLF-Agg-Dem2	-0.05	4.20	-0.0	2.7
OLF-Agg-Dem3	1.33	-0.78	0.7	-0.3
OLF-Agg-Dem4	3.77	3.40	1.3	0.8
OLF-Agg-Dem5	5.21	-4.41	2.8	-1.3
OLF-Agg-Dem6	-38.27	-50.44	-5.8	-2.1
Unem-Agg-Dem1	-4.60	-7.56	-2.3	-2.5
Unem-Agg-Dem2	4.73	-1.02	1.4	-0.2
Unem-Agg-Dem3	8.54	9.65	1.7	1.3
Unem-Agg-Dem4	-2.65	-8.73	-0.3	-0.5
Unem-Agg-Dem5	30.00	28.33	1.5	0.7
Unem-Agg-Dem6	196.20	134.90	2.1	0.4
Q-12	0.43	0.57	3.8	3.1
Q-23	1.49	0.78	13.8	4.4
Q-34	0.28	-0.35	2.4	-1.9
AQ-12	-0.01	-0.02	-1.7	-2.7

AQ-23	-0.03 -0.02	-9.4 -3.5
Q-34	-0.00 0.01	-0.4 1.1
A-62	-0.31 0.07	-1.5 0.2
A-63	-0.22 0.02	-1.0 0.0
A-64	-0.24 0.57	-0.9 1.1
A-65	-0.05 0.39	-0.1 0.4
A-66	0.20 -5.91	0.3 -0.0
A-67	-0.31 -1.84	-1.1 -1.7
A-68	0.34 -1.30	1.3 -1.2
A-69	0.35 -0.41	1.5 -0.5
AFP-62	0.02 0.40	0.0 0.5
AFP-63	-0.11 -0.69	-0.2 -0.6
AFP-64	0.36 -0.70	1.2 -1.1
AFP-65	-0.08 -0.63	-0.2 -0.6
AFP-66	-0.23 5.04	-0.3 0.0
Tightness	0.06 0.04	0.8 0.4
Quit	-0.01 -0.01	-0.4 -0.0
Time	-0.02 0.01	-2.5 0.7