

Transition to insecurity

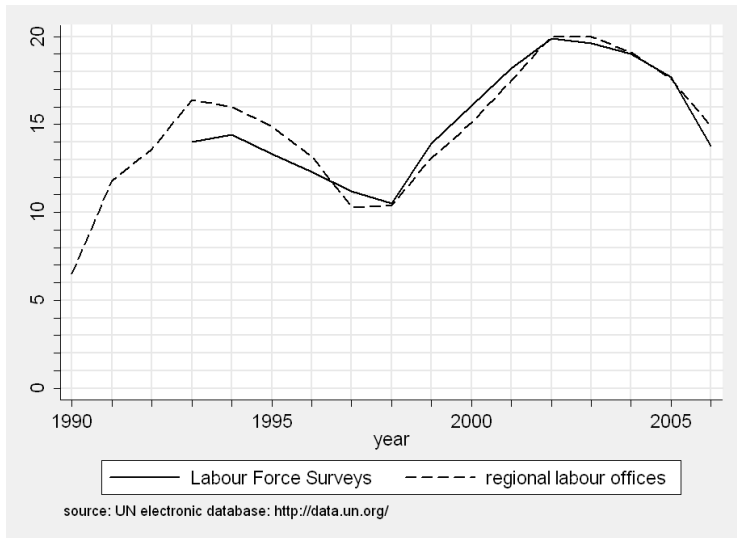
Employment Dynamics in Poland (1988-2008) and Its
Sociodemographic Differentiation

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Unemployment rate in Poland



How did the Polish labor market look like and how did it change over the period 1988-2008?

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- ▶ Previous analyses: mainly cross-sectional data and official statistics

Domański 2002, Frątczak et al. 2007, Grajek 2001, Kotowska and Sztanderska 2007, Łobodzińska 1977, Matysiak and Steinmetz 2008, Orazem and Vodopivec 2000, Pollert 2003,

- ▶ POLPAN: unique, 20-years work histories
- ▶ transitions between employment and non-employment

How did the Polish labor market look like and how did it change over the period 1988-2008?

Gender

Increase of meritocracy

Dynamics of changes

How did the Polish labor market look like and how did it change over the period 1988-2008?

Gender

- ▶ women are less attached to the labor market than men
- ▶ gender differences are larger at low educational levels

Increase of meritocracy

Dynamics of changes

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Increase of meritocracy

importance of educational level grew over time

Dynamics of changes

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Increase of meritocracy

importance of educational level grew over time

Dynamics of changes

- ▶ unprecedented decrease of employment stability (unemployment + transitions to inactivity, pensions and disability)
- ▶ especially difficult period: 1998-2002 (growing unemployment)
- ▶ initially affected: men (collapse of the heavy industry) , women were disproportionately more often leaving employment after 1992 (crisis in the public sector)

Data

POLPAN survey: 1993–1998–2003–2008
work histories in the period 1988–2008

- ▶ beginning month
- ▶ ending month
- ▶ short description



episodes of continuous employment min 15 h/week (even if jobs, hours of work etc. changed)

vs.

episodes of continuous non-employment (including both unemployment and inactivity, such as retirement, disability, home making; DO NOT include the period between finishing school and the 1st job)

Analytical schema

Survival analysis

Probability of interrupting employment

Sample: the employed

3,903 episodes

(1,681 right-censored)

2,482 respondents

longest: 27 yrs, median 5.5 yrs

Probability of undertaking employment

Sample: the non-employed

1,777 episodes

(543 right-censored)

996 respondents

longest: 20 yrs, median: 11 months

correction of standard errors of estimation by using the clustering option

Exponential transition rate model

$$\begin{aligned} r(t) &= r = \exp(\alpha + \beta_1 \cdot X_1 + \beta_2 \cdot X_2 + \beta_3 \cdot X_3 + \dots + \beta_n \cdot X_n) \\ &= \exp(\alpha) \cdot \exp(\beta_1)^{X_1} \cdot \exp(\beta_2)^{X_2} \cdot \exp(\beta_3)^{X_3} \cdot \dots \cdot \exp(\beta_n)^{X_n} \end{aligned} \quad (1)$$

$$r(t) = \lim_{t' \rightarrow t} \frac{P(t \leq T < t') | T \geq t}{t' - t} \quad (2)$$

- ▶ assumes that the hazard rate is constant (e.g. probability of interruption employment is not related to the duration of employment)
- ▶ assumes that values of independent variables are measured at the beginning of each episode and that during the episode they do not change
- ▶ → exponential transition rate model with episodes splitting

Stages of analysis:

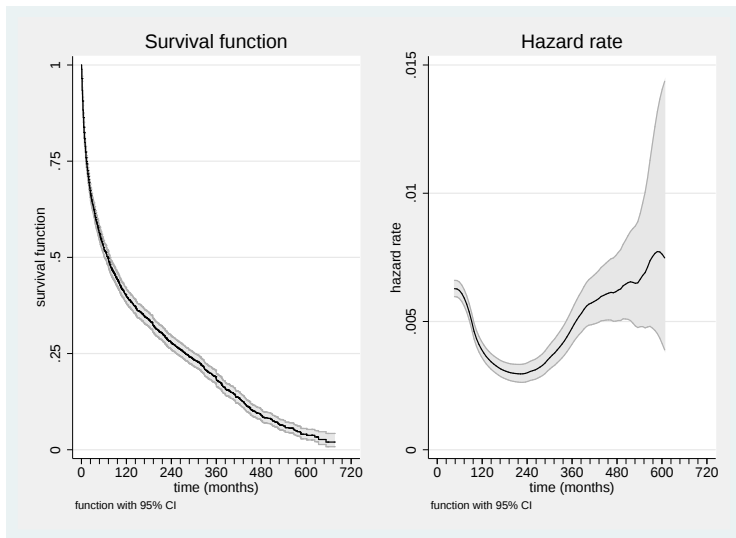
Stage 1 Nonparametric Kaplan–Meier method

- ▶ no assumptions concerning the dynamics of the process

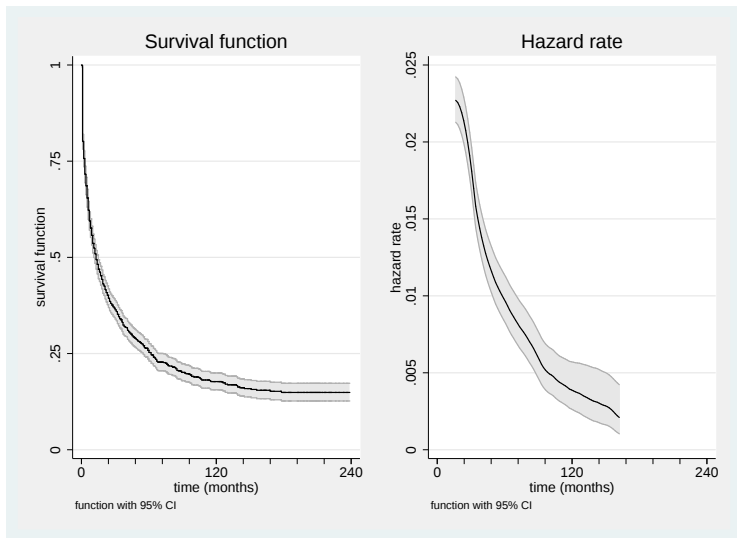
Stage 2

Stage 3

Interrupting employment (Kaplan-Meier method)



Undertaking employment (Kaplan-Meier method)



Stages of analysis:

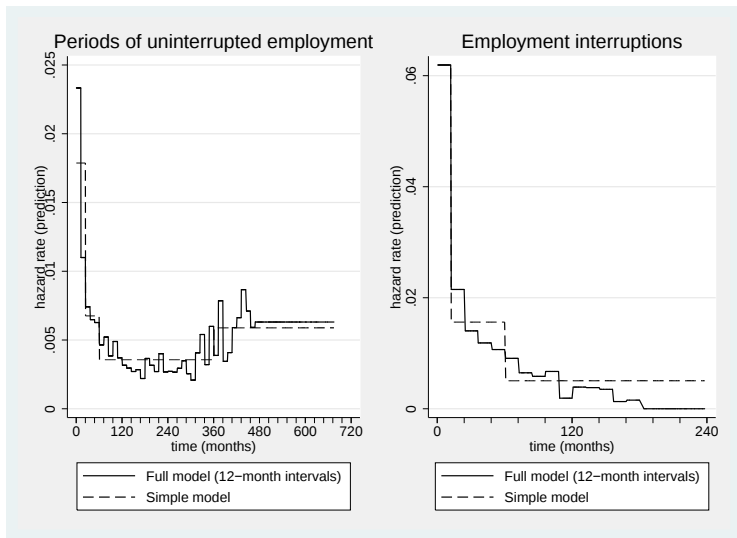
Stage 1 Nonparametric Kaplan–Meier method

- ▶ no assumptions concerning the dynamics of the process

Stage 2 Dynamics of undertaking and interrupting employment

Stage 3

Dynamics of the process



Stages of analysis:

Stage 1 Nonparametric Kaplan–Meier method

- ▶ no assumptions concerning the dynamics of the process

Stage 2 Dynamics of undertaking and interrupting employment

Stage 3 Exponential transition rate model with episode splitting

- ▶ time-invariant variables
- ▶ variables changing in time

Multivariate analysis - 4 models

	Risk of interrupting employment		Chances of undertaking employment	
	Model 1a	Model 1b	Model 2a	Model 2b
	no interactions	with interactions	no interactions	with interactions
Number of episodes	23,796 episodes of employment	23,796	5,419 episodes of non employment	5,419
AIC	8,347.7	8,361.1	5,479.1	5,478.9
BIC	8,557.8	8,660.0	5,637.4	5,709.8

Hypotheses

Gender

Women's risk of interrupting employment was higher, and their probability of resuming employment was lower than that of men.

Men's advantage over women in chances of interrupting and resuming employment is greater at lower educational levels.

Multivariate analysis - gender

	Risk of interrupting employment				Chances of undertaking employment			
	Model 1a		Model 1b		Model 2a		Model 2b	
	exp(b)	t	exp(b)	t	exp(b)	t	exp(b)	t
Woman	1.08	(1.47)	1.05	(0.37)	0.63	(-6.61)***	0.65	(-1.74)

Interactions:

Sex x age

woman x age 55+	1.16	(1.11)	0.35	(-3.21)**
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Sex x education

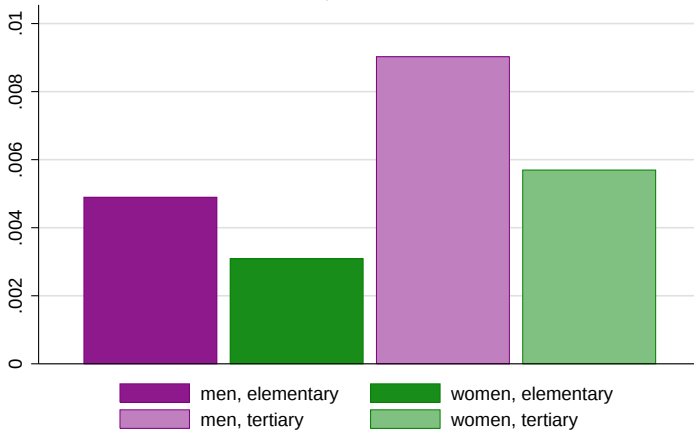
woman x vocational	1.00	(0.01)	0.83	(-0.69)
woman x secondary	1.00	(0.00)	1.14	(0.48)
woman x tertiary	0.99	(-0.05)	1.31	(0.83)

Multivariate analysis - gender

- ▶ employment of women just as stable as employment of men
- ▶ BUT (re)entering employment if for women more difficult
- ▶ no difference across educational levels

Predicted hazard rate of undertaking employment

30 yrs old, 1988



Hypotheses

Increase of meritocracy

After 1989, the importance of educational level as a factor shaping the risk of interrupting and chances of resuming work gradually increased over time.

Multivariate analysis - meritocracy

Risk of interrupting employment				Chances of undertaking employment			
Model 1a		Model 1b		Model 2a		Model 2b	
exp(b)	t	exp(b)	t	exp(b)	t	exp(b)	t

Education:

	ref cat		ref cat		ref cat		ref cat	
elementary								
vocational	0.89	(-1.39)	1.52	(1.44)	1.19	(1.46)	1.09	(0.10)
secondary	0.82	(-2.26)*	1.20	(0.59)	1.29	(2.09)*	0.74	(-0.32)
tertiary	0.58	(-5.61)***	0.98	(-0.07)	1.84	(4.03)***	1.85	(0.68)

Year

	ref cat		ref cat		ref cat		ref cat	
1986-1988								
1989	6.75	(14.21)***	9.93	(8.79)***	1.05	(0.17)	1.11	(0.15)
1990-1997	7.48	(18.53)***	11.36	(10.62)***	0.89	(-0.47)	0.83	(-0.25)
1998-2002	8.17	(18.13)***	10.84	(9.66)***	0.84	(-0.68)	0.75	(-0.38)
2003-2008	7.16	(16.47)***	9.49	(8.96)***	1.54	(1.68)	1.37	(0.42)

Interactions:

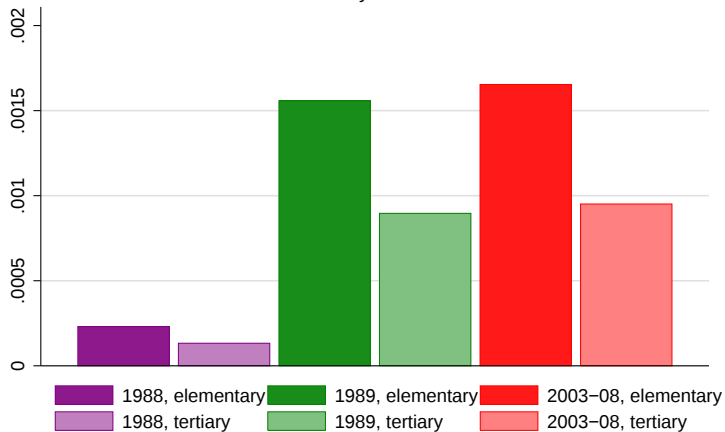
Year x education

1989-97 x vocational	0.55	(-2.10)*			1.13	(0.15)
1989-97 x secondary	0.63	(-1.54)			1.56	(0.48)
1989-97 x tertiary	0.53	(-1.68)			0.87	(-0.15)
1998-08 x vocational	0.62	(-1.59)			1.20	(0.21)
1998-08 x secondary	0.76	(-0.88)			1.70	(0.56)
1998-08 x tertiary	0.66	(-1.10)			0.84	(-0.19)

Multivariate analysis - meritocracy

- ▶ large educational differences – both in risk of interrupting and chances of resuming work
- ▶ no evidence of the differences growing over time

Predicted hazard rate of employment interruption, men 30 yrs old



Hypotheses

Dynamics of changes

The year 1989, compared to earlier periods, brought increased risk of interrupting employment and decreased chances of resuming employment. Within the 1988–2008 time span, the years 1998–2002 had the highest risk of interrupting work and the lowest chance of resuming work after an interruption.

During the economic crisis of 1989 (layoffs in heavy industry), the risk of interrupting employment was higher for men than for women.

Multivariate analysis - changes in time

	Risk of interrupting employment				Chances of undertaking employment			
	Model 1a		Model 1b		Model 2a		Model 2b	
	exp(b)	t	exp(b)	t	exp(b)	t	exp(b)	t
Year								
1986-1988	ref cat		ref cat		ref cat		ref cat	
1989	6.75	(14.21)***	9.93	(8.79)***	1.05	(0.17)	1.11	(0.15)
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Sex x year

woman x year 1989	1.05	(0.29)			0.73	(-0.68)
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Multivariate analysis - changes in time

- ▶ 10-fold increase of the risk of interrupting work
- ▶ no change in the chances of undertaking work
- ▶ no support for hypothesis that men were affected in the initial period (1989)
- ▶ *unexpected*: vocational education protected from losing a job in the period 1989-97

Multivariate analysis - life course

	Risk of interrupting employment				Chances of undertaking employment			
	Model 1a		Model 1b		Model 2a		Model 2b	
	exp(b)	t	exp(b)	t	exp(b)	t	exp(b)	t
1st job	3.18	(12.88)***	3.21	(12.97)***	—		—	
Age of undert. employment	1.083	(5.44)***	1.08	(5.41)***	—		—	
Age of undert. employment ²	1.00	(-4.44)***	1.00	(-4.44)***	—		—	
Age of interr. employment	—		—		1.03	(0.44)	1.05	(0.66)
Age of interr. employment ²	—		—		1.00	(1.61)	1.00	(1.34)
Age	0.90	(-5.69)***	0.90	(-5.68)***	1.14	(1.89)	1.13	(1.69)
Age ²	1.00	(4.54)***	1.00	(4.58)***	1.00	(-4.84)***	1.00	(-4.58)***
Age 55+	2.09	(5.83)***	1.95	(4.87)***	0.79	(-1.05)	1.16	(0.64)

Interactions:

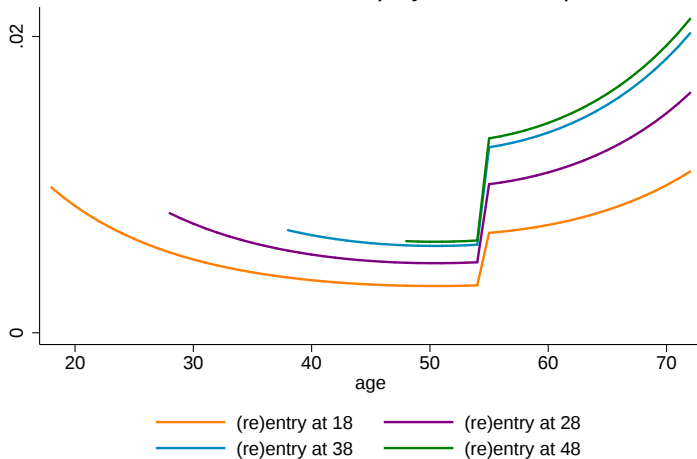
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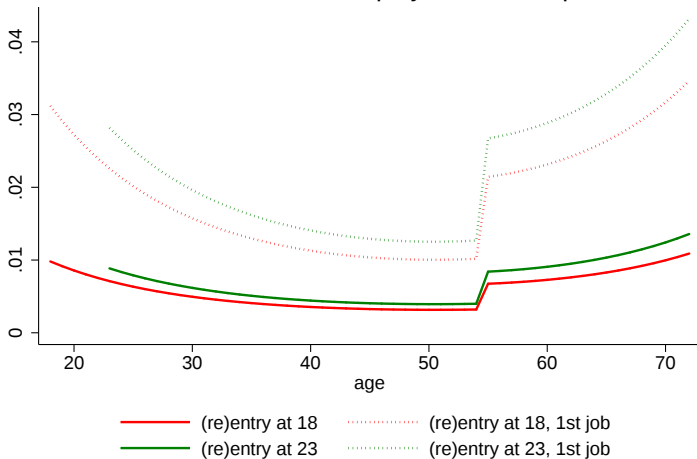
Multivariate analysis - life course

- ▶ low stability of 1st jobs
- ▶ low stability of late careers
- ▶ over the age of 55 women less often re-enter the labor market

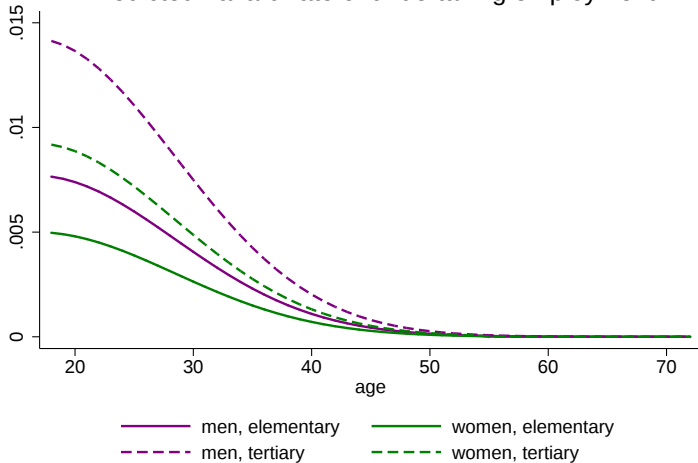
Predicted hazard rate of employment interruption, men



Predicted hazard rate of employment interruption, men



Predicted hazard rate of undertaking employment



Multivariate analysis - place of residence

Risk of interrupting employment				Chances of undertaking employment			
Model 1a		Model 1b		Model 2a		Model 2b	
exp(b)	t	exp(b)	t	exp(b)	t	exp(b)	t

Region:

	ref cat		ref cat		ref cat		ref cat	
central								
wielkopolska	0.99	(-0.09)	0.99	(-0.09)	0.95	(-0.43)	0.94	(-0.52)
silesia	0.85	(-1.92)	0.85	(-1.95)	0.93	(-0.61)	0.94	(-0.53)
west	1.36	(3.30)***	1.37	(3.38)***	0.71	(-2.81)**	0.70	(-2.95)**
pomerania	1.01	(0.09)	1.01	(0.06)	1.12	(0.90)	1.12	(0.97)
north-east	1.05	(0.47)	1.04	(0.41)	1.02	(0.19)	1.03	(0.25)
east	1.07	(0.57)	1.07	(0.53)	1.11	(0.64)	1.10	(0.56)
malopolska	0.97	(-0.29)	0.97	(-0.31)	0.85	(-1.38)	0.85	(-1.35)
Village	0.66	(-6.60)***	0.66	(-6.66)***	0.76	(-3.64)***	0.75	(-3.76)***

Western region: Lubuskie, Wielkopolskie, Zachodnio-Pomorskie

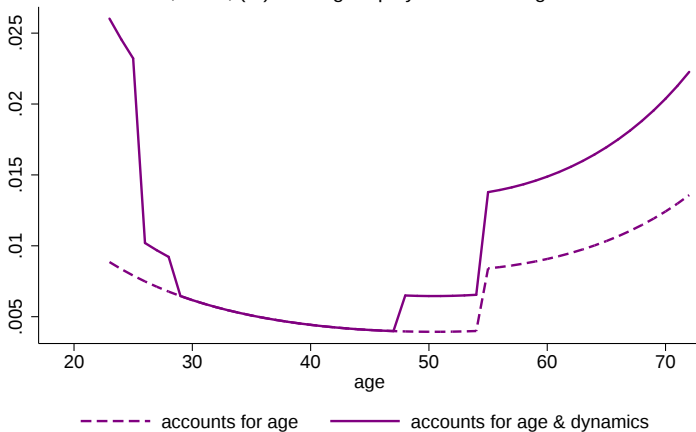
Multivariate analysis - place of residence

- ▶ problems of the western region
- ▶ stability of rural areas

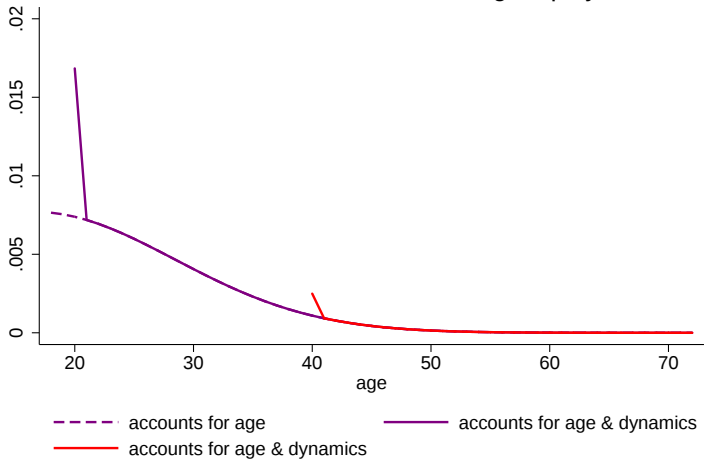
Multivariate analysis - individual dynamics

	Risk of interrupting employment				Chances of undertaking employment			
	Model 1a		Model 1b		Model 2a		Model 2b	
	exp(b)	t	exp(b)	t	exp(b)	t	exp(b)	t
Dynamics of the process:								
0-24 months	2.94	(11.85)***	2.96	(11.85)***	—		—	
24-60 months	1.36	(3.51)***	1.37	(3.54)***	—		—	
60-300 months	ref cat		ref cat		—		—	
300-720 months	1.64	(3.14)**	1.63	(3.12)**	—		—	
0-12 months	—		—		2.30	(3.01)**	2.28	(2.96)**
12-60 months	—		—		0.94	(-0.27)	0.93	(-0.32)
60-240 months	—		—		ref cat		ref cat	

Predicted hazard rate of employment interruption men, 1988, (re)entering employment at the age of 23



Predicted hazard rate of undertaking employment



Summary (1)

Gender

- ▶ women are attached to employment just as strongly as men
- ▶ but their chances of undertaking employment are 40% lower
- ▶ no evidence for larger gender gap among less educated

Meritocracy

- ▶ tertiary education - 50% better off than elementary (both chance of starting work and the risk of interrupting work)
- ▶ the stable effect of education seems *more important* as the employment stability decreased

Summary (2)

Transformation

- ▶ large increase of the hazard risk of employment interruption
- ▶ no changes of the chances of undertaking employment
- ▶ no evidence of men being more affected in 1989
- ▶ persons with vocational education were protected from losing their jobs in 1989-97

Other

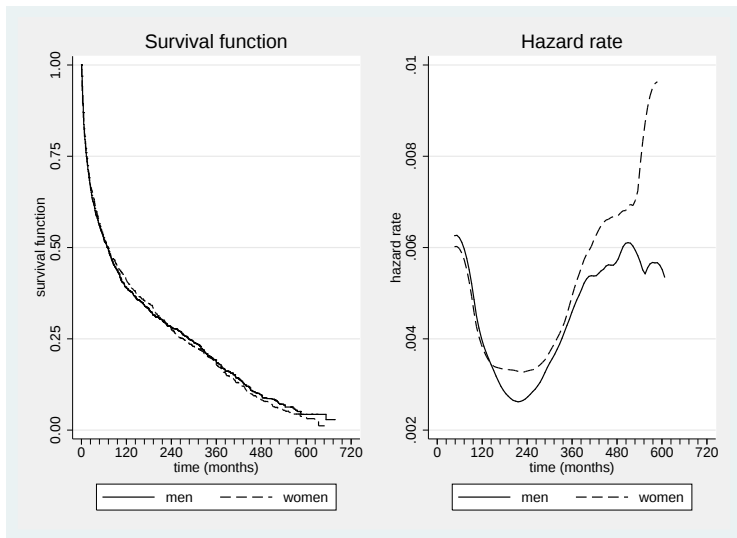
- ▶ instability of late and early careers
- ▶ less stable careers of people entering employment at later age
- ▶ deprivation of western region
- ▶ stability of both employment and non-employment in rural areas

Final comments

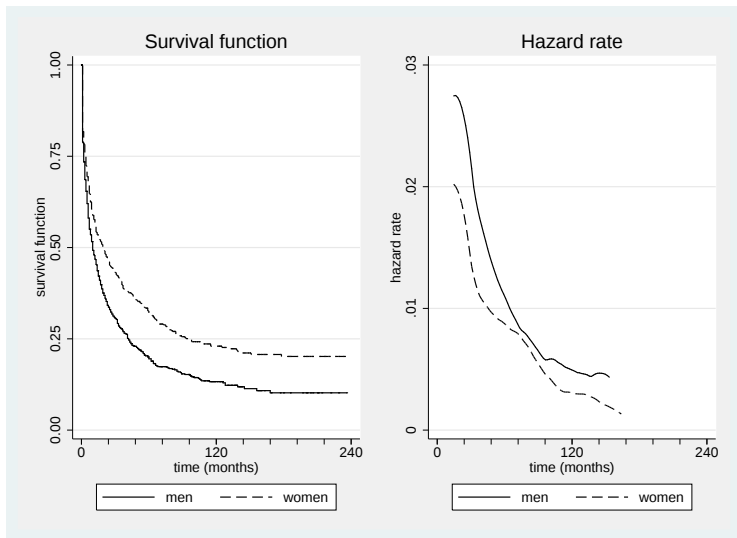
- ▶ interpretation of exponential, multiplicative model
- ▶ possibilities to extend the use of the same data

Thank you!

Gender differences - interrupting work



Gender differences - resuming work



Predicted hazard rate of employment interruption, men

