From labor market to pension-age inactivity: micro evidence from Russian data

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Motivation

Policy-relevant:

- Expected sizeable decrease of working age population - by 13.5 mn, from 70% in 2010 to 56.6% in 2050
- Are there potential resources to increase pension-age labor force participation?
  - Constraints?
    - Health
    - Skills
    - Motivation
    - Labor demand
- The role of pension and labor market regulation

Academic-literature-relevant:

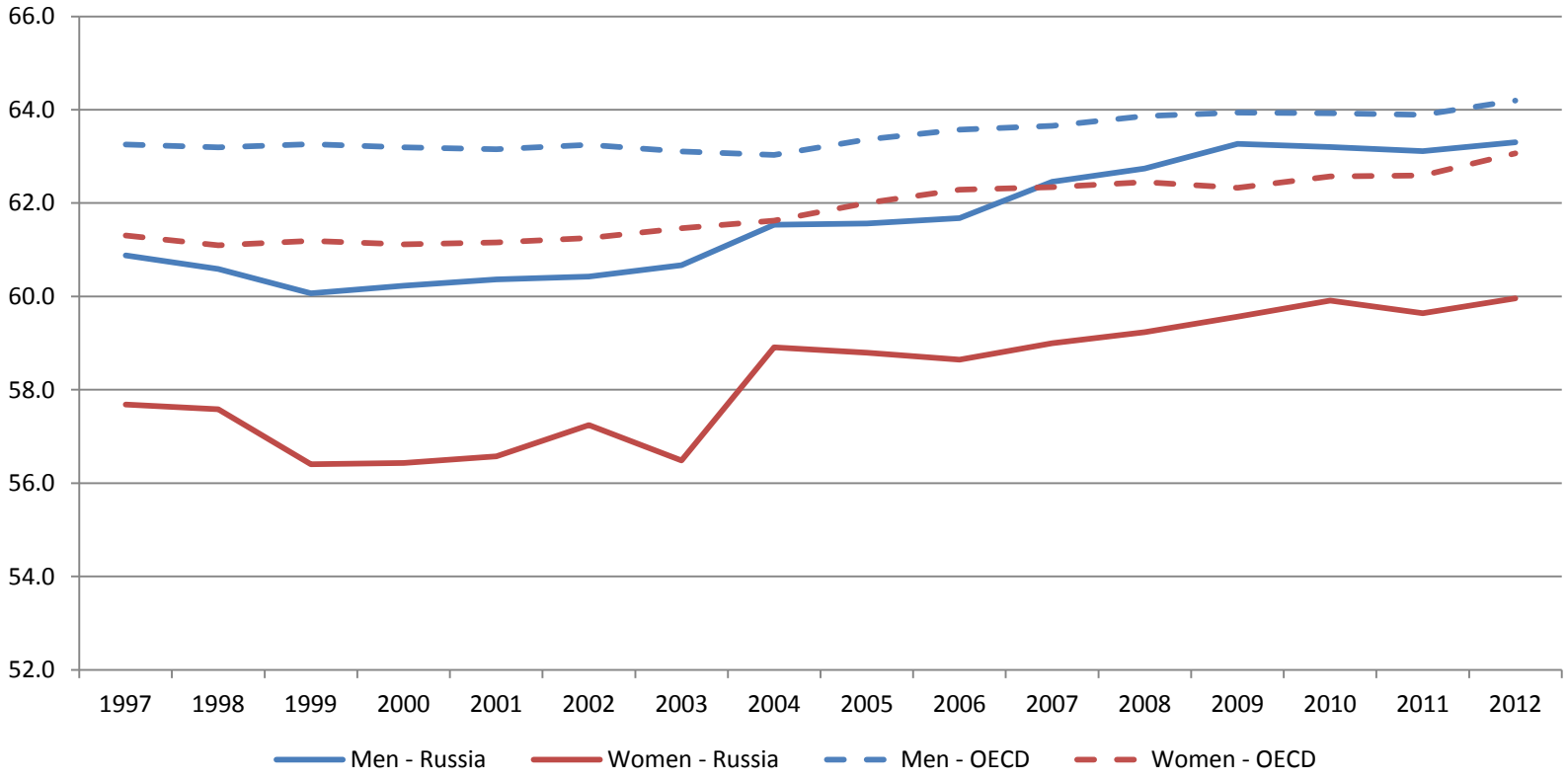
- Exit to pension-age inactivity in a different environment of combination of
  - no penalty for work beyond pension age,
  - underdeveloped public insurance (against loss of income)
  - lack of risk-free long-term private financial instruments
- Pension age and occupational structure

Life expectancy at pension age

Year	Males (60 year)	Females (55 years)	Average
2000	13.2	22.5	19.6
2010	14.3	23.9	21.2
2020	16.4	25.9	23
2030	18.6	27	24.9
2040	19.3	28.6	25.5
2050	20	29.2	25.8

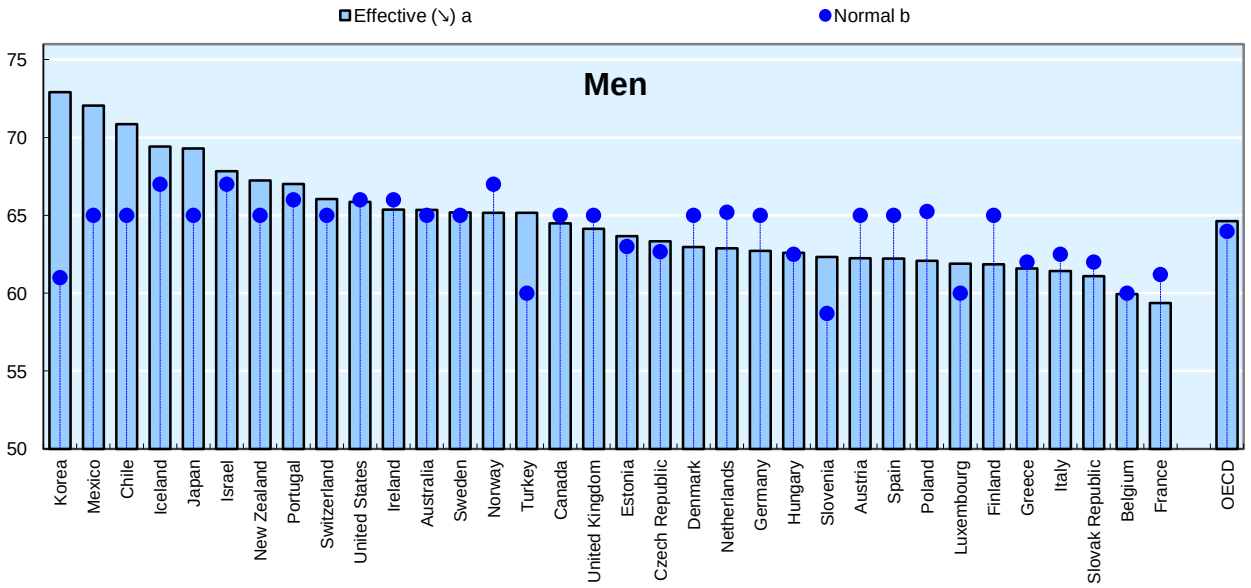
Source: OECD, 2011, based on Pension Fund statistics

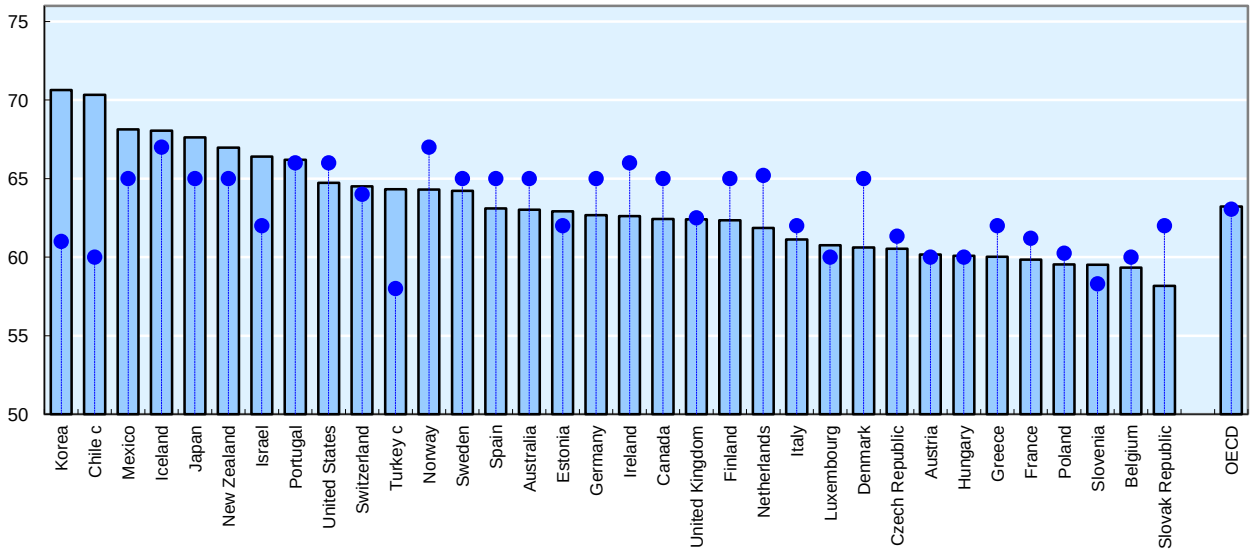
Effective pension age, Russia and OECD average, 1997-2012



Source: Levin, 2014, Working longer and more productive in aging Russia based on OECD data

Average effective age of retirement versus the normal retirement age, 2009-2014





Source: OECD estimates derived from the European and national labor force surveys, OECD Pensions at a Glance 2015 (http://oe.cd/pag - figures 7.8 & 7.9).

Russia: stimuli to continue labor life beyond pension age

- Low pension age
- No penalty for work beyond pension age
- Low replacement rates (pension to wage)
  - Gerber and Radl 2014: low income is a motive to continue labor life
- Weak stimuli introduced by 2015 reform (stimuli to postpone application for pension)

Average pension to wage replacement rates

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Base pension	10.3	9.5	8.9	7.7	9	7.6	9	9.6	12.2
Insurance pension	21.3	20.3	19.5	19.9	16.7	15.3	15.3	18.2	23.5
Transfers	1.3	1.1	1.8	4.5	4.9	4.6	4.3	5	4.5
Total, pension and transfers	32.9	30.8	30.2	32.2	30.5	27.5	28.6	32.9	40.2

Source: Eich, Gust, and Soto 2012, IMF Working paper WP/12/201

Average and individual replacement rates

- Average RR conceals huge variation in individual RR
  - Pensions are highly compressed as compared to wages
  - Pension reforms of 2015 introduces no changes – upper bound of annual pension scores
  - No study of individual RR though Pension Fund administrative data would allow

Research questions

- What are the determinants of exit from labor market to pension-age inequality?
  - Health
  - Reservation wage vs wage in the labor market
    - Family circumstances
    - Income
  - Low labor demand
    - Skills (education and experience)
    - Ability to adopt, mobility characteristics
- What are the changes experienced before retirement
  - Employment
  - Wages

Data

- Russian Longitudinal Monitoring Survey: 1995 – 2015

- Nationally representative data (about 5 ths households and 10 ths adults each round)
  - Sample – two-stage random sample of addresses based on 1989 micro-census
  - World-level standards of sampling, selection and training of interviewers, data quality control
- Has a panel component though sizeable attrition
- Subsample of 40-80 age group

http://www.cpc.unc.edu/rlms

Definition of pension-age inactivity:

Does not work & Gets pension & Does not want to work

Methodology

- **Survival analysis**
  - to get rid of bias due to non-normality of time till event time and right censoring
  - hazard rates for non-censored and survival functions for censored episodes
- **Episode: time till pension age inactivity**
- **Proportional hazard model**

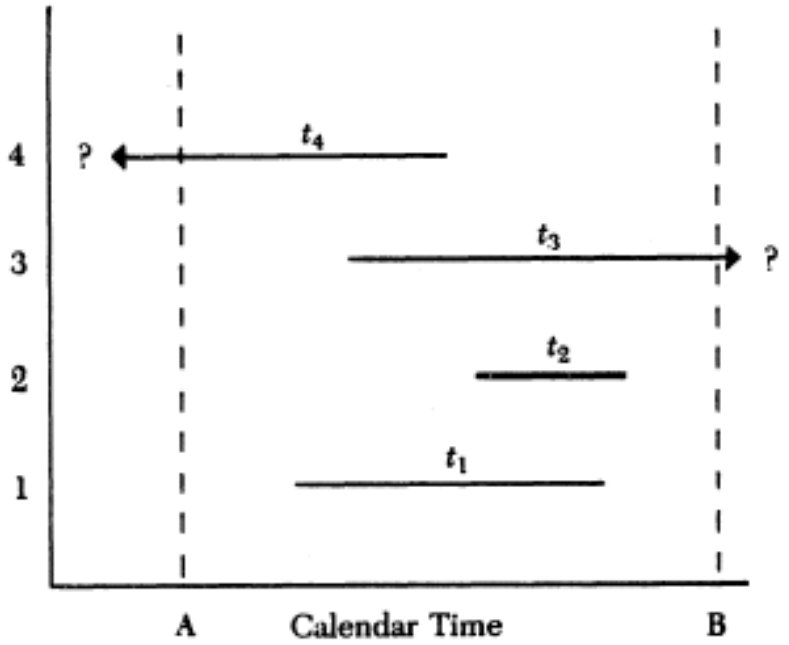
$$\lambda(t, x, \beta, \lambda_0) = \phi(x, \beta)\lambda_0(t),$$

$$\phi(x, \beta) = \exp(x'\beta) \qquad \partial \ln \lambda(t, x, \beta, \lambda_0)/\partial x = \beta$$

- Parametric – Weibull specification

$$\lambda(t) = \lambda p(\lambda t)^{p-1}$$

- Non-parametric – Cox specification

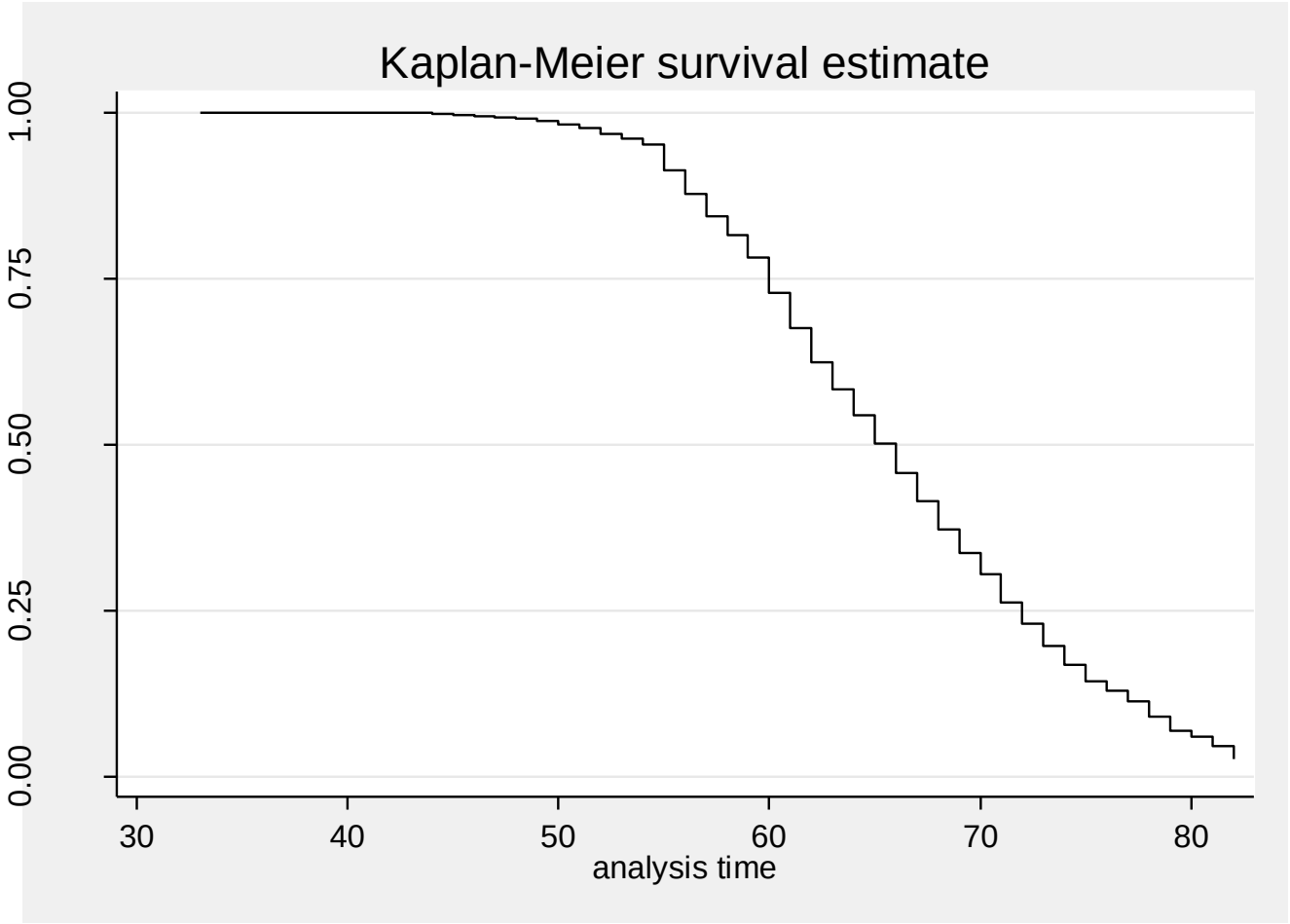


A: Beginning of study period (e.g., March survey)
B: End of study period (e.g., April survey)
t_1, t_2: Completed spells
t_3: Right-censored spell
t_4: Left-censored spell

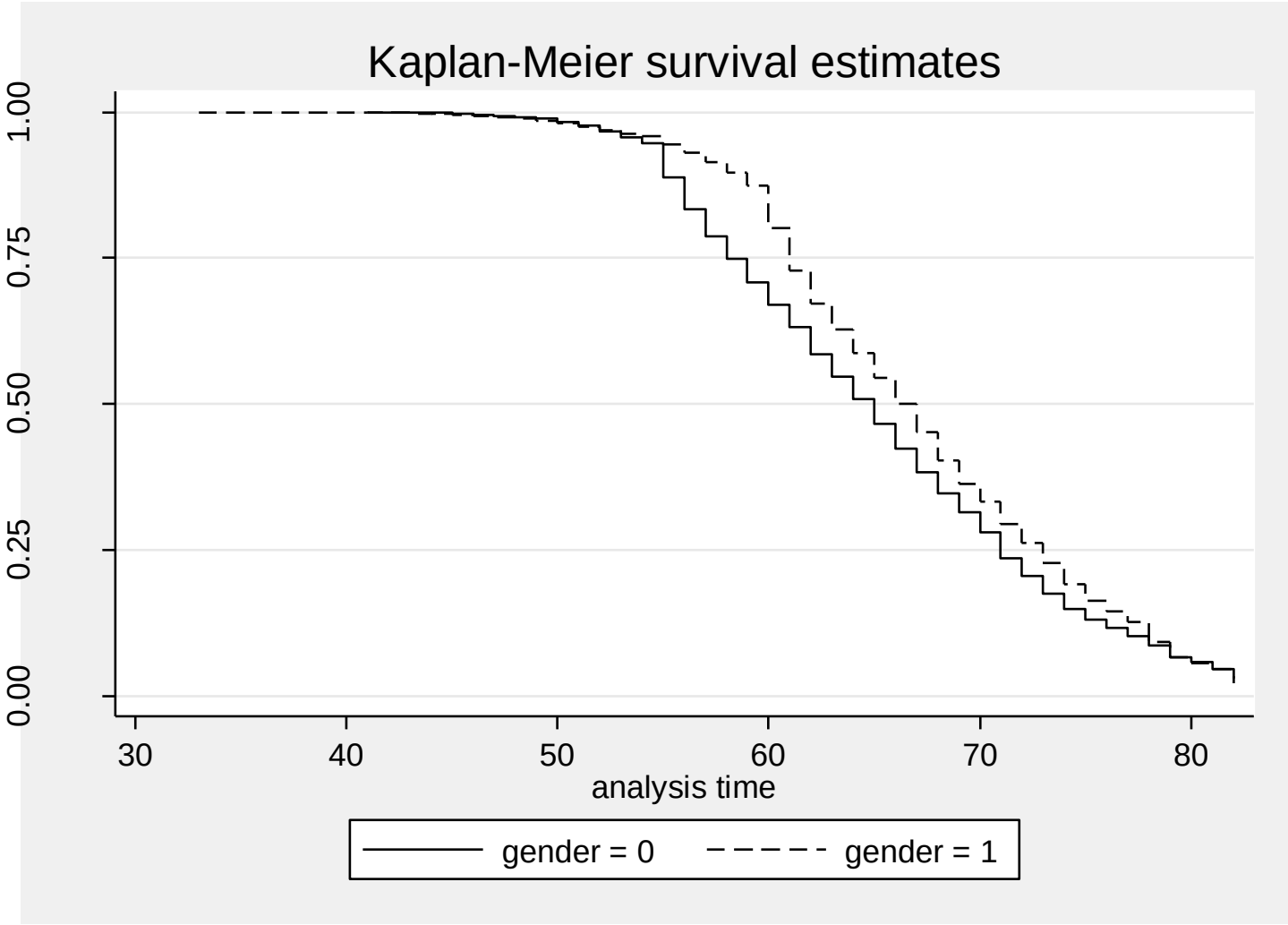
Figure 1. Duration Data

Explanatory variables

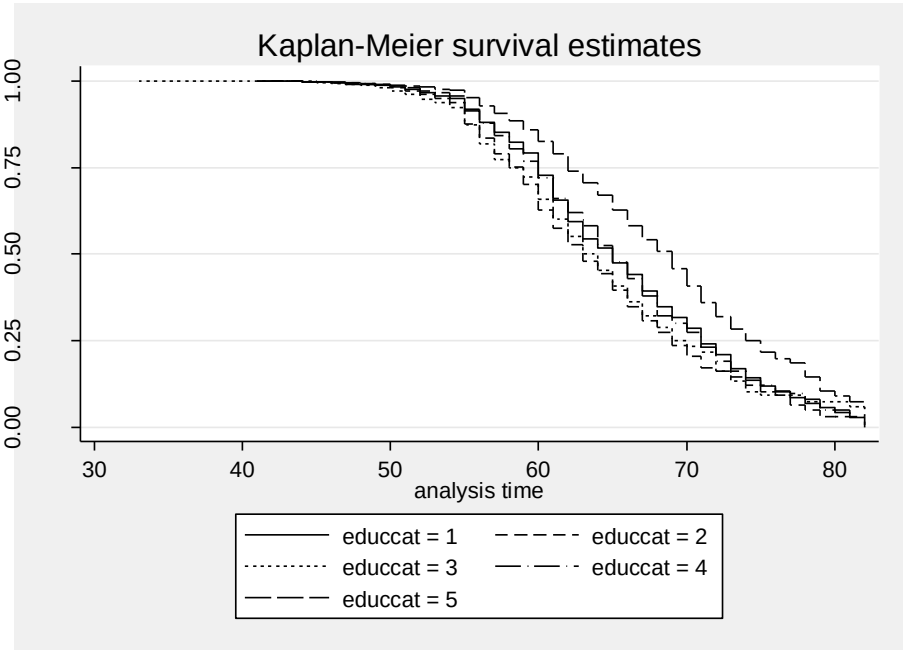
- *Pension age*
- *Education*
- *Family circumstances*
- *Labor market*
  - *Occupational groups*
  - *Entrepreneurship and self-employment*
- *Health*
- *Income*
- *Control on regions and years*



	25% of sample	50% of sample	75% of sample
Total sample	60	66	72



	25% of sample	50% of sample	75% of sample
Total sample	60	66	72
Males	61	67	73
Females	58	65	71


Kaplan-Meier survival estimates
1.00
0.75
0.50
0.25
0.00
30
40
50
60
70
80
analysis time
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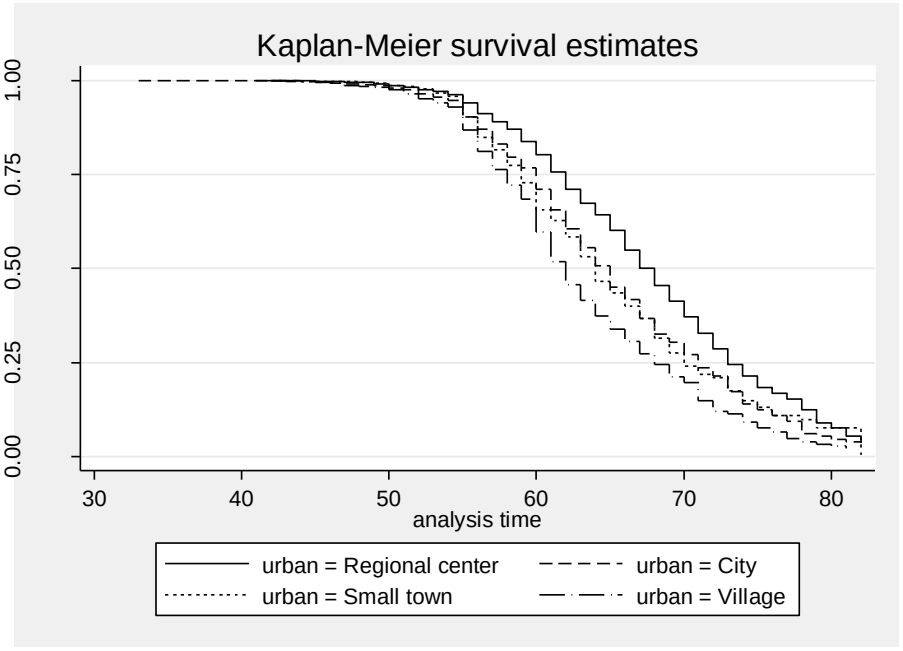
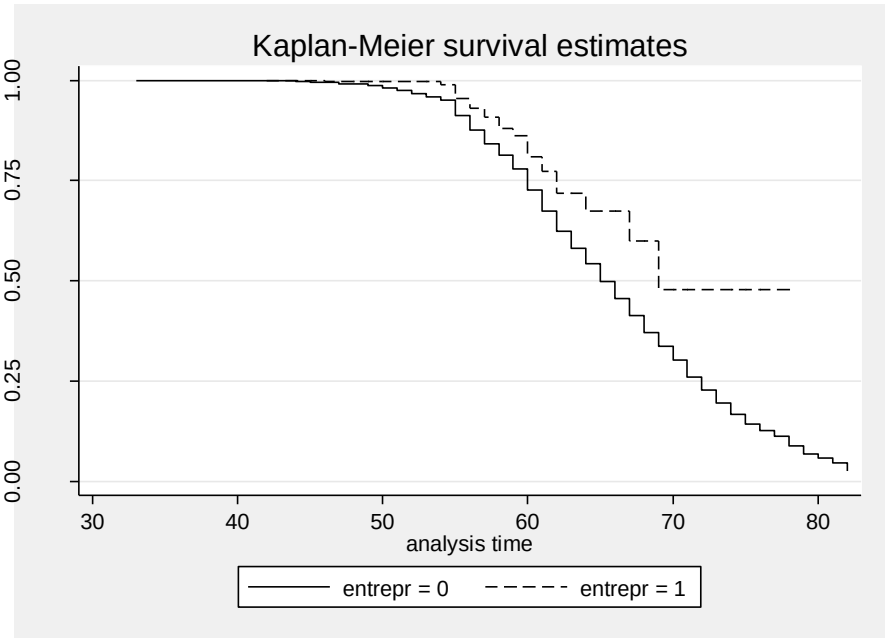
educcat = 2
educcat = 3
educcat = 4
educcat = 5


Kaplan-Meier survival estimates
1.00
0.75
0.50
0.25
0.00
30
40
50
60
70
80
analysis time
urban = Regional center
urban = City
urban = Small town
urban = Village


Kaplan-Meier survival estimates
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0.75
0.50
0.25
0.00
30
40
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60
70
80
analysis time
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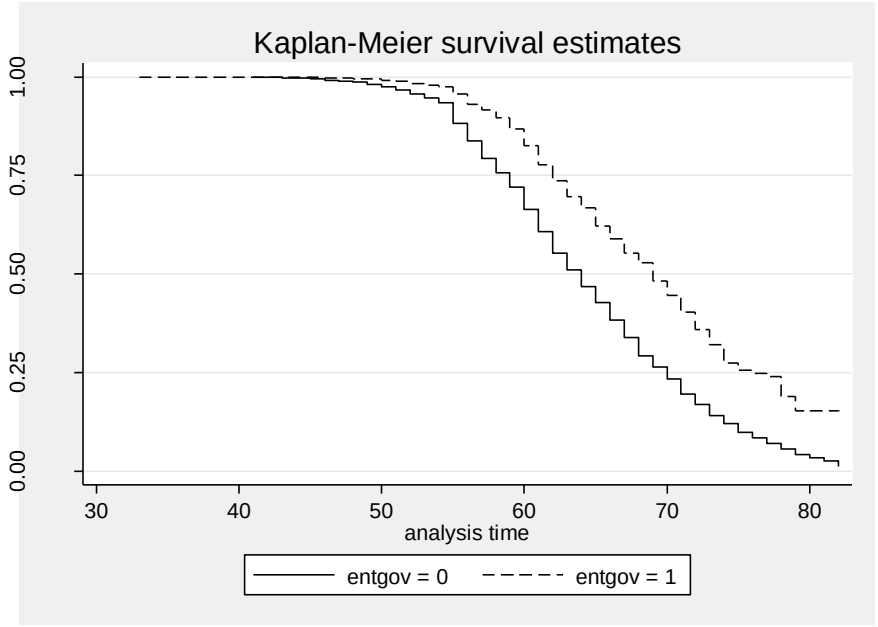
Kaplan-Meier survival estimates
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0.75
0.50
0.25
0.00
30
40
50
60
70
80
analysis time
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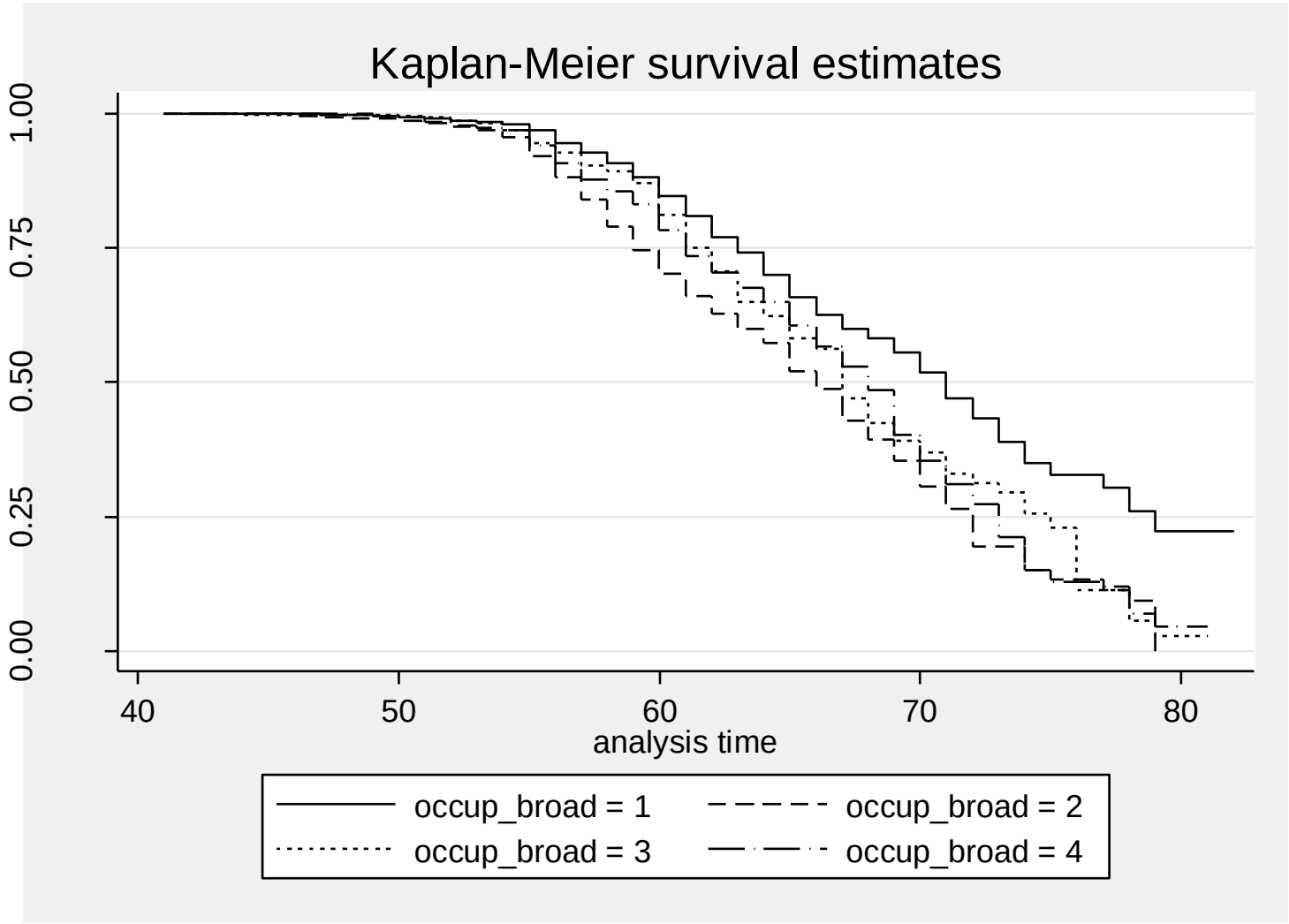
Kaplan-Meier survival estimates
1.00
0.75
0.50
0.25
0.00
40
50
60
70
80
analysis time
occup_broad = 1
occup_broad = 2
occup_broad = 3
occup_broad = 4

Survival time averages, by groups

	Survival time (age)		
	25% of sample	50% of sample	75% of sample
Regional center	62	68	73
City	60	65	71
Small town	59	64	70
Village	58	62	68
No secondary school	60	65	71
Secondary school	59	63	69
Junior professional	58	64	70
Secondary professional	60	65	71
Unioversity and more	62	69	75
Work at state enterprise	62	69	76
Does not work at state sector	59	64	70
Top occupations	63	71	79
Mid occupations	59	66	72
Skilled workers	62	67	75
Unskilled	61	68	73

Results: pension age, education

	Weibull			*Cox*		
	Hazard	*Hazard*	*Hazard*	*Hazard*	*Hazard*	*Hazard*
Gender: Males	-0.019	-0.071	-0.019	-0.081	-0.119	-0.081
	[0.091]	[0.085]	[0.091]	[0.094]	[0.086]	[0.094]
Pension age dummy	1.048	1.006	1.048	0.641	0.612	0.641
	[0.066]***	[0.063]***	[0.066]***	[0.067]***	[0.062]***	[0.067]***
Education: secondary school - reference						
No secondary school	-0.29	-0.28	-0.29	-0.18	-0.183	-0.18
	[0.063]***	[0.057]***	[0.063]***	[0.067]***	[0.061]***	[0.067]***
Junior Professional	0.009	0.004	0.009	0.045	0.037	0.046
	[0.068]	[0.064]	[0.068]	[0.069]	[0.066]	[0.069]
Secondary Professional	-0.054	-0.076	-0.053	-0.058	-0.076	-0.058
	[0.061]	[0.057]	[0.061]	[0.060]	[0.058]	[0.060]
University and higher	-0.282	-0.342	-0.281	-0.191	-0.259	-0.191
	[0.064]***	[0.060]***	[0.064]***	[0.063]***	[0.060]***	[0.063]***

Results: labor market

	Weibull			*Cox*		
	Hazard	*Hazard*	*Hazard*	*Hazard*	*Hazard*	*Hazard*
Labor Market						
Entrepreneur as the main activity		-0.911 [0.270]***			-0.856 [0.266]***5]***	
Has experience with own business	-0.131 [0.077]*			-0.147 [0.082]*		
Has experience with successful own business			-0.168 [0.119]			-0.166 [0.124]
Has experience with Unsuccessful own business			-0.106 [0.097]			-0.135 [0.104]
Work at state enterprise or in public sector	-0.505 [0.049]***	-0.434 [0.045]***	-0.506 [0.049]***	-0.517 [0.048]***	-0.452 [0.044]***	-0.518 [0.048]***
Occupation - ISCO 4-6 and not working for wages are refernce group						
High skilled (1-3 ISCO groups)	-0.502 [0.065]***	-0.465 [0.062]***	-0.501 [0.065]***	-0.511 [0.064]***	-0.475 [0.061]***	-0.51 [0.064]***
Qualified workers (6-7 ISCO groups)	-0.135 [0.086]	-0.164 [0.080]**	-0.135 [0.086]	-0.178 [0.085]**	-0.208 [0.078]***	-0.178 [0.085]**
Unskilled (9 ISCO group)	-0.238 [0.067]***	-0.202 [0.061]***	-0.238 [0.067]***	-0.262 [0.067]***	-0.227 [0.061]***	-0.262 [0.067]***

Results: income and health

	Weibull			*Cox*		
	Hazard	*Hazard*	*Hazard*	*Hazard*	*Hazard*	*Hazard*
Income						
Ln Income from primary job	-0.045	-0.021	-0.045	-0.046	-0.022	-0.046
	[0.008]***	[0.006]***	[0.008]***	[0.009]***	[0.007]***	[0.009]***
Ln per capita household expenditures	-0.138	-0.147	-0.138	-0.141	-0.15	-0.141
	[0.025]***	[0.023]***	[0.025]***	[0.026]***	[0.024]***	[0.026]***
Health						
Bad health (1-very poor and poor health)	0.232	0.172	0.232	0.272	0.227	0.272
	[0.048]***	[0.044]***	[0.048]***	[0.056]***	[0.051]***	[0.056]***
Had a heart attack	0.083	0.089	0.082	0.133	0.121	0.133
	[0.089]	[0.081]	[0.089]	[0.096]	[0.086]	[0.096]
Had a stroke	0.317	0.325	0.317	0.336	0.339	0.336
	[0.105]***	[0.100]***	[0.105]***	[0.110]***	[0.104]***	[0.110]***
Diabetus	-0.001	0	-0.002	0.024	0.024	0.023
	[0.065]	[0.061]	[0.065]	[0.071]	[0.065]	[0.071]

Results: family and settlement types

	Weibull			*Cox*		
	Hazard	*Hazard*	*Hazard*	*Hazard*	*Hazard*	*Hazard*
Family circumstances						
Married	0.608	0.562	0.608	0.489	0.445	0.489
	[0.051]***	[0.047]***	[0.051]***	[0.054]***	[0.050]***	[0.054]***
Married male	-0.529	-0.419	-0.528	-0.472	-0.377	-0.472
	[0.100]***	[0.093]***	[0.100]***	[0.103]***	[0.095]***	[0.103]***
Small children in household	-0.087	-0.073	-0.086	-0.118	-0.108	-0.118
	[0.101]	[0.093]	[0.101]	[0.098]	[0.089]	[0.098]
Female*Small children in hh	0.166	0.25	0.165	0.176	0.242	0.176
	[0.125]	[0.115]**	[0.125]	[0.135]	[0.120]**	[0.135]
Settlement type: small town - reference						
Regional centers	-0.307	-0.283	-0.307	-0.286	-0.261	-0.286
	[0.048]***	[0.045]***	[0.048]***	[0.049]***	[0.045]***	[0.049]***
Large towns/cities	0.091	0.059	0.092	0.094	0.08	0.094
	[0.080]	[0.075]	[0.080]	[0.082]	[0.075]	[0.082]
Rural	0.253	0.225	0.253	0.244	0.224	0.245
	[0.054]***	[0.050]***	[0.054]***	[0.055]***	[0.051]***	[0.055]***
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-43.326	-42.725	-43.33			
	[0.601]***	[0.552]***	[0.601]***			
Number of observations	59853	65288	59853	59853	65288	59853

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Results

- Males and females behave very similar around their statutory pension age:
  - Controlling for the statutory pension age, there are almost no gender differences left
- Health is important (self-reported, stroke)
- Social role of “babushka” gets some confirmation
- Married tend to exit quicker, though gender difference here
- University degree prolongs labor market attachment
- High skilled (ISCO 1-3) and unskilled stay in the labor market longer
- Experience as entrepreneurship and work at state enterprise/public sector decreases hazard rates
- High-wage and high-income groups work longer (lower replacement rate)