

Once a baker, always a baker? The effect of structural characteristics of occupations on occupational mobility

Rational Choice Sociology:
Theory and Empirical Application

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- Ongoing discussion on deprofessionalization and increasing occupational flexibility:
 - Structural changes on the labor market (Bergmann/Mertens 2011; Eichhorst et.al. 2009)
 - Weakening binding power of occupations (Giesecke/Heising 2010; Kocka/Offe 2000; Baethge/Baetge-Kinsky 1998; Voß/Pongratz 1998)
- But, empirical evidence of relative constant rates of occupational mobility (Rhein/Trübswetter 2012; Mayer et al. 2010; Hall 2009; Seibert 2007; Erlinghagen 2004; Behringer 2002; Bender et al. 1999; Konietzka 1999a, 1999b)
- More in detail, Mayer et al. (2010) and Grunow/Mayer (2007) show:
 - Decrease of direct occupational mobility
 - Increase of indirect occupational mobility
 - Occupational changes often accompanied by further education (q.v. Schaeper et.al. 2000)

- Previous research contribution:
 - Description and explanation of dynamics of occupational mobility over time,
 - based on human capital theory arguments on individual level
 - International comparisons based on degree of regulation of occupational systems

- Aim of this project:
 - Applying the theory of labor market segmentation and social closure on analyses of occupational mobility
 - Complement explanations on structural level

- **Research question:**
 - How do structural characteristics of occupations influence occupational mobility?

- Arguments on individual level:
 - In Germany: strong linkage of the educational system and labor market positioning (Dietrich/Abraham 2008; Georg/Sattel 2006; Konietzka 1999; Müller/Shavit 1998; Allmendinger 1989)
 - High transferability of occupation-specific human capital between companies,
 - but depreciation in case of inter-occupational mobility (Grunow/Mayer 2007)

- Arguments of segmentation theory and social closure theory:
 - Structural barriers between labor market segments hinder occupational mobility (Blossfeld/Mayer 1988; Köhler/Preisendörfer 1988; Sengenberger 1987; Lutz/Sengenberger 1974; Doeringer/Piore 1971)
 - Occupations drive (horizontal) social closure between occupational positions (Weeden 2002; Weber 1956):
 - Reduction of competition within the segment by restricting access to resources and opportunities only to occupation holders (Parkin 1979) and
 - boosting demand for products and services provided only by occupation holders

- Occupations as an institution:
 - Linkage of occupation specific bundles of skills with specific combination of tasks (Abraham et al. 2011; Grunow/Mayer 2007)
 - Institution as regulation of cooperation, coordination and allocation in interactions (Esser 2000; North 1992, 1988)
- Occupations structure the matching processes on the labor market:
 - Decrease of information asymmetry through signals → reduction of transaction costs of matching process (Williamson 1985; Spence 1973; Coase 1937)
 - Regulation of entry points to segmented labor markets (Kupka 2006)
 - Regulation of the utilization of skills (Dostal et al. 1998)
 - Variance in power to reduce bounded rationality of labor market actors and to erect barriers around occupational segments (Abraham et al. 2011; Richter/Furubotn 2010)

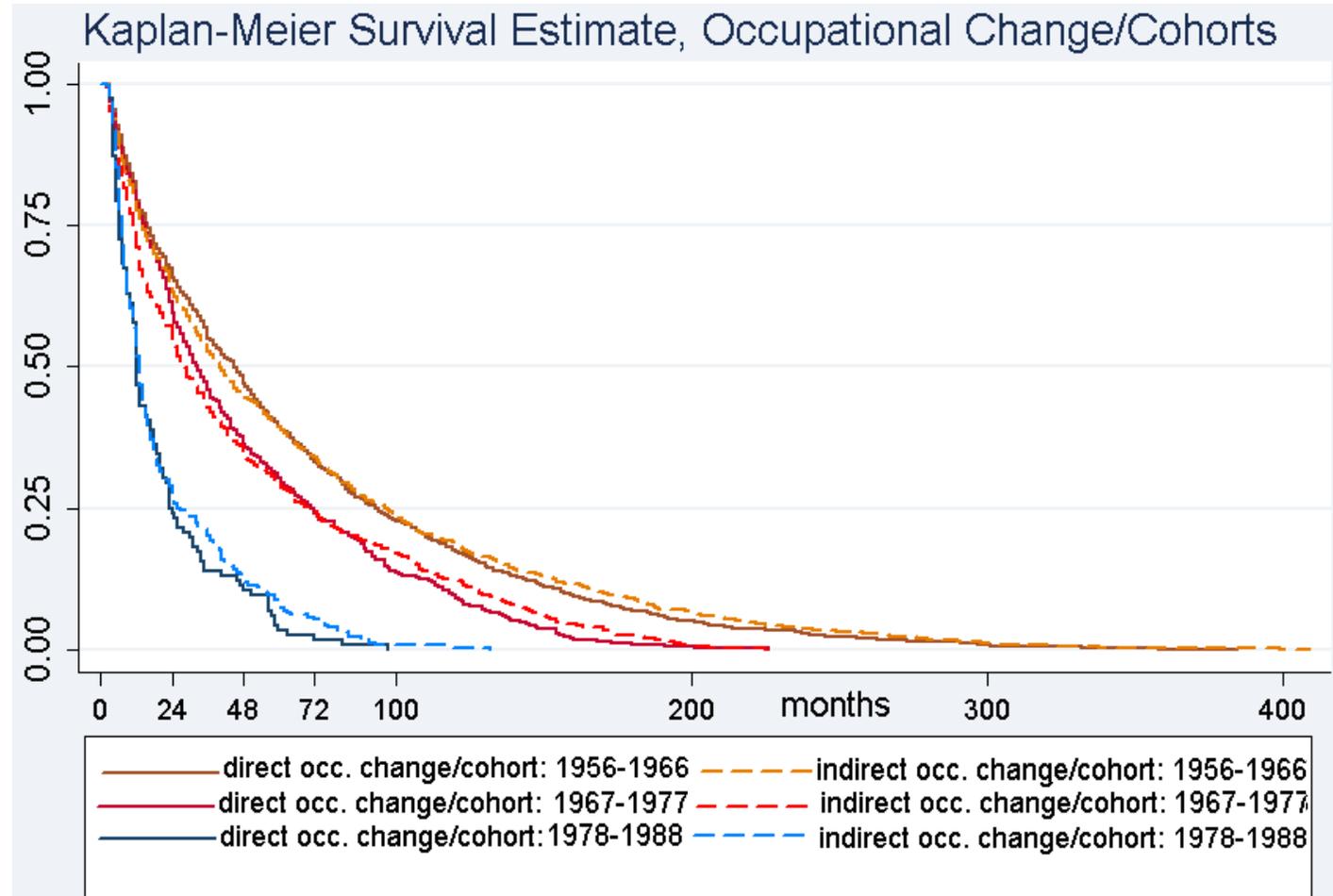
- As occupation is a multidimensional construct (Dostal et al. 1998), structuring characteristics works via several mechanisms: (e.g.)
- **Standardization:** (Grunow/Mayer2007; Weeden 2002; Konietzka 1999; Müller/Shavit 1998)
 - "Training regulations" defining objectives, content and examination requirements for vocational education and practice licenses
 - Precise signals of required skills and consistent contents
- **Voluntary certification:** (Weeden 2002)
 - Certification from (independent) educational institution for entry
 - Less standardized, but signal of specialization and quality of provided output
- **Association representation:** (Schroeder et al. 2011; Weeden 2002)
 - Professional or umbrella association representing interests of occupation holders,
 - collective strategy to create boundaries around occupation, influencing training contents, increasing and channeling demand for product or service

- Occupational closure reduces intra-occupational competition, raises returns and improves positions of occupational insiders (Weeden 2002)
→ leads to segmentated labor markets
- Modeling occupational closure by means of indicators:* 0/1
- Project part I: Outward orientated occupational mobility:
 - H1) **Standardization:**
Standardized credentials decrease the hazard rate of occupational mobility
 - H2) **Voluntary certification:**
Voluntary certifications somehow decrease the hazard rate of occupational mobility
 - H3) **Association representation:**
Association representations decrease the hazard rate of occupational mobility

*data source: BERUFENET.de

- Data: IAB- Study "Working and Learning in a Changing World" (ALWA)
 - Retrospectively collected life course data of 10,076 participants born between 1956–1988 living in Germany
 - Detailed information on schooling and training, labor market entry and occupational trajectories (Antoni et al. 2010)
- Sample restriction:
 - Regular workers with at least 30 hour/week; no interns, trainees, seasonal workers
 - Workers in dependent employment or self-employment
 - First occupation lasting at least 3 months
- Measurement of occupational mobility:
 - Event: First change of worker's occupation on 3-digit level of the class. code (KldB88)
 - Only changes of occupation coinciding with change of company

- Observations: 6002
- Events: 3949
- Perc. of occ. mobility:
65.8 %
- Direct occ. changes:
1843
- Indirect occ. changes
(interruption > 3m):
2106



Piecewise constant exponential model: occupational change

	Model 1		Model 2	
	Haz. Ratio	Robust Std. Err.	Haz. Ratio	Robust Std. Err.
<i>Cohort: 1956-1966 (ref.)</i>				
Cohort: 1967-1977	1.346 ^{***}	(0.045)	1.343 ^{***}	(0.045)
Cohort: 1978-1988	2.384 ^{***}	(0.142)	2.405 ^{***}	(0.144)
Sex: male	0.898 ^{***}	(0.029)	0.836 ^{***}	(0.029)
Edu: no occup. training	1.230 ^{***}	(0.073)	1.257 ^{***}	(0.076)
<i>Edu: vocational training (ref.)</i>				
Edu: master/technician	0.763 ^{***}	(0.058)	0.748 ^{***}	(0.057)
Edu: university degree/PhD	0.905 [*]	(0.041)	0.950	(0.048)
Adequacy of occ. training	0.652 ^{***}	(0.021)	0.634 ^{***}	(0.021)
Job interruption in months (cum.)	1.012 ^{***}	(0.001)	1.012 ^{***}	(0.001)
Direct occupational change	4.601 ^{***}	(0.157)	4.609 ^{***}	(0.158)
Standardization			1.143[*]	(0.064)
Voluntary certification			0.813^{***}	(0.028)
Association representation			0.937[*]	(0.031)
Observations	5974		5974	
Log pseudoL	-8319.7		-8298.3	
AIC	16675.4		16638.7	
Df	18		21	

Note: no constant term was estimated in the equation

Time intervals at 0, 6, 12, 24, 36, 60, 120, 240, 360 months

Source: own calculation based on data from ALWA, N of occupations: 91

- Conclusion:
 - Increasing occupation mobility over last three cohorts
 - Structural characteristics have an effect on occupational mobility
 - H2+H3 preliminary evidence: voluntary certification and association representation decrease the hazard rate of occupational mobility
 - H1 preliminary evidence: standardization does not decrease the hazard rate of (outward orientated) occupational mobility

- Outlook:
 - Modeling for all occupation episodes over life time (repeated events)
 - Including time varying covariates: times of unemployment, further education, care
 - Further and improved indicators
 - Project part II: Segmentation as a result of occupational closure, has to be considered with inward orientated occupational mobility

Thanks for your attention!

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- Occupations in sample (min. N =20):

Klassifikation der Berufe 1988 3-steller	mean(durne~88)	mean(bordn)	mean(zert)	mean(bverb)
11. Landwirte	119.5	1	0	1
32. Agraringenieure, Landwirtschaftsbera	63.78261	0	0	1
51. Gärtner, Gartenarbeiter	110.4918	1	0	1
53. Floristen	112.3182	1	0	1
141. Chemiebetriebswerker	81.87755	1	0	0
171. Schriftsetzer	99.04762	1	0	0
221. Dreher	107.375	1	0	0
261. Feinblechner	73.11667	1	0	1
262. Rohrintallateure	92.78049	1	0	0
271. Bauschlosser	70.95238	1	0	0
273. Maschinenschlosser	105.5	1	0	0
274. Betriebsschlosser, Reparaturschloss	89.46914	1	0	0
275. Stahlbauschlosser, Eisenschiffbauer	112.5217	1	0	0
281. Kraftfahrzeuginstandsetzer	101.6914	1	0	0
282. Landmaschineninstandsetzer	60.05263	1	0	0
284. Feinmechaniker	69.91666	1	0	0
291. Werkzeugmacher	91.54688	1	0	0
303. Zahntechniker	124.3478	1	0	1
311. Elektroinstallateure, -monteure	116.208	1	0	0
312. Fernmeldemonteure, -handwerker	132.1714	1	0	0
314. Elektrogerätebauer	67.58462	1	0	1
315. Funk-, Tongerätetechnik	44.21951	1	0	1
321. Elektrogeräte-, Elektroteilemontier	28	0	0	0
351. schneider	61.61905	1	0	1
356. Näher, anders nicht genannt	28.86667	1	0	0
391. Backwarenhersteller	97.27273	1	0	1
401. Fleischer	117.4333	1	0	1
411. Köche	94.39024	1	1	1
441. Maurer	106.3718	1	0	0
451. Zimmerer	91.28125	1	0	1
472. Sonstige Bauhilfsarbeiter, Bauhilfe	23.91667	0	0	0
501. Tischler	106.0734	1	0	1
511. Maler, Lackierer - Ausbau	109.3043	1	0	0
522. Warenaufmacher, Versandfertigmacher	30.86111	1	0	0
601. Ingenieure des Maschinen- und Fahrz	111.75	0	0	1
602. Elektroingenieure	125.8929	0	0	1
603. Architekten, Bauingenieure	139.0175	0	0	1
607. Sonstige Ingenieure	89.06	0	0	1
611. Chemiker, Chemieingenieure	132.4815	0	0	1
612. Physiker, Physikingenieure, Mathema	108.9524	0	0	1

■ Occupations in sample (min. N =20):

633. Chemielaboranten	100.1538	1	0	0
635. Technische Zeichner	96.06593	1	0	0
681. Groß- und Einzelhandelskaufleute, E	80.45594	1	1	1
682. Verkäufer	72.04498	1	1	0
683. Verlagskaufleute, Buchhändler	86.08696	1	0	0
685. Apothekenhelferinnen	96.40909	1	0	0
691. Bankfachleute	141.9145	1	1	0
694. Lebens-, Sachversicherungsfachleute	132.2	1	1	1
701. Speditionskaufleute	85.82	1	1	0
702. Fremdenverkehrsfachleute	77.45834	1	1	1
703. Werbefachleute	59.97368	1	1	1
712. Eisenbahnbetriebsregler, -schaffner	120.85	1	0	0
714. Kraftfahrzeugführer	86.14516	1	0	1
732. Postverteiler	107.7302	1	0	0
744. Lager-, Transportarbeiter	39.57627	0	1	0
751. Unternehmer, Geschäftsführer, Gesch	82.2963	1	1	1
752. Unternehmensberater, Organisatoren	87.6	0	1	1
753. Wirtschaftsprüfer, Steuerberater	115.7303	1	0	1
762. Leitende und administrativ entschei	191.2982	1	0	0
772. Buchhalter	84.77419	1	1	1
773. Kassierer	46.5625	1	0	0
774. Datenverarbeitungsfachleute	122.1439	1	1	0
781. Bürofachkräfte	111.4607	1	1	0
782. Stenographen, Stenotypisten, Maschi	84.64103	1	1	0
784. Bürohilfskräfte	73.80556	0	0	0
813. Rechtsvertreter, -berater	95.06896	1	1	1
821. Publizisten	92.36364	0	1	1
823. Bibliothekare, Archivare, Museumsfa	141.4762	0	0	1
833. Bildende Künstler, Graphiker	102.25	1	1	1
841. Ärzte	141.1356	1	0	1
852. Masseur, Krankengymnasten und verw	124.2647	1	1	1
853. Krankenschwestern, -pfleger, Hebamm	149.2129	1	1	1
854. Helfer in der Krankenpflege	43.83333	1	0	1
855. Diätassistenten, Pharmazeutisch-tec	102.5455	1	1	1
856. Sprechstundenhelfer	96.63309	1	0	0
857. Medizinallaboranten	173.1724	1	1	1
861. Sozialarbeiter, Sozialpfleger	76.21154	1	1	1
862. Heimleiter, Sozialpädagogen	100.766	1	0	1
864. Kindergärtnerinnen, Kinderpflegerin	137.3428	1	0	1
872. Gymnasiallehrer	116.4615	1	0	0
873. Real-, Volks-, Sonderschullehrer	117.2679	1	0	0
877. Sonstige Lehrer	38.5	1	1	1

- Occupations in sample (min. N =20):

881. Wirtschafts- und Sozialwissenschaft	92.51163	0	1	1
882. Geisteswissenschaftler, anders nich	85.88889	0	0	1
883. Naturwissenschaftler, anders nicht	97.25	0	0	1
901. Friseure	72.31481	1	0	1
911. Gastwirte, Hoteliers, Gaststättenka	71.2	1	1	1
912. Kellner, Stewards	44.37209	1	1	1
921. Hauswirtschaftsverwalter	58	1	0	1
923. Hauswirtschaftliche Betreuer	17	1	0	0
933. Raum-, Hausratreiniger	37.11111	0	0	0

- PWCE-Model: individual level covariates only

Exponential regression -- log relative-hazard form

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No. of subjects      =          5974      Number of obs      =          29869
No. of failures     =          3925
Time at risk        =          604124

Log pseudolikelihood = -8319.6963      wald chi2(18)     = 115934.54
                                          Prob > chi2       =           0.0000
    
```

(Std. Err. adjusted for 5974 clusters in newid)

_t	Haz. Ratio	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
t1	.0062035	.0003901	-80.82	0.000	.0054841	.0070173
t2	.0073492	.0004614	-78.25	0.000	.0064982	.0083115
t3	.0055927	.0003331	-87.08	0.000	.0049765	.0062852
t4	.004867	.0003116	-83.19	0.000	.0042931	.0055176
t5	.0039643	.0002357	-93.03	0.000	.0035283	.0044542
t6	.0036493	.0002001	-102.35	0.000	.0032774	.0040635
t7	.0029279	.0001654	-103.30	0.000	.0026211	.0032706
t8	.0016505	.0001985	-53.26	0.000	.0013038	.0020893
t9	.0035485	.001521	-13.16	0.000	.0015317	.0082206
kohort2	1.346101	.0451033	8.87	0.000	1.26054	1.437469
kohort3	2.38389	.1420788	14.58	0.000	2.12107	2.679276
sex	.8975948	.0284558	-3.41	0.001	.8435199	.9551363
edu1	1.230167	.0732618	3.48	0.001	1.09464	1.382474
edu3	.7631758	.0576153	-3.58	0.000	.6582091	.8848818
edu4	.9046741	.0405249	-2.24	0.025	.8286337	.9876925
adequate	.6524142	.0213689	-13.04	0.000	.611848	.69567
interimbr~88	1.012292	.0005016	24.65	0.000	1.011309	1.013275
direct	4.600795	.1570805	44.70	0.000	4.302998	4.919202

note: no constant term was estimated in the main equation

- PWCE-Model: individual level covariates and structural characteristics of occupations

Exponential regression -- log relative-hazard form

```

No. of subjects      =          5974          Number of obs      =          29869
No. of failures     =          3925
Time at risk        =          604124
Log pseudolikelihood = -8298.3325          wald chi2(21)     = 115227.23
                                                Prob > chi2       =          0.0000
    
```

(Std. Err. adjusted for 5974 clusters in newid)

_t	Haz. Ratio	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
t1	.006437	.0005633	-57.65	0.000	.0054224	.0076415
t2	.0076518	.0006636	-56.19	0.000	.0064557	.0090695
t3	.0058446	.0004494	-60.83	0.000	.0049523	.0068977
t4	.005092	.0004447	-60.46	0.000	.0042909	.0060426
t5	.0041488	.0003494	-65.12	0.000	.0035175	.0048935
t6	.0038177	.000311	-68.34	0.000	.0032542	.0044787
t7	.0030484	.0002513	-70.27	0.000	.0025936	.003583
t8	.0017126	.0002332	-46.79	0.000	.0013115	.0022363
t9	.0036928	.0016098	-12.85	0.000	.0015713	.0086782
kohort2	1.343092	.0454072	8.73	0.000	1.25698	1.435104
kohort3	2.405188	.1439225	14.67	0.000	2.139018	2.704478
sex	.8358173	.0290493	-5.16	0.000	.7807777	.8947369
edu1	1.256976	.0762976	3.77	0.000	1.115989	1.415776
edu3	.7477027	.0572298	-3.80	0.000	.6435427	.8687216
edu4	.9502927	.0483027	-1.00	0.316	.8601842	1.049841
adequate	.6343353	.0213439	-13.53	0.000	.5938517	.6775788
interimbr~88	1.012263	.0005032	24.52	0.000	1.011277	1.01325
direct	4.608697	.1584207	44.45	0.000	4.308426	4.929894
bordn	1.143318	.0639816	2.39	0.017	1.024549	1.275855
zert	.8129799	.0281884	-5.97	0.000	.759567	.8701487
bverb	.9368728	.0310641	-1.97	0.049	.8779245	.9997792

note: no constant term was estimated in the main equation

- Correlations of the structural characteristics of occupations

	bordn	zert	bverb
bordn	1.0000		
zert	0.1409*	1.0000	
bverb	-0.2718*	-0.0237*	1.0000

- Correlations of the structural characteristics of occupations and cohorts

	bordn	zert	bverb	kohort1	kohort2	kohort3
bordn	1.0000					
zert	0.1409*	1.0000				
bverb	-0.2718*	-0.0237*	1.0000			
kohort1	-0.0243*	-0.0258*		1.0000		
kohort2			0.0129	-0.8036*	1.0000	
kohort3	0.0365*	0.0468*	-0.0143	-0.4048*	-0.2189*	1.0000

- Correlations of the structural characteristics of occupations and sex

	bordn	zert	bverb	sex
bordn	1.0000			
zert	0.1409*	1.0000		
bverb	-0.2718*	-0.0237*	1.0000	
sex	-0.1042*	-0.3275*	-0.0624*	1.0000

- Correlations of the structural characteristics of occupations and education

	bordn	zert	bverb	edu1	edu2	edu3	edu4
bordn	1.0000						
zert	0.1409*	1.0000					
bverb	-0.2718*	-0.0237*	1.0000				
edu1	-0.0500*	0.0368*	0.0366*	1.0000			
edu2	0.3613*	0.0295*	-0.1975*	-0.4490*	1.0000		
edu3	0.0459*	-0.0218*	0.0314*	-0.0693*	-0.3856*	1.0000	
edu4	-0.4440*	-0.0497*	0.2000*	-0.1217*	-0.6769*	-0.1045*	1.0000

- Correlations of the structural characteristics of occupations and adequate occupation

	bordn	zert	bverb	adequate
bordn	1.0000			
zert	0.1409*	1.0000		
bverb	-0.2718*	-0.0237*	1.0000	
adequate	0.1247*	-0.1061*	-0.0296*	1.0000

- Correlations of the structural characteristics of occupations and cum. job interruption

	bordn	zert	bverb	inter~88
bordn	1.0000			
zert	0.1409*	1.0000		
bverb	-0.2718*	-0.0237*	1.0000	
interimbr~88	0.0524*			1.0000