Kambourov & Manovskii (2005): "Occupational Specificity of Human Capital"

Prof. Sargent's Reading Group

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Question of the paper

Besides general labor-market experience, what drives wage growth?

- $EmpTen$: tenure with employer
- $OccTen$: tenure in occupation
- $IndTen$: tenure in an industrial sector

Previous literature:

- Shaw (1984, 1987): papers on occupation-specific skills "[that were largely] ignored by the literature."
- "Perhaps this is due to the well-known fact that survey data on occupation and industry affilitation are riddled with measurement error."

Motivating fact

US Displaced Workers Survey:

- Displaced from job in last 5 years: 15% reduction in weekly earnings
- Displaced and changed occupation: 18% drop
- Displaced but stay in occupation: 6% drop

New data

Panel Study of Income Dynamics (PSID), 1999: *Retrospective Occupation-Industry Supplemental Data Files*

- Assigns 3-digit 1970 Census codes to reported occupations and industries
- Done for household heads and wives
- 1968-1980

Use this to

- estimate returns to $OccTen$ vs. $IndTen$, $EmpTen$
- evaluate different methods to identify occupation/industry switches (skip here)

Retrospective Files

- Both original and retrospective file assign code based on worker's job description in interview.
- But: Coders could compare job descriptions over years in retrospect
- 2-digit occupational mobility (switch Occ between two years) 1976-1980:
  - Original files: 26%
  - Retrospective files: 11%
- Authors present evidence that the retrospective files do better at identifying true switches.

Estimation equation

$$\ln w_{it} = \gamma' x_{it} + \beta_0 EmpTen_{it} + \beta_1 OJ_{it} + \beta_2 OccTen_{it} + \\ + \beta_3 IndTen_{it} + \beta_4 WorkExp_{it} + \theta_{it}$$

$EmpTen_{it}$:	Tenure of i with current employer at t
$OccTen_{it}$:	Tenure in occupation
$IndTen_{it}$:	Tenure in industry
$WorkExp_{it}$:	Labor-market experience
OJ_{it}:	Dummy for first year with current employer

Residual

$$\theta_{it} = \mu_i + \lambda_{ij} + \xi_{im} + \nu_{in} + \varepsilon_{it}$$

μ_i: individual fixed effect

λ_{ij}: Employer-match component

ξ_{im}: Occupation-match component

ν_{in}: Industry-match component

ε_{it}: Error term

Endogeneity!

An idea for IV

Make tenure vector orthogonal on fixed effects (graph!). For occupation:

$$\tilde{OccTen}_{it} = OccTen_{it} - \frac{1}{T_{it,Emp}} \sum_{i=1}^{T_{it,Emp}} OccTen_{it}$$

Removes correlation with

- μ_i: worker fixed effect
- ξ_{im}: Occ-match component.

Problems with this IV

$\tilde{OccTen}_{it}$ is still correlated with (see graph!)

- λ_{ij}: Emp-match effect
- ν_{in}: Ind-match effect

For within-spell-demeaned $\tilde{EmpTen}$ and $\tilde{IndTen}$, have similar problems:

- $\tilde{EmpTen}$: potentially correlated with Ind-match and Occ-match effect
- $\tilde{IndTen}$: potentially correlated with Occ-match and Emp-match effect

"Arguing for orthogonality" (I)

- Authors argue for each potential correlation: Can't affect β_{OccTen}
- Most problematic: Workers might shop for...
  - ...better Emp-match inside Occ
  - ...better Ind-match inside Occ

  Could bias up β_{OccTen}!

"Arguing for orthogonality" (II)

$Empl/Ind$-shopping inside Occ creates no problems since:

- Most Emp-switching early in career, but results still hold for sample of old workers
- If high-paying firms select Occ-experienced workers: *Should* indeed attribute these wage gains to $OccTen$!
- Supporting data on Emp-changes (see next slide)

Data on employer changes

Layoffs vs. voluntary quits (PSID survey question):

	One digit		Two Digit		Three Digit	
	Switch	Stay	Switch	Stay	Switch	Stay
% layoffs	.371	.363	.370	.366	.378	.341
(St. Err.)	(.028)	(.031)	(.026)	(.033)	(.024)	(.037)

- Altonji & Shakatko (1987): Wages . . .
  - . . . increase by 5 % on quit
  - . . . fall upon layoff
- Thus: ". . . $OccTen$ is not likely to be correlated with the quality of employer matches".

Results: Full model

	One Digit			Two Digit			Three Digit		
	2 years (1)	5 years (2)	8 years (3)	2 years (4)	5 years (5)	8 years (6)	2 years (7)	5 years (8)	8 years (9)
A. OLS									
Occupation	.0730*	.1616*	.2243*	.0750*	.1666*	.2321*	.0891*	.1995*	.2794*
	(.0076)	(.0170)	(.0232)	(.0078)	(.0172)	(.0237)	(.0082)	(.0186)	(.0259)
Industry	.0279*	.0707*	.1134*	.0279*	.0695*	.1098*	.0109	.0306	.0690*
	(.0079)	(.0167)	(.0224)	(.0080)	(.0169)	(.0228)	(.0081)	(.0170)	(.0227)
Employer	.0103	.0056	.0030	.0012	-.0083	-.0151	.0010	-.0106	-.0194
	(.0139)	(.0144)	(.0160)	(.0137)	(.0145)	(.0164)	(.0136)	(.0149)	(.0172)
B. IV-GLS									
Occupation	.0368*	.0802*	.1108*	.0496*	.1069*	.1418*	.0539*	.1197*	.1680*
	(.0064)	(.0139)	(.0194)	(.0065)	(.0145)	(.0204)	(.0068)	(.0153)	(.0220)
Industry	.0212*	.0464*	.0634*	.0054	.0132	.0204	-.0020	-.0064	-.0123
	(.0068)	(.0146)	(.0199)	(.0067)	(.0141)	(.0191)	(.0071)	(.0149)	(.0201)
Employer	.0022	.0034	.0062	-.0003	.0023	.0060	.0008	.0019	.0044
	(.0093)	(.0118)	(.0152)	(.0093)	(.0124)	(.0163)	(.0095)	(.0136)	(.0182)

Results: Partial models

IV: 3-digit

	1	2	3
$EmpTen$	$.0066^*$		$.0002$
	$(.0018)$		$(.0022)$
$OccTen$		$.0239$	$.0275^*$
		$(.0034)$	$(.0036)$
...	...	...	...
$IndTen$	$.0129^*$	-0.0009	$-.0008$
$WorkExp$	$.0511^*$	$.0560^*$	$.0485^*$
$WorkExp^2$	$-.0008^*$	$-.0007^*$	$-.0008^*$

Results: Robustness

- Results robust across specifications:
  - Leave out $IndTen$
  - 1,2,3-digit classifications
  - Different definitions of Occ- and Ind-changes
- Occ-effects are always largest and significant
- IV: 2-3% $OccTen$-premium per year
- OLS: 3-5% $OccTen$-premium per year

Conclusions

- Substantial returns to $OccTen$: 12-20% over first 5 years
- $IndTen$, $EmpTen$ way less important than $OccTen$
- Results robust
- This is consistent with human capital being *occupation-specific*
- *US Displaced Workers Survey*: Occ-switcher drive the results of large earnings losses of displaced workers
- PSID Retrospective Files: Originally coded Occ and Ind often wrong