

Changes in Productivity in Job-to-Job Transitions: Evidence in Labor Mobility in Academia

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Thinking About Labor Mobility

- ▶ Why do workers move?
 - One of the fundamental questions in economics
 - Higher wages, idiosyncratic shocks, etc.
 - But do workers necessarily “gain” productivity?
- ▶ From a department’s perspective
 - Changes in movers’ productivity
 - Spillover effects of workers’ destination
- ▶ **This Paper:**
 - Faculty mobility in academia
 - Publications & co-authorship as measures of “productivity” and “network”

What We Do

How do job-to-job transition in academia impact movers' productivity and their peers/colleagues?

Data Collection & Productivity Measure

- ▶ Collect data on publications and authors
 - Publication data: IDEAS database (published & maintained by RePEc)
 - Top 300 journals according to H-Index (title, author(s), journal names, and publication year)
 - Faculty data: 164 universities and 167 liberal arts colleges
 - Academic CVs (education, graduation year, employment history, and editorial experience)
- ▶ Measure productivity of academics
 - H-index system to rank each journal and track at faculty-year level

Empirical Analysis

- ▶ Today's talk: Two-way fixed effects (TWFE) model (never-movers vs. one-time movers.)
 - Multiple movers: (Callaway and Sant'Anna, 2021) in progress!
- ▶ DID event study analysis
 - Average treatment effects of moves + persistence of the changes

Preview of Findings

- ▶ Significant increase in mover's productivity
 - Immediate effects (An increase in productivity by about 0.15 “AER” publication)
 - Effect is persistent: remains within the next 5 years of the move
- ▶ Newcomers positively affect existing peers' productivity
 - Productivity spillover seems to be “instantaneous”: small magnitude of about 0.01 AER
 - Effect gets stronger exactly after 5 years following a move

Related Literature

Labor Mobility in Academia

- ▶ Carpenter, Cone, and Sarli (2014); Conley and Önder (2014); Dong, Zheng, and Kahn (2020); Liang, Gu, and Nyland (2022)

⇒ **First study to cover a large sample with more than 3,000 faculty and 300 departments in the U.S.**

Social networks and peer effects

- ▶ Manski (1993); Goldsmith-Pinkham and Imbens (2013); Angrist (2014); Bramoullé, Djebbari, and Fortin (2020)

⇒ **Quantifying short-run and long-run peer effects through networks.**

Productivity Spillovers

- ▶ Kantor and Whalley (2014); Nagaraj, Shears, and de Vaan (2020); Moretti (2021); Teplitzkiy et al. (2022)

⇒ **Consistent spillover effects**

Outline

1 Data Description & Summary Statistics

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Data

Publications Data

- IDEAS database (published & maintained by RePEc)
- Top 300 journals according to h -index (title, author(s), journal names, and publication year)
- Author name, journal name, title, year
- How to rank publications? (Combes and Linnemer, 2010)

Table 15: Top 120 journals for the CL -index

Journal	Rk	Class	CLm	CLh	Journal	Rk	Class	CLm	CLh
quarterly j. of economics	1	AAA	100	100	j. of banking and finance	61	A	26.3	6.92
american economic review	2	AAA	98.1	96.2	canadian j. of economics	62	A	25.9	6.69
j. of political economy	3	AAA	96.2	92.6	j. of common market studies	63	A	25.2	6.34
econometrica	4	AAA	95.7	91.6	macroeconomic dynamics	64	A	25	6.27
review of economic studies	5	AAA	81	65.6	land economics	65	A	24.6	6.04
j. of financial economics	6	AA	80.6	65	industrial and corporate change	66	A	24.4	5.97
j. of monetary economics	7	AA	75.8	57.5	economic inquiry	67	A	24.2	5.87
r. of economics and statistics	8	AA	74.1	54.9	economy and society	68	A	24.2	5.86
j. of economic theory	9	AA	72.8	52.9	regional science and urban eco.	69	A	24	5.75
j. of finance	10	AA	72.2	52.1	labour economics	70	A	23.8	5.67
j. of econometrics	11	AA	68.6	47	j. of comparative economics	71	A	23.4	5.46
economic journal	12	AA	64.5	41.6	insurance: math. and economics	72	A	23.3	5.41
rand j. of economics	13	AA	63.7	40.6	j. of inter. money and finance	73	A	23.2	5.4
j. of public economics	14	AA	62	38.5	inter. j. of game theory	74	A	23.1	5.33
j. of inter. economics	15	AA	61.5	37.8	eco. dev. and cultural change	75	A	23	5.3
j. of the european eco. association	16	AA	57	32.5	oxford bull. of eco. and statistics	76	A	22.9	5.26
european economic review	17	AA	55.2	30.4	national tax journal	77	A	22.8	5.19
j. of labor economics	18	AA	55.1	30.3	explorations in eco. history	78	A	22.4	5
international economic review	19	AA	54.7	30	env. and resource economics	79	A	22.1	4.9
games and economic behavior	20	AA	54.1	29.2	social choice and welfare	80	A	21.9	4.79
review of financial studies	21	A	49.1	24.1	j. of population economics	81	A	21.8	4.76
j. of business and eco. statistics	22	A	48.1	23.2	economics of education review	82	A	21.4	4.57
j. of health economics	23	A	43.9	19.3	water resources research*	83	A	20.7	4.3

Data

Affiliations data: 164 universities and 167 liberal arts colleges from U.S. News

- ▶ Economics departments, ~3,000 faculty members in total
- ▶ Academic CVs (affiliation history by year, PhD and Bachelors graduation year and institution, editorial experience, gender)

Salary data by year from OpenPayrolls (for public institutions)

- ▶ Work in progress

We merge the Publications and Affiliations Data on first and last name (challenging!)

- ▶ Work surprisingly well: less than 1% economists share the same first and last names per our data

Finally, we aggregate “publication points” at faculty-year.

Average Years of Experience and Total Productivity by Move

Rank of Move	Mean Exp	Total productivity	Freq.
1	6.05 [4.50]	679.63 [1085.63]	1559
2	9.99 [5.53]	1322.44 [1578.29]	592
3	14.57 [7.72]	2178.49 [2322.36]	151
4	19.68 [8.22]	3755.12 [3362.26]	41
5	24.35 [6.98]	4002.08 [4415.74]	17
6	31.75 [5.18]	2511.98 [3466.85]	8
7	34.00 [5.48]	2679.44 [3668.98]	5
Total	8.09 [6.34]	1022.70 [1583.33]	2,373
Never Mover	11.003 [9.09]	792.8 [1165.08]	
Total			41,091

Notes: This table shows the average years of experience and total productivity for each corresponding move. Standard deviations are in brackets.

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Empirical Methods

Simple DiD case

- ▶ One time movers vs. never movers

$$y_{it} = \pi M_i \times Post_{it} + \mathbf{X}_{it}\beta + \alpha_{jt} + \alpha_i + \alpha_t + \varepsilon_{it}, \quad (1)$$

More complicated ‘all movers’ case

- ▶ Requires Callaway and Sant’Anna (2020)
- ▶ Work in progress

Endogeneity?

- ▶ Moves don’t happen randomly
- ▶ However, the job market does involve some degree of randomness

Potential channels for a positive effect:

- ▶ The person moves, experiences a significant boost in productivity due to having
 - new colleagues (information exchange)
 - if moved to a higher ranked institution, the “name” effect. Both testable.. work in progress!
- ▶ The person already had working papers (which we don’t observe) and they get published after the move.
- ▶ The person (mover) has high “unobserved” ability that varies by time, i.e., better network and/or effort to move.
 - To mitigate to a degree: we include individual FEs.

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Results

The Impact of Mobility on Academic Productivity, One-Time Movers vs Non-Movers

Dependent variable	(1) <i>CLm</i>	(2) <i>CLm</i>	(3) <i>CLm</i>	(4) <i>CLm</i>
$Move \times Post$	6.830*** (1.016)	5.377*** (1.078)	4.096*** (1.077)	11.713*** (2.317)
Exp		1.510*** (0.132)	1.895*** (0.133)	0.950** (0.469)
Exp^2		-0.043*** (0.003)	-0.052*** (0.003)	-0.035*** (0.003)
Observations	46,127	46,127	46,115	45,972
R^2	0.002	0.011	0.088	0.360
Individual FE				✓
Institution FE			✓	✓
Year FE			✓	✓

Notes: This table shows the results of our estimation of the DID model for one-time movers and non-movers. All regressions are weighted by department size. Robust standard errors are clustered at the institution-year level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The Impact of Mobility on Mover's Productivity

Dependent variable	(1) <i>CLm</i>	(2) <i>CLm</i>	(3) <i>CLm</i>	(4) <i>CLm</i>
<i>Move</i> × <i>Post</i>	6.640*** (2.314)	4.663** (2.143)	8.311*** (2.302)	5.885*** (2.128)
<i>Exp</i>			2.391*** (0.122)	2.121*** (0.479)
<i>Exp</i> ²			-0.058*** (0.003)	-0.050*** (0.003)
Observations	55,088	54,944	55,088	54,944
<i>R</i> ²	0.077	0.375	0.090	0.380
Mean	37.64	37.64	37.64	37.64
Individual FE		✓		✓
Institution FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓

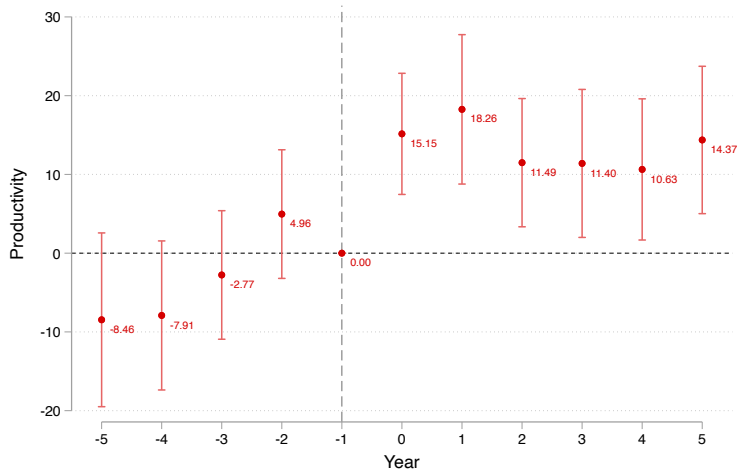
Notes: This table shows the results of our estimation of the TWFE model. All regressions are weighted by department size. Robust standard errors are clustered at the institution-year level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The Impact of Accumulative Moves on Mover's Productivity

Dependent variable	(1) <i>CLm</i>	(2) <i>CLm</i>	(3) <i>CLm</i>
<i>NumMove</i>	7.758*** (0.636)	5.269*** (1.321)	15.275*** (2.131)
<i>NumMove</i> ²			-3.505*** (0.631)
<i>Exp</i>	1.893*** (0.126)	2.185*** (0.477)	2.193*** (0.477)
<i>Exp</i> ²	-0.051*** (0.003)	-0.046*** (0.003)	-0.042*** (0.003)
Observations	55,088	54,944	54,944
<i>R</i> ²	0.095	0.381	0.382
Individual FE		✓	✓
Institution FE	✓	✓	✓
Year FE	✓	✓	✓

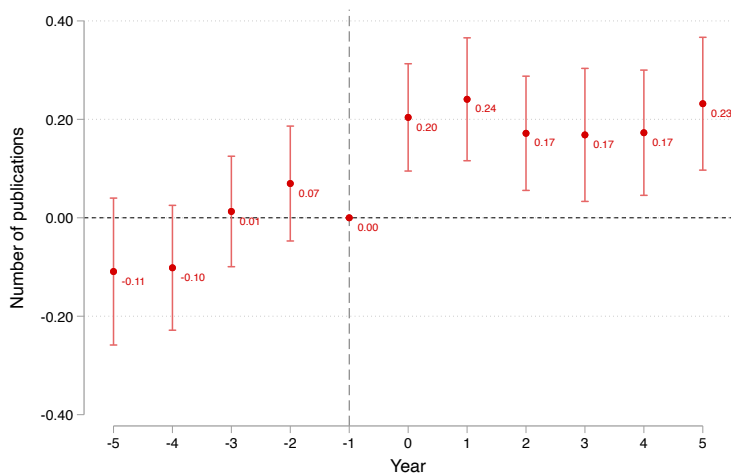
Notes: This table shows the results of our estimation of the TWFE model. All regressions are weighted by department size. Robust standard errors are clustered at the institution-year level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Dynamic Impacts of Moves on Productivity, One-Time Mover vs Non-Mover



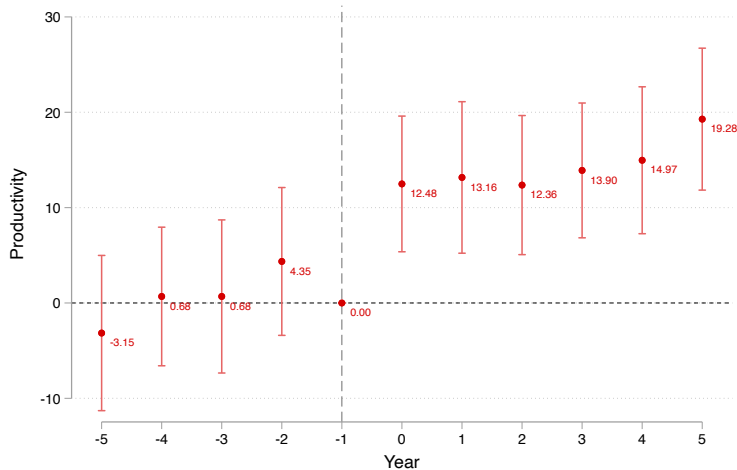
Notes: This figure shows the dynamic effects of moves on productivity for one-time mover and non-mover.

Dynamic Impacts of Moves on Number of Publications, One-Time Mover vs Non-Mover



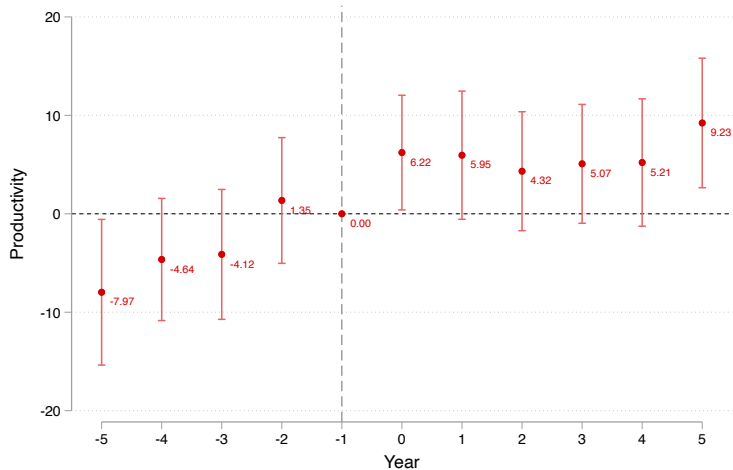
Notes: This figure shows the dynamic effects of moves on the number of publications for one-time mover and non-mover.

Dynamic Impacts of Moves on Productivity, All Moves without Individual FE



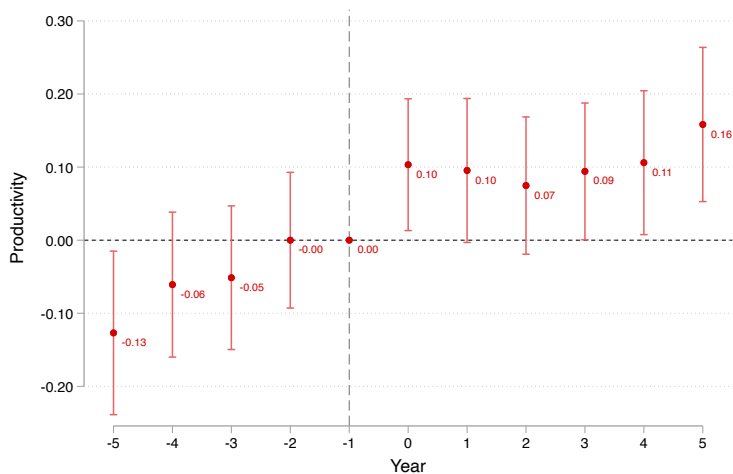
Notes: This figure shows the dynamic effects of moves on productivity for the full sample.

Dynamic Impacts of Moves on Productivity, All Moves with Individual FE



Notes: This figure shows the dynamic effects of moves on productivity for the full sample and we add individual researcher fixed effect.

Dynamic Impacts of Moves on Number of Publications, All Moves with Individual FE



Notes: This figure shows the dynamic effects of moves on the number of publications for the full sample and we add individual researcher fixed effect.

The Impact of Arrival on Department Productivity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent variable	Quality-adjusted productivity						Number of publications count					
	<i>CLm</i>	<i>CLm</i>	<i>CLm</i>	<i>CLm</i>	<i>CLm</i>	<i>CLm</i>	Count	Count	Count	Count	Count	Count
<i>Arrival</i> _{<i>t</i>-1}	1.367*	1.563*	1.681**	1.651**	1.539*	1.523*	0.010	0.010	0.010	0.010	0.007	0.005
	(0.811)	(0.808)	(0.812)	(0.805)	(0.800)	(0.799)	(0.017)	(0.016)	(0.017)	(0.017)	(0.017)	(0.017)
<i>Arrival</i> _{<i>t</i>-2}		-0.363	-0.420	-0.476	-0.460	-0.476		-0.019	-0.016	-0.019	-0.019	-0.021
		(0.764)	(0.757)	(0.748)	(0.747)	(0.748)		(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
<i>Arrival</i> _{<i>t</i>-3}			-0.001	0.033	0.037	-0.097			0.004	-0.001	-0.002	-0.007
			(0.743)	(0.748)	(0.753)	(0.743)			(0.017)	(0.017)	(0.017)	(0.017)
<i>Arrival</i> _{<i>t</i>-4}				0.523	0.800	0.853				0.015	0.020	0.020
				(0.769)	(0.782)	(0.788)				(0.017)	(0.018)	(0.018)
<i>Arrival</i> _{<i>t</i>-5}					1.204	1.335*					0.008	0.001
					(0.737)	(0.730)					(0.017)	(0.016)
<i>Arrival</i> _{<i>t</i>-6}						-0.396						-0.014
						(0.739)						(0.016)
Observations	8,238	7,923	7,629	7,345	7,076	6,810	8,238	7,923	7,629	7,345	7,076	6,810
<i>R</i> ²	0.461	0.474	0.482	0.496	0.511	0.518	0.360	0.369	0.373	0.383	0.394	0.403

Notes: This table shows the results of our estimation of the TWFE model of Equation (1). Robust standard errors are in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The Impact of Arrival on Department Productivity, Universities and LACs

	(1)	(2)	(3)	(4)
	University		LAC	
Dependent variables	<i>CLm</i>	Count	<i>CLm</i>	Count
$Arrival_{t-1}$	1.386 (0.853)	0.003 (0.018)	3.466 (2.257)	0.030 (0.040)
$Arrival_{t-2}$	-0.790 (0.816)	-0.035** (0.017)	2.264 (1.755)	0.064* (0.039)
$Arrival_{t-3}$	-0.392 (0.840)	-0.020 (0.018)	2.053 (1.467)	0.080 (0.052)
$Arrival_{t-4}$	0.945 (0.884)	0.013 (0.019)	1.024 (1.474)	0.076 (0.052)
$Arrival_{t-5}$	2.321*** (0.834)	0.022 (0.018)	-3.079** (1.232)	-0.098*** (0.037)
$Arrival_{t-6}$	-0.162 (0.863)	-0.014 (0.018)	-0.884 (1.109)	-0.014 (0.038)
Observations	4,558	4,558	2,248	2,248
R^2	0.467	0.309	0.282	0.334

Notes: This table shows the results of our estimation of the TWFE model of Equation (1) for universities and liberal arts colleges. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

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Conclusion & Discussion

Robust correlation between move and productivity.

- ▶ Whatever the source is (investing in research individually prior, or post in the new environment) the effect persists.
- ▶ From the department's perspective: some positive effect depending on the tenure process.
- ▶ Forthcoming: Heterogeneity by gender, PhD institution, co-author networks, types of moves, salary, department size..

Conclusion & Discussion

Thank you! For questions/suggestions:

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