

The Allocation of Talent over the Business Cycle and its Long-Term Effect on Sectoral Productivity

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Do economic crises reallocate talent?

- Crises affect hiring in cyclical sectors more than in acyclical sectors.
- For example, during great recession hiring in financial sector plummeted while applications to masters programs jumped up (at least at LSE).

Crises potentially change the allocation of talent across sectors:

- ① Is this transitional or long run?
- ② Does it matter beyond the individual worker (for output, productivity, innovation etc)?

Sizeable literature. In particular:

- Oyer (2008) finds that MBA graduates do not get to go to investment banking during crises, which massively affects their lifetime income.
- Von Wachter et al (2012) corroborate that graduates get worse jobs in recession and that the effects are long run.
- Bedard and Herman (2008) show that better (male) students apply for graduate school in recession.

Questions about composition of talent and its effect on outcomes remain largely unanswered.

Consider the selection of talented individuals into academia over the business cycle.

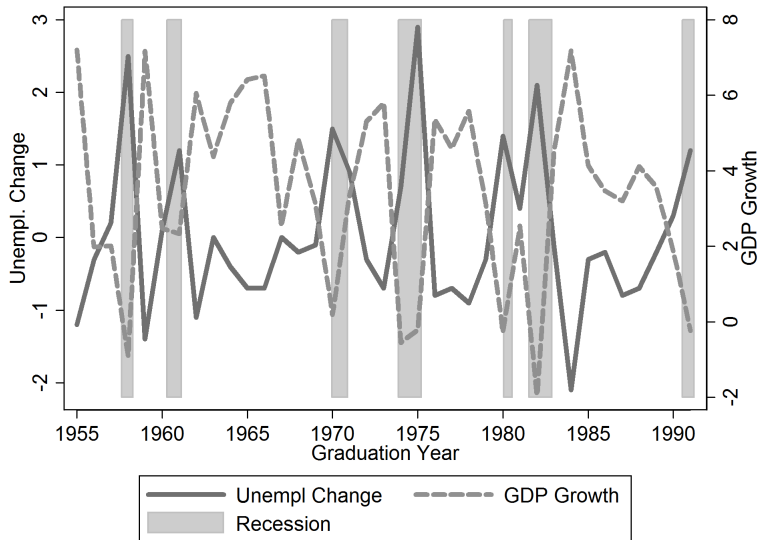
- Are more talented individuals entering PhD programs in economics during crises?
- Are more (talented) PhD graduates trying to stay in academia during crises?
- Measure talent by publication output over ten years after graduation, i.e. have real productivity effects.

- American Economic Association list of doctoral dissertations 1955 to 1994. Keep those from top 30 PhD programs.
- Match individuals with all their publications in JSTOR (1955-2004).
- NBER recessions, unemployment levels and changes, and GDP growth (1949-1994).
- Academic after PhD? Faculty listings, AEA membership, publication indicator.
- Other: university rankings, journal rankings, yearly PhD program sizes.

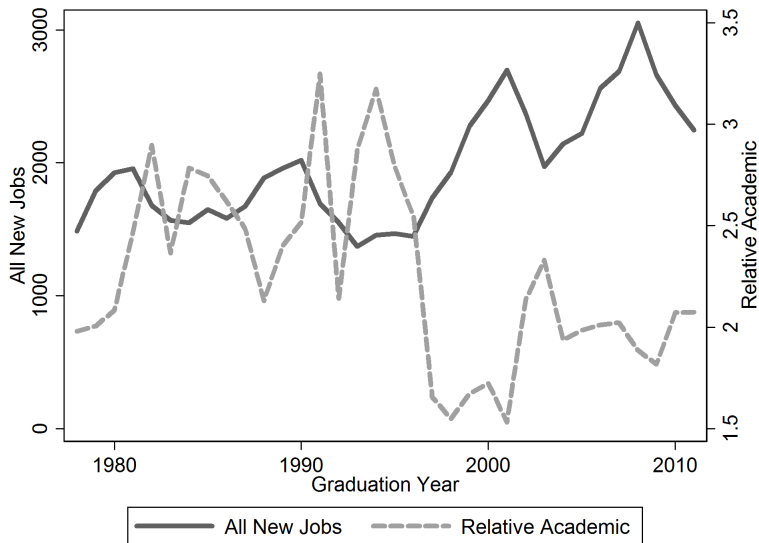
Summary statistics

	mean	sd	min	max	p10	p90
Productivity	32.42	86.56	0.00	1738.10	0.00	96.40
Productivity (Academic)	55.82	112.89	0.00	1738.10	0.00	166.80
Academic	0.50	0.50	0.00	1.00	0.00	1.00
Unemployment Change	0.05	1.06	-2.10	2.90	-0.90	1.50
Unemployment	6.03	1.55	3.50	9.70	3.80	7.70
GDP Growth	3.37	2.41	-1.94	7.20	-0.27	6.42
Recession	0.19	0.39	0.00	1.00	0.00	1.00
Observations	12210					

Business cycle variables



Relative academic job offers over the cycle

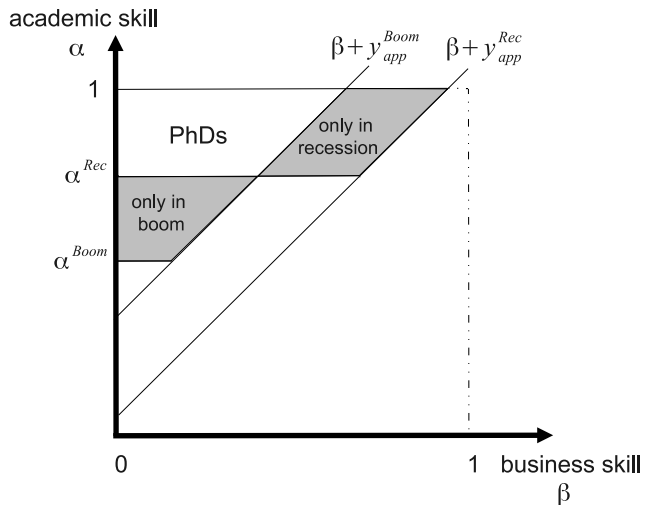


Stylized Model of Career Choice between Business and Academia

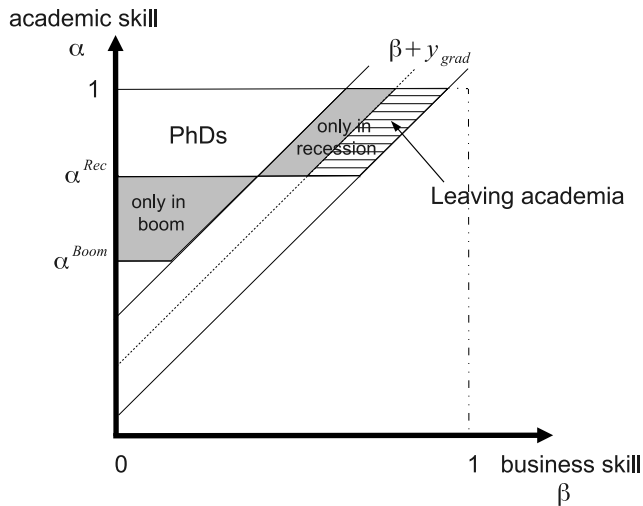
- Individuals have heterogeneous academic skill α and business skill β .
- Business hires everyone offering $w^B(\beta) = \beta + \tilde{y}_t$, where \tilde{y}_t is the state of the BC.
- (Non-)pecuniary compensation in academia also varies with BC but less so: $w^A(\alpha) = \alpha + a\tilde{y}_t$, where $a < 1$.
- Entry into top 30 PhD program is competitive (more applicants than spaces) and more or less fixed number of spaces over the BC.

Individuals choose the job that offers the highest compensation and PhD programs take the best applicants in terms of α .

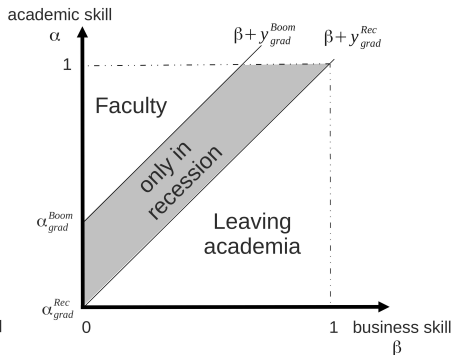
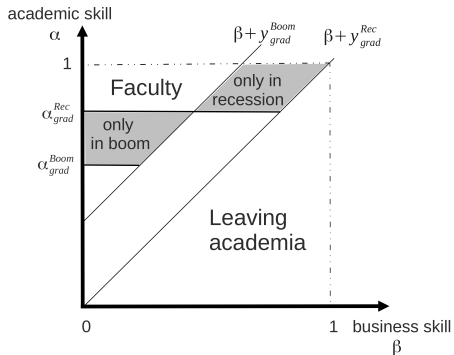
Recession PhD entrants dominate boom entrants



Fewer recession PhD entrants stay in academia



More or better recession PhDs in academia



We run regressions of the form

$$q_{i,t} = \beta \cdot y_{app,t} + \gamma \cdot y_{grad,t} + \delta \cdot \text{controls} + \epsilon_{i,t},$$

- outcome $q_{i,t}$: average publication output of PhDs / stayers in academia; propensity to stay in academia
- BC measures $y_{app,t}$, $y_{grad,t}$: recession indicators, unemployment, GDP.
- Controls: university-decade dummies.

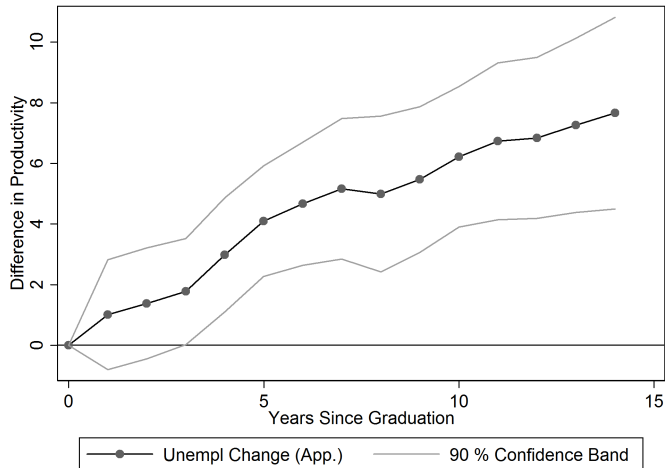
Main Regression Result (I)

	Productivity	Academic	Productivity
Unempl Change (Application)	1.50** (0.67)	-0.89 (0.58)	3.23*** (0.96)
Unempl Change (Graduation)	2.31*** (0.65)	1.36** (0.61)	2.72** (1.20)
Subsample	All	All	Academic
University-Decade Dummies	Yes	Yes	Yes
Observations	1068	1068	1047

NOTE.—Standard errors clustered on the graduation year in parentheses.

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

Long-term productivity difference of academics entering PhD at 1% higher unemployment rate.



Main Regression Result (II)

	Productivity	Academic	Productivity
Unemployment (Application)	1.54** (0.65)	-0.75 (0.79)	2.94** (1.11)
Unemployment (Graduation)	1.78** (0.74)	-0.24 (0.59)	3.04** (1.26)
GDP Growth (Application)	-0.65** (0.29)	0.47* (0.24)	-1.45*** (0.43)
GDP Growth (Graduation)	-0.70** (0.33)	-0.41 (0.27)	-0.74 (0.56)
Recession (Application)	2.08 (2.11)	-3.25** (1.55)	5.28* (2.95)
Recession (Graduation)	4.49** (2.15)	2.16 (1.28)	4.96 (3.58)
Subsample	All	All	Academic
University-Decade Dummies	Yes	Yes	Yes
Observations	1068	1068	1047

NOTE.—Standard errors clustered on the graduation year in parentheses.

- Quantile regressions show that recession PhDs are better across the distribution.
- Outcomes: different measures for productivity
- Other controls: flexible time trends, subfields, three NRC university tiers, foreign students,
- Different measures of becoming an academic.
- Controls: university-decade dummies.

- PhD entrants during typical recession 17 percent more productive than entrants during typical boom.
- Academics graduated in recession 14 percent more productive than academics graduated in boom. Additionally, three percent more recession graduates stay in academia.

Indicates that the business cycle does change the allocation of talent into academia and that this has productivity and output effects.

- Holds for other sectors as well?

THANK YOU!