Research Funding and Collaboration

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Overview

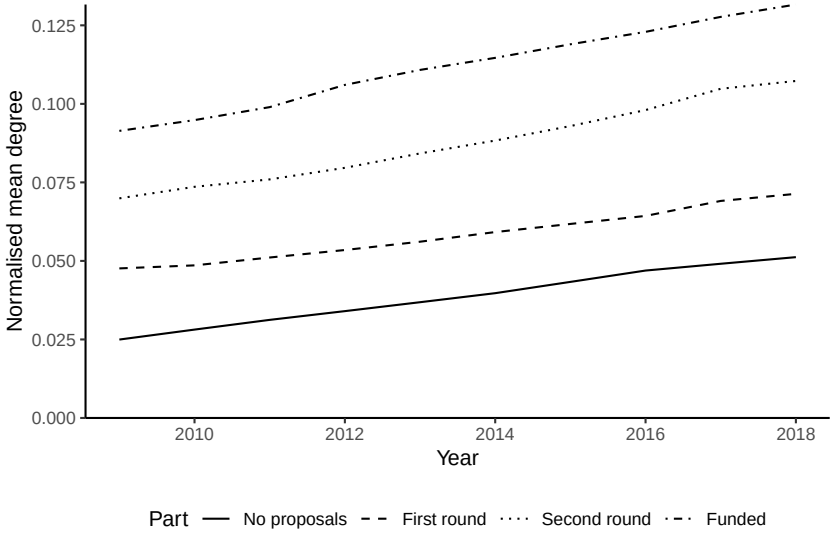
- Growing incidence/importance of co-authorship (e.g., Wuchty et al., 2007)
  $\Longrightarrow$ Growing interest in team formation mechanisms
- We study one potential mechanism: **research funding contests**
  - Shared idea creation, development
  - Screening opportunities
  - Proposal outcome signals idea quality
- In our data:
  - Researchers with more successful proposals tended to have more co-authors
  - Pairs who co-submitted during previous ten years were more likely to co-author
  - Accounting for publication lag suggests causal effect of funding on subsequent co-authorship

Data

- Scopus publication records on New Zealand (NZ) researchers and international co-authors, 1996–2018
  - 7.8 million publications (mainly articles, conf. proceedings)
  - 7.1 million author IDs
- Applications to Marsden Fund (premier funding source for basic research in NZ), 2000–2018
  - 18,811 “first round” proposals
    - 22% advanced to second round of Marsden selection process
    - 10% funded
  - 16,401 unique applicants (57% NZ-based)
- Linked set of 13,193 author-applicant pairs (hereafter “researchers”)

Co-authorship network

- Linked data define time-varying co-authorship network
  - Nodes are researchers
  - Edges join pairs who co-authored during previous 10 years
- Captures birth and decay of active collaborations over time
- Next slide:
  - partition node set by latest round $\in \{$none, first, second, funded$\}$ of Marsden process reached during previous ten years
  - compare mean degree (= # co-authors) of researchers in each part



Mean co-authorship network degree by latest round reached (as % of potential neighbors in network)

Empirical strategy

- We estimate

$$\Pr(\texttt{coauth}_{ijt} = 1) = \text{logit}^{-1}\left(x_{ijt}\beta + u_{ijt}\right),$$

  where

  - $\texttt{coauth}_{ijt} = 1$ iff researchers i and j co-author in year t
  - x_{ijt} is a vector of pair $\{i, j\}$'s characteristics in year t
  - β is a vector of coefficients to be estimated
  - u_{ijt} is an error term

- x_{ijt} contains

  - Proposal outcome dummies (e.g., co-funded in prev. 10 years)
  - Covariates intended to capture
    - assortative preferences (# prev. co-authors, # citations)
    - intellectual match quality (ASJC field overlaps)

- Observations are researcher pairs in a given year

Logistic regression estimates

Dependent variable: Co-authored in year t ($\texttt{coauth}_{ijt}$)					
	Lag between dep. and indep. variables (years)				
	One		Two	Three	Four
	(1)	(2)	(3)	(4)	(5)
Co-submitted	0.248^{***}	0.715^{***}	0.324^{***}	0.046	-0.173
	(0.017)	(0.057)	(0.066)	(0.078)	(0.097)
Co-adv. to 2nd round	0.137^{***}	-0.087	-0.218	-0.141	-0.128
	(0.029)	(0.099)	(0.114)	(0.132)	(0.159)
Co-funded	0.631^{***}	0.086	0.268	0.501^{**}	0.635^{***}
	(0.031)	(0.125)	(0.137)	(0.157)	(0.191)
Covariates		Yes	Yes	Yes	Yes
Pair and year FEs		Yes	Yes	Yes	Yes
Observations	247,110	124,619	97,450	73,263	51,841
Researcher pairs	46,052	19,091	16,620	14,060	11,408
Years	9	9	8	7	6

Standard errors in parentheses ($^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$)

Summary

- Do research funding contests promote co-authorship?
  - Our evidence from NZ's premier contest suggests "yes"
- Econometrically:
  - More successful pairs more likely to co-author
  - Controlling for covariates and FEs restricts co-authorship rate gains to submitting proposals
  - Allowing for publication lags shifts gains to funding receipt
- Funding appears to have causal impact on subsequent co-authorship
- But can't distinguish whether funding "effect" represents
  - benefit of having more resources to pursue research ideas
  - benefits associated with signal/prestige of winning Marsden grant

See NBER w27916 for more details

Thanks for listening!

Dependent variable: Co-authored in year t ($\texttt{coauth}_{ijt}$)				
	Lag between dep. and indep. variables (years)			
	One	Two	Three	Four
	(2)	(3)	(4)	(5)
Proposal dummies	Yes	Yes	Yes	Yes
Prior co-authorship	-2.193^{***}	-1.902^{***}	-1.612^{***}	-1.155^{***}
	(0.031)	(0.034)	(0.041)	(0.054)
Log mean degree	0.944^{***}	0.703^{***}	0.383^{***}	0.313^{***}
	(0.044)	(0.048)	(0.053)	(0.063)
Log diff. in degrees	-0.016	-0.001	0.035	0.006
	(0.017)	(0.019)	(0.022)	(0.027)
Log mean citation impact	0.184^{***}	0.279^{***}	0.302^{***}	0.457^{***}
	(0.042)	(0.047)	(0.054)	(0.065)
Log diff. in citation impacts	0.014	-0.019	-0.014	-0.024
	(0.014)	(0.015)	(0.017)	(0.020)
Pair and year FEs	Yes	Yes	Yes	Yes
Observations	124,619	97,450	73,263	51,841

Standard errors in parentheses ($^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$)