GENDER AND COLLABORATION

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Introduction

- Major concern: differences across gender in the workplace.
- Two important dimensions – participation and performance.
- Widespread evidence for growth in participation in knowledge intensive sectors.
- Trends in performance less well understood.
- Concrete dimension of performance: research productivity in economics.
Research Productivity: Men vs Women

![Graph showing the average number of papers produced by female and male researchers from 1975 to 2020. The graph indicates fluctuations in productivity over time.]
Sources of differences in productivity

In earlier work, we explored the role of collaboration:

- Research is very much a collaborative activity:
  - individuals discuss ideas with each other,
  - present work to colleagues and
  - co-author with each other.

- How do collaboration networks relate to the gender output gap?
General Considerations

- more collaborations facilitate access to new ideas.
- higher overlap among connections (higher clustering).
- repeated interaction (higher strength of ties) raises peer pressure and trust.

Thus differences in number of coauthors and clustering could be important.
Network Variables

- **Degree**: Number of co-authors
- **Strength of Tie**: Number of papers co-authored with same co-authors, normalized by total number of papers within a five year period
- **Clustering**: Share of co-authors that are themselves collaborators

\[
CC_{i,t} = \frac{\sum_{j \neq i; k \neq j; k \neq i} g_{ij}g_{ik}g_{jk}}{\sum_{j \neq i; k \neq j; k \neq i} g_{ij}g_{ik}}
\]

Let us look at networks of 2019 Economics Nobel Prize Laureates
2019 Economics Nobel Laureate: Esther Duflo

Network 2000-2009: Degree:19  Clustering:0.14
2019 Economics Nobel Laureate: Abhijit Banerjee

Network 2000-2009: Degree:22   Clustering:0.09
2019 Economics Nobel Laureate: Michael Kremer

Network 2000-2009: Degree: 34   Clustering: 0.04
Degree: 23% less for women
Strength: 9.4% higher for women
Clustering: 6.1% higher for women
Comparison across disciplines: Economics vs sociology

- Study the period 1963 to 1999.
- Share of women has grown over time, but output difference remains significant.
- Sociology exhibits similar network differences as economics.

Fraction of women

Year


Fraction of women

Year
Productivity Across Years: 1970-1999

![Graph showing productivity trends across years from 1970 to 1999.](image-url)
Possible explanation for observed differences

Approach: differences in costs and benefits and in opportunities. There are two primary routes for forming collaborations.

- Collaborations with unknown or new colleagues.
- Collaborations with colleagues introduced by current collaborators.

Parsimonious assumption: first channel costlier for women.
Implications for Degree, Clustering, Strength

If women have higher costs establishing new collaborations then:

1. Men will have a higher degree than women.
2. Women will have a higher clustering coefficient than men.
3. Women will have a higher strength of ties than men.

This is consistent with the empirical patterns.

Possible sources for cost difference: women may travel less than men due to family constraints, economists may be less open to forming links with female colleagues, women may be more risk averse.

Examination of network formation remain an open problem.
Summary

- Gender disparity in economics research over period 1970-2017
- Fraction of women has grown significantly
- Difference in research productivity between men and women has remained unchanged
- Sources of differences: men and women have very different collaboration networks.
- These differences also obtain in sociology.
- Propose a potential explanation for the network differences.