

# GENDER AND COLLABORATION

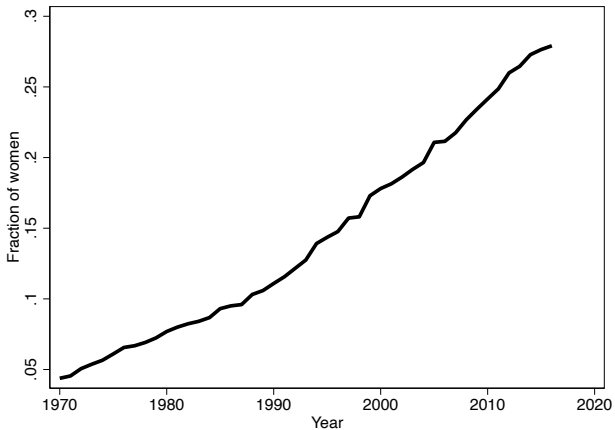
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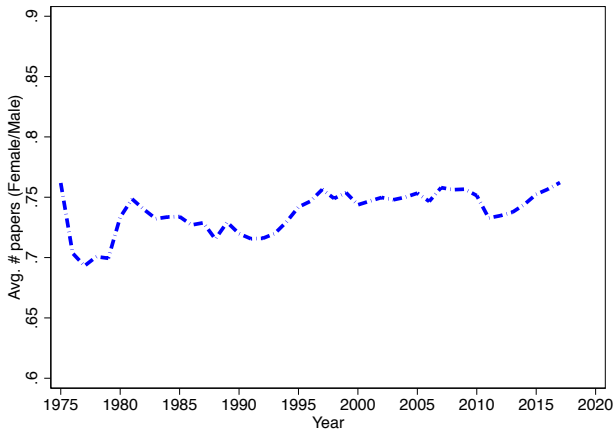
# Introduction

- 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.

## Women in Economic Research: 1970-2017



# Research Productivity: Men vs Women



# 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

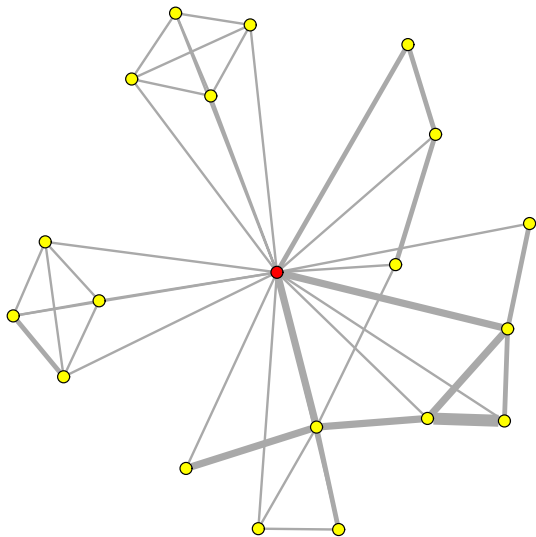
- *Degree*: Number of co-authors
- *Strength of Tie*: Number of papers co-authored with same co-authors, normalized by total number of papers within a five year period
- *Clustering*: Share of co-authors that are themselves collaborators

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

Let us look at networks of 2019 Economics Nobel Prize Laureates

# 2019 Economics Nobel Laureate: Esther Duflo

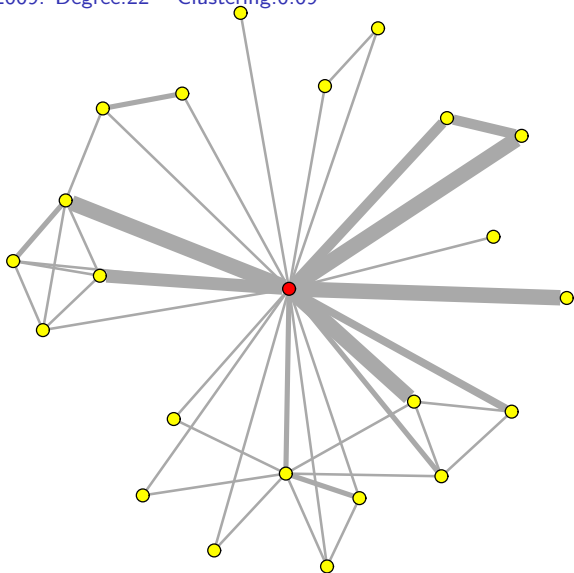
Network 2000-2009: Degree:19 Clustering:0.14





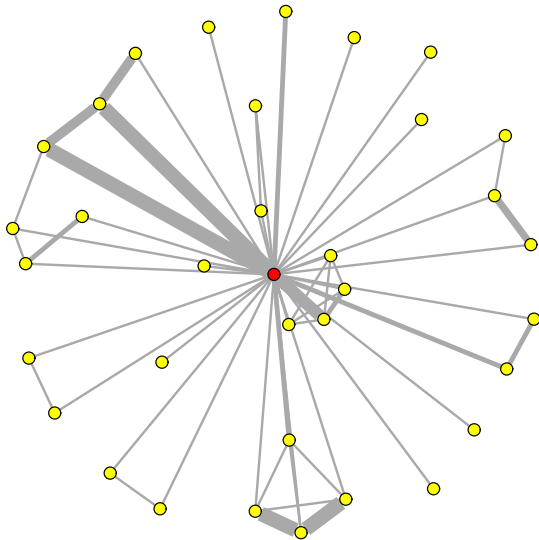
# 2019 Economics Nobel Laureate: Abhijit Banerjee

Network 2000-2009: Degree:22 Clustering:0.09

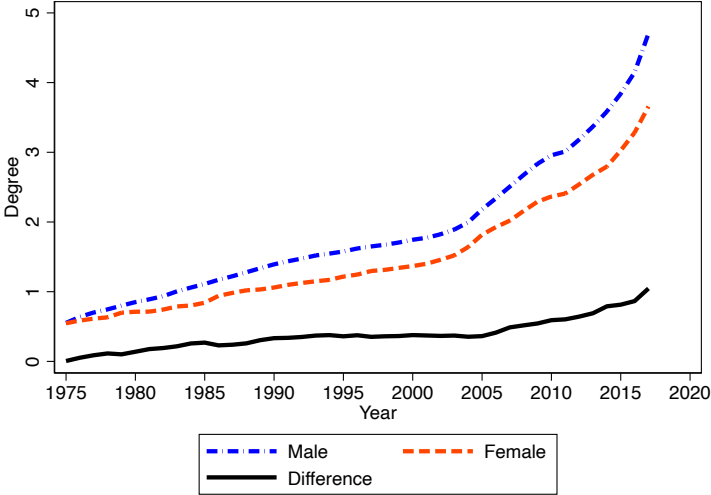


# 2019 Economics Nobel Laureate: Michael Kremer

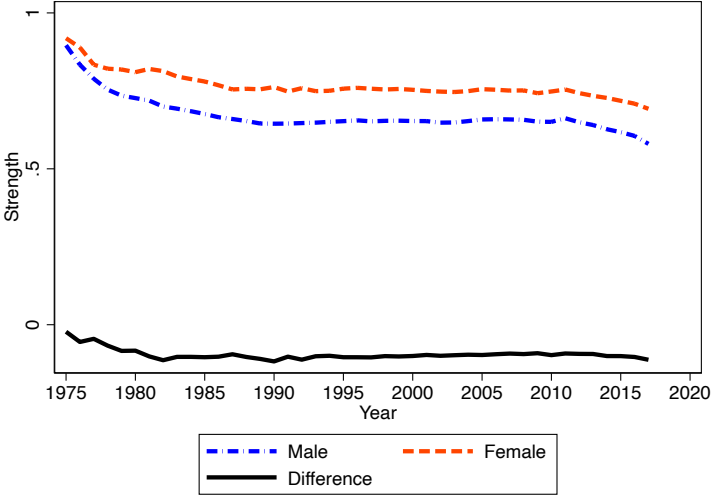
Network 2000-2009: Degree: 34 Clustering:0.04



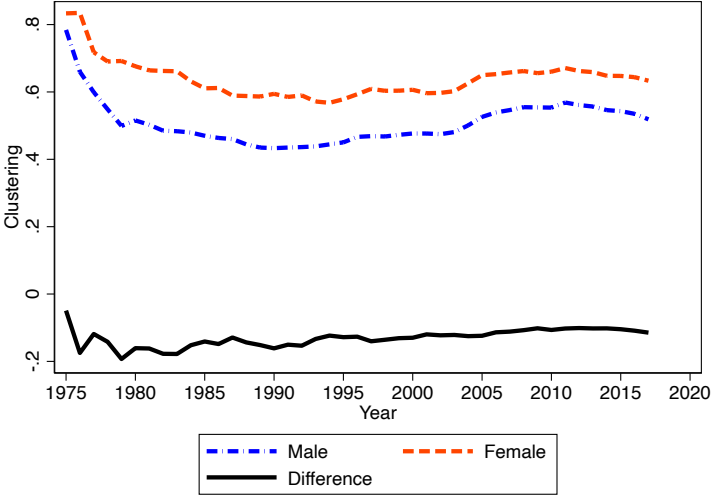
Degree: 23% less for women



Strength: 9.4% higher for women



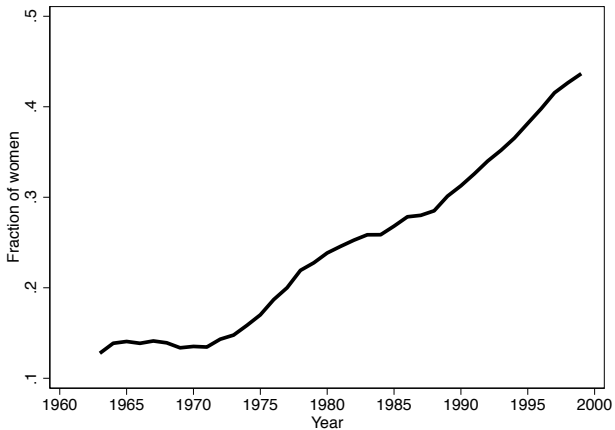
# Clustering: 6.1% higher for women



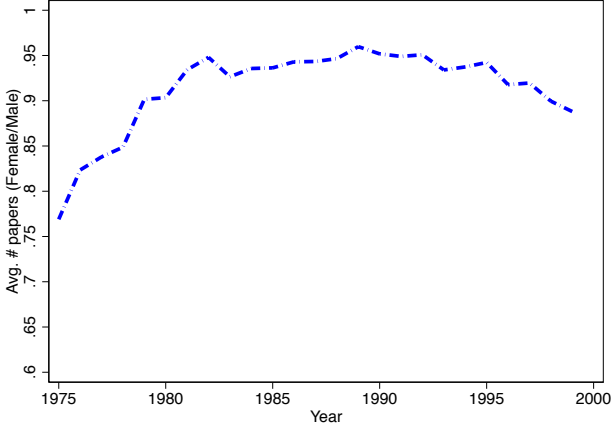
## Comparison across disciplines: Economics vs sociology

- 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.

## Women in Sociology: 1963-1999



# Productivity Across Years: 1970-1999





## 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.