

The Path of Economics Research Production

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Introduction

- Main focus
 - Composition of economics research production in terms of the share of theoretical and empirical research output (published research articles)
- Why important?
 - The production of knowledge in a discipline and the diffusion of that knowledge over time impact its ability to stay relevant, answer pertinent questions, and grow by attracting followers and support.
 - Kuhn (1962)

ECONOMICS RESEARCH PRODUCTION

Important issues

- Theoretical vs. Empirical research
- Pace of production of economic research (Ellison 2002, Hammermesh 2013, Hadavand et al 2024)
- Credibility of research findings (Angrist & Pichke 2010, Ioannidis et al 2017, Ioannidis & Doucouliagos 2013, Leamer 1983)

Useful overview of these issues in Angrist et al. 2017, Brodeur et al. 2016, Card & Dellavigna 2014 and Hammermesh 2013.

THEORY and EMPIRICS

- Shift from theoretical research to empirical research in economics
- Dominance of economic theory in research
 - WWII – notable turning point
 - Creation of new economic associations (e.g., Econometric Society)
 - Creation of influential mathematics oriented journals
 - Rise in mathematical economics and the mathematizing of economics and social sciences (Samuelson 1952, AER – appraisal of economic theory and mathematics)
 - Leading role of trailblazing economists such as Paul Samuelson
 - Influx in the economics discipline of prominent physicists/mathematicians who partially worked in economics, such as von Neumann
 - Several sources discuss rise of mathematical economics and how economics became a mathematical science (O’Rand 1992, Weintraub, 2002, 2017)

THEORY and EMPIRICS

- Increasing proportion of empirical research in economics
 - Changing structure of publishing markets
 - Increase in the number of journals
 - Entry of online journals
 - Changes in technology for producing research lowered the costs of producing economic research
 - Advancements and diffusion of computers
 - Development of econometric methods along with new computer software for doing empirical estimation/testing,
 - availability of data sets
 - internet/globalization for gathering/transcribing data
 - Lower cost of floating new journals, including online journals
 - Government agencies and private sector demanding more evidence-based research

Model

- Develop simple dynamic model to explain the shifts between theoretical and empirical research papers
- Researcher who is specialized in empirical economic research maximizes a utility function by publishing research output subject to a constraint.
- Utility is
 - an increasing function of publication of empirical research
 - An increasing function of income from empirical research
 - A decreasing function of publications in theoretical research
- There is an implied trade-off between empirical and theoretical research output

Model

- Utility $\text{Max} \int U(P, Y, p) e^{-\delta t} dt$

where

- P: publications in empirical research
- Y: income from producing empirical research
- p: publications in theoretical research
- δ : time preference

- Constraint $\dot{p} = rp \left(1 - \frac{p}{K}\right) + epy - cP$

where

- r: rate of growth of theory papers
- e: effort devoted to writing/producing theoretical papers
- y: income from theory papers
- K: upper bound (maximum number) of theory papers
- c: competition rate of empirical papers

Model Equilibrium - I

- Steady state equilibrium for empirical research and for theoretical research resulted in
 - Multiple equilibria
 - (Low P , high p) implies theory dominates economic research → stable equilibrium
 - (High P , low p) implies empirics dominates economic research → saddle point equilibrium
- Equilibrium between empirical and theoretical research depends on the relative size of the parameters r and c . As these parameters change, a shift (seesaw effect) in the balance between theory and empirics can occur.
- c can change over time due to exogenous shocks
 - technology changes
 - Change in number of publication outlets
 - Organization of publishing markets
- The shocks affecting relative sizes of r and c explain how the model moves out of (evolves from) one equilibrium to another equilibrium.

Model Equilibrium - II

- Consider a particular equilibrium when economics reaches either the maximum number of theoretical papers or of empirical papers (they do not appear conjointly because of the assumed trade-off)
- Both these equilibria are found to be structurally unstable and will not remain there
- This suggests that there will always be some balance over time between empirical and theoretical research in economics

CONCLUSIONS

- Path of production of economics research has been described by
 - Shift from economic theory dominated research production to an explosion of empirical research in economics
 - This shift largely explained by development of quantitative methods and technology driven advances in computers, software, data availability and publication outlets
- Thoughts for the future
 - how will future technological innovations affect the composition of economic research production
 - They are likely to continue having a positive effect on empirical research
 - How about theoretical research? (AI?)

Thank You!

Ideas?

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