

Economic Approaches to Understanding Career Decisions



With special attention to
minorities choosing research
careers



3 Major Patterns

- Quantify, Quantify, Quantify
 - variables, methods, and effects
- Use economic theory as a guide
 - human capital theory
- Multivariate techniques on large data sets
 - separate out influence of different factors
 - produce results that generalize to the population



Quantifying Career Decisions

- Quantifiable Variables of Interest
 - Career Outcomes
 - salary, productivity - continuous
 - attrition, promotion - limited values
 - Determinants of outcomes
 - education, family income - continuous
 - race, sex, type of school - limited values



Quantifying Career Decisions (cont.)

- Quantitative methods
 - Multivariate Regression
 - estimates linear relationship between outcome variables and the determinants of outcomes.
- Quantitative Effects
 - $\text{outcome} = a + b(\text{minority}) + c(X) + \text{error}$
 - $X =$ set of controls contributing to outcome
 - b gives the numerical effect of minority status on outcome



Human Capital Theory as a Basis for Career Studies

- An individual has a stock of human capital (skills, knowledge, ability) that she rents to employers for a wage
- Education and on the job training are examples of investments in human capital
- Decision about whether to invest or which investment to make is a ***COST BENEFIT CALCULATION*** made by a rational and perfectly informed actor



Cost Benefit Calculation may be different for minorities

- Costs - tuition, books, foregone earnings
 - depend on family income, loan availability, scholarships
- Benefits – future wages
 - depend on quality of education, job opportunities
- Discounting of future income v. current costs
 - depends on family income, family structure, expected duration of work life



Interventions to Change the Calculation

- Enhance the human capital acquisition process
 - Mentoring programs
- Increase the returns to the investment
 - Better Job Placement
- Reduce Costs
 - Fellowships
- Change weighting of future v. present
 - Better Education about Opportunities



Multivariate Analysis of Large Data Sets

- Large Random Samples of Population
 - Pros
 - results generalize to the population
 - collected by the government--quality control
 - Cons
 - information collected is quite general
 - difficult to answer specific questions in depth



Multivariate techniques

- Estimate the numerical effect of minority status on career outcome and explain why it occurs
 - Baseline Effect
 - $\text{Pr}(\text{invest}) = a - b(\text{minority})$
 - Add in variables which might explain the minority effect
 - $\text{Pr}(\text{invest}) = a - b(\text{minority}) + c(\text{family income})$
 - $\text{Pr}(\text{invest}) = a - b(\text{minority}) + c(\text{family income}) + d(\text{loans})$
 - goal is to explain away the minority effect— b approaching zero
 - Identify the factors behind the minority effect and design policy to address those factors.



Multivariate techniques (cont.)

- Estimate the quantitative effects of interventions (ex. mentorship)
 - $\text{Pr}(\text{invest}) = a + b(\text{mentor}) + c(\text{controls})$
 - estimate for majority and minority individuals
 - b gives the effect of being mentored on the probability of investing in a graduate degree
 - Problems of Selectivity
 - those who are mentored may be the smartest, most ambitious
 - mentoring effect picks up these other effects as well



Multivariate techniques (cont.)

- Solutions

- Use fancy econometric techniques
 - not very reliable or satisfying
- Create individualized data sets
 - collected from randomized trials—ethical?
 - collected from natural experiments
 - Example: compare investment in graduate degrees for graduates of a number of schools of which a subset had an institutionalized mentoring system



Conclusion -- Contribution to Understanding Careers

- Human capital theory
 - gives a framework to understand career decisions and how interventions might influence them
- Multivariate analysis of large data sets
 - gives numerical estimates of the effect of minority status on career outcomes
 - identifies factors through which minority status is affecting outcomes
 - gives numerical estimates of the effects of interventions on career outcomes