Data collection strategies

Based on RISIS publication "*W10-5.2 CDH-Plus: Building empirical lenses with official statistics*"

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Motivation

- PhD careers are changing in the knowledge society
- Trained PhDs move with their skills and knowledge from job-to-job and sector-to-sector
- These new developments raise questions on costs and benefits

→ Need for data

→ Today: Brief Review of the state of statistical evidence

Career Space

Academic vs Non-Academic:

- Traditional academic career (“retention”): PhD moves to faculty positions
- Non-Academic career (“export”): PhD moves into another sector (private or government)
- Hybrid Career: Movement back and forth to the academic sector

Domestic vs Foreign:

- Foreign-trained PhD enters labor-market from abroad
- Domestically trained PhD moves into a foreign labor-market
- Non-movers

Ehrenberg (1991): Academic Labour Supply Model

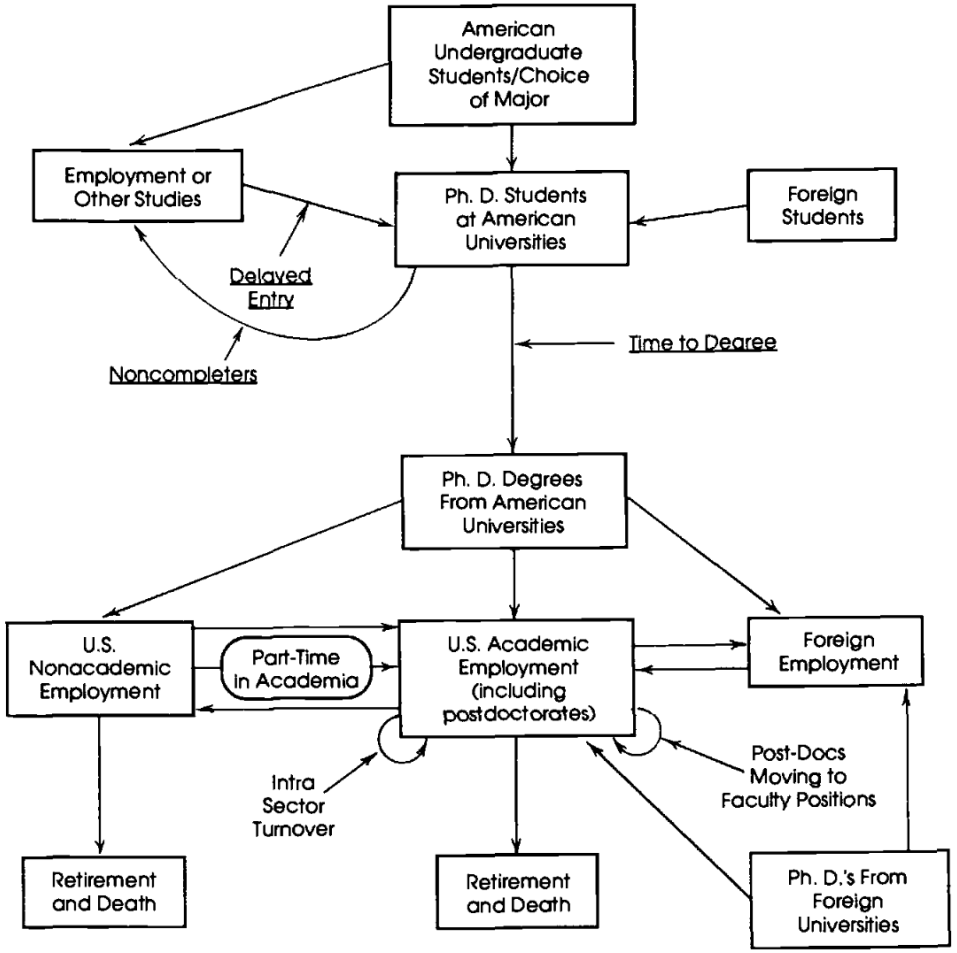

Figure 7.1 Academic labor supply.

Cañibano et al. (2019): Updated Scientific Research Career Typology

RPO type	Sector	Research career type		
Universities	Public or Private	Academic research careers	Mixed careers	Hybrid careers
Combined organizations (i.e. CRCs, ERCs)	Public and Private			
Firms	Private	Industrial R&D careers		
Government laboratories, institutes, organizations (including international organizations)	Public	Government research careers		
Hospitals	Public Private			
Non-profit organizations	Private			

Int. and National Data Collection Exercises

International work:

- OECD, EUROSTAT and UNESCO: “CDH – Career of Doctorate Holders” supplemented by European Science Foundation (ESF)
- EU’s Mobility Patterns and Career Paths (MORE) surveys
- RISIS infrastructure project

National work:

- US: NSF, Survey of Earned Doctorates (SED)
- Germany: NACAPS, Promoviertenpanel
- Finland: KOTA
- Norway: Doctoral Monitor

Emerging Patterns

- Employment in research and development is growing (European Science Foundation 2017; Eurostat 2017; LERU 2018)
- The main employment of PhDs happens outside than inside academia (Eurostat 2017; European Science Foundation 2017)
- The doctorate delivers consistently better rates of employment (ESF 2017; OECD 2016) and better financial rates of return (Zolas et al. 2015; Mertens and Röbken, 2013; Van der Steeg et al., 2014; Skovgaard Pedersen, 2016)
- The employment patterns vary greatly from discipline to discipline (Auriol et al. 2013, European Science Foundation 2017)
- Women are underrepresented in research jobs (Eurostat 2017)
- Boundary between research and non-research jobs has become much more permeable (LERU 2018).

How can PhD careers be observed empirically?

Different approaches:

- Register-based: Education and labour-market registers hold in official statistics
- Survey-based:
  - Adaptation of existing instruments, e.g. labour-force surveys
  - Dedicated surveys targeting graduating PhDs
  - Surveys targeting scientists
- Census-based: E.g. national population and housing censuses
- Document-based
  - Based on publication in bibliometric databases
  - Based on openly available dissertations
  - Based on openly available CVs
- Combinations

CDH-light / UOA Approach

- Joint UN, OECD and Eurostat intent on providing consistent metrics to observe diffusion of trained PhDs over time and across country
- Could data that are already being collected by the national agencies of ERA countries provide reliable information?
- Decentralized, depending on national statistical offices
- Apply common concepts, definitions, and classifications on domestic data

CDH-light / UOA Approach

- Gap between the potential of the CDH-light approach and results so far
- Coverage: Few countries have published their data
- Comparability: National data is derived from different national sources
  - Dedicated survey
  - Labour-Force Survey
  - Population Census
  - Register data

Dedicated survey-based approach

→ Questionnaire tageting PhD holders

Advantages

- Overcome the various data constraints in the diverse countries with single harmonized approach
- More granular information on the person, the degree, and the workforce participation in one single data collection

Disadvantages

- Reducing int. comparability by national surveys
- Costly to put into the field, to harvest and to compile affecting for example timeliness
- Might be better suited to inform about labour market snapshot than time series of career job changes
- Methodical survey challenges, e.g. self-reporting, sampling frame, non-responses
- Sample-based

Labour-Force Survey Approach

→ Adapt existing labor force surveys

→ Indicators about the labour market and the population

- Advantages:
  - Light-weight approach: Based on an existing data harvesting procedure
  - Carried out regularly
  - Same instrument is deployed in many European countries
- Disadvantages
  - Snapshot approximation of the labor-market status at given points in time, no career over time
  - Population frame based on the entire labour force, does not specifically target PhDs
  - Sample-based

Register-based approach

→ Use of existing administration data

→ Data collection and matching on individual level

- Generic information (Gender, age, migratory status)
- Educational attainment
- Employment: status, current employer(s), earnings

- Advantages
  - "Light" approach relying on previously collected data
  - Traces careers of PhDs: sectors, employers, location, income levels
  - Population-based
- Disadvantages
  - Availability of data and feasibility of data matching
  - Reduced information depth/width compared to survey

Document-based approaches

- CV-based
  - Advantage: Self-reported career can be observed
  - Disadvantage: Data availability is restricted
- Publication-based
  - Advantage: Details on academic/bibliometric career
  - Disadvantage: Coverage, information depth/width
- Dissertation-based
  - Advantage: Centralised and information rich starting point
  - Disadvantage: Combination with other sources required to observe career