The Creation of the Employment Dynamics Estimates

John M. Abowd (Cornell U/CISER; U.S. Census Bureau; NBER; CREST),
Paul A. Lengermann (U of Maryland; U.S. Census Bureau),
Lars Vilhuber (Cornell U/CISER; U.S. Census Bureau; York U, Toronto)

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Background

- Turbulent economy
  - Firm entry and exit
  - Job creation and destruction, worker churning
  - Worker mobility
- Economists and statisticians need data to understand this at many levels of disaggregation
  - Geography
    - Workplace
    - residence
  - Demographic (age, gender)

Indicators

Current	New
Jobs Total payroll	Jobs Total payroll Gross job loss Net jobs New hires

Demography

Current	New
None	Male Female Age categor 14-18 19-21 22-24 25-34 35-44 45-54 55-64 65+ Immigrant Native born

Location

Current	New
Workplace	Workplace Residence

Geography

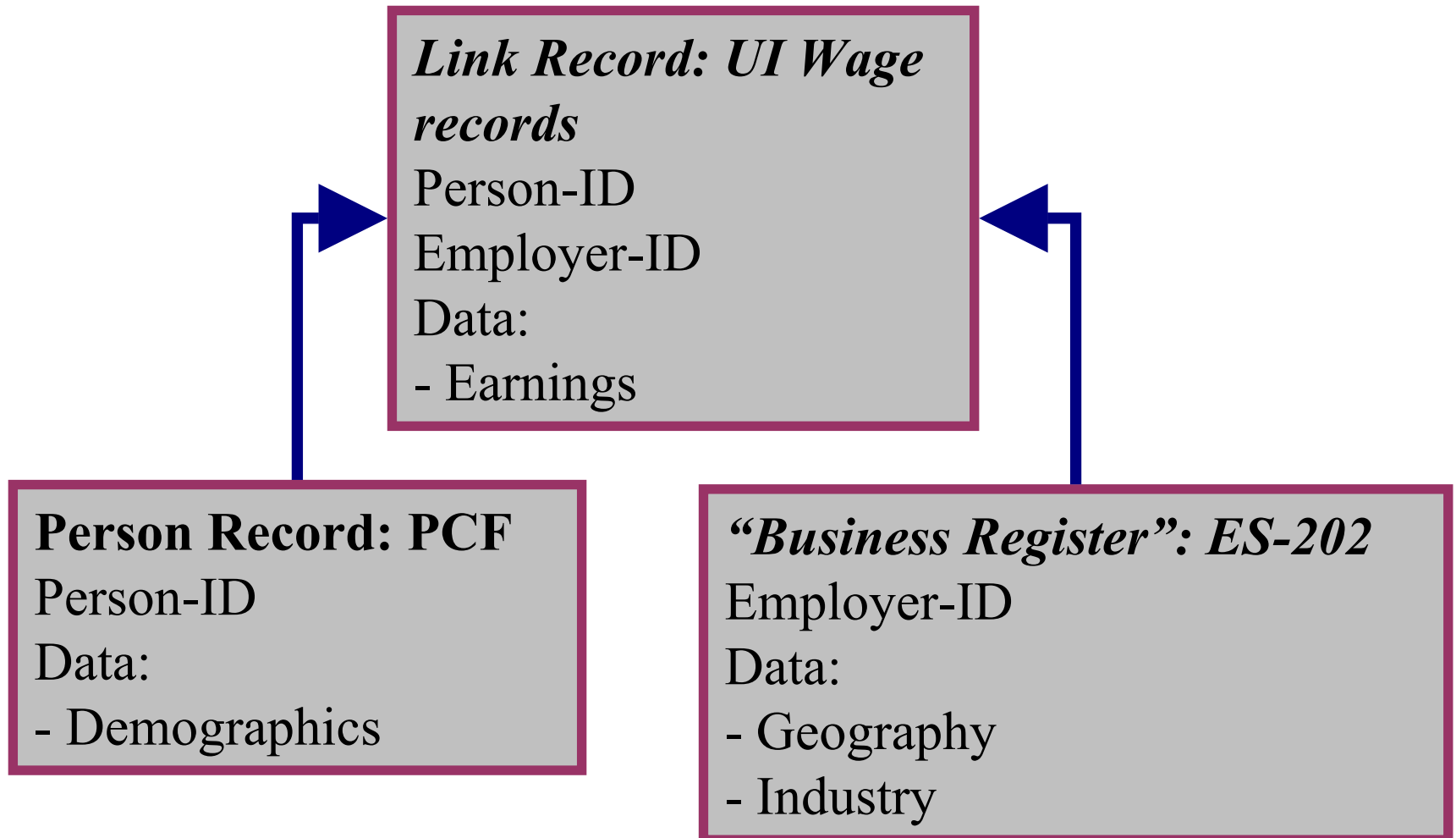| Current	New
National State County	National State County Sub-county Workforce investment area

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Employment Dynamics

- Present statistics only show uni-dimensional job creation and destruction
- Linked data permit disaggregation of existing measures and creation of new measures
  - by demography
  - By 4-digit SIC
  - workplace vs. residence
  - Worker flows vs. job flows
- Has not existed because
  - Data acquisition cost
  - (Computer) technology

The Longitudinal Employer - Household Dynamics Program

Demographic Surveys

Household Record
Household-ID
Data

Person Record
Household-ID
Person-ID
Data

Link Record
Person-ID
Employer-ID
Data

Economic Censuses and Surveys
Census Entity-ID
Data

Business Register
Employer-ID
Census Entity-ID
Data

The Longitudinal Employer - Household Dynamics Program

Link Record: UI Wage records
Person-ID
Employer-ID
Data:
- Earnings

Person Record: PCF
Person-ID
Data:
- Demographics

"Business Register": ES-202
Employer-ID
Data:
- Geography
- Industry
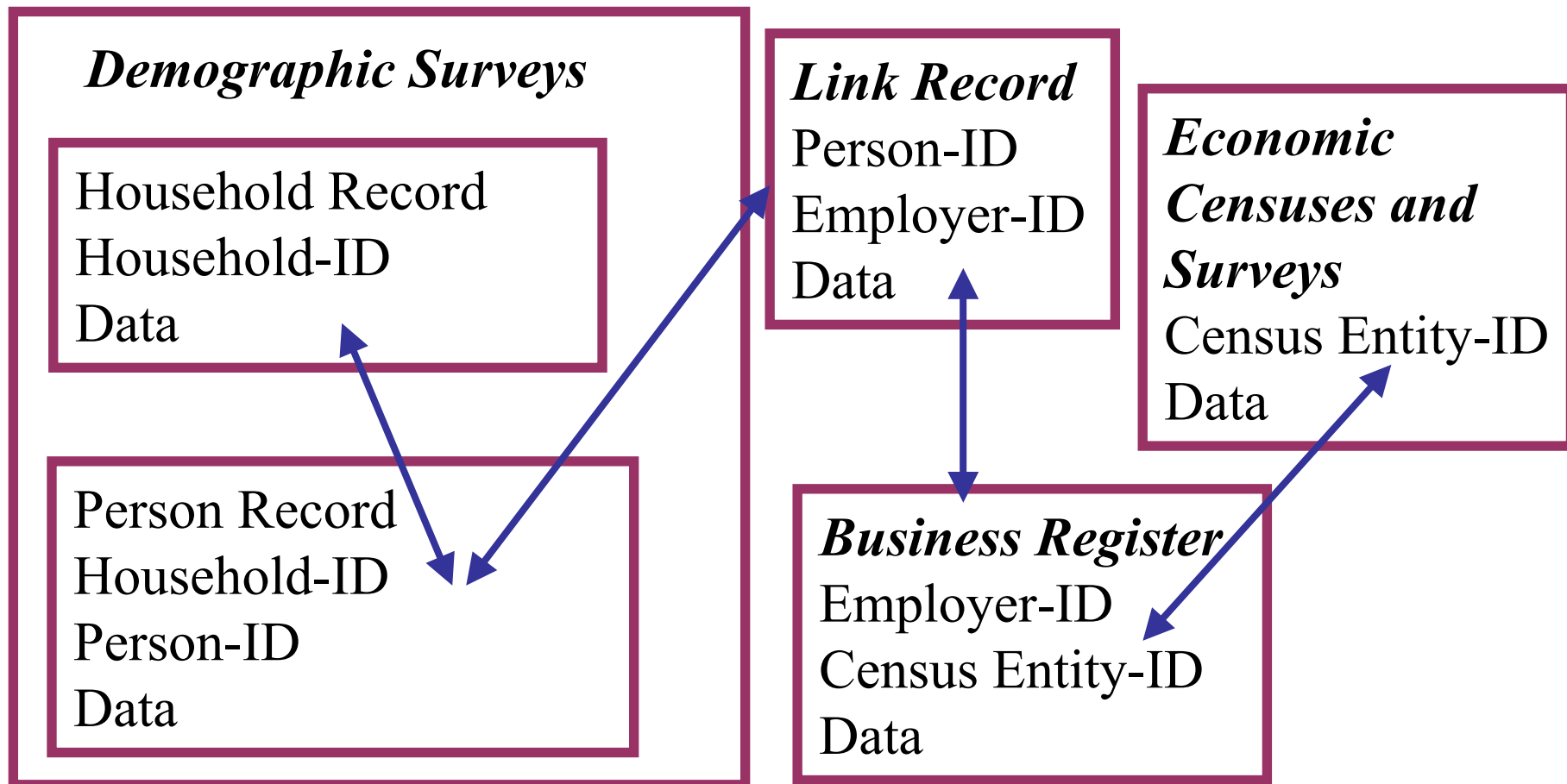
EDE Overview

- Base Data
- Processing
  - Standardization
  - Editing of Identifiers
- Creation of EDE Internal Files
- Disclosable EDE Statistics

State Data

- Data
  - Received: *UI wage record and ES-202* data for California, Florida, Illinois, Maryland, Texas, Minnesota, North Carolina, Pennsylvania.
  - New Jersey, Oregon to come
  - Currently covers 60% of US workforce
- Expansion to US universe over next four years
- Received quarterly (six months after transaction date)
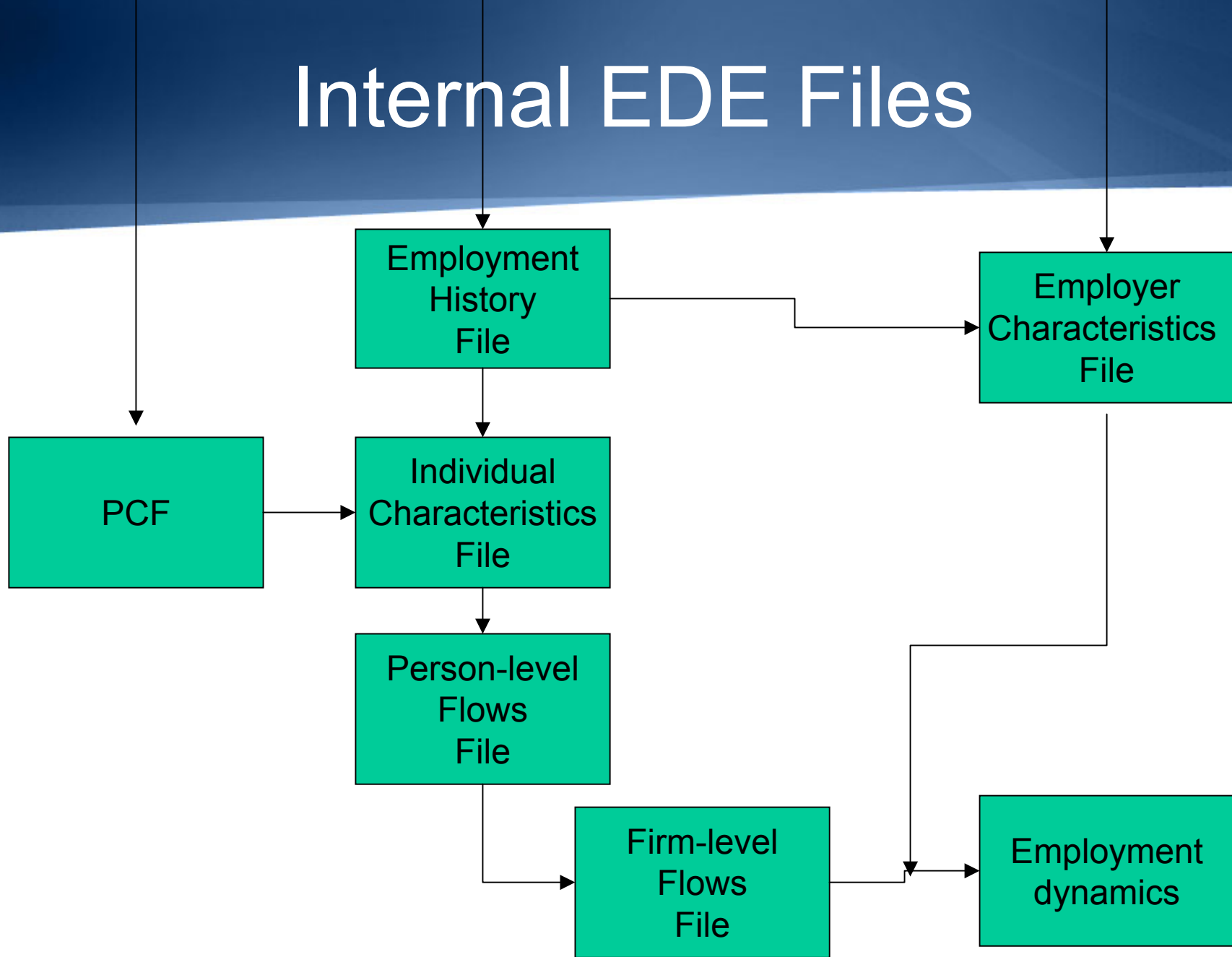
Standardization/Anonymization
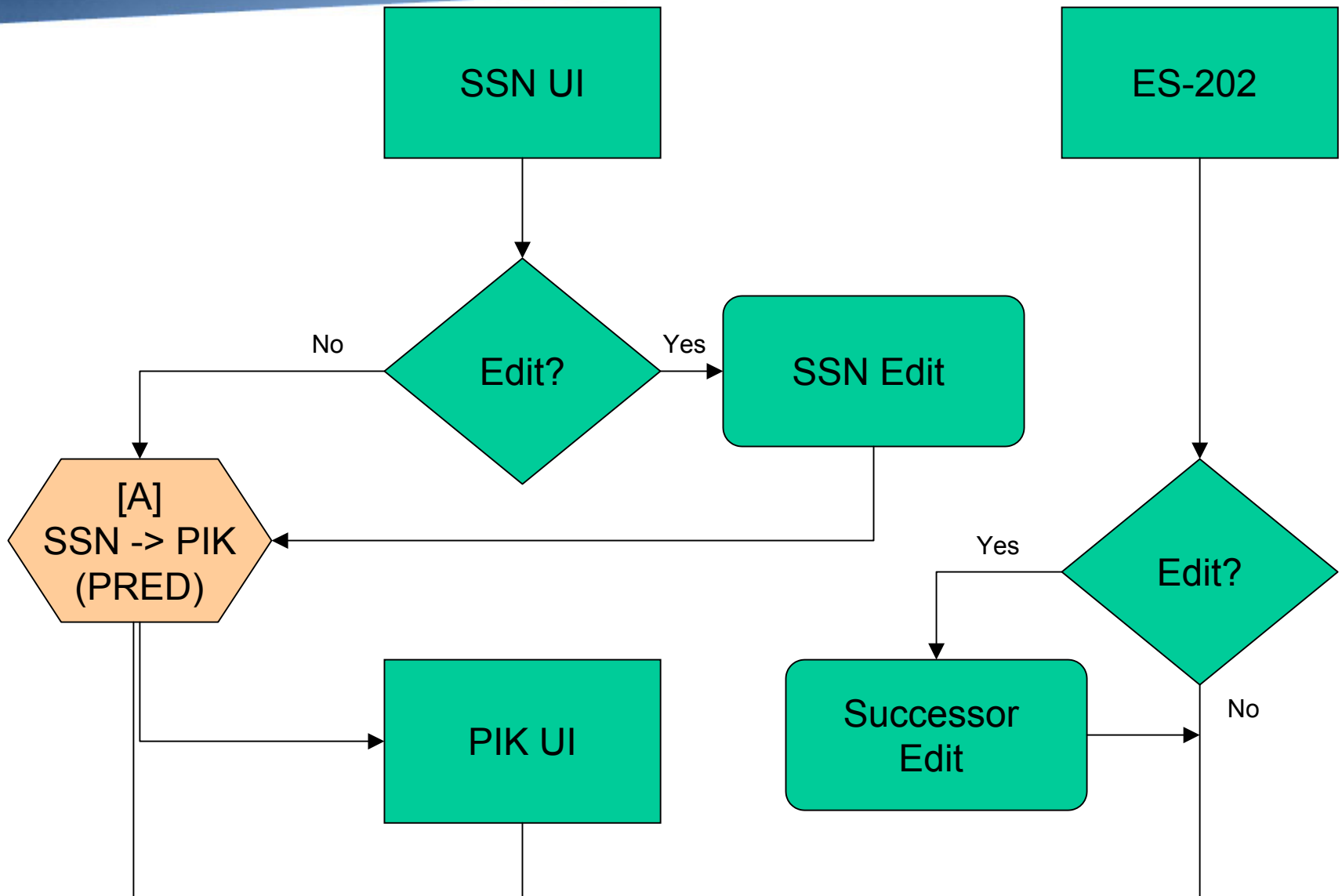
Editing Identifiers

- Problem:
  - Miscoding of SSNs
  - Administrative change in UI account number of firms
- Solution:
  - Identification of miscoded SSNs based on job history, earnings, name information
  - Identification of successor firms based on large cross-"firm" movements of workers
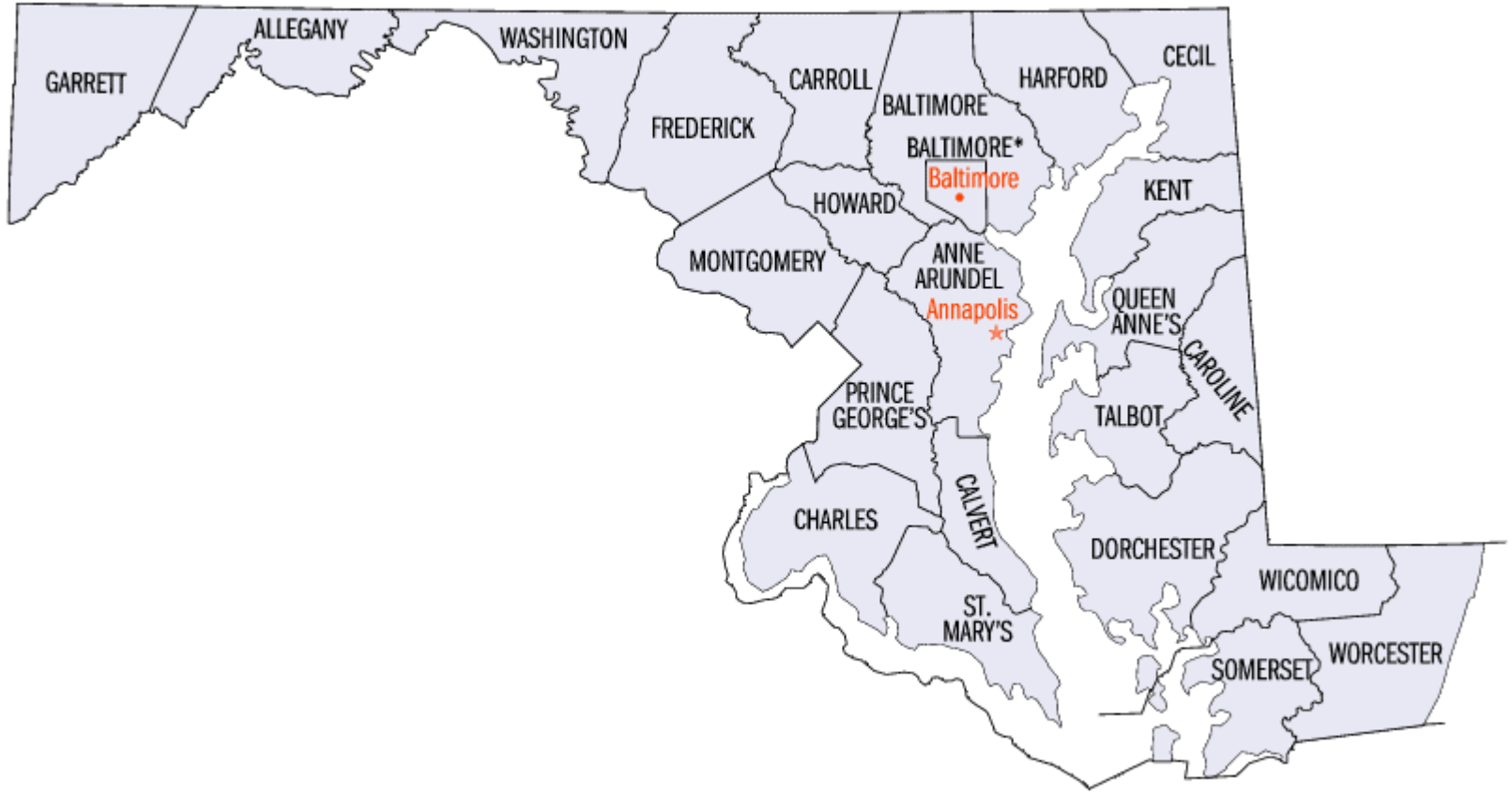
Editing Identifiers: Results

- 7-15% of single-period interruptions of job spells are found to be spurious
- 70-260% additional firm-ID links can be identified using UI wage records than from using ES-202 data
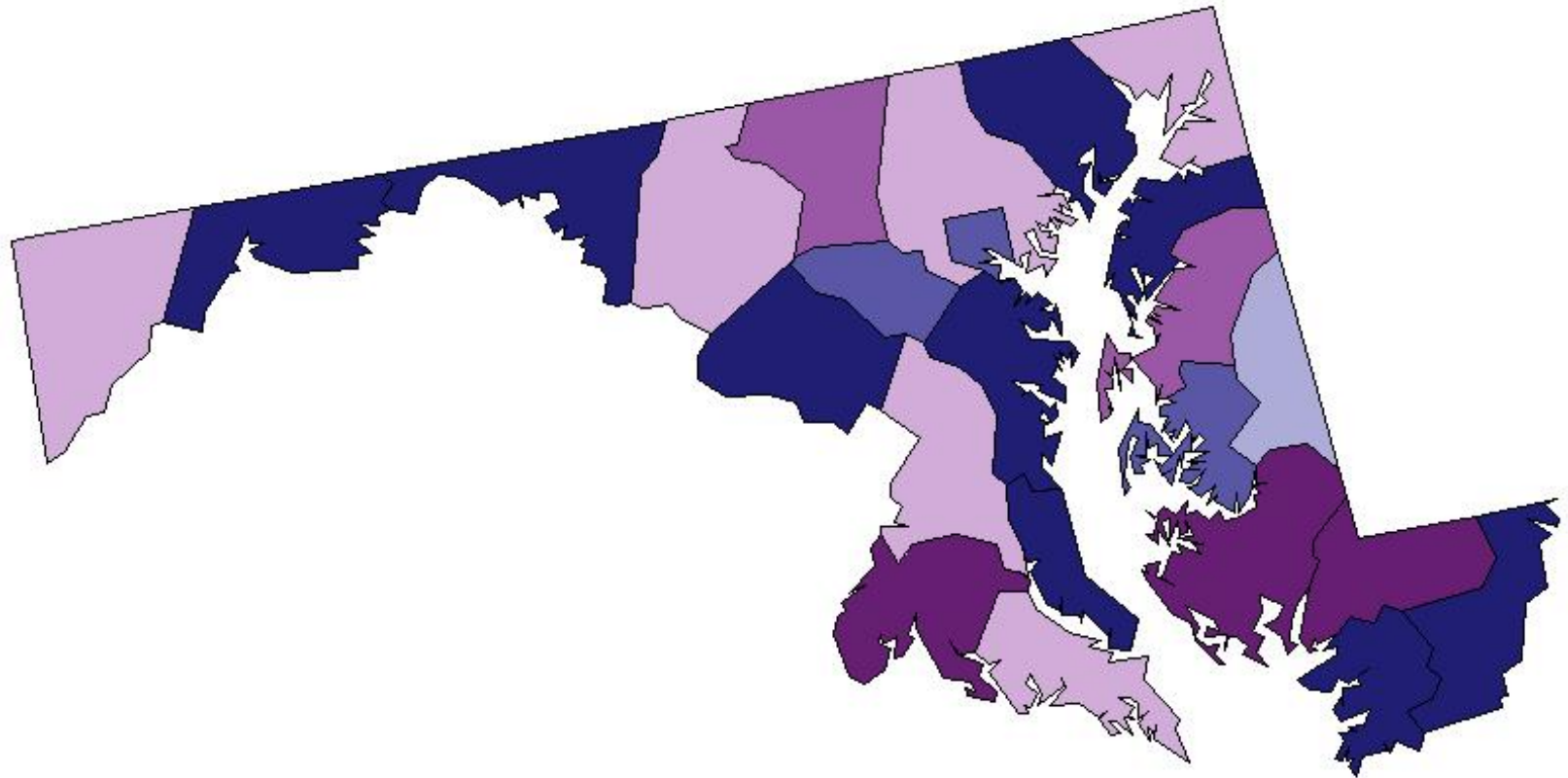
Internal EDE Files

```
                          Employment
                           History ──────────────┐    Employer
                            File                  └──▶ Characteristics
                              │                         File
                              ▼                           │
    PCF ──▶ Individual                                    │
            Characteristics                               │
            File                                          │
              │                                           │
              ▼                                           │
            Person-level                                  │
            Flows                                         │
            File                                          │
              │                                           │
              ▼                                           ▼
                          Firm-level ──────────▶ Employment
                          Flows                  dynamics
                          File
```
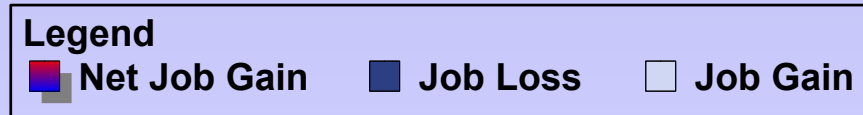
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Maryland Example
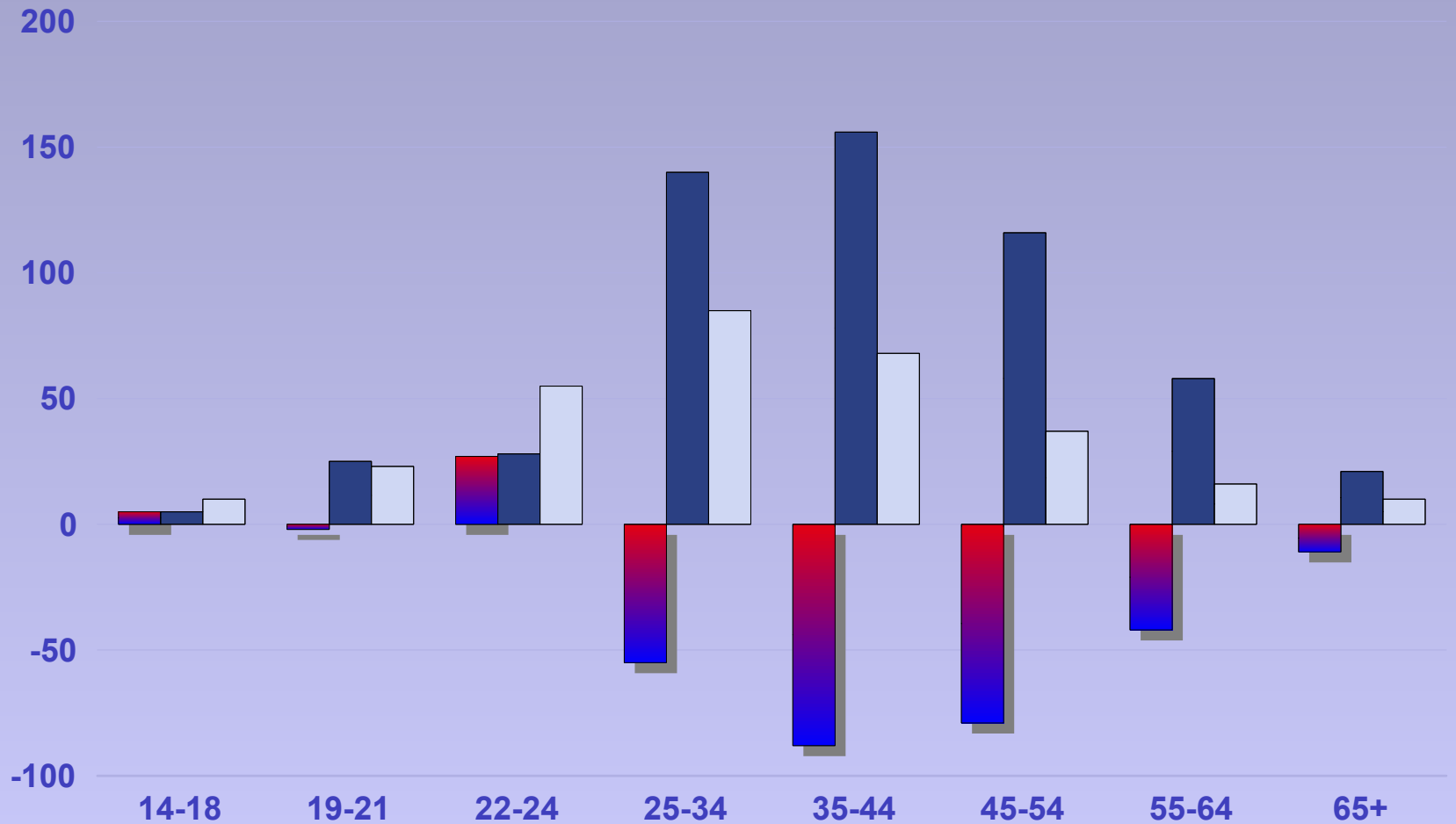
Example Graph

Maryland

Variable: Net Job Creation (Per 100)
Employees, Same Sex and Age Group
Year: 1999 Quarter: 2
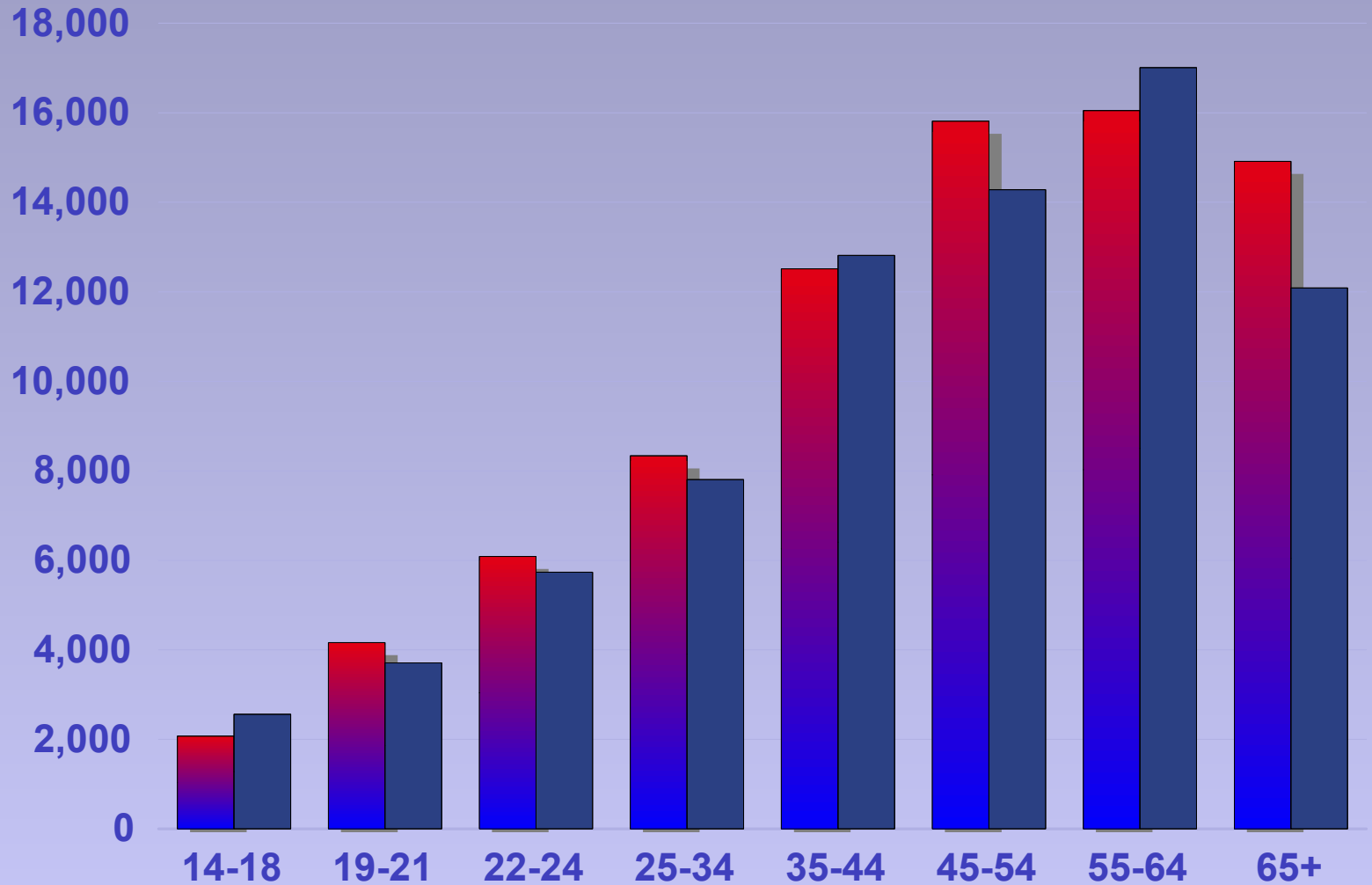Sex: Male and Age Group: Ages 22-24

Midpoint of Range: -5 -3 -1
                     1   3   5

Male Job Gain and Job Loss in High Technology Industries in Montgomery and Frederick Counties, Maryland

Earnings and Earnings of New Hires in High Technology Industries in Montgomery and Frederick Counties, Maryland

Legend
■ Earnings   ■ New Hire Earnings
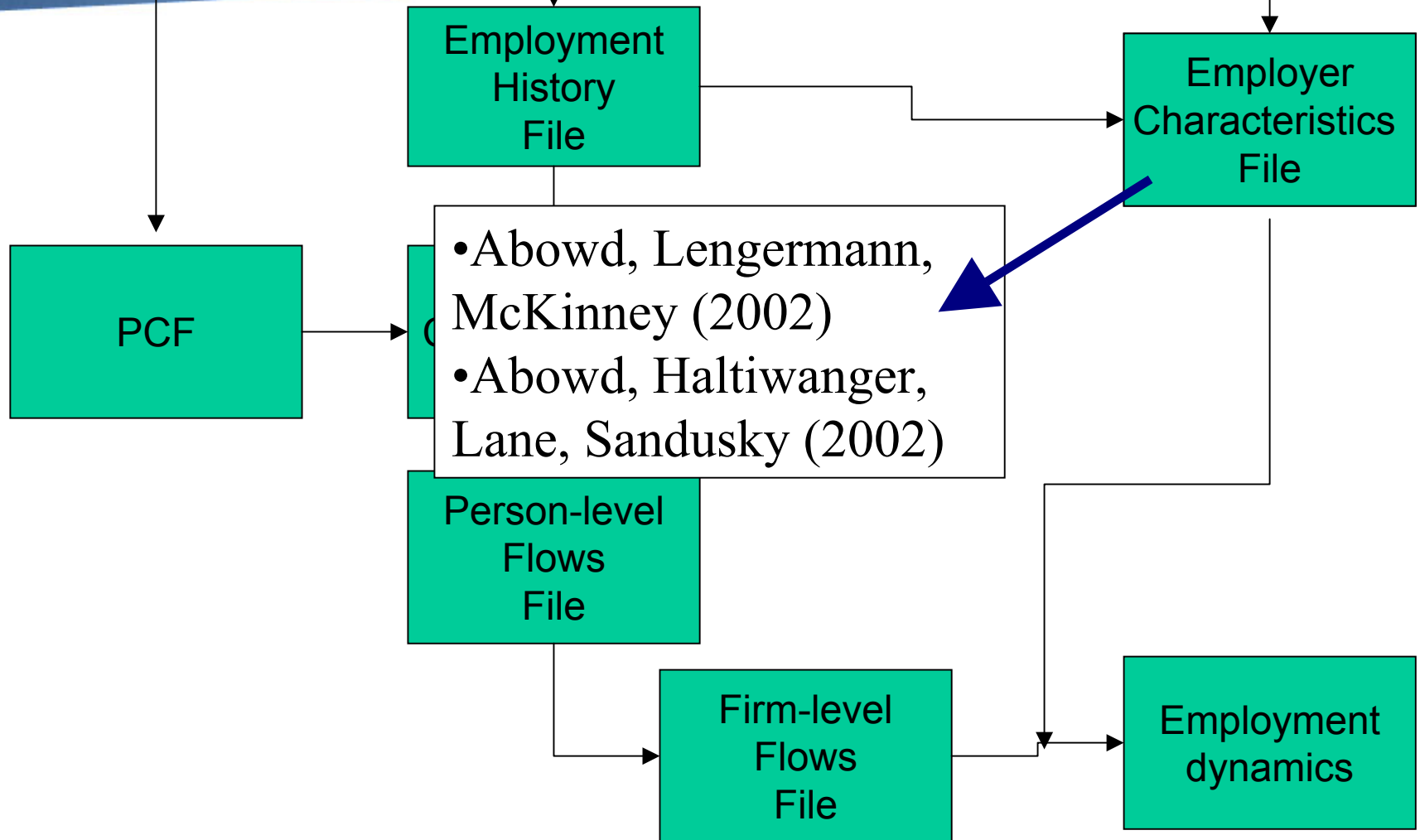
Problem: Confidentiality

- Cell sizes start to get small
  - age 19-21
  - male
  - new hire in
  - small county XYZ
  - => potentially leads to disclosure of identity
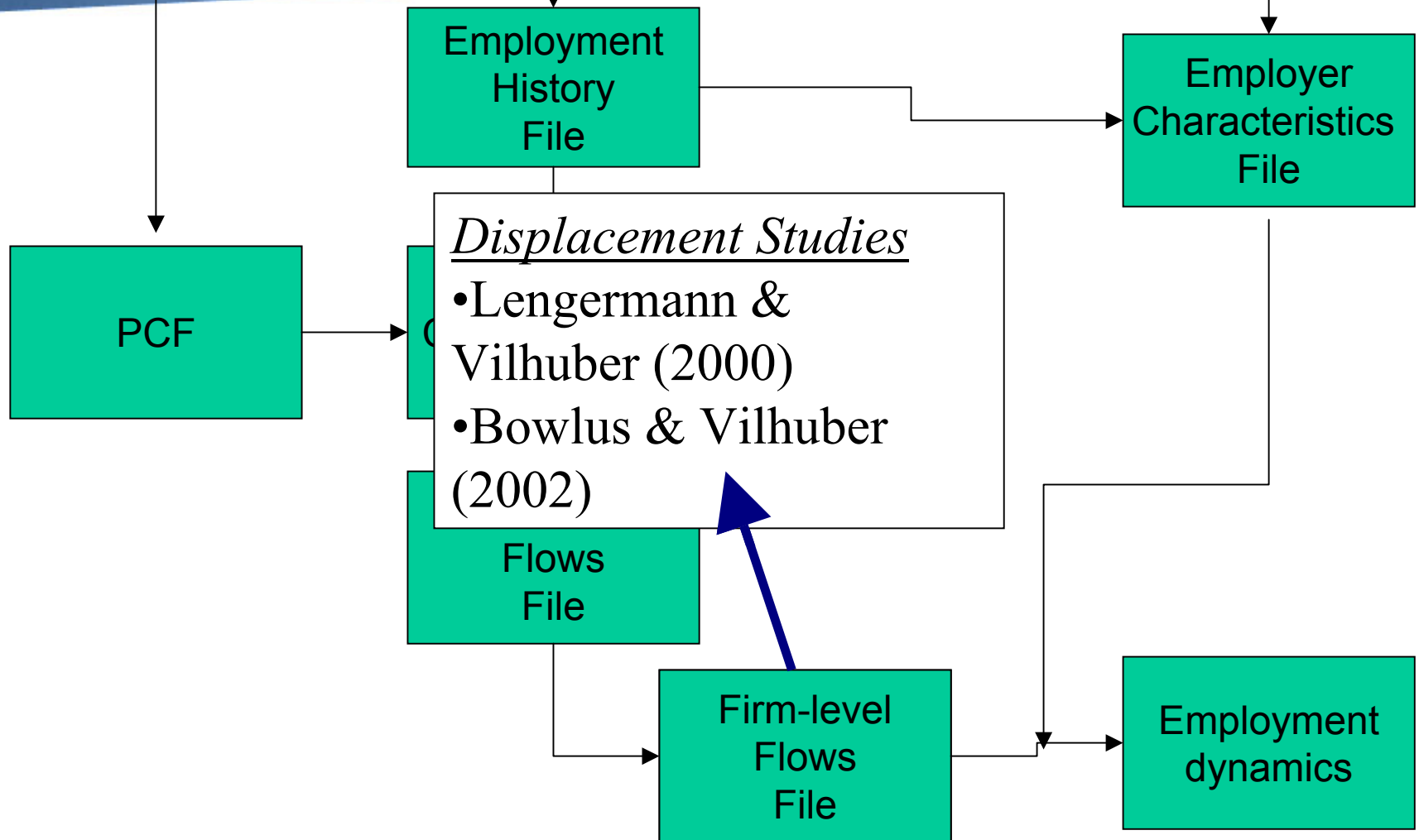- Previous solution: suppression and complementary suppression

Confidentiality: Solution

- New solution: noise infusion
- Specially constructed "noise" is added at the firm level
- If aggregated county/industry statistics based on too few individuals/firms, noise does not cancel out (flagged)
- Some suppressions if based on too few individuals, no complementary suppressions

Alternative uses of EDE Files: ECF

```
                    Employment                          Employer
                    History                             Characteristics
                    File                                File

PCF                                •Abowd, Lengermann,
                                   McKinney (2002)
                                   •Abowd, Haltiwanger,
                                   Lane, Sandusky (2002)

                    Person-level
                    Flows
                    File

                              Firm-level              Employment
                              Flows                   dynamics
                              File
```

Alternative uses of EDE Files: Firm-level flows

Employment History File

Employer Characteristics File

PCF

Displacement Studies
- Lengermann & Vilhuber (2000)
- Bowlus & Vilhuber (2002)

Flows File

Firm-level Flows File

Employment dynamics

Alternative uses of EDE Files: Person-level flows & ICF

Employment History File

Employer Characteristics

Almost Personnel Economics:
- Lengermann (2002) "Is It who you are, where you work, or with whom you work"

PCF

Individual Characteristics File

Person-level Flows File

Firm-level Flows File

Employment dynamics
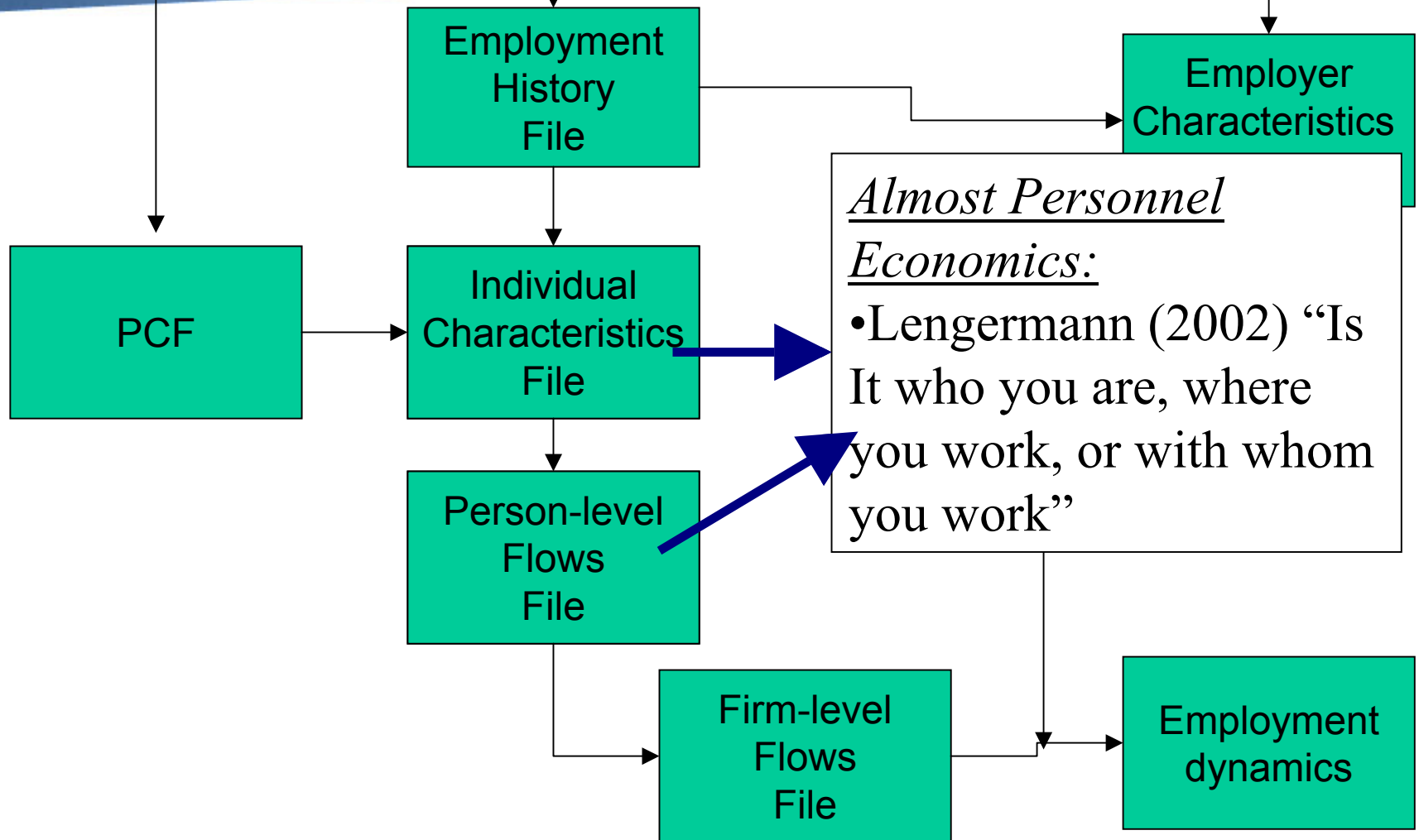
Next Steps…

- Many, many more research issues
- Funding for national program for official statistics
- Distribution of Quarterly Indicators
- Development of access protocols to microdata