Admin Revenue for Multi-Units:

Allocation and Imputation

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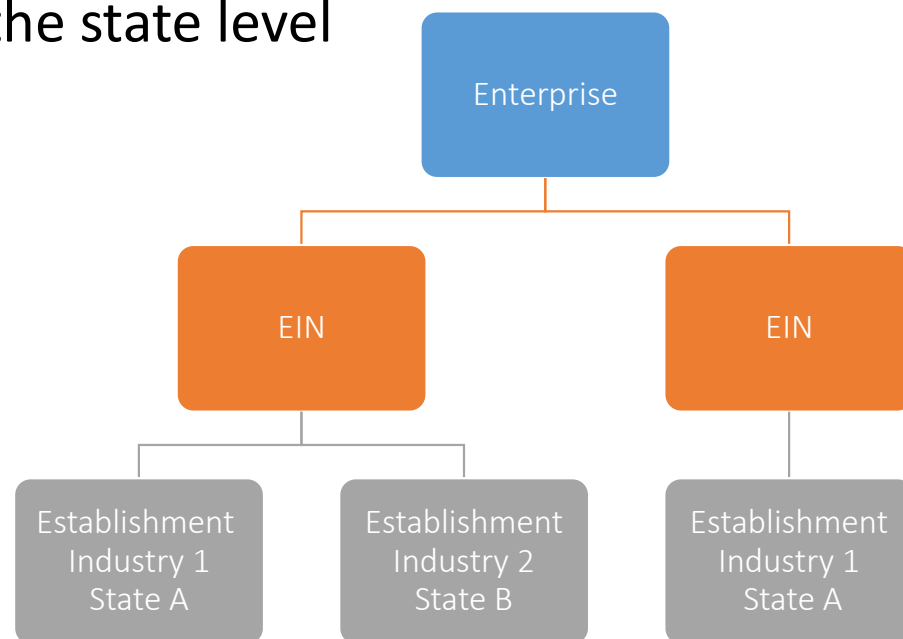
Background

Problem:

- County Business Patterns (CBP) is an annual series that provides payroll and employment data by industry

- Revenue is not available for establishments in non-Census years

Previous work:

- Identify outliers for single-unit firms (SUs)

- Develop imputation methods for SUs

- Develop establishment-level imputation methods for multi-unit firms (MUs)

Objective

- Model revenue for MUs through imputation at the EIN level
- Aggregate revenue for industries at the state level
- Challenges:
  - Complexity
  - Missingness
  - Outliers and misreported data
  - Definitional differences
  - Establishments without revenue

Enterprise

EIN | EIN

Establishment Industry 1 State A | Establishment Industry 2 State B | Establishment Industry 1 State A
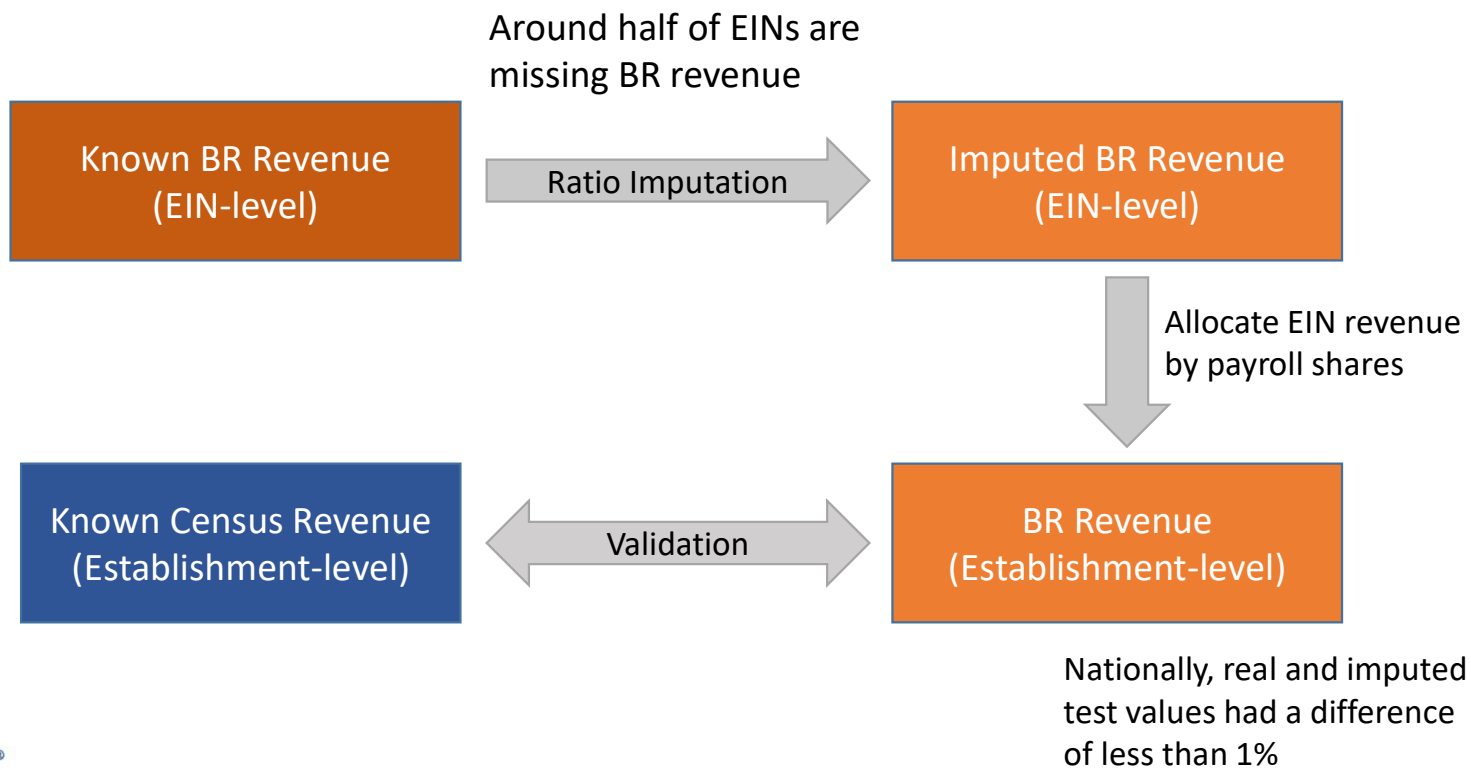
Allocating EIN revenue to establishments

- Division of an EIN's payroll across establishments is often correlated to division of revenue
  - Use shares of payroll to allocate EIN revenue
- Use Census establishment-level revenue values to validate allocated EIN-level revenue

EIN	Establishment	Payroll	Payroll Shares	Census Revenue	Revenue Shares	EIN Revenue	Allocated Revenue
1234	Location 1	1000	.8	2500	.76	3500	2800
1234	Location 2	250	.2	800	.24	3500	700

Mock data for example purposes.

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Imputation Process

Known BR Revenue (EIN-level)

Around half of EINs are missing BR revenue

Ratio Imputation →

Imputed BR Revenue (EIN-level)

Allocate EIN revenue by payroll shares

Known Census Revenue (Establishment-level)

Validation

BR Revenue (Establishment-level)

Nationally, real and imputed test values had a difference of less than 1%

Next steps

- Document definitional differences

- Reconcile data sources

- Edits at the EIN level for outliers and misreported data

- Refine imputation methodology for EIN-level revenues and allocate revenues to establishments

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