



Using Naturally-Occurring Data for
Retail Sales, CPI, and PCE:
The Future is Now

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Naturally-occurring or non-designed data for consumer spending and prices

Household transactional data, e.g.,

- Michigan-Berkeley account data project
- JPMorgan Institute
- Homescan

Naturally-occurring or non-designed data for consumer spending and prices

Aggregated transaction data

- Credit/debit card transactions
 - FRB/Palantir
 - BEA pilot
- Non-retail transactions
 - Hotel
 - Airlines
 - Movie Theater
 - Medical

Naturally-occurring or non-designed data for consumer spending and prices

Price data, e.g.,

- Scanner data, e.g., Nielsen
- CPI pilot (presentation today)
- Webscraped, e.g., Billion Prices Project
- Redding-Weinstein project (last meeting)

Naturally-occurring or non-designed data for consumer spending and prices

Sales and unit value data combined

- *Scanner data, e.g., Nielsen**
- *CPI pilot (presentation today)**
- Retailer transactions

*Joint price, sales measurement not implemented

Retail transactions data

- Detailed, SKU level
 - Sales
 - Unit values
- Aggregated to ELI-like level
 - Sales
 - Price indexes
 - Joint measurement of price and quantity
- Transmitted to statistical agencies
 - FRB/Palantir software tool

Current Architecture

<p>Census (nominal spending)</p> <p>Data collection: Retail Trade surveys (monthly and annual) Economic Census (quinquennial)</p> <p>Published statistics: Retail Trade (monthly)</p>	<p>BLS (prices)</p> <p>Data collection: Consumer expenditure survey (spending weights) Telephone Point of Purchase survey (purchase location) CPI price enumeration (Probability sampling of goods within outlets)</p> <p>Published statistics: Consumer Price Index (monthly)</p>
<p style="text-align: center;">BEA (aggregation and deflation)</p> <p>Data collection: Census and BLS data supplemented by multiple source</p> <p>Published statistics: Personal Consumption Expenditure: Nominal, real, and price (monthly) GDP (quarterly)</p>	

Current Architecture

<p>Census (nominal spending)</p> <p>Retail Trade surveys Economic Census</p> <p>→ nominal sales</p>	<p>BLS (prices)</p> <p>Consumer expenditure survey → weights Telephone Point of Purchase survey → outlets CPI price enumeration → price quotations</p> <p>→ price indexes</p>
<p>BEA (aggregation and deflation)</p> <p>Personal Consumption Expenditure: Nominal, real, and price</p>	

New data: Household Accounts

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New data: Web scraped prices

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New Architecture: Retail transactions

- Integrates price and quantity measurement
- Combines multiple data collections
 - Retail sales survey
 - CPI: Multiple data collections
- Potential measurement improvements
 - Timeliness
 - Frequency
 - Geographical detail
 - Accounting for changing goods

New Architecture: Challenges

- Requires retailer cooperation
- Turnover of goods and services
- New techniques for constructing price indexes
 - Revealed preference approach (Feenstra/Redding-Weinstein)
 - New hedonics, aided by machine learning
- Challenges for statistical agencies
 - Technical
 - Organizational