

Using Census Business Data

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Variety of Uses

- Population Census = size of population?
- Economic Census = size of economy?
- Aggregate economic growth
- Published disaggregation
 - Industry, Geography, Plant size
- Also confidential micro-data
- Public Policy topics (and academic)

Outline

- The Annual Survey of Manufactures
- The Longitudinal Research Database
- Other Business Surveys
- National Income and Product Accounts
- Industry-Level Research
- Plant-Level Research

ASM Overview

- Nature of the survey
- Sampling frame and plan
- Documentation
- ASM data in RDCs

Nature of the Survey

- Target Population:
 - The Annual Survey of Manufactures (ASM) provides sample estimates of statistics for all manufacturing establishments with one or more paid employee. The U.S. Census Bureau conducts the ASM in each of the 4 years between the economic census which is collected for years ending in 2 and 7. The economic census - manufacturing is the sample frame from which the ASM is chosen and presents more detailed data than the ASM. Among the statistics included in this survey: employment, payroll, value added by manufacture, cost of materials consumed, value of shipments, detailed capital expenditures, supplemental labor costs, fuels and electric energy used, and inventories by stage of fabrication.
- <http://www.census.gov/mcd/asmhome.html>

Sampling Frame and Plan

- Frame population: Economic Census of Manufactures in the 2 and 7 years
- Sample is drawn in the 3 and 8 years, then used for five consecutive years (4-8 and 9-3)
 - This means that a component of any Census of Manufactures is the ASM sample, which was drawn from a frame population based on the previous EC
 - Supplemental frame of new establishments is used to refresh sample between ECs
- Base sample is a multistage probability sample with large establishments sampled with probability one (self-representing)
- There have been many significant redesigns of the ASM sample. Historical information is in McGuckin and Pascoe

Documentation

- Questionnaire:
 - <http://help.econ.census.gov/BHS/ASM/About.html>
- Publications:
 - <http://www.census.gov/prod/2006pubs/am0531gs1.pdf>
- Purpose: measure size of aggregate economy and individual industries, compute National Income and Product Accounts

ASM Data in RDCs

- Documentation at CES:
<http://www.ces.census.gov/index.php/ces/1.00/researchdata>
- Annual Survey of Manufactures data available at CES for 1973 to 2005

Longitudinal Research Database

- Why Longitudinal?
- Longitudinal integration of ASM and CM (Census of Manufactures) data
- Linking the LRD to other data
- Using the LRD in RDCs
- Extension to LBD

Why Longitudinal?

- More degrees of freedom
- Panel analysis; fixed effects
- Total Factor Productivity growth
Growth accounting method
 $\text{TFP growth} = \text{output growth} - \text{input growth}$
- Capital stock
Perpetual inventory method
(investment flows, depreciation rate)

Longitudinal Integration of ASM/CM

- Described in detail in McGuckin and Pascoe
- Large establishments have a different dynamic pattern than small establishments due to sample design (self-representing vs. sampled)
- Consistent variable definitions
- <http://www.census.gov/econ/overview/ma0800.html>

Linking the LRD to Other Data

- Establishment identifiers are provided, can link to other Census-collected datasets
- Some links to non-Census data already exist (Compustat, EPA data, ES-202)
- Other links are accomplished by using the Business Register (formerly Standard Statistical Establishment List) and record linking software

Using the LRD in RDCs

- LRD includes ASM and CM data
- LRD is requested by requesting the appropriate years of ASM and CM (“Longitudinal” part comes from the establishment-specific linkages included in the CES-based versions of the ASM and CM data files)

Extension to LBD

- Longitudinal Business Database
- Improved longitudinal linkages
- Extended to non-manufacturing
 - May be non-establishment aggregates
 - Fewer data variables available
 - Less annual data available

Other Business Surveys

- Census of Manufactures
- Pollution Abatement Costs and Expenditures Survey
- Etc ...

Census of Manufactures

- Includes Annual Survey questions, plants
- Includes all establishments (not just ASM)
- Includes many additional questions
 - Expenditures on computers
 - Inventory valuation
 - Materials consumed
 - (questions vary over time)
- Published detail: geography, size classes

PACE Survey

- Pollution Abatement Costs and Expenditures
- Subsample of ASM (high-pollution sectors)
- Capital expenditures and operating costs
- 1973-1986, 1988-1994, 1999, 2004/5+
- Published with geography, industry detail

Etc ...

- Manufacturing Energy Consumption Survey
- Survey of Manufacturing Technology
- Survey of Plant Capacity Utilization
- Research and Development Survey
- Current Industrial Reports
- Datasets collected by Census for other agencies (need permission; easy to link)

NIPA Research

- Measuring Aggregate Economy
- Equivalence
- Documentation

Measuring Aggregate Economy

- Gross Domestic Product
 - Goods and services
 - produced in US
 - during one year
- Possible double-counting across industries
 - $\$Production = \$Wheat + \$Flour + \$Bread ?$
- Value-added = $\$Output - \$Material\ Inputs$
- Allows breakdown of contributions to GDP

Equivalence

- Three (4) ways to measure size:
- Production = Sum of All Value-Added
- (Production = Value of Final Goods)
- Purchases = $C + I + G + X - M$
- Income = National Income + Depreciation + PayOut – PayIn + Discrepancy

National Income and Product Accounts

Examples

- Table 3 (Product Side)
- Table 9 (Income Side)
- BEA website with NIPA data:
<http://www.bea.gov/National/Index.htm>

Industry-Level Research

- CES-NBER Manufacturing Industry Productivity Database
- Other Published Data
- Research Examples

CES-NBER Manufacturing Industry Productivity Database

- Available on NBER website:
 - <http://www.nber.org/nberces/nbprod96.htm>
- Documented in Bartelsman and Gray
<http://www.nber.org/nberces/t0205.pdf>
- Basic ASM-CM data
- Also prices, capital stock, productivity
- Consistent industries (SIC/NAICS)
- Currently 1958-1996; extending to 2004

Other Published Data

- Other ASM data
 - Labor costs, investment, inventories
- Economic Censuses
 - Geography, some size classes
- Complications
 - Changes in industry definitions
 - Hard to get older years in electronic form

Research Examples

- Impact of Pollution Abatement Costs
 - Combine PACE and ASM data
 - Geographic (SMSA) variation, employment
 - Industry variation, productivity slowdown
- Impact of Trade on Employment
 - Combine import/export data with ASM data
- Impact of Computers on TFP
 - Combine CM-computers and ASM data

Plant-Level Research

- Advantages and Disadvantages
- Standard Procedures
- Research Examples

Advantages and Disadvantages

- Advantages
 - Many more observations
 - Comparisons within industry
 - Micro/Plant foundations of Macro/Industry
- Disadvantages
 - More work to understand/clean data
 - Need to work at RDC (time, \$)

Standard Procedures

- Often examining plants in single industry
 - Easier to justify common “production function”
- Nearly always linking to external data
- Usually plant-specific external data
- Sometimes geography-specific data

Research Examples

- CES working papers web site
<http://www.ces.census.gov/index.php/ces/1.00/cespapers>
- Shadbegian and Gray (2003)
 - PACE => abatement capital stock
 - ASM => productivity, size
 - EPA data => emissions