INFO 7470/ILRLE 7400
Economic and Business Surveys

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(based in part on 2007 lecture by Wayne B. Gray)
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Outline

- Review: entity definitions
- Business/Establishment surveys by federal statistical agencies:
  - BLS
  - Census Bureau
- In-depth example: Annual Survey of Manufactures
- Other examples
ASM Overview

- Nature of the survey
- Target population
- Sampling frame
- Data collection
- Documentation
- ASM data in RDCs
Annual Survey of Manufactures

- “manufactures”, not “manufacturers”
- manufacture (plural manufactures)
  - The making of goods or wares by manual labor or by machinery, esp. on a large scale.
  - The making of producing of something; generation
  - the thing manufactured

(Webster's College Dictionary, 1996)
Nature of the survey

- To provide key *intercensal* measures of manufacturing activity, products, and location for the public and private sectors.
- Best current measure of current U.S. manufacturing industry outputs, inputs, and operating status
Target population

- all manufacturing establishments with one or more paid employees
- Multi-activity locations are broken into separate “establishments”, at the discretion of the reporting entity, “if the plant records permit such a separation and if the activities are substantial in size”
- Exclusions:
  - Central administrative offices
  - Non-employers
Sampling frame

- Economic Census of Manufacturing (years ending in 2 and 7)
  - Total sample size: approximately 50,000 establishments
  - Universe size: 346,000 manufacturing establishments
- Sample is drawn in the 3 and 8 years,
- then used for five consecutive years (4-8 and 9-3)
Sampling frame (2)

- Consequence: a component of any Census of Manufactures is the ASM sample, which was drawn from a frame population based on the previous CM
- Refreshing: Supplemental frame of new establishments is used to refresh sample between CMs
Annual frame maintenance

- Three sources
  - Internal Revenue Service administrative records (=> *Business Register updates, Register-based statistics*) are used to include new single-unit manufacturers
  - Manufacturers classification survey identifies kinds of business
Sampling method

- Sampling method:
  - ~ 10,000 establishments with certainty,
  - ~ 40,000 establishments with probability proportional to a composite measure of establishment size.

- [http://www.census.gov/manufacturing/asm/how_the_data_are_collected/index.html](http://www.census.gov/manufacturing/asm/how_the_data_are_collected/index.html)
Survey content

- employment,
- payroll,
- value added by manufacture,
- cost of materials consumed,
- value of shipments,
- detailed capital expenditures,
- supplemental labor costs,
- fuels and electric energy used,
- inventories by stage of fabrication.
ASM Data collection methods

- Mail-in forms
- Electronic transmission
- Web reporting

http://bhs.econ.census.gov/bhs/asm/index.html
ASM notes

- multi-establishment business are surveyed on a single form (per EIN)
- Most establishments receive a long form to reduce burden (MA-10000(L))
- about 5,000 single-establishment firms from industries with large numbers of small firms (that have between 5 to 20 employees) receive a short form (MA-10000(S))
  - Less detail on shipments, employment, etc.
ASM changes

If not shown, please enter your 11-digit Census File Number (CFN) from the mailing address.

### PHYSICAL LOCATION

**A.** Is this establishment's physical location the same as shown in the mailing address? (P.O. Box and rural route addresses are not physical locations.)

- 0031 □ Yes - Go to line B

- 0032 □ No - Enter physical location

  - 0035 Number and street

  - 0036 City, town, village, etc.

  - 0037 State

  - 0038 ZIP Code

**B.** Is this establishment physically located inside the legal boundaries of the city, town, village, etc.? *(Mark "X" only ONE box.)*

- 0041 □ Yes

- 0042 □ No

- 0043 □ No legal boundaries

- 0044 □ Do not know

**C.** In what type of municipality is this establishment physically located? *(Mark "X" only ONE box.)*

- 0046 □ City, village, or borough

- 0047 □ Town or township

- 0048 □ Other

- 0049 □ Do not know

### OPERATIONAL STATUS

Which of the following best describes this establishment's operational status at the end of 2010? *(Mark "X" only ONE box.)*

- 0051 □ In operation

- 0052 □ Under construction, development, or exploration

- 0053 □ Temporarily or seasonally inactive

- 0054 □ Ceased operation - Give date at right

  - 0055 □ Sold or leased to another operator - Give date at right AND enter name and address of new owner or operator and Employer Identification Number (EIN) below

  - 0056 Name of new owner or operator

  - 0057 EIN (9 digits)

  - 0058 Mailing address (Number and street, P.O. Box, etc.)

  - 0059 City, town, village, etc.

  - 0060 State

  - 0061 ZIP Code

- 0062 Month

- 0063 Day

- 0064 Year
Difference short-long form

SALES, SHIPMENTS, RECEIPTS, OR REVENUE

A. Total value of products shipped and other receipts
   (Report detail in 2.) ................................. 00100
   2010  2009
   $ Bil.  Mil.  Thou.  $ Thou.

B. Value of products exported (This is a breakout of the
   value reported on line A.)

Report the value of products shipped for export. Include
shipments to customers in the Commonwealth of Puerto
Rico and U.S. possessions, as well as the value of
products shipped to exporters or other wholesalers for
export. Also, include the value of products sold to the
U.S. Government to be shipped to foreign governments.
Exclude products shipped for further manufacture,
assembly, or fabrication in the United States. ........... 00130

C. Shipments to other domestic plants of your company for
   further assembly, fabrication, or manufacture

1. Is this the only establishment of this firm?
   □ Yes - Go to 6
   □ No - Go to line C2

2. Market value of products shipped to other domestic
   plants of your company for further assembly,
   fabrication, or manufacture (This is a breakout of
   the value reported on line A.) .......................... 00205

SALES, SHIPMENTS, RECEIPTS, OR REVENUE

Total value of products shipped and other receipts (Report
detail in 2.) ................................. 00100

E-SHIPMENTS
Annual Survey of Manufactures
Electronic Single Location

The Annual Survey of Manufactures for companies with one establishment is now conducted through the Census Bureau's new Direct Internet Reporting System. Click the Report Online button to begin.

Click here to complete your survey online

For step by step instructions on how to navigate through Direct Internet Reporting, click on QuickCards Reference

The Direct Internet Reporting requires:

System Requirements

1. A web browser with 128-bit encryption (most browsers released since 1998 are sufficient).
2. A username and password that is located in the address label of your report form.
3. The username and password is case-sensitive.

*Click here to return to Electronic Reporting.
Uses of the ASM

- ASM is the primary basis for updates of the Longitudinal Research Database (LRD).
- Official publications:
  - Statistics for Industry Groups and Industries
  - Value of Product Shipments class.
  - Geographic Area Statistics (by state)
Linkages of the ASM

- **Data elements:**
  - By CFN
  - By name
  - By EIN
  - By location

- **Dimensions**
  - To CM
  - To other surveys
  - Across time (⇒ LRD, LBD)
ASM Documentation

- Definitions, etc.: http://www.census.gov/manufacturing/asm/definitions/index.html
- Tabular data (replaces printed publication since 2006 data) http://factfinder.census.gov/servlet/IBQTable?_bm=y&ds_name=AM0931GS101
ASM in the RDCs

- Documentation at CES: http://www.ces.census.gov/index.php/ces/researchdata?detail_key=1
- Annual Survey of Manufactures data available at CES for 1973 to 2006
Use of ASM as complement to CM


- Example of issue: “for plants that were not in the Annual Survey of Manufactures [...] but in the mail universe of the CM, book-value data are imputed in years other than 1987.”

- Solution: use ASM as control for larger model
Use of ASM/CM

- NBER-CES Manufacturing Industry Database (Bartelsmann, Becker, Gray)
- annual industry-level data on output, employment, payroll and other input costs, investment, capital stocks, TFP, and various industry-specific price indexes
- Available in RDC
Longitudinal Research Database
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
  - TFP growth = output growth – input growth
- Capital stock
  - Perpetual inventory method
    (investment flows, depreciation rate)
LRD=Integration of ASM/CM

- Described in detail in McGuckin and Pascoe (1988)
- 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
  - CFN
  - EIN
- Some links to non-Census data already exist (Compustat, EPA data, ES-202)
- Other links are accomplished by using the Business Register and probabilistic record linkage
Using the LRD in RDCs

- “Virtual dataset”
- 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
Longitudinal Business Database
Improving on LRD: LBD

- Jarmin & Miranda (2002) CES-WP-02-17
  http://www.ces.census.gov/index.php/ces/cespapers?detail_key=101647

- Improved longitudinal linkages
  - Based on the Business Register only
  - Fixes broken linkages using probabilistic matching
Additional benefits of LBD

- Linkage to ASM, CM, other surveys
- Extended to non-manufacturing
  - May be non-establishment aggregates
  - Fewer data variables available
  - Less annual data available
Supreme benefit of LBD

- Available synthetic data outside of the RDC
  http://www.vrde.cornell.edu/news/data/lbd-synthetic-data/

- ...
Other Business Surveys

- Pollution Abatement Costs and Expenditures Survey
- Etc …
PACE Survey

- Pollution Abatement Costs and Expenditures
- Subsample of ASM (high-pollution sectors)
- Capital expenditures and operating costs
- Published with geography, industry detail
P ACE Research usage

- http://www.ces.census.gov/index.php/ces/searchpapers?
  search_terms=p ace&allpapers=1

- CES-WP-93-6, “Environmental Regulation And Manufacturing Productivity At The Plant Level” (Gray and Shadbegian)

- PACE => abatement capital stock
- ASM => productivity, size
- EPA data => emissions
- “a $1 increase in compliance costs appears to reduce TFP by the equivalent of $3 to $4.”
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)

http://www.census.gov/ces/dataproducts/economicdata.html
Economic Data

Economic data refers to the Economic Census of establishments and various surveys and data for establishments and firms. With very few exceptions, the public uses variations of these files are limited to data presented in aggregate form. The following tables list establishment and firm-based data, the survey period, the frequency of data collection, the years of data available at CES, and the sponsoring federal agency. Each link goes to a description of the data available at the RDOs. Access to these data will only be granted to qualified researchers on approved projects with authorization to use specific data sets.

Some Census Bureau’s surveys are sponsored in whole or in part by other federal agencies. Sponsorship of data collections may also change over time. External research projects using these data may require permission of the sponsoring agency. Most economic data contain Federal Tax Information (FTI). Use of these data requires approval of the Internal Revenue Service (IRS).

<table>
<thead>
<tr>
<th>Data Set</th>
<th>Frequency</th>
<th>Unit of Enumeration</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Census of Auxiliary Establishments (Aux)</td>
<td>Every 5 Years</td>
<td>Establishment</td>
<td>1977–2007</td>
</tr>
<tr>
<td>Census of Construction Industries (CCI)</td>
<td>Every 5 Years</td>
<td>Establishment</td>
<td>1972–2007</td>
</tr>
<tr>
<td>Census of Mining (CMI)</td>
<td>Every 5 Years</td>
<td>Establishment</td>
<td>1987–2007</td>
</tr>
<tr>
<td>Census of Retail Trade (CRT)</td>
<td>Every 5 Years</td>
<td>Establishment</td>
<td>1977–2007</td>
</tr>
<tr>
<td>Census of Services (CSE)</td>
<td>Every 5 Years</td>
<td>Establishment</td>
<td>1977–2007</td>
</tr>
<tr>
<td>Census of Transportation, Communications, and Utilities (CUT)</td>
<td>Every 5 Years</td>
<td>Establishment</td>
<td>1977–2007</td>
</tr>
<tr>
<td>Census of Wholesale Trade (CWT)</td>
<td>Every 5 Years</td>
<td>Establishment</td>
<td>1977–2007</td>
</tr>
</tbody>
</table>

*All economic censuses are sponsored by Census Bureau.

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<tr>
<td>Business Register Data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CompuStat-SSEL Bridge (CSB)**</td>
<td>Annually</td>
<td>Establishment</td>
<td>1981–2005</td>
</tr>
<tr>
<td>Form 5500 Bridge File</td>
<td>Annually</td>
<td>Establishment</td>
<td>1992–2006</td>
</tr>
<tr>
<td>Longitudinal Business Database (LBD)</td>
<td>Annually</td>
<td>Establishment</td>
<td>1976–2005</td>
</tr>
<tr>
<td>Ownership Change Database (OCDB)</td>
<td>Every 5 Years</td>
<td>Establishment</td>
<td>1963, 1967–2002</td>
</tr>
</tbody>
</table>

**The CSB was constructed using the 2001 and 2006 CompuStat and its historic files.
Plant-level research
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
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, $)
Common 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
BLS surveys

- National Compensation Survey (NCS) http://www.bls.gov/ncs/
- Job Openings and Labor Turnover Survey (JOLTS) http://www.bls.gov/jlt/
- Current Employment Statistics (CES) http://www.bls.gov/ces/
BLS RDC

- Access to the confidential versions of these surveys is only feasible at the BLS RDC in Washington (not the Census RDC)
- Protocols are different (more resource constrained)
- http://www.bls.gov/bls/blsresda.htm