

Micro-based Data for Research and Policy Analysis an historical overview

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Overview

- Review by historical period, with an emphasis on future
- Policy
- Research
- Data

Supply and Demand for Research with Firm-level Data

- Since 1995 the quantity of research using firm-level data has ballooned, however measured.
- In 2014/15 Economist Job market, about 30% of macro/trade candidates use firm-level data or heterogeneous firm models
- Is increase in quantity demand or supply related?
- Supply seems inelastic, demand very elastic
- Policy needs drive both, with variation across countries (ie a lot of research using Chilean and Colombian micro data, not much with Polish data). Important roles played by national econ and fin ministries, OECD, World Bank, DG ECFin, and now ECB

Origins of National Accounts

- The System of National Accounts was developed as a response to the crisis and the Keynesian theories of demand shortfall (RA Stone).
- The supply side of the economy, and chains of production linking final expenditure to factor incomes were not considered policy relevant.
- Timeseries of final demand components, sometimes at quarterly frequency, grew over time.
- Individual records in survey data only served purpose of generating reliable estimate of mean or sum, possibly conditional on some characteristic

Early Econometric Research

- Basic identification problem is understood (Tinbergen)
- Econometric models emerge for use in forecasting
- Phillips curve, consumption function, Okun's law, Trade equations
- Advances in inference and estimation of lag structures
- Basic VAR developed out of Arima models

Policy

- Taylor-rule emerging as policy paradigm, CB independence and acknowledgment of time-consistency problems
- Painful period of disinflation over, now worry about small unemployment fluctuations and signs of incipient inflation
- In EU period of convergence and compliance with SGP criteria
- Occasional balance of payments and exchange rate episodes
- Transition of Eastern Europe
- Macro time-series were main policy indicator. Some attempts at structural policy evaluation

Research

- Lucas-critique: need to consider expectations. No more extrapolations from historical correlations of outcome variables
- Incorporating sticky prices (NK features) into RBC models
- Time-series methods to deal with unit-roots; GMM as way to instrument endogenous variables
- Time-series estimation of Euler equations for Consumption and Investment
- Similar for trade, monetary empirical work
- Beginning of worry about representative agent for (macro) time-series analysis (Caballero & Engel)
- IO and labor economics dispense with representative agent

Data

- 30 years of quarterly or annual timeseries of expenditure components of GDP
- Micro data emerging in labor (Gross flows, wage equations) or structural reform of industry
- Interest in firm-level data emerging for supply side (potential GDP, productivity, financial frictions, investment)
- Access to firm-level data cumbersome, both for technical and bureaucratic reasons

Statistical Bottlenecks

- Stats agencies were not very happy about firm-level research in early years. DGs of stats agencies were not happy about cross-country sharing in early years.
 - Prohibition of 'tabulations' at US Census
 - Worry about disclosure
 - Worry about 'unique, uncontested indicator'
 - Worry about statistical properties of research results
 - Worry about cross-country comparability

Firm-level vs macro indicators

- Integration of multiple sources in NA, (RAS available sources using accounting rules)
- NA covers all sectors and activities; firm-level covers business sector, size threshold and selection of activities (industries)
- Unlikely that aggregates from both sources will coincide. Differences are informative.
- Firm-level provides types of aggregates not available in NA: moments, joint moments, industry splits (e.g. exporters vs non-exporters).

Measurement Error

- Three sources of error potentially affect comparability of indicators built from firm level data:
 - Classical error of firm-level measures: $X = X^* + \epsilon$
 - Errors in observed firms (samples): $\Omega = \Omega^* + \Psi$
 - Method of aggregation of indicator: $I = A[X_f | f \in \Omega]$

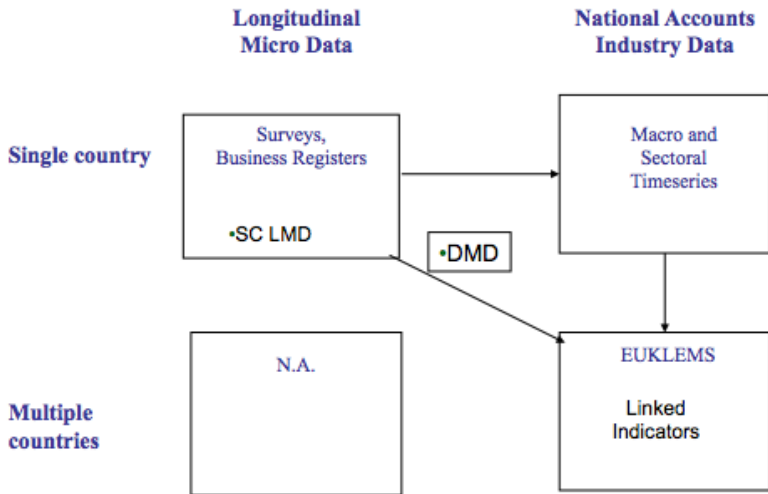
Comparative Analysis of Enterprise Data

- Following an initial international conference on firm-level data in Washington (Nat Acad of Sci and OECD, 1995), the first CAED conference (Comparative Analysis of Enterprise Data) was held in Helsinki in 1996
- Since then, 11 more CAED conferences have taken place in US, EU, and Asia, with latest in 2013 in Atlanta
- (Is there interest for CAED 2015 in Frankfurt?)
- Topics have traditionally been broad, IO, Labor, Innovation, Growth, Macro, Regional, Trade, Finance, Management
- Commonality of presentations is type of source data

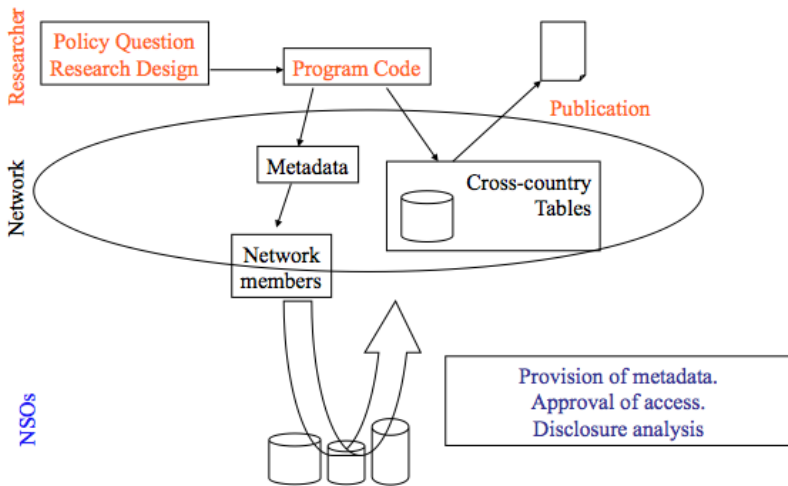
Cross-country microdata projects

- First attempt: Doms, Jensen, Kramarz, Motohashi, and Nocke (1995)
- OECD firm-level projects (Bartelsman and Scarpetta, 2000-2004)
- World Bank projects (Bartelsman, Haltiwanger, Scarpetta, 2003-2008)
- International Wage flexibility projects (Dickens, Gotte, Groshen,, 2006)
- Eurostat Projects (Bartelsman et al., 2007-2013)
- Efige (2009-2012)
- CompNet (2013,...)

Distributed Micro Data Analysis



Distributed Micro Data Analysis



Policy

- Productivity boom, and dot-com bust
- Inflation well under control, unemployment low
- In EU, inflation low, bond rates converged, introduction and expansion of euro
- In EU beginning of product market reforms, privatisations, deregulations of network sectors, competition policy
- Structural policy reforms start using single-country firm-level data

Research

- DSGE framework developed further (Clarida et al)
- Dynamic heterogeneous firm models (Hopenhayn)
- Firm-level productivity estimation (Olley-Pakes, Levinsohn-Petrin)
- Firm-level trade models (Eaton & Kortum; Melitz)
- Further development of labor search models
- Overview of trade (Caves) and productivity (Bartelsman and Doms) applications of firm-level data

Data

- NA timeseries augmented with detailed industry and production data (KLEMS)
- Detailed product prices, scanner data
- Employer-employee datasets
- Linkages of firm-level data with trade, R&D, ICT
- Firm-level data available in multiple countries
- Cross-country micro data projects (OECD, WB, Eurostat)

Policy

- Financial Crisis, Sovereign Debt Crisis, Secular Stagnation
- Monetary Policy, Bank Supervision, Fiscal, Structural Policy questions
 - Price and wage developments and expectations
 - Productivity growth
 - Potential GDP developments
 - Unemployment
 - Trade imbalances, competitiveness
 - Investment Demand: credit constraints, aggregate demand, (or technology)

Heterogeneous Firm Models

- Trade models (Melitz and Redding; Eaton, Kortum, and Kramarz)
- Investment frictions (Cooper and Haltiwanger; Kahn and Thomas)
- Labor Frictions (Lentz and Mortensen)
- Credit Constraints (Moll; Midrigan and Xu)
- Misallocation (Hsieh and Klenow; Restuccia and Rogerson)
- Growth and innovation (Acemoglu et al.)
- Models with interactions of above features (Booming Literature)

Micro to macro models

- Uncertainty (Bloom)
- DSGE with heterogeneous firms (Bloom et al.)
- Networks of Producers (Oberfield)
- Micro data and macro elasticities (Oberfield)

Emerging Policy Questions

- What is transmission mechanisms through which volatility affects economy?
 - Investment frictions, financial distortions (Gilchrist et al.)
 - Network structure (Acemoglu et al. 2012)
 - International competition amplifies shocks (Rossbach)
- Any chance of inflation?
 - Micro distribution of 'output gaps'
 - Capacity constraints and trade
 - Mark-ups, wage bargaining

Emerging Policy Questions

- Are we facing secular stagnation? Will structural reform help?
 - Understanding changing nature of production structure from CRTS to high intangible and DRTS at firm level may shed light on this
 - Technological advances may be capital savings and thus hold back investment without weak demand being the culprit
 - Cross-country and industry data with information at firm-level frontier may help distinguish different theories

Uses of CompNet Data

- Use the data for its strengths
 - Various aspects of within-industry heterogeneity
 - Information on higher moments
 - Information in 'relative' terms, relative to mean, relative to another variable, relative to cross-country average
 - Cross-country, industry panel datasets
 - Linking the data to official aggregates
- Avoid uses that data cannot support
 - Beware of country-time specific statistical breaks in source data
 - Avoid cross-country 'level' comparisons of data that are published elsewhere
 - Understand which indicators are still 'research in progress'.
Use them in analysis, not in tables.

Conclusions

- More research is needed