Application of Large-scale Business Data

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RIETI Policy Symposium
March 5th 2009

Unauthorized Translation(RIETI) / 仮訳（RIETI）

1. Large-scale Data & National Economic Accounting

- Corporate Transaction-based Data & National Economic Accounting

  At the ESRI, after its departure from legacy system, optimization, by an algebraic specification description called AADL (Algebraic Accounting Description Language), in estimating national economic accounting is being promoted (Led by Prof. Deguchi)

- In the future, formulation of national economic accounting system, based on financial accounting procedure, by using transaction-bade data among private corporations is expected. Under the new system, maintenance of dual equivalence of production and cost is realized

（Reference 1）

- Icelandic PPI is measured from scanned POS data, and the result is used for national economic accounting
- In Canada a trial is proposed to increase accuracy on analyzing prediction error of GDP statistics and data modification, and economic movement in time of emergency situation, with the use of high-frequent data. Canada also proposes to monitor consumer spending in real time through electronic data implanted on debit card. (Galbraith=Tkacz(2008))

2. Large-scale Data & Financial Activity（I）

- For the first time in the world Tokyo Stock Exchange put XBRL (extensive business reporting language) into practical use within TDnet (Timely Disclosure Network)
- The Bank of Japan utilizes bank data acquired from XBRL for off-site monitoring as well as conducts analysis on management of financial institutions such as profitability and credit risk, and discloses the findings on ”Financial Stability Report”
- Financial Services Agency also reports financial statements of listed corporations on EDINet

2. Large-scale Data & Financial Activity（II）

- As for settlement data between banks, after RTGS (Real Time Gross Settlement) of the BOJnet has been put in use, “Network Structure” in transaction can be analyzed by utilizing large-scale transaction data
- Network structure of fund transaction is similar to that of Internet, having a characteristics of fractal (self-similarity independent of scale and power distribution of links in connection with nodes) (Inaoka, Ninomiya, Taniguchi, Shimizu, Takayasu (2003)) . Recent call market shifts from Star Type, which sets call loan broker as a hub, to decentralized type. Imakubo et Soejima (2008)

2. Large-scale Data & Financial Activity（III）

- It is important to clarify Network Structure in order to learn where settlement risk will be concentrated (e.g. role of credit line) while under pressure or what kind of impact liquidity supply from the central bank has.
- The same can be said for settlement risk among corporate transactions. All Banks Net data provides rich information on corporate transactions
- It is necessary to obtain only statistically important information on corporate transactions, and replace in a way that does not touch on corporate confidentiality, and allow to extract (Crowd sourcing). From the past “XBRL” experience, the usage of data needs to be beneficial for corporations

（Reference2）

- Swedish central bank conducts financial analysis on corporate bankruptcy rate and budget, by combining tax data, corporate financial data and “Financial income survey” for budget

3. Large-scale Data & Consumer Price

- Utilize POS data for Japanese CPI (Consumer Price Index): three items of personal computer (desktop), personal computer (laptop) and camera are quality-checked by hedonic approach. In the process, price index is created from POS data at major electronic retail stores nationwide, by collecting price and stock data and using information on the specifics by type
- Issues: specific information differs from each POS provider. Subject corporation change. Continuity of information provision remains questionable

（Reference 3）

- Netherlands and Norway obtain CPI from scanned POS data

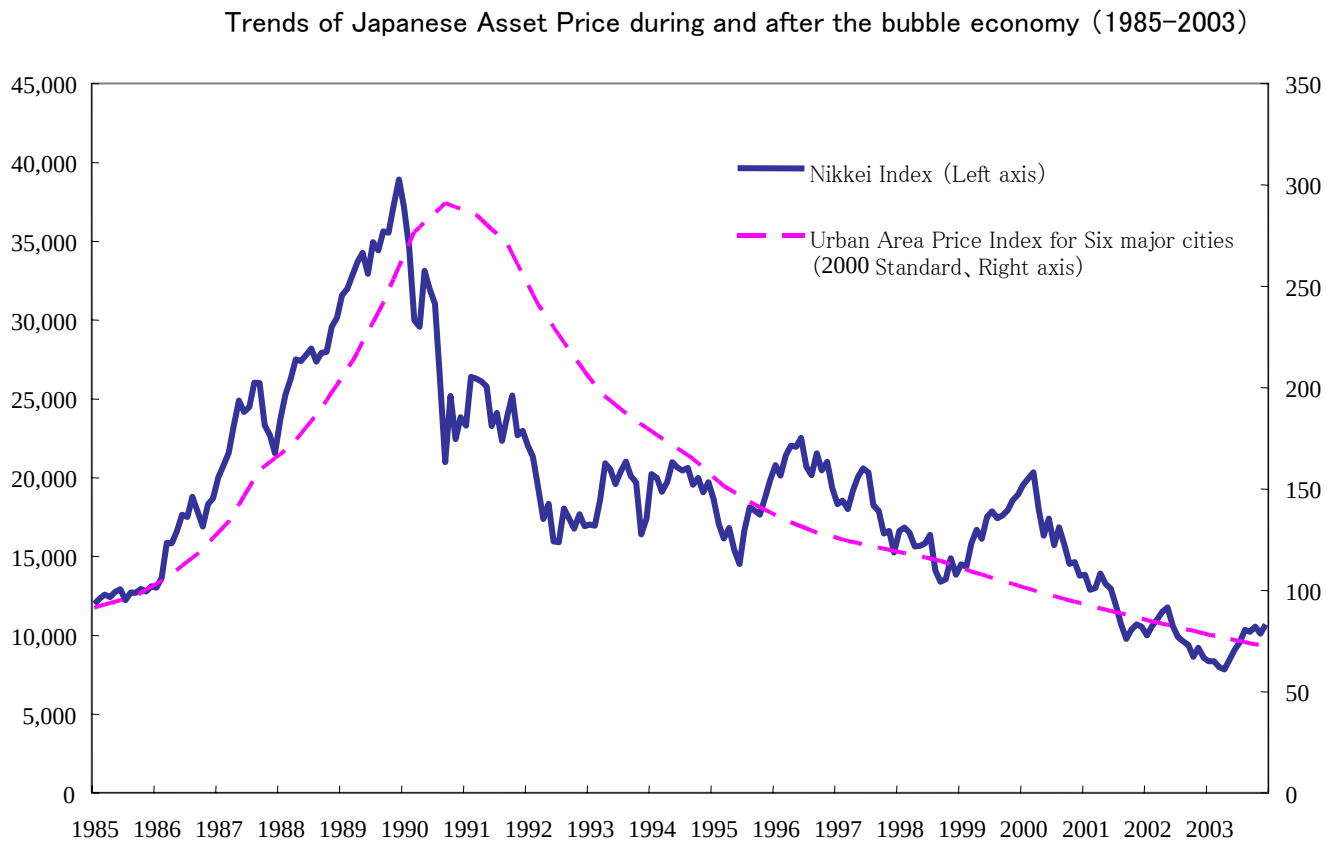
4. Large-scale Data & Financial Policy(I)

- Proper management of financial policy ("Timeless Perspective financial policy") and price setting by corporations
- The slope of the Phillips curve with the use of micro data such as POS data and original CPI data is different from the slope obtained through micro analysis
- Whether or not the price determined by corporate is time-dependent (Calvo, Taylor) or state-dependent (Golosov et Lucas) alters the effectiveness and the appropriateness of the financial policy to be applied
- On the other hand, despite the result of questionnaire on shipping data showing the Phillips curve in Japan is moderate, that is not due to high and frequently-revised retail price observed in POS date but due to adherence of manufacturer shipment price. Abe, Sotoki et Watanabe (2008)

4. Large-scale Data & Financial Policy（II）

- Tail risk in asset price: It happens not once in hundred years but more frequently. Why US bubble is labeled as Sequential “Staggered Bubble”? (Applying model under hypothesis of the same lognormal distribution, thus repeat mistakes in one direction).
- At present, US and British governments, and the Federal Reserve System adopt insurance system for non-performing assets held by banks. However, it is unclear if fixing the rate is determined in line with proper understanding of tail risk

Asset price bubble in Japan



Asset price bubble in US