Experimental Use of New Data Sources for Prompt Identification of Changes in Firms' Status

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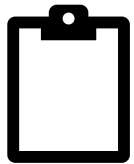www.singstat.gov.sg

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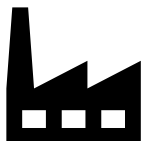 - Experimental Use of Property Stamp Duty Data

Introduction

- Significant changes in business activities of firms, especially those of large firms, may have a sizeable impact on economic and business statistics compiled by various divisions in Singapore Department of Statistics (DOS)

- To facilitate the early detection of significant changes in firms' business activity, DOS embarked on a pilot project on Early Triggering to promptly detect:

    (i)   Entries and exits of large firms
    (ii)   Firms with substantial changes in revenue and/or employment

- Early Triggering pilot project leverages on the Statistical Business Register (SBR) and higher frequency data, including qualitative data from online sources

Roles of Statistical Business Register

The Statistical Business Register (SBR) serves as the foundational statistical infrastructure for the compilation of business and economic statistics, and contains key information such as enterprise name, Unique Entity Number (UEN), registration date and industrial classification (SSIC).
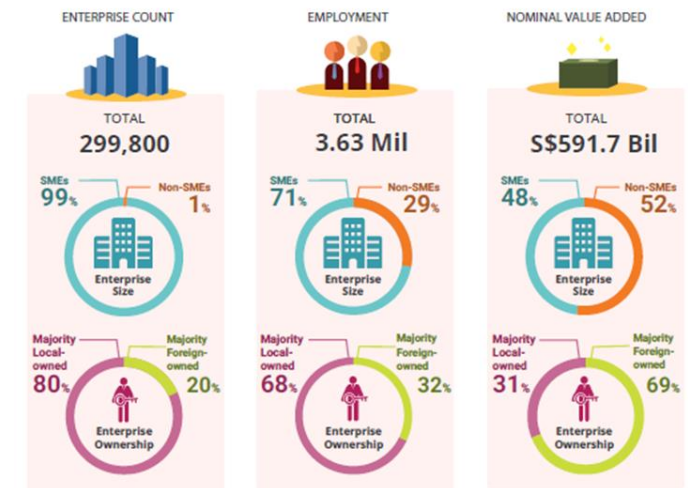
Provide comprehensive coverage for survey sampling frame and contact information for use in conducting of business surveys

Produce indicators on characteristics of firms (e.g. enterprise landscape statistics, high-growth firms) and support firm-level data integration with other data sources for in-depth analysis

Singapore's Enterprise Landscape 2022

ENTERPRISE COUNT
TOTAL
299,800
SMEs 99% Non-SMEs 1%
Enterprise Size
Majority Local-owned 80% Majority Foreign-owned 20%
Enterprise Ownership

EMPLOYMENT
TOTAL
3.63 Mil
SMEs 71% Non-SMEs 29%
Enterprise Size
Majority Local-owned 68% Majority Foreign-owned 32%
Enterprise Ownership

NOMINAL VALUE ADDED
TOTAL
S$591.7 Bil
SMEs 48% Non-SMEs 52%
Enterprise Size
Majority Local-owned 31% Majority Foreign-owned 69%
Enterprise Ownership

Coverage and Maintenance of the SBR

Multiple data sources are integrated in the update of the SBR:

- Primarily based on various administrative data, supplemented by statistical survey returns from DOS and Research & Statistics Units (RSUs)

Administrative Source	Administrative Data
• **Regulatory Authority of Business Registration & Financial Reporting**: Accounting and Corporate Regulatory Authority (ACRA) of Singapore	Identification and demographic information (e.g. UEN, business name, registration date, shareholder information, industrial classification)
• ACRA • **National Tax Authority**: Inland Revenue Authority of Singapore (IRAS)	Financial Information (e.g. Revenue, Profit)
• **Manpower Authority:** Ministry of Manpower (MOM), Central Provident Fund Board (CPFB)	Employment and Wages
• **Authority for trade facilitation**: Singapore Customs / Enterprise Singapore	Merchandise Trade (i.e. imports, exports)

- Experimental use of AI/ML to text mine big data and unstructured data from admin sources

Challenges

Data users are requesting for faster indicators to detect economic changes early, which helps to facilitate policy agencies to prepare timely responses

Some data sources are not timely for early detection of such changes as these data are filed once a year only with information available more than one year after firms' financial year ending

In response to these emerging data demands, DOS has been exploring new data sources in updating the SBR and developing more timely economic indicators

The data from SBR and other sources are useful for the pilot "Early Triggering" project to facilitate the early detection of significant changes in firms' business status and activity

Early Triggering with Employment and GST Data

The following higher frequency administrative data are well suited to promptly identify changes in firms' business activities:

Employment data from the Central Provident Fund Board (CPFB) and Ministry of Manpower (MOM)

Goods & Services Tax (GST) data from the Inland Revenue Authority of Singapore (IRAS)

Early Triggering with Employment and GST Data

Employment data from the Central Provident Fund Board (CPFB) and Ministry of Manpower (MOM)

- Central Provident Fund (CPF) is Singapore's mandatory social security savings scheme, funded by contributions from both employers and employees

- Employers of <u>local</u>* workers are required to declare wage information and pay CPF contributions for all local workers on a monthly basis

- Firms employing <u>foreign</u> workers must apply relevant work passes with MOM. Employers are also required to update MOM if there are revisions in foreign employee's salary or personal particulars

- Data from CPFB and MOM comprise timely information on local and foreign employment and wages
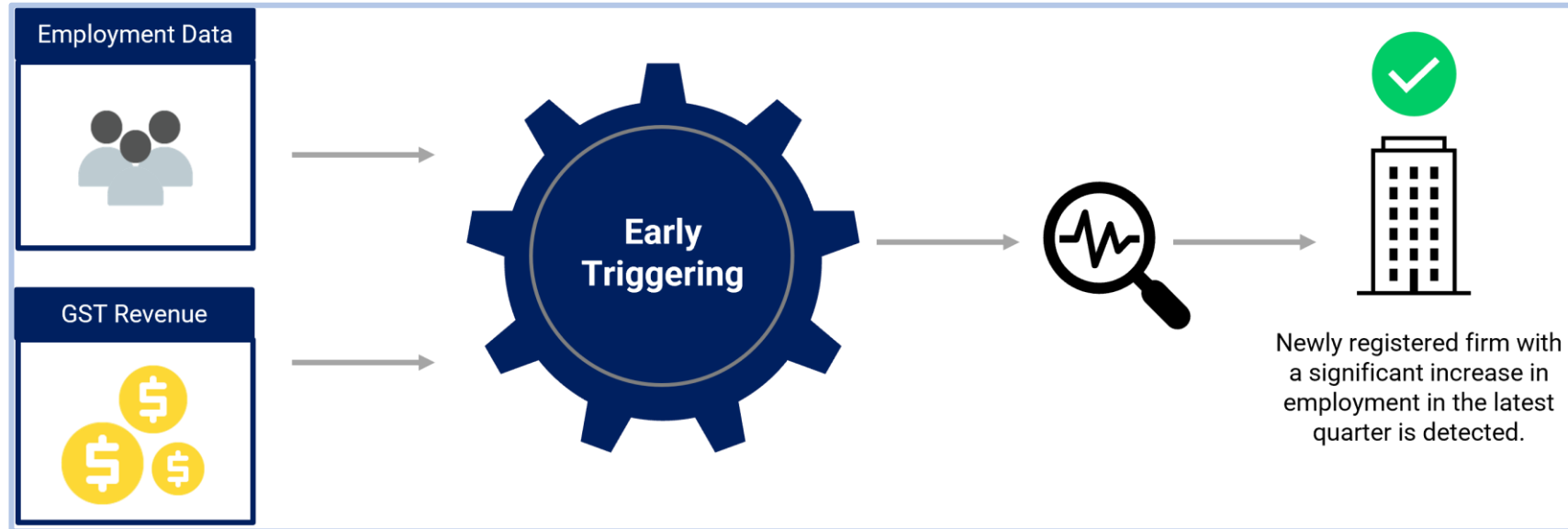
* Refer to Citizens and Permanent Residents of Singapore

Early Triggering with Employment and GST Data

Goods & Services Tax (GST) data from the Inland Revenue Authority of Singapore (IRAS)

- GST is a broad-based consumption tax levied on the purchases of goods and services in Singapore

- Firms with annual taxable turnover exceeding S$1 million must register for GST while firms with annual taxable turnover not exceeding S$1 million can voluntarily register for GST

- GST data include firms' revenue and taxable purchases

- GST data are timely as firms are required to file GST on a quarterly basis, within one month after the end of the accounting period

Early Triggering with Employment and GST Data

Employment Data

GST Revenue

Early Triggering

Newly registered firm with a significant increase in employment in the latest quarter is detected.

- On a quarterly basis, firms with changes in employment and/or revenue exceeding sector-specific thresholds are identified and shared with economic and business statistics divisions for their information and further assessment

- Sector-specific quantitative thresholds are developed based on the revenue and employment percentile distributions of firms by industry and discussions with relevant DOS divisions

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Use of Qualitative Data as Supplementary Indicators

- Information from larger firms on their business outlook as well as major restructuring plans in the next six months is collected in DOS's Quarterly Business Expectations Survey

- This information is shared with the relevant DOS divisions

- Work together with a service provider to sieve through and select online business news based on keywords such as firm expansion and restructuring plan

- A summary of the news articles is compiled into a Weekly Economic Brief for sharing with the relevant officers

- Text mine web-based data and extract key features from corporate websites of firms, and apply supervised machine learning to derive an indicator on firms' internet presence

- Information may be used as an early indication of firms that are commencing business activities

Experimental Use of Electricity Consumption and Property Stamp Duty Data in Early Triggering

DOS has been exploring new data source for incorporation into SBR and to serve as additional indicators in the Early Triggering project

Electricity Consumption Data

Property Stamp Duty

Electricity Consumption Data

💡 Meters are installed in all households and establishments in Singapore to measure electricity consumption

💡 Monthly electricity consumption data are available for use in production of official statistics (e.g. electricity consumption of businesses and/or households)

💡 Data of electricity consumption for business accounts contain information such as:
- UEN
- Address of the establishment
- Amount of electricity (in kWh) consumed in the billing month

Property Stamp Duty Data

Property stamp duty is the tax on documents relating to transactions of properties in Singapore

Parties involved in property transactions are required to e-stamp documents of sales & purchase agreement or tenancy agreement and pay stamp duty

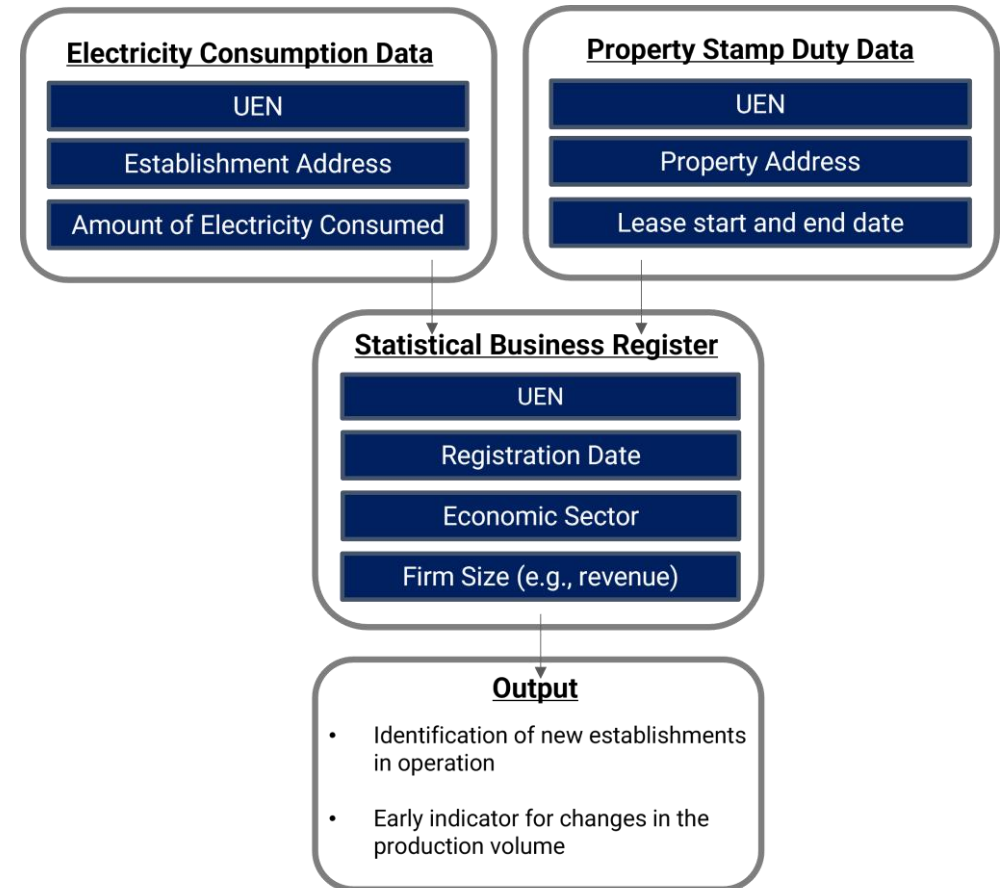Stamp duty data from IRAS contain information such as:
- UEN
- Property address
- Selling price of property
- Monthly rental amount
- Lease start & end date

For more information on stamp duty, please refer to IRAS website: https://www.iras.gov.sg/taxes/stamp-duty

Experimental Use of Electricity Consumption and Property Stamp Duty Data

Integration of electricity consumption and stamp duty data at establishment level with firm characteristics information in the SBR could serve as additional sources for Early Triggering:

- Information on firms' new electricity meter accounts and leases or purchases of commercial properties could be used to identify new establishments or outlets in operation

- Significant changes in electricity consumption can also be used as an early indicator for changes in the production volume

Electricity Consumption Data
- UEN
- Establishment Address
- Amount of Electricity Consumed

Property Stamp Duty Data
- UEN
- Property Address
- Lease start and end date

Statistical Business Register
- UEN
- Registration Date
- Economic Sector
- Firm Size (e.g., revenue)

Output
- Identification of new establishments in operation
- Early indicator for changes in the production volume

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Learning Points

✓ SBR is useful in the early detection of significant changes in firm's business activity using higher frequency data

✓ Qualitative data can provide an early sensing of events that may impact firm's performance

✓ Experimental use of electricity consumption and property stamp duty data can also be used for updating establishment information in the SBR