Developing the Prototype Longitudinal Business Database: New Zealand's experience

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Abstract

This paper describes Statistics New Zealand's development of the prototype Longitudinal Business Database (LBD). The LBD is the result of a two-year feasibility study to integrate longitudinal administrative and survey data, at the enterprise level, that will meet users' needs to better understand the dynamics of enterprise performance without increasing respondent load. The LBD has been used to produce a selection of prototype official statistics (examples of these are included in this paper). These outputs demonstrate the benefits of integrating unit-record data from survey and administrative sources. The paper covers current and future uses of the LBD, its construction, the legislative environment, the challenges faced and the solutions adopted.

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Disclaimer

Access to the data used in this study was provided by Statistics NZ in accordance with security and confidentiality provisions of the Statistics Act 1975. Only people authorised by the Statistics Act 1975 are allowed to see data about a particular, business or organisation. The results in this paper have been confidentialised to protect individual businesses from identification.

The results are based in part on tax data supplied by Inland Revenue to Statistics NZ under the Tax Administration Act 1994. This tax data must be used only for statistical purposes, and no individual information is published or disclosed in any other form, or provided back to Inland Revenue for administrative or regulatory purposes. Any person who had access to the unit-record data has certified that they have been shown, have read and have understood section 81 of the Tax Administration Act 1994, which relates to privacy and confidentiality. Any discussion of data limitations or weaknesses is not related to the data's ability to support Inland Revenue's core operational requirements.

Statistics NZ protocols were applied to the data sourced from the New Zealand Customs Service; the Foundation for Research, Science and Technology; New Zealand Trade and Enterprise; and Te Puni Kokiri. Any discussion of data limitations is not related to the data's ability to support these government agencies' core operational requirements.

1. Motivation

The need for a common set of financial variables linked to non-financial survey data became clear when Statistics New Zealand began developing a suite of new business performance surveys in 2003. It was thought that the impact on respondent load could be reduced if the common financial variables could be collected once and used repeatedly.

With this in mind, Statistics NZ undertook a two-year project known as IBULDD (Improved Business Understanding via Longitudinal Database Development), to test the feasibility of producing such data. The project was funded by the Cross-Departmental Research Pool with a significant additional contribution from the Ministry of Economic Development (MED).

The project had four main objectives:

- produce new and improved official statistics

- improve the access and usability of microdata for researchers

- reduce respondent burden

- improve the efficiency of Statistics NZ's data handling (statistical architecture).

Policymakers and a range of interest groups need official statistics that allow them to make evidence-based decisions. IBULDD developed and tested the methodology to produce new official statistics that measure the dynamics of business growth and performance. The ability to produce longitudinal outputs from the prototype Longitudinal Business Database (LBD) represents a 'quantum leap' in information for users of business performance data. The project successfully delivered the LBD, which will be a key element in Statistics NZ's new statistical architecture.

This paper describes the LBD; the project that developed the LBD, including the challenges faced and solutions adopted; New Zealand's legislative environment; and the current and future uses of the LBD. The paper concludes with a selection of the prototype official statistics that were produced using the LBD.

2. Description of the LBD

The LBD is a longitudinal dataset of integrated business-related data. It is enterprise-based and annual. Its length, breadth and depth make it a powerful tool.

- Length – annual data for 2000–06 (some data is available for earlier and later years)

- Breadth – population coverage and imputation ensures that key financial data is available for a census of enterprises

- Depth – range of data includes information on business demographics, financial data, employment, goods exports, government assistance, and management practices.

The backbone of the LBD is the Longitudinal Business Frame (LBF). This is a longitudinal register of businesses and includes demographic data. Administrative data from other government agencies, including Inland Revenue and the New Zealand Customs Service, is linked to the LBF, along with a number of Statistics NZ sample surveys that measure business practices and performance. A key part of the IBULDD work involved establishing the common linkages, common units, and common timeframes for all the source data. Table 1 presents the integrated components of the LBD.

Table 1

Prototype Longitudinal Business Database (LBD)
Integrated components

Component	Years	Description
The backbone of the LBD		
Longitudinal Business Frame (LBF)	2000–06	Contains longitudinally linked data for most enterprises operating in New Zealand. It includes information on employment, location, industrial activity, and ownership relationships. The LBF enables individual business units to be tracked over time.
Administrative data linked to the LBF		
Business Activity Indicator (BAI)	1992–2006	The BAI is a monthly series based on the supply of administrative data from Inland Revenue. The main source of this data is GST (goods and services tax) 101 form. GST is a tax based on the sale of goods and services.
Financial accounts (IR10)	1999–2006	The Accounts Information Form (IR10) collects a summary of information relating to the business and its operations (profit and loss statement, and balance sheet). The Inland Revenue supplied data is transformed by Statistics NZ and then linked to IBULDD.
Company tax returns (IR4)	1999–2006	The IR4 income tax return is compulsory for businesses that are registered as companies. It includes income, tax calculation, refunds and/or transfers, provisional tax, and disclosures. IR4 data is supplied to Statistics NZ by Inland Revenue and is then linked to IBULDD.
Linked Employer-Employee Database (LEED)	2000–06	A Statistics NZ integrated database that provides an insight into the operation of New Zealand's labour market, such as job and worker flows. Created by linking a longitudinal employer series from the Business Frame to a longitudinal series of employer monthly schedule (EMS) payroll data from Inland Revenue.
Overseas Merchandise Trade data	1988–2007	A daily shipment-level series based on administrative data supplied by the New Zealand Customs Service. In the LBD, this daily data is aggregated to monthly, and provides information on the importing and exporting of merchandise goods between New Zealand and other countries.
Government assistance data	2000–06	Information on the assistance provided directly to businesses by the Foundation for Research, Science and Technology, New Zealand Trade and Enterprise, and Te Puni Kōkiri.
Sample survey data linked to the LBF		
Annual Enterprise Survey (AES)	1997–2006	Provides annual financial performance and financial position information about industry groups operating within New Zealand. AES is the basis of the national accounts produced by Statistics NZ.
Business Operations Survey (BOS)	2005–06	Collects measures of business performance and a range of practices and behaviours which may have some impact on that performance, including innovation and business use of information and communication technology.
Innovation Survey	2003	Collected information on the characteristics of innovation in New Zealand private-sector businesses.
Research & Development Survey (R&D)	Biennially 1996–2006	Collects information on business, government and higher education (university) spending on R&D.
Business Practices Survey (BPS)	2001	Collected information on business and management practices.
Business Finance Survey (BFS)	2004	Collected information on the capital structure of businesses in New Zealand, the sources of finance they use, and their recent financing experiences.

Population

The population of the LBD consists of all enterprises that have at any time been included on the Statistics NZ Business Frame (and consequently have been allocated an industry classification). Enterprises are included on the Business Frame when they are identified (from administrative information) as having met the threshold criteria. Eligible enterprises are further defined as being economically active (and therefore in scope for the prototype statistics presented later in this paper) in a particular year if they have filed administrative data with selected financial or employment values greater than zero.[2]

3. The IBULDD project

The IBULDD project began at a time when Statistics NZ was working on a number of data integration projects that used administrative data, including:

- the student loan and allowance integrated dataset – currently used to produce annual statistics on the borrowing, qualifications and income of students who have participated in the student loans scheme or have received an allowance

- LEED – currently used to produce quarterly and annual releases on the labour market dynamics of New Zealand.

This meant that some of the legal aspects of integrating administrative data had already been investigated. In addition, the LBF, used by the LBD, had already been developed by the LEED project. However, there still remained challenges specific to the development of the LBD and these are examined in a later section.

At the same time, Statistics NZ was developing its vision for statistical architecture, which included the development of a production LBD. The IBULDD project fitted within the architecture by developing the prototype model.

The project followed traditional project management principles. This section describes some of the key aspects of the project.

Governance

Governance was critical to the project's success. The strong commitment of the sponsor, business owner, project manager and the project team, along with the extensive support across government, enabled challenges and issues to be resolved effectively. The broad range of people involved in the project, both within Statistics NZ and externally, is illustrated by the governance groups below:

- a sponsors' group (made up of internal and external members)

- an internal steering committee

- a project board (internal members)

- an external technical advisory group

- a working group (the core project team)

- other internal advisors (from related projects or infrastructure).

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2 Consequently, there is some under-coverage of micro-enterprises because they never meet the criteria for being on the Business Frame. For more information, see Statistics New Zealand (2007).

Needs analysis

One of the first stages of the project was to analyse the needs of users, in particular researchers, in order to meet the second objective of the project (improve the access and usability of microdata for researchers). This involved working with a number of government agencies to identify research questions that could potentially be answered by the LBD. These needs, combined with Statistics NZ's objectives (see section 1, Motivation), were used to determine the structure and content of the LBD.

Data providers

As the LBD uses significant amounts of administrative and survey data, the cooperation of each data provider was critical. Most of the administrative data (excluding the government assistance data) is processed and used elsewhere within Statistics NZ. The IBULDD project team worked with the relevant areas of Statistics NZ to:

- gain approval from the providing agencies to link the data to the LBD

- access and understand the data and metadata (including understanding the existing processes applied to the data).

The government assistance data was collected and linked to the LBD as part of an interdepartmental policy evaluation project.

International peer group review

Because the project was so novel, an international peer group review was held 10 months into the project, in October 2006. The review team was made up of representatives from the Australian Bureau of Statistics, the US Bureau of the Census and the UK Office for National Statistics. The team expressed enthusiasm for the aims and methods expounded, remarked positively on the way Statistics NZ had addressed many difficult problems, and provided recommendations for the continued development of the LBD (Blanchette, Jarmin and Ritchie 2006). The peer group was informed of progress throughout the project and continues to be notified of statistical and research outputs.

4. Challenges and solutions

The challenges faced during the development of the LBD included: designing the structure of the database, developing imputation methodologies, establishing microdata access, and ensuring confidentiality was protected. This section examines each of these.

Database structure

The work on the structure of the database began with deciding on and applying the standard units and periodicity, followed by structuring the data and metadata. The approach was to keep it simple to start with and enhance as necessary. This work is detailed below.

Periodicity

Most of the source data is provided on an annual financial-year basis. Because most businesses in New Zealand use a March balance date, the decision was made to create an annual database using March years. When needed, data was aggregated to an annual basis using the enterprises own balance date. Each balance date was then allocated to the March year with the greatest overlap.

All core financial information and business characteristics are available for 2000–06. While this is good, it can be improved by adding the data for current years as it becomes available. The IBULDD project has prepared for this by establishing systems and processes for linking additional years of data. The costs of an annual update are comparatively small, but the benefits are significant. This will be particularly true as the LBD extends to encompass complete business cycles.

Unit of observation

Most of the data used in the LBD is enterprise or tax-unit based. Tax data is provided by IRD number, which, for 99.7 percent of economically significant businesses on the Business Frame, has a one-to-one relationship with enterprise number. The decision was made to use the enterprise as the unit of observation.

The IBULDD project developed and tested the methodologies to aggregate data to the enterprise level. For example, overseas merchandise trade data records consignments against client numbers. This data is mapped to a unique enterprise number and aggregated to the relevant March year. The Annual Enterprise Survey is based on kind of activity units, and is aggregated to enterprise level before it is linked into the LBD. Government assistance data records grants, advice, or other services provided. This data is probabilistically matched to the LBF and then aggregated to enterprise level within IBULDD.

An enterprise is defined as a business or service entity operating in New Zealand, and is based on a legal entity. From an economic perspective, enterprises are subject to 'false' births and deaths. For example, if a business reregisters with the Companies Office, it may be assigned a new enterprise number. The original enterprise number will appear to have ceased operating even though the same economic activity may be continuing in the same location with the same owners. The proposed solution to this issue is to develop the concept of a longitudinal enterprise, which will refer to the business itself, not the legal entity. The LBF tracks individual plants (geographic units), using several methods including employment matching. In simple cases of false exit and entry, these unit-level links can be used to repair enterprise-level links. However, further work is needed for groups that are more complex.

Database structure

The LBD is stored on a Microsoft SQL server, which can be queried using SQL or SAS. The requirements were that the storage be secure, be able to store large amounts of data, and be easy and quick to query.

Raw data from each source is stored as a 'load' table. This data is then aggregated to an annual, enterprise-based 'fact' table. The unique identifiers in each fact table are the enterprise and year. An in-principle decision was made to make both raw and transformed data available to users so that any change to the data can be unwound. This approach recognises that generic rules are not best for all applications.

Metadata

As data from each source was collected and linked to the LBD, the metadata was also collected and collated into a central repository. Metadata already existed for survey data, but some additional metadata was required for the administrative data.

An ongoing challenge is to develop better methods to distil and harmonise this metadata.

Imputation

Survey data linked to the LBD, as well as data from the Business Activity Indicator (BAI) series, have already had some imputation applied during the survey processing stage. IBULDD developed the imputation methodology to apply to missing BAI and Inland Revenue IR10 data. Cases that lead to an enterprise receiving an imputed value for sales or income include:

- enterprises that fall below mandatory size thresholds (currently $40,000) for filing GST

- enterprises that file an incomplete or internally inconsistent IR10

- enterprises that are GST-exempt

- misidentification of start-up and ceasing dates for enterprises (eg due to administrative lags in filing).

Three imputation methods were used to impute missing BAI and IR10 values in the LBD. Interpolation was the first method of choice. If this was not applicable historical imputation was used, and if this was not applicable then donor imputation was used. The nearest neighbour for use as a donor is determined using financial and employment data from LEED, IR10 and BAI.

Confidentiality

Linking data from different sources raises issues about privacy, confidentiality and security. The LBD has the following protection methods in place.

- Access to the entire LBD is restricted to the IBULDD project team.

- Government departments and researchers may only access an anonymised version of the LBD, and only through Statistics NZ's Data Lab. A rigorous application process and strict eligibility criteria apply, based on the requirements of the Statistics Act 1975 and Inland Revenue.

- The anonymised version of the LBD has had all variables that might identify an enterprise removed.

- The LBD is protected by Statistics NZ's strict security policy that applies to both the IT system and the physical building.

- All outputs from the Data Lab are checked to ensure they do not breach confidentiality.

5. Legislative environment

The LBD was developed within the legislative requirements of the Statistics Act 1975, the Tax Administration Act 1994 and the Privacy Act 1993.

The Statistics Act covers how Statistics NZ collects, uses, securely stores, and manages access to data. Data obtained under the Act is to be used only for statistical purposes. The Act provides for discretion to approve data access by other government departments for bona fide statistical and research purposes under tightly controlled conditions. Statistics NZ is also able to contract independent contractors (which can include individuals from non-government or academic institutions) to carry out work that contributes towards enabling Statistics NZ to deliver quality official statistics.

The Tax Administration Act allows Inland Revenue to provide data to Statistics NZ under the discretion of the Commissioner, who needs to be satisfied that the integrity of the tax system isn't going to be compromised by Statistics NZ's use of the data. The data that can be provided is that which is "not undesirable to disclose", and which is "reasonably necessary" for Statistics NZ to carry out its official duties under the Statistics Act.

The Tax Administration Act also covers Inland Revenue's declaration of secrecy that must be signed before accessing the data.

The Privacy Act protects the privacy of individuals. While there is no specific legislative requirement around data matching for statistical purposes, Statistics NZ is concerned that the privacy of individual people is safeguarded, and is seen to be protected. The Data Integration Manual describes Statistics NZ's Data Integration Policy. As the LBD includes information on enterprises only, and not on individuals, some of the requirements, such as preparation of a privacy impact assessment, do not apply.[3]

Microdata access

An anonymised version of the LBD can be accessed through Statistics NZ's Data Lab or through secondment to Statistics NZ. A rigorous application process and strict eligibility criteria, based on the requirements of the Statistics Act 1975, apply. Government departments and other researchers (with backing from a recognised institution) undertaking research for public benefit can be granted access to microdata.

The induction process for new users includes a description of the structure of the database and the imputation applied. All outputs from the LBD are confidentialised to protect individual businesses from identification.

6. Current use

The IBULDD project confirmed that the creation of a database such as the LBD is feasible and valuable. The value of the LBD is illustrated by its current uses.

- A set of prototype new and improved official statistics have been produced (examples of these are included in this paper).

- It has enabled government to evaluate policy and understand business dynamics without commissioning new surveys and adding to respondent load.

- Lessons learnt during the IBULDD project have been used to develop the road map for the implementation of the statistical architecture, which will improve the efficiency of Statistics NZ's data handling (McKenzie 2008).

- Statistics NZ's understanding of the difference between the data and metadata requirements for aggregate, cross-sectional statistics, and the requirements for microdata research and longitudinal analysis, has increased.

- A dozen researchers have access to and are using the LBD for microdata research related to topical public policy issues.

The LBD became available in April 2007. Within only three months, four research papers were produced by the Ministry of Economic Development (MED), and

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3 The LBD does contain aggregated worker information from LEED.

presented at the New Zealand Association of Economists Conference 2007 on these topics:

- firm level patterns in merchandise trade

- firm dynamics, market structure and performance

- currency hedging behaviours of exporters

- comparison of quantitative and qualitative performance measures.[4]

Additional research papers have been or are currently being produced on the following topics:

- OECD cross-country micro study on innovation and productivity (MED and Statistics NZ)

- Evaluating government business assistance programmes (MED)

- The impact of immigration and local workforce characteristics on innovation and firm performance (Department of Labour, Motu Economic and Public Policy Research (Motu), and the Reserve Bank of New Zealand (RBNZ))

- International engagement and firm performance (including the determinants of entry and exit, and the effects of exchange rate volatility on exporting) (RBNZ, Motu and University of Waikato)

- Productivity and agglomeration in Auckland (Motu and MED)

- Business practices and firm performance (RBNZ, Motu and University of Waikato)

- Exporters' optimal and selective hedging choices (RBNZ, Motu and University of Waikato)

- Relationship banking and access to finance in New Zealand firms (MED)

- Product mix and volatility of firm performance (the New Zealand Treasury)

- Estimating aggregate R&D expenditure using a micro model (Statistics NZ and RBNZ).

7. Future use

The IBULDD project developed the framework necessary to integrate data using common linkages, units and timeframes. This framework allows additional years of data and additional datasets to be efficiently integrated into the LBD, enabling its length and depth of information to increase over time. Beyond this updating process, it is intended that a future production model of the LBD would be used to:

- reduce respondent load by removing the need for financial questions in surveys

- produce new official statistics and enable existing official statistics to be produced more efficiently

- contribute to dissemination tools (eg benchmarking, Table Builder)

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4 See Fabling & Sanderson (2008); Fabling et al. (2008); Fabling & Grimes (2008); and Fabling, Grimes & Stevens (2008), respectively.

- support the production of new financial performance metrics and continue to be a valuable resource for microdata research.

Benefits of using the LBD for microdata research

The LBD has a unique ability to "turn data into relevant knowledge, efficiently" (Statistics NZ mission), by:

- providing answers to more specific questions on the economy, business behaviour, and performance distributions, than could be answered using unlinked raw data

- meeting the expectations of a national statistical office to adapt to a changing world and provide information as and when it is needed

- providing the information needed to meet the increasing demand for evidence-based policy

- promoting new insights on the impact of policy and business practices through the linking of different datasets

- giving information on the economy that can be used to inform government, businesses, communities, and citizens.

The LBD is an example of intelligent data usage because it:

- increases the amount of information extracted from data already collected

- enables longitudinal analysis

- increases and maximises the use of administrative data

- provides a valuable tool for government that does not increase respondent load

- increases the quality of information by giving alternatives to using imputed data and improving imputation methods.

8. Prototype official statistics

This section presents a selection of the prototype official statistics published by Statistics NZ in December 2007. The target population for these results is the private, for-profit sector. For more information refer see Statistics NZ (2007).

Industry growth

Each year there were 51,000 to 61,000 start-up enterprises – enterprises that became economically active (ie 11–13 percent entry annually). The number of enterprises that ceased economic activity each year was less than the number of start-ups, and varied between 38,000 and 48,000.

Distribution of income

Figure 1 shows smoothed distributions of total income in 2005 for each industry, against the distribution for the population of enterprises.[5]

For some industries, the distributions are similar to that of the entire population. However, a number of industries have distributions that are quite different, for example:

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5 These distributions are displayed in natural logs because the underlying distributions are highly skewed.

- The agriculture, forestry and fishing industry has, on average, higher income than the entire population. However, there are many enterprises with an income lower than the population average (perhaps simply reflecting the wider Business Frame coverage in this industry).

- The mining and quarrying industry has a much more dispersed distribution and a higher income (on average) than the entire population.

- The manufacturing industry has, on average, a slightly higher income than the entire population, but includes a group of high-income enterprises.

- The electricity, gas and water supply industry has a bi-modal distribution, which means there are two groups of enterprises. The larger of these two groups has, on average, income that is slightly below the population average. The second group consists of high-income enterprises.

- The wholesale trade industry has a much more dispersed income distribution than the entire population. This industry also has a group of high-income enterprises.

Figure 1

Income
By industry
2005
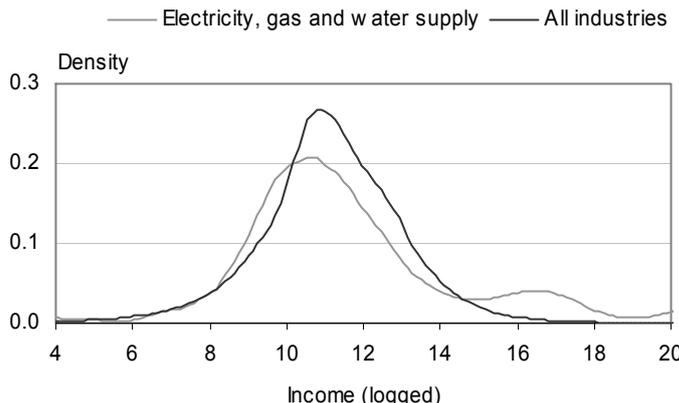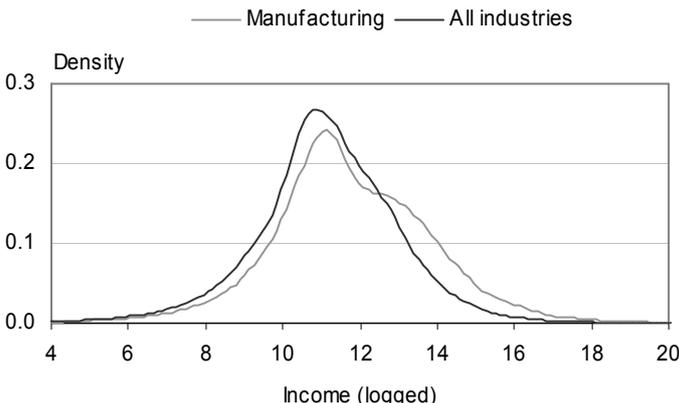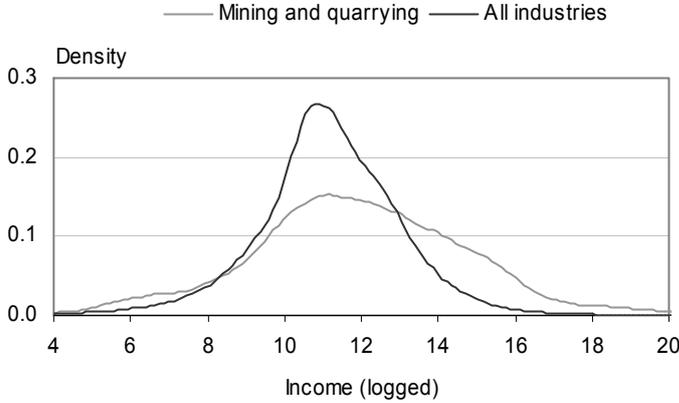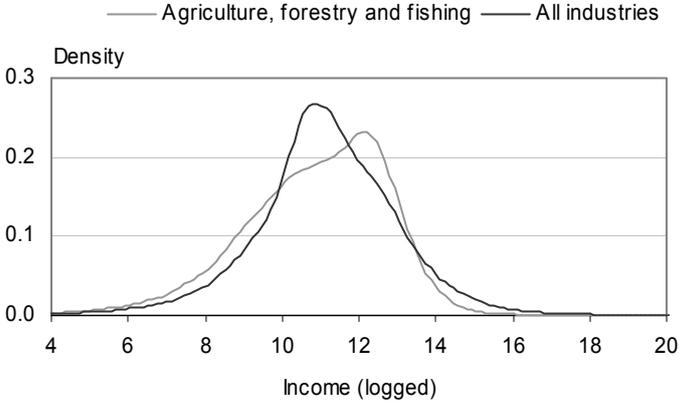
**Note:** The x-axis has been restricted to between 4 and 20 to protect confidentiality.

Source: Statistics New Zealand's prototype Longitudinal Business Database.

Figure 1 shows the power of IBULDD compared with aggregate sample-based statistics. The size of the database allows consideration of the distribution of enterprises within classification groups, such as industry. It enables consideration of not only the substantial heterogeneity within industries, but also whether or not the chosen classificatory groups are useful.

Exporting manufacturers

The percentage of manufacturers that export increased from 9.1 percent in 2000 to 11.4 percent in 2005. The exporters' share of the total employment in the manufacturing industry is much higher than their share of enterprises, and has been growing steadily. In 2005, exporting manufacturers accounted for 58 percent of employment in the manufacturing industry, rising from 50 percent in 2000 (figure 2).

Figure 2

Exporting Manufacturers
2000–2005
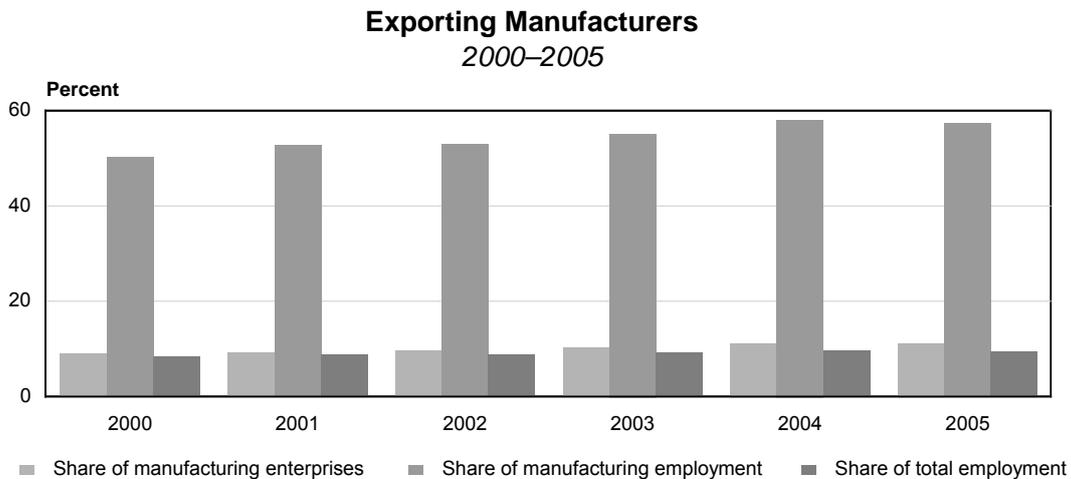
Source: Statistics New Zealand's prototype Longitudinal Business Database.

Innovation outcomes

The LBD allows a longitudinal analysis to be added to any cross-sectional result of a business survey. The analysis period can be both before, and after, the survey period. An analysis before the survey period can identify motivating factors, and an analysis afterwards can show outcomes. This section demonstrates an example of an outcome.

To measure an effect of innovation on business performance, the sales and employment growth of 'product innovators' (those that reported in the survey that they had offered new, or significantly improved products to customers) was compared with that of enterprises without a product innovation ('not product innovators') for a period following the introduction of a product innovation.

This analysis uses the subset of the population that responded to the Business Practices Survey 2001 and were still economically active in 2005[6] – approximately 2,400 enterprises. These enterprises are grouped into product innovators and not product innovators.

In 2001, the average sales figure for product innovators was $21 million – higher than for not product innovators ($15 million). Between 2001 and 2005, sales for product innovators grew an average of over $600,000 per year. Not product

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6 **Note:** The attrition rate for product innovators and not product innovators is very similar (at around 12 percent).

innovators initially had declining sales in 2002 and 2003, but over the 2001–05 period, sales grew on average less than $400,000.

Table 1

Average sales growth for enterprises
By innovation status
2001–05

Innovation status	Number of enterprises[1]	Average sales for 2001 (NZ$)	Average annualised sales growth ($NZ)			
			Years			
			2001–02	2001–03	2001–04	2001–05
			Base: 2000 year			
Product innovators[2]	1,656	21,341,958	691,724	532,671	777,495	620,522
Not product innovators	759	15,437,754	-655,280	-89,869	78,021	375,079

(1) Enterprises that responded to the 2001 Business Practices Survey and were economically active in 2005.
(2) Enterprises in the 2001 Business Practices Survey that reported that they had offered new or significantly improved products to customers in the last three years. Note this definition no longer corresponds with the OECD's Oslo Manual (2005) definition of innovation used in Statistics New Zealand's innovation reports.
Source: Statistics New Zealand's prototype Longitudinal Business Database

Enterprises receiving government assistance

More small businesses received assistance than large businesses. In 2005, 56 percent of recipients had an employment count of fewer than 10, and 27 percent had an employment count of 10–49. In 2005, the manufacturing industry had the largest number of businesses receiving government assistance; 36 percent of all recipients were in the manufacturing industry in 2005. It was also the industry with the largest proportion of its businesses receiving assistance (2 percent).

Glossary

BAI
Business activity indicator – derived by Statistics New Zealand using GST data.

Balance date
The date of the end of the financial year.

Business Frame
A register of all businesses operating in New Zealand.

Donor imputation
The imputed value is the value of the nearest neighbour in the LBD. The nearest neighbour is determined by grouping enterprises into subgroups based on industry and lifespan.[7] Matching variables (financial and employment data from LEED, IR10 and BAI) are then used to determine the nearest neighbour from within an enterprise's subgroup.

Employment
Employment refers to total employment count and includes both employees and working proprietors. It is defined as the rolling mean employment (RME) plus the number of working proprietors. RME is a 12-month moving average of the monthly employee count figure. Both the employee and working proprietor counts are obtained from tax data.

Enterprise
A business or service entity operating in New Zealand. It can be a company, partnership, trust, estate, incorporated society, producer board, local or central government organisation, voluntary organisation or self-employed individual.

Firm
See enterprise.

GST
Goods and services tax

Historical imputation
If a previous value exists, but not a subsequent value, the imputed value is the value from the previous year.

IBULDD
Improved Business Understanding via Longitudinal Database Development – Statistics NZ's feasibility project to develop a longitudinal database of business information.

IR4
Company income tax return filed with Inland Revenue.

IR10
Accounts information form filed with Inland Revenue.

LBD
Statistics NZ's prototype Longitudinal Business Database developed by the IBULDD project.

LBF
Longitudinal Business Frame – an annual longitudinal register of all businesses operating in New Zealand.

LEED
Linked Employer-Employee Database – an administrative dataset of integrated employer and employee information.

Linear interpolation
For missing values, where previous and subsequent values exist, the imputed values are the average of the values existing in the previous and subsequent years.

PBN
Permanent business number – a unique identifier assigned to a geographical location, for example a site, factory or shop.

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7 Lifespan refers to the period of economic activity of an enterprise.

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Statistics New Zealand (2007). *Potential Outputs from the Longitudinal Business Database*, Statistics NZ, Wellington.

Related links

LBD: http://www.stats.govt.nz/economy/business/longitudinal-business-database.htm

LEED: http://www.stats.govt.nz/leed/default.htm

Peer Group Review: http://www.stats.govt.nz/developments/ibuldd-peer-review-report.htm

Data Integration Manual: http://www.stats.govt.nz/NR/rdonlyres/35662748-4DBC-41DA-A519-E6D9D7748C20/0/DataIntegrationManual.pdf

Data Lab: http://www.stats.govt.nz/products-and-services/microdata-access/data-lab/default.htm

Table Builder: http://www.stats.govt.nz/products-and-services/table-builder/default.htm