

LINKING OF ESTABLISHMENT AND ENTERPRISE DATA FOR CANADA

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BACKGROUND

The ability to link enterprise-based financial statistics with establishment-based production statistics depends on

- the existence of internal information for operating units of the businesses that correspond to the statistical units
- a relationship between the concepts and definitions used in business's management information and production statistics in order to transform data based on business definitions and concepts into data based on economic statistics definitions and concepts.

The Strategy for Linking Establishment and Enterprise Data

The strategy for linking establishment and enterprise data consists of two parts. The first part of the strategy is to establish specialists for individual enterprises who will be familiar with the business and can make arrangements to collect data from it. These specialists would have to understand the internal management information systems well enough to translate them into the required collections for the statistical agency.

The second part of the strategy is to collect data from the internal management information systems for the responsibility centres and for the enterprise as a whole. The aggregate enterprise accounts serve as a control total to ensure that coverage is not duplicated and is complete. The data items that are collected are the nearest to the economic definitions as it is possible to get using the business accounting definitions. The data collected for establishments would be used as control totals for the data collected from individual establishments. See Appendix A for a description of Business Management Information Systems.

Additional data would have to be collected or estimates made for adjustments to the business accounting data to derive economic production data.

A questionnaire - the Consolidation Questionnaire - was derived to use as a tool for collecting information on a business accounting definition for the units that corresponded to statistical units.

Tools to Aid in Achieving the Objectives:

As a means of attaining these objectives some basic tools are proposed:

The first tool as suggested is a relationship between Statistics Canada and the individual enterprises. Statistics Canada must develop individuals with knowledge of MIS's, accounting practices and Statistics Canada's requirements who can interpret Statistics Canada's requirements to the business. They would

have to be capable of tailoring collection to the individual business. This requires some examples of the preferred treatment in different types of MIS's and organization of businesses.

The second tool is the consolidation questionnaire.

The Consolidation Questionnaire (CQ):

The Consolidation Questionnaire is shown below. It is a survey about the units of a business and does not necessarily produce any independent outputs. That is, it would affect estimates for the production accounts but would not be a new class of data.

The CQ requests quantitative data on seven financial variables and demonstrates the consolidation of these accounts from the lowest level accounting entities to the highest level Corporate consolidated accounts.

1. Total Operating Revenue
2. Total Operating Expenses
3. Operating Profit
4. Capital Expenditures
5. Closing Inventory
6. Depreciation Expense
7. Amortization (of Intangibles and Deferred Charges)

In addition the CQ:

- is collected for each level in the organization and each unit within each level
- collects only data that are available in the MIS of the business and does not ask for additional estimates to be prepared
- at each level collects an unconsolidated total, a consolidation adjustment and consolidated totals for the level for each data item. Each lower level total appears in the totals for the level above.

	Operating Revenue			Operating Expense		
Organizational Units	Unconsolidated	Consolidation Adjustment	Consolidated	Unconsolidated	Consolidation Adjustment	Consolidated
	Operating Profit			Depreciation and Amortization of Intangibles		
Organizational Units	Unconsolidated	Consolidation Adjustment	Consolidated	Unconsolidated	Consolidation Adjustment	Consolidated
	Amortization of Intangibles			Closing Inventories		
Organizational Units	Unconsolidated	Consolidation Adjustment	Consolidated	Unconsolidated	Consolidation Adjustment	Consolidated
	Capital Expenditures					
Organizational Units	Unconsolidated	Consolidation Adjustment	Consolidated			

Surveys In Scope for Comparison

There are a number of surveys to which the consolidation questionnaire data can be compared. These included:

1. Production (establishment) surveys (ES)
2. Public and Private Investment in Canada (Capital Expenditure Surveys - CES)
3. Quarterly Financial Surveys (QFS)
4. Consolidation Questionnaire (CQ)

Production establishment surveys

This is a group of surveys that collect data for establishments which would be used to measure production. The data collected would typically include:

Revenue

Revenue Detail (Activities/Broad Groupings)
Selected Revenue Detail by Commodity

Expenses

Wages and Salaries
Intermediate Inputs
Intermediate Input Detail (Broad Grouping)
Intermediate Input Detail by Commodity

Inventories

In fact, collection practices vary considerably from survey to survey.

Industry coverage is not complete; the unit may be other than the establishment and the data items collected may not be complete.

Public and Private Investment in Canada (Capital Expenditure Surveys - CES)

The statistical unit is the establishment for this survey. A Large Company Capital Expenditure Survey has also been undertaken for which the enterprise is the statistical unit. The data collected are capital expenditures - forecast, mid-year and actual versions for each reference year. Structure detail of construction expenditures and at least broad headings of expenditures on machinery and

equipment are also collected. This is additional data of the production statistics class but collected through a separate survey.

Quarterly Financial Surveys (QFS)

This is an enterprise based survey which uses concepts based on Generally Accepted Accounting Principles. Both data collected and the statistics produced are based on this concept. The data collected are the balance sheet and income statement for all industries and a number of other data in specific industries. Output is also recast into a national accounting framework. It is used in the production accounts of the SNA to provide estimates of corporate profits. This version of the data should be compatible conceptually with the production surveys.

QFS and CQ Comparisons

The following table summarizes comparisons between the QFS and the CQ.

	QFS	CQ	DIFFERENCE
OPERATING REVENUE			
Simple	11227	8311	2917
Absolute			4941
OPERATING EXPENSES			
Simple	11003	7844	3159
Absolute			4800
OPERATING PROFIT			
Simple	466	225	241
Absolute			396
CAPITAL EXPENDITURE			
Simple	626	697	71
Absolute			386
CLOSING INVENTORY			
Simple	1137	1007	131
Absolute			396
DEPRECIATION AND AMORTIZATION			
Simple	633	831	199
Absolute			282
AMORTIZATION OF INTANGIBLES			
Simple	69	48	21
Absolute			93

Most of the differences were minor but in two cases the consolidation questionnaire was missing some units that should have been included. Also, in one case the consolidation questionnaire included businesses outside Canada. In these three cases, the consolidation questionnaire data was changed to what was felt to be the better estimates for comparisons to the ES's.

Production Surveys and the CQ

There are many more potential sources of difference between these two sets of data than between the consolidation questionnaire and the QFS. The consolidation questionnaire is based on a model in which as complete a set of the seven data items as possible is collected for all units belonging to an enterprise. The ES surveys collect a different set of data which is not necessarily complete. The set of data collected varies by industry. In addition, surveys do not exist for all of the industries e.g. services to mining. The collection of the ES survey questionnaires was stopped at a point early in 1994. It is possible that some additional questionnaires were received in Statistics Canada but not passed on to the Consolidation Questionnaire group. In addition, it is possible that some corrections were made as a result of editing which do not appear on the questionnaires.

Potential sources of difference are:

- Units not covered (different profiles)
- Data items not covered
- Industries not covered
- Inconsistent reporting to surveys
- ES report not received (by the CQ group)

The following tables contain data on the differences classified as much as possible by source. The table does not include all differences and allocating differences to sources is judgemental. In addition, it should be considered preliminary.

The first quantifiable difference is one that arises because of differences for head office and auxiliary units. In some cases, no questionnaire is sent to the head office. This is shown as lines 1 and 2 in the table. Line 3 illustrates that there are no head offices reported on the ES that are not already included on the CQ. Data may be reported differently on the CQ and the ES for some head offices (lines 4 and 5).

There may also be differences for production units. Line 6 is units missing on the CQ. However, there were none of which we were aware. There are also a

number of production units not surveyed (lines 7 and 8). The industries may not be surveyed. Lines 9 and 10 are differences in reporting to the two surveys. Some of this large difference is the result of duplicate reporting of some values.

Line 12 indicates the value of amortization which is a conceptual difference between business accounting and economic accounting. Line 11 is a remaining unexplained residual.

CQ/ES COMPARISON TABLE

ITEM			Revenue	Expense	Revenue Expense Residual
			a	b	c
SOURCE OF DIFFERENCES					
Head Office and Auxiliary Unit Differences					
Not Surveyed at Establishment Level	Simple	1	56	188	-132
	Absolute	2	56	196	171
Unit not Reported on CQ		3	0	0	0
Reporting Differences	Simple	4	-498	-466	-93
	Absolute	5	498	466	93
Production Units					
Missing on CQ		6	0	0	0
Not Surveyed on ES	Simple	7	1280	1444	-156
	Absolute	8	1280	1451	169
Reporting Difference from CQ	Simple	9	14	843	829
	Absolute	10	148	1007	859
Other Reasons					
Unallocated		11	860	579	281
Amortization		12		-896	896

Because the consolidation questionnaire is based on a top down approach, it may include data which is not available to the lower levels in the accounting process. However, one could not expect to obtain some of the detailed data that is currently collected on the ES's from this level in the accounting structure.

Differences in Reporting and their Implications

There are several different aspects of the comparison.

Head Office and Ancillary Units Survey Incomplete

First, head office and other ancillary units are not necessarily completely surveyed. In this study, it is apparent that there are large gaps in the data for both revenue and expenses but especially for expenses. In some cases, the data for the head office per the production questionnaires is different from the consolidation questionnaire. In fact, not all head office questionnaires attempt to collect all revenue and expense values.

Production Technical Units in Establishment Surveys

For this group of businesses the differences are significant. Some of the differences could be conceptual but others clearly are not. There are significant differences in reporting. It appears in at least one case that the ES surveys are incorrect because the values are larger than would be expected for head office.

Non-allocated Revenue and Expenses

The CQ shows that businesses do have expenses of the various production units that are not currently collected. These expenses are of two types - direct expenses which are not collected and allocated indirect expenses of head office or ancillary unit expenses that are not allocated to the establishments. The amounts that are not allocated by enterprise are mainly the head office expenses.

The Impact of Correct Profiles on the Accuracy of Data

The profiles were consistent between the ES and the consolidation questionnaires. Nevertheless there were differences in the data collected.

Simple Differences vs. Absolute Differences

Simple differences were smaller than absolute differences. Absolute differences indicate that there were differences for the reporting about individual units. This type of difference affects geographical total and industry totals but not necessarily aggregate data. Geographical data could include domestic values since

many of the larger enterprises are multi-national. The simple values provide a better indication of the effect on aggregate values. However, these values underestimate the overall effect on aggregates because some of the offsets are between enterprises. A better value would be the sum of the absolute differences for enterprises.

Revenue Values

There are differences in revenue values. In terms of the raw differences, it is difficult to interpret them. The absolute differences are much larger than the raw differences.

Expense Values

Expense values are very different on the CQ compared to ES surveys.

Consolidation Adjustments

Consolidation adjustments were relatively small.

Conclusions and Recommendations

Allocated values should be collected and treated as service payment.

Unallocated head office and support unit expenses should be allocated to using units and treated as service flows.

Coordinated collection arrangements should be made for large businesses. These differences occurred despite the fact that the profiles were the same.

The CQ should be used to provide minimum coverage of non-covered industries and units.

The CQ should provide minimum "establishment data" for company based production surveys.

Appendix A - Management Information Systems

General

Management information systems for responsibility centres will include at a minimum the revenue that is under the direct control of the manager of the operating unit. They may also include allocated revenues and expenses - revenue or expenses that can be attributed to the responsibility centre but which are shared or are the responsibility of another responsibility centre. As a result, they indicate at least two important points about the responsibility centre reports. They indicate which unit is responsible for a particular process or function. They also give the costs of the responsibility centre which are consumed in the production process of the unit. Finally they tell how much of the other expenses of the company the unit is considered to "consume". The management information system has a relationship to the organizational structure but it can be fairly tenuous.

The organizational structure will list persons in the business according to their reporting responsibility. The accounting or management information structure will show how the data are aggregated and allocated within the accounting and management information structures.

One significant point is that the persons in the organization (or at least the structure to which they are attached) will have a specific geographical location although it may not be the same for all employees of the unit.

However, the revenues and expenses recorded in particular accounts of the accounting structure will not necessarily have a single geographical location. They could be an accumulation of costs and revenues from a variety of geographical locations.

Management information systems are designed to provide information on the revenues and costs that a manager of a particular unit is responsible and accountable for (usually direct costs attributable to the activity). It may also provide information on other revenues or costs for which there is a varying degree of shared responsibility with others in the organization (indirect costs and expenses).

There are usually two kinds of responsibility units in a management information system - cost centres and profit centres. There may also be revenue centres. Profit centres will have data on both revenues and costs and the net balance between them. Usually units of the business producing products that are sold in an external market will be profit centres. Generally, units providing support are considered to be cost centres.

For the profit centres, the net value of revenue less expense is usually called a contribution to overhead if not all indirect costs and expenses have been allocated and operating profit if all or a substantial part of indirect costs and expenses have been allocated. The other units are cost centres and to the extent possible they will measure their performance in terms of costs to produce quantities of output or in terms of cost against target.

Some businesses do not designate internal profit centres. Instead units record only expenses against some measure of production which could be quantities or quantities weighted with standard costs. Revenues are considered to accrue to the company as a whole.

Management information systems may include business lines, product lines, operating units, support units, corporations, head office, corporate and adjustments.

Typically there are four different treatments of revenues and expenses within the management information systems.

1. Transactions with transactors outside the business at market prices. (External market prices)
2. Transactions within parts of the business at transfer prices (market equivalents or cost). Both a revenue and an expense would be recorded. (Internal Revenues at transfer prices)
3. Cost allocations within the business. There is no revenue recorded but a cost is recorded. Units whose costs are allocated will not usually have a revenue but it is possible that they will have. (Cost allocations) The cost can take two distinct forms - a broad aggregate of costs and an item by item transfer of costs. This is the less desirable approach of the two.
4. Costs which are associated with units which have no revenue and no cost allocation. (Unallocated costs)

Profit centres could record revenue types 1 or 2. They could also record costs of types 1, 2 or 3. Cost centres can record expenses of types 1, 2 and 3.

The MIS will contain a number of data items and a number of units. Not all units will have all the data items. Some are considered by the business to either be the responsibility of only some units or to be corporate level items, i.e. taxes are not necessarily attributable to any individual responsibility centre of the business. In addition some items will be eliminated in the process of aggregation. For example, data for a business line will not include allocated head office expenses for the business line head office.

The Strategy to Link the Data

There is a linkage between the responsibility centres of the business and the overall accounts of the business. It is on this linkage that the establishment enterprise linkage is constructed. In this approach, data are collected for the enterprise which correspond in the business accounts as closely as possible to the economic accounting definitions. Additional data would have to be collected at the establishment level to obtain the full set of required data.

The kind of data available for the responsibility centres will vary by business. The following table summarizes some of the major data items that would appear in the income statement.

	General and Corporate	Executive	Corporate Head Office	Support / Service Unit	Intermediate (e.g. Regional) Head Office	Operating Unit	TOTAL BUSINESS
OPERATING REVENUE							
OPERATING REVENUE (INCOME FROM OUTSIDERS)							
INTERNAL TRANSFERS							
OPERATING EXPENSES							
DIRECT COSTS AND EXPENSES							
DEPRECIATION AND AMORTIZATION							
OTHER OPERATING EXPENSES							
Wages and Salaries and Employee Benefits (2)							
INDIRECT EXPENSES							
Allocations from General and Corporate (2) (4)							

	General and Corporate	Executive	Corporate Head Office	Support / Service Unit	Intermediate (e.g. Regional) Head Office	Operating Unit	TOTAL BUSINESS
Allocations from Corporate Head Office (2) (4)							
Allocations from Intermediate Head Office (2) (4)							
Allocations from Support / Service Units (2) (4)							
Internal Transfers - Service Charges (2) (4)							

<p>(1) May only be available in internal reports of the organizational unit rather than summary reports and may not be available for revenue (e.g. standard cost valuation might be used)</p> <p>(2) Might not include employee benefits at the responsibility centre level which might be accounted for at head office or corporate</p> <p>(3) Purchased materials and services is not likely to be a category in the summary responsibility centre reports.</p> <p>(4) May not appear as separate entries</p>	Eliminated for Enterprise	
	Data Available	
	Data Availability Dependent on MIS	
	Not Available	

	General and Corporate	Executive	Corporate Head Office	Support / Service Unit	Intermediate (e.g. Regional) Head Office	Operating Unit	TOTAL BUSINESS
Allocations from Corporate Head Office (2) (4)							
Allocations from Intermediate Head Office (2) (4)							
Allocations from Support / Service Units (2) (4)							
Internal Transfers - Service Charges (2) (4)							

(1) May only be available in internal reports of the organizational unit rather than summary reports and may not be available for revenue (e.g. standard cost valuation might be used) (2) Might not include employee benefits at the responsibility centre level which might be accounted for at head office or corporate (3) Purchased materials and services is not likely to be a category in the summary responsibility centre reports. (4) May not appear as separate entries	Eliminated for Enterprise	
	Data Available	
	Data Availability Dependent on MIS	
	Not Available	

Appendix B - The Preparation, Interview, Collection and Analysis Process for the Consolidation Questionnaire

Preparation for the process included assembling the profiles of the businesses, training of staff in the various surveys that might direct questionnaires to the enterprises and the preparation of an interview package. The CQ project was pursued in two phases. The first phase was undertaken in the fall of 1993. It involved personal interviews with senior officers of the enterprises selected for the project. This report provided some information on the practices of businesses in their Management Information Systems. However, the relative importance of the various data items was not known. Also as part of the first phase a consultation was done for a number of large businesses to determine if they understood the problem and if they had other suggestions to solve the problem.

The second phase involved the collection and analysis of data reported on the CQ by enterprises that agreed to participate in the test. All responses were received during the months of April and May 1993. A comparison of the CQ data with data reported on the Bureau's annual surveys for 1992 was undertaken. The analytical work was late in starting and only concluded in February 1994.