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ALTERNATE WAYS OF MEASURING INTERNATIONAL MERCHANDISE TRADE A BLUEPRINT FOR THE FUTURE

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BACKGROUND

CUSTOMS BASED TRADE DATA

International trade data represent an integral element of every country's statistical program and are almost universally derived from Customs administrative documents. Because of this, trade data embody a number of unique features.

Foremost, they are among the very few current economic statistics that are drawn from a census of all relevant transactions. Because of this, they lend themselves to a multiplicity of very detailed breakdowns which makes them one of the few economic indicators that has immediate relevance for small as well as large business.

Secondly, the statistical data derived from Customs documents are generally very reliable because there is an immediate operational benefit to business in providing accurate and complete information to facilitate the movement of their goods across international borders and because the provision of this information is enforced by Customs.

And, not least in importance, trade data are virtually free to statistical agencies because they are a by-product of regular Customs operations.

Detailed, accurate and timely trade data are critical to decision making in both the public and the private sector. Governments require trade data to effectively manage taxation and foreign exchange policies and to negotiate multinational trade agreements and tariff negotiations. In the business sector, trade data are used continually to measure market shares, monitor price trends, identify import and export markets and to guard against unfair trade practices.

WINDS OF CHANGE

Recent developments in the international and domestic trading environments, however, such as Europe 1992, the Canada/U.S. Free Trade Agreement, NAFTA, Customs 2000, electronic data interchange and pressure from the business community to reduce paper burden are going to influence both the way in which Customs will collect information in the future and the way in which statistical agencies can derive and produce international trade statistics.

ALTERNATE DATA SOURCES PROJECT

To ensure that it can continue to produce international trade data at the level of detail required by its user community, Statistics Canada has established its *Alternate Data Sources Project* to develop a long term contingency proposal for measuring trade statistics in a situation of significantly reduced or non-existent Customs documentation.

To accomplish this task, the Project has focused its activity on four integral sub-projects:

i maintaining ongoing liaison with Customs to ensure that the requirements of the trade statistical program are considered in the development of all "Customs 2000" initiatives;

ii investigating the documentation and record keeping practices of exporters and importers to determine the availability and accessibility of trade data elements for a survey driven trade statistical program;

iii measuring user demand for trade data and assessing user response to the possibility of reduced detail and timeliness of trade data in the future in order to evaluate the impact of a survey driven trade program on the utility of the data; and,

iv developing and analyzing well defined and properly stratified frames of exporters and importers as a basis for survey methodologies and cross-sectional analysis.

The analysis and integration of these sub-projects provide the necessary framework for the development and evaluation of survey-based strategies for the trade program in terms of both collection methodology and user requirements.

II ANALYTICAL FINDINGS

USER CONSULTATION

The user consultation program substantiates that the demand for trade data is widespread at all levels of aggregation. It is in the business sector, however, that the requirement for detailed and timely trade statistics is especially crucial.

Users who depend heavily on trade data are willing to provide whatever support they can to preserve the trade statistics program as it presently exists. Their strong conviction is that any conversion to a survey-based trade program would seriously impair the utility of the data, particularly in terms of the current quality and detail. Frequency of release seems to be the only field for compromise and even here a move from monthly to quarterly would have a critical impact on those users who require trade data to monitor immediate market conditions.

RESPONDENT CONSULTATION

In tracking the linkages between commercial and Customs documentation, it is clear that the commercial invoice is the key document for deriving the basic data elements required by Statistics Canada - commodity, value, quantity, origin and destination. The invoice, however, will not consistently provide the HS code, mode of transport, freight detail or Customs clearance information.

The commodity detail provided by the 10-digit HS code is one of the key attributes that make trade data so valuable to the user community. Because the 10-digit HS code incorporates tariff identifiers, it is a required part of the commodity description on all Customs documents. The majority of companies, however, use the services of a broker in assigning HS codes and will have limited in-house familiarity with or need for the classification system.

Mode of transport and freight detail are not always included on the invoice but are usually available on related transportation documents. Customs clearance information (port of clearance, date of clearance) would also require reference to transportation documents.

While it is apparent that both importers and exporters can provide the necessary data elements for maintaining the trade statistics program, the ease with which respondents can compile these data elements for survey purpose varies considerably. For firms with integrated sales, purchasing and traffic systems, the burden of supplying this information to Statistics Canada on a regular survey basis would be minimal, provided sufficient lead time is given to adjust their output systems. Firms that are decentralized in structure or operating at a low level of automation (and these represent the majority) anticipate a substantial "response burden" being imposed by a Statistics Canada survey questionnaire or any other collection method.

IMPORTER AND EXPORTER DATABASES

The principal objectives in developing importer and exporter databases were to establish an information base on the trading universes and a mechanism for the storage and maintenance of frame information in a survey environment. The utility of these databases, however, has expanded into the analytical field and they have proven to be powerful tools for longitudinal and cross-sectional analyses of trading activities and, via linkage with other Statistics Canada files, offer the potential to analyze trade, production and ownership data in a fully integrated environment.

To date, the importer and exporter databases have been used to carry out several analytical studies: the size and structure of the trading communities; the impact of selected survey thresholds on commodity and value coverage; trade by industry sector; trade among business affiliates; and, a longitudinal analysis of importers.

This paper, however, focuses on the size and structure of the trading communities and the impact of selected survey thresholds on commodity and value coverage, because these are the two studies which will most influence the evolution of a strategy for the future within the context of the *Alternate Data Sources Project*. Although no distinction is made in this paper between trade among NAFTA partners and those outside NAFTA, the final blueprint should be equally applicable to the measurement of trade within and outside the trading block. For measurement of trade with off-shore countries, a Customs based solution may still be applicable.

Size and Structure of the Canadian Trading Community

The Canadian trading community comprises a small number of trading units[1] which generate a large share of the total import/export value and transaction volume coupled with a large number of trading units who generate only a small share of value and volume.

The $10 million threshold on imports would raise the number of lost commodities to 285 (5.7%). These lost commodities represent $133.5 million, (0.09%) of total import values. The $10 million threshold for exports raises the number of lost commodities to 1,751 (42.3%). While these lost commodities account for $1.2 billion, they represent only 0.9% of total value exports.

The H.S. chapters affected by the selection of these static thresholds involve raw materials, textile and manufactured products. Chapter 84 (Machinery and Mechanical Appliances, parts thereof) shows the highest value of lost commodities for both imports and exports, for almost all thresholds. Other chapters affected include animal, vegetable and mineral products. These chapters, however, comprise many small importers and exporters the fall outside the threshold.

Nonetheless, while the proportion of commodities that disappear appears to be significant (especially for the export threshold of $10 million), the commodities that disappear represent less than 1% of the total value of imports or exports, regardless of the selected threshold.

A survey of a small number of trading units could achieve adequate levels of both value and commodity coverage. The commodity losses resulting from the different thresholds, although higher for exports, are not excessive and account for relatively low values. Moreover, their composition shows that no major commodities in terms of trade value are included. It would be possible, therefore, by refining various thresholds, to achieve an acceptable balance between value coverage, commodity disappearance and the sample size.

III A BLUEPRINT FOR THE FUTURE

As trade statistics will still be needed if the traditional revenue protection role of Customs disappears, an alternative system, capable of providing information similar to that based on Customs sources, will have to be developed.

Analyses of the supply and demand for trade statistics and of the size and structure of the trading communities shows:

- that there is a demonstrated demand for reliable detailed monthly trade statistics;
- that respondents can generally provide the information required for statistical purposes but that in a survey environment the timeliness, quality and detail of this information may deteriorate;
- that the structure and behaviour of the trading communities is such that different survey methods, concepts and methodologies would have to be used for collecting data from the various distinct segments of the trading communities;
- that a survey approach providing detailed, complete and monthly data covering all traders may not be feasible and or justifiable given the size and structure of the trading communities;
- that the statistical information should be collected from respondents (traders) and not from documents accompanying the goods since merchandise may cross borders without accompanying documents; and,
- that new and innovative data collection, such as computerized reporting systems and survey methods, may be required.

At the same time, however, the *Alternate Data Sources Project* has to ensure that the following requirements are considered in developing its blueprint for a "survey driven trade statistical program":

- to minimize and/or reduce response burden;.
- to preserve timely, detailed information for a very high portion of trading activity;
- to maintain international comparability;
- to match information requirements to the internal commercial systems of respondents;
- to implement highly flexible data collection procedures that are automated to the fullest extent; and,
- to safeguard historical continuity.

PRINCIPAL ELEMENTS OF THE BLUEPRINT

- Large traders can provide detailed, timely information to Statistics Canada from their internal commercial systems. These traders show consistent behaviour over time, represent a very large proportion of total trade activity and, as a general rule, are good respondents. There is no reason to believe that they would not be able to provide the same of amount of detail with the same periodicity as present. However, in order to facilitate the collection of data in a constantly evolving informatics environment, Statistics Canada would have to develop highly flexible collection instruments such as custom made software and must also be able to communicate with traders using Electronic Data Interchange (EDI).

- Small traders account for a very small percentage of total trade - 129,000 importers, for example, account for almost 90% of the universe but less than 5% of the total value of imports. They are reluctant respondents and are often not capable of providing the information required. Their behaviour pattern, however, is very similar to that of large traders.

Table 1

Canadian Imports and Exports for 1990:
Number of Importers and Exporters, Their Size and Associated Trade Values. Preliminary

	Imports				Exports			
Size of Trade Value Range($)	No. of Trading Units	%	Value $mill.	%	No. of Trading Units	%	Value $mill.	%
Over $50 M	277	0.2	77,411	54.3	352	0.5	92,510	68.1
$5 M to $50M	2,809	1.9	37,088	26.0	1,995	2.7	28,524	21.0
$0.5M to $4.9M	13,871	9.5	21,617	15.2	7,010	9.4	11,453	8.4
Less than $0.5M	128,877	88.4	6,518	4.5	64,823	87.4	3,463	2.5
Total	145,832	100.0	142,634	100.0	74,180	100.0	135,950	100.0

In 1990, there were 145,832 trading units who imported $142.6 billion and 74,180 trading units who exported $135.9 billion. The concentration of these trading units by value range is illustrated in Table 1. Large importers, those importing more than $50 million per year, represent 54.3% of total imports but only 0.2% of the total number of importers; and, a small number of exporters, representing 0.5% of the total, account for 68.0% of total export values. Conversely, 88.4% of the total importer community generate only 4.5% of import values and 87.4% of the exporters account for only 2.5% of export values.

This dichotomy in the distribution of trading units, which is evident in both value ranges and in volume of shipments, indicates that a survey of a small proportion of the trading population is likely to yield high coverage in terms of value, shipments, and transactions.

Survey Scenarios: Potential Value and Commodity Coverage at Different Thresholds

To assess the value and commodity coverage that might be achieved under different survey scenarios, three arbitrary thresholds - $1 million, $5 million and $10 million - were examined. The population in each scenario includes all trading units with annual imports or exports greater than or equal to the survey threshold.

Table 2, which measures the impact of the three thresholds on sample size, value and commodity coverage[2], shows that a $1 million threshold for imports would yield 92.5% value and 99.1% commodity coverage with a sample of 11,044 trading units (7.6% of the total universe) and that for exports, this $1 million threshold would provide 96% value but only 83.1% commodity coverage with a sample representing 8.4% of the universe (6,463 trading units). A $10 million threshold, with a sample of 1,571 importers (1.1% of the universe), could achieve 72.9% value and 94.3% commodity coverage while for exports, the sample size of 1,394 (1.9%), could yield value coverage of 84.1% but only 57.6% commodity coverage.

Table 2

Survey Scenarios: Imports 1990. Preliminary

	No. of Trading Units	%	Value $bill.	%	No. of HS6 Commodities	%
Total	145,832	100.0	142.6	100.0	5,012	100.0
M>1Mill.[3]	11,044	7.6	131.9	92.5	4,965	99.1
M>5Mill.	3,084	2.1	114.5	80.3	4,856	96.9
M>10Mill.	1,571	1.1	103.9	72.9	4,727	94.3

Table 2 - cont'd

Survey Scenarios: Exports 1990. Preliminary

	No. of Trading Units	%	Value $bill.	%	No. of HS6 Commodities	%
Total	74,180	100.0	135.9	100.0	4,135	100.0
X>1Mill.[4]	6,463	8.7	130.4	96.0	3,435	83.1
X>5Mill.	2,347	3.2	121.0	89.0	2,781	67.3
X>10Mill.	1,394	1.9	114.3	84.1	2,383	57.6

These thresholds exclude many exporters and their commodities. Some commodities disappear completely, while of others, only a small percentage remains. Commodity disappearance for both imports and exports rises as the threshold is increased and the selection of a static threshold denotes an inverse relationship between commodity coverage and sample size.

A closer look at commodity coverage is provided in Table 3, which shows how many HS-6 commodities would be lost completely under the different survey scenarios.

Table 3

Lost Commodities: Imports 1990. Preliminary

	Value $mill.	%	No. of Comm.	No. of Lost Comm.	%	Value of Lost Commodities $mill.	% Total Imports
Total	142,643	100.0	5,012		100.0		
M>1Mill.	131,942	92.5	4,965	47	0.9	2.5	0.002
M>5Mill.	114,498	80.3	4,856	156	3.1	53.6	0.038
M>10Mill.	103,943	72.9	4,727	285	5.7	133.5	0.094

Lost commodities: Exports 1990. Preliminary

	Value $mill.	%	No. of Comm.	No. of Lost Comm.	%	Value of Lost Commodities $mill.	% Total Exports
Total	135,951	100.0	4,135		100.0		
X>1Mill.	130,436	96.0	3,435	700	16.9	73.2	0.05
X>5Mill.	121,035	89.0	2,781	1,354	32.7	547.5	0.40
X>10Mill.	114,317	84.1	2,383	1,751	42.3	1,284.9	0.91

For all thresholds, exports show a higher proportion of lost commodities. The range for lost commodities in exports extends from 17% to 42%, implying that large exporters specialize in a limited number of product lines while smaller traders export more diversified commodities. In comparison, the 1% to 6% range in commodity loss in imports implies that large importers not only dominate but are also importing diversified product lines.

For imports, the lowest threshold would result in a loss of 47 commodities (0.9%) associated with a value of $2.5 million, representing 0.002% of total imports. The same threshold for exports would cause the disappearance of 700 commodities (16.9%) worth $73.2 million, representing 0.05% of total export value.

Given their relative importance and stable behaviour the following options can be considered: exempt them from statistical reporting; obtain annual summary data from them either on a census or on a sample basis and estimate monthly movements based on previous behaviour patterns or the behaviour patterns of larger traders; or, use the Goods and Services Tax (GST) system to estimate their activity.

- Medium size traders represent an important contribution to trade flows, they are numerous and their reporting capabilities vary considerably. Any survey strategy would have to take into account: the number of traders and commodities they trade; data availability and ease of obtaining it; response burden; resource availability; and, the demand for data. Based on the present imperfect knowledge of this segment of the population the following options are being considered:

i to collect monthly summary (not transaction based) statistics from all respondents regardless of their size or the commodities they trade;

ii to collect monthly summary statistics from a sample of traders where the sample size would be a function of the size of the trader;

iii to collect monthly summary statistics from a sample of traders where the sample size would be a function of the size of trader and the commodities traded; or,

iv to collect summary data either on a census or a sample basis on a quarterly basis only.

Obviously, the option of accepting transaction level details in machine readable form is an option not to be discarded.

Table 4 provides a brief comparison between the existing Customs based system and the possible future survey based systems.

Table 4

Comparison of Existing (Customs) and Future (Survey) Systems

	Present (Customs)	Future (Survey)
Data Source	Administrative, Customs	Survey form(s), respondent
Timing	Time goods cross border	After goods crossed border
Statistical period	Calendar month	Calendar month, year or quarter
Responsible party	Exporter/Importer (may be delegated to others)	Exporter/Importer
Coverage	Full coverage of commercial imports Almost full coverage of exports	Partial coverage of both exports and imports
Frame	Not known	Well defined
Data elements	Extensive	Reduced
Quality	Imports better and more complete than exports	Coverage of exports and imports may be the same but quality of exports better than imports
Data collection	Tapes and paper documents	Various (eg. E.D.I., Customs software, etc.)

Three principal differences exist between the two systems. These can be summarized as follows.

i Relationship between respondents and Statistics Canada

Presently there is very little interface between traders and Statistics Canada as compliance (for both imports and exports) and the quality of imports data are the responsibility of Customs. With a survey based system, a direct and close relationship will have to be established among respondents and the statistical agency.

ii Establishment of a frame of traders.

Establishing a universe of shippers and consignees involved in trade is essential in developing and implementing a survey based statistical system. The definition and delineation of the respondent (e.g. firms, establishments) both from a methodological as well as from a legal point of view is critical.

Derivation of a frame for previous years, based on existing Customs documentation, presented a difficult but manageable task. What is imperative, however, is the development of an update mechanism independent of the present Customs sources. One option may be to use the GST filing system with modifications to allow the separate capture of exporter identification information whenever an exporter applies for a GST drawback. Identification of importers via the GST system is a viable option.

iii Reduce Response Burden

The present statistical system is a by product of the traditional role of Customs which has been one of "protection of revenue". The same data that Customs requires in its day to day operation lends itself admirably to the compilation of trade data, without putting extra burden on the respondent. It is recognized that with liberalization of trade rules (F.T.A., NAFTA), there will be considerable pressure on the statistical agencies to reduce and minimize the response burden on business. The blueprint envisaged reduces the response burden by exempting certain respondents from reporting requirements, by decreasing the number of data elements demanded, by introducing highly automated reporting systems and adopting sampling methodologies, and by possibly changing to quarterly periodicity.

IV CONCLUSION

The development and implementation of a survey based trade statistical program presents an formidable undertaking which is critically dependent on the successful completion of the following key tasks.

- Develop an update mechanism for the databases (births).
- Profile all units on the frame and define and delineate reporting units
- Promote the concept of a survey driven program to users and respondents
- Negotiate and establish criteria for i) inclusions and exclusions ii) value thresholds for defining large, medium and small traders and associated data elements and periodicity, and iii) thresholds for commodity coverage.Ideally, it would also be of benefit to align statistical and fiscal obligations under the GST in order to establish "benchmarks" and "checks" in a situation where the fiscal population (G.S.T.) would correspond to the statistical population of exporters and importers.The *Alternate Data Sources Project*, as described, addresses the issue of how to derive trade statistics without Customs documentation. It assumes the worst case scenario and provides a contingency plan for such an occurrence. Even though this worst case scenario may never transpire, it is likely that the Customs based statistics will undergo significant changes over the next few years, a few of which include: self assessment combined with audit; periodic accounting; summary reporting; and, greater use of E.D.I., etc. The blueprint for the future, consequently, will also provide a contingency plan for measuring trade statistics in a situation of substantially reduced or modified Customs documentation.

The successful completion of the *Alternate Data Sources Project* in late 1993 will prepare Statistics Canada to start moving towards a survey driven trade statistics program. The importer and exporter databases, which support the critical frame information for a survey driven program and which already provide a means for controlling export undercoverage and estimating for data, will also serve as powerful tools to analyze trade, production and ownership data in a fully integrated environment.

Statistics Canada is not a pioneer in the endeavour to develop a survey based trade program. The European experience provides an important prototype for us to study, and fortunately, we do not currently face the same stringent implementation schedule as our European counterparts. Against these principal assets of experience and time, however, balances our most serious liability. Canada has no parallel for the Value Added Tax (VAT) to serve as the framework for collection activity and as a mechanism for monitoring its accuracy and coverage.

1. A trading unit is defined as an entity engaged in importing or exporting merchandise. It may be an individual, a company, establishment, an agent, or division of a company, government agency, etc.

2. Commodity coverage is estimated on an "all or nothing" basis. Commodities are considered "covered" when there are values greater than zero reported in a selected target population.

3. M>1(5,10)Mil denotes imports of $1(5,10) million or more.

4. X>1(5,10)Mil implies exports of $1(5,10) million or more.