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SPPI for Wholesale Services in Canada

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1. Definition of the Service Being Collected

The wholesale sector is comprised of establishments primarily engaged in the wholesale distribution of merchandise on their own account (taking title to goods), or the buying and selling on a commission or fee basis (the goods being owned by others).

The wholesaling process is an intermediate step in the distribution of merchandise; wholesalers act as marketing intermediaries that neither produce nor consume the finished product, but instead sell to retailers, other merchants, and/or to industrial, institutional, and commercial users. However, some wholesalers, in particular those that supply non-consumer capital goods, sell merchandise in single units to final users.

The sector is comprised of two main types of wholesalers: wholesale merchants, and wholesale agents and brokers. Wholesale agents and brokers have been excluded from the initial development of the Wholesale Price survey.

The target population for the Wholesale Price Survey consists of all establishments primarily engaged in the wholesale sector, as identified on Statistics Canada's Central Frame Database. The sample was selected with probability proportional to size and allocated across trade groups using revenue as the size measure. The targeted sample size was approximately 3,000 establishments, or approximately 40 sample units per NAICS.

2. Pricing Unit of Measure Collected

The pricing methodology is defined as the margin price per unit, derived by subtracting the average purchase price per unit from the average selling price per unit. These prices reflect real transactions measured monthly, but collected on a quarterly basis.

The nature of the wholesale industry presents certain challenges about how best to capture price change, while meeting the constant quality assumptions inherent in constructing a price index. The survey asks respondents to select three main products which are representative of their business activity based on the sales revenue generated by these products in the past fiscal year. The products, their descriptions (or specifications) and their prices are obtained, collected and verified through a combination of mail-out and telephone contact or follow-up. The respondents are also asked for the product's country of origin (domestic, or imported and from what country).

The reported purchase and selling prices represent an average monthly price. Respondents are asked to continue reporting for the selected products each quarter. When a product becomes obsolete, the respondent is asked to provide a comparable product replacement.



3. Market Conditions and Constraints

3.1 Size of Industry¹

In Canada, wholesaling is a multi-billion-dollar industry, with sales totalling \$660 billion in 2006. The industry employed an average 740,000 Canadians in 2006 and makes a substantial contribution to the Canadian economy. Between 2001 and 2006, wholesale output, as measured by Gross Domestic Product (GDP), grew at twice the rate of the overall economy, making it the fastest growing of all major industrial sectors during this period.

From the perspective of developing the Canadian SPPI, the wholesale industry is an important service to be covered, representing about 13% of business service sector GDP (2002). When retail services are included, the distributive trades sector is approximately 28% of the business service sector GDP.

The total number of wholesaling units is approximately 120,000 (See Table 1).² The top six trade groups (in terms of *number of units*) represent almost 77%, these trade groups being: *Other Products, Machinery and Equipment, Agents and Brokers, Food, products, Home and Personal Products, and Building Supplies*. About 73% of all units average have annual revenues greater than \$30,000.

Table 1: Approximate Count of Wholesaling Units In Canada

| Trade Group | Total Number of Units | % |
|-------------------------------------|-----------------------|------|
| Farm products | 2,619 | 2.2 |
| Petroleum Products | 1,676 | 1.4 |
| Food, products | 12,107 | 10.0 |
| Alcohol and Tobacco Products | 696 | 0.6 |
| Apparel | 5,729 | 4.7 |
| Home and Personal Products | 11,930 | 9.9 |
| Pharmaceuticals | 972 | 0.8 |
| Motor Vehicles | 2,649 | 2.2 |
| Motor Vehicle Parts and Accessories | 4,759 | 3.9 |
| Building Supplies | 11,332 | 9.4 |
| Metal Products | 1,678 | 1.4 |

¹ All figures in Canadian dollars.

² This a general figure meant to represent a approximate count drawn from Statistics Canada's Business Register. These figure may not exactly match others reported elsewhere, since the term *units* is broadly defined to include enterprise or other business units. It is *not* an official STC estimate.



| | | |
|--|----------------|--------------|
| Lumber and Millwork | 2,076 | 1.7 |
| Machinery and Equipment | 14,276 | 11.8 |
| Computers and Other Electronic Equipment | 5,457 | 4.5 |
| Office and Professional Equipment | 7,268 | 6.0 |
| Other Products | 21,922 | 18.2 |
| Agents and Brokers | 13,547 | 11.2 |
| | | |
| Total | 120,693 | 100.0 |

3.2 Special Conditions and Restrictions

The wholesale industry is not a regulated industry in Canada, therefore there are little in the way of special conditions or restrictions on how a wholesaler operates. One important fact is that wholesalers import a large share of the goods they distribute. Typically, the largest share of imports (about two-thirds) has come from the United States, although more and more goods are coming from the Asian market.

Wholesalers have been quick to adopt new information and communications technologies and have recorded above-average growth in capital investments. Like all industries, computerisation has improved their performance.

Globalisation, offshore outsourcing, and the arrival of American-style retailing, such as big box stores and club warehouses, have all helped propel wholesalers forward. This is especially true in terms of commodities with a predominantly retail base, such as motor vehicles, food, and home and personal products.

3.3 Record Keeping Practices

Specific data collection issues were identified for each of the Trade Group/NAICS strata. Most notable was the variation in the types and quantities of products that wholesalers carry which ranged from a relatively small number of unique items to thousands and sometimes tens of thousands of specific products. Some wholesalers have difficulty in reporting price information by product or item, and find it much easier to supply information by line or department. Collection of corresponding detailed product or item specifications is an ongoing challenge for the wholesale industry.

In the early stages of testing, respondents identified the availability of electronic data, so data retrieval itself does not pose a problem. However, historical product price data is generally not archived by the wholesaler and it is difficult for respondents to report for periods greater than six months, so “point in time” data is reported.



4. Standard Classification Structure and Detail Related to the Area

The main classification of wholesale activity is by industry. The Wholesale Price survey is based on the definition of wholesale trade under NAICS (North American Industrial Classification System). NAICS is the agreed upon common framework for the production of comparable statistics by the statistical agencies of Canada, Mexico and the United States. The agreement defines the boundaries of twenty sectors. NAICS is based on a production-oriented, or supply based conceptual framework in that establishments are grouped into industries according to similarities in production processes used to produce goods and services.

The wholesale sample of of approximately 3,000 units was selected using the 2005 Business Register (BR) frame. Collection was started using a phased approach and initially only 3 Trade Group strata of about 300 units were surveyed. Gradually the number of Trade Group/NAICS strata was increased.

The publishing target for wholesale commodity data is the NAICS 5-digit classification (excluding NAICS 41911 to 41917 and 41919 for now), and will be comparable to the Origin & Destination data at the 5-digit NAICS level (see Appendix A). At the present time, wholesale price data are not published at the product level, but NAPCS coding of wholesale product data is on the horizon. The NAICS pertaining to Agent and Brokers (NAICS 419XX) are currently not in scope for the SPPI and will be addressed later on. Agent and Brokers represent 3.9% of the total wholesale industry output.

The main variables used to price the wholesaling service are:

- **Product Description** – Identifies the product attributes which can be used to uniquely identify and track the product through time.
- **Country of Origin** – If the product is imported, the respondent is asked to identify from which country.
- **Wholesale Average Purchase Price** – The average purchase price for the month is defined as the cost of a good/product to the wholesaler from the supplier or manufacturer, excluding all taxes.
- **Wholesale Average Selling Price** – The average selling price for the month is defined as the cost to the retailer, merchant, and/or industrial, institutional, or commercial user as charged by the wholesaler, excluding taxes and freight..
- **Unit of Measure** – Refers to a particular quantity, defined and adopted by convention, with which other quantities of the same kind are compared. Units of measure have conventionally assigned names and symbols (PLU, SKU, etc.).



- **Wholesale Activities** – A list of activities (breaking of bulk, shipping, warehousing, etc.,) performed by the wholesaler for the products chosen.

5. Evaluation of Standard vs. Definition and Market Conditions

The SPPI does not have any special or additional classifications that differ from the turnover survey program. The existing classification structure (NAICS) used to produce the SPPI are consistent with the turnover surveys. Also, the sample source for the SPPI and turnover surveys is the same – STC’s Business Register. As a result, sample comparison and clean up is easier to do between both surveys. Industry level estimates of price change and turnover will also be directly comparable.

On the commodity dimension, the NAICS 5-digit level used by the SPPI will resemble very closely the re-designed wholesale origin and destination commodity survey, so commodity level comparisons of price change and turnover will be coherent. So that at the NAICS 5-digit level, the standard *does* include necessary product detail based on identified price determining characteristics.

6. National Accounts Concepts and Measurement Issues for the Area Related to GDP Measurement

While the measurement of turnover is relatively easy for the Canadian SNA, constant dollars estimates are conceptually more difficult to derive. This is because there are no current *direct* price indexes for wholesaling services to use (until the SPPI program). Instead, real output must be estimated indirectly. For monthly GDP, changes in constant price output are used as indicators of the growth rates in constant price value added. The movement in constant price output is assumed to be represented by the month-to-month growth rates in constant price sales by wholesalers.

In the case of annual GDP estimates, (i.e. the deflation of Input/Output Accounts), the commodity output is deflated. For the wholesale industry the major output commodity is wholesale margins. The real GDP is derived by taking the difference between the industry gross output and the industry intermediate inputs at constant prices which is known as *the double deflation method*. In the absence of a *direct* price index, the price movement is measured indirectly via a derived implicit price index. The implicit price index is calculated by taking the sum the current dollar wholesale margins divided by the sum of constant dollar wholesale margins.

For wholesale commodity output (i.e. the wholesale margins), an implicit price index is used to deflate the current dollar value of wholesale commodity output. The implicit price index (IPI) applied is the quotient of current dollars divided constant dollars for total wholesale margins (as one of seven margins representing the difference between producer price and purchaser of all input and final demand commodities). The constant



dollar wholesale margins for input and final demand commodities used in the calculation of the IPI are obtained by applying current dollars average margin ratio to the current dollar producer value of input and final demand commodities.

7. Pricing Method(s) and Criteria for Choosing Various Pricing Methods

As mentioned, the type of price generally collected is an margin per unit price. That is, the respondent provides the purchase price and the selling price for a selected product (or homogeneous product line in some cases) and a margin price per unit is derived to represent the ‘price’ of wholesaling services (see (1)).

$$(1) \quad MP_{unit}^t = P_{Selling/unit}^t - P_{Purchase/unit}^t$$

Using the Quality Assurance Framework tool as a guide for evaluating design of the wholesale SPPI, the results show the general design of the survey to belong to the TYPE A group (see table X below).

Table x: PPI Quality Assessment Framework

| Points | Category and Questions | Score |
|--------|---|----------|
| | 1. Shipment Price (Weight = .10) | |
| | <i>Select a. or b.</i> | |
| 0 | a. Price represents order pricing, actual price at shipment may well be different. | |
| 100 | b. Price represents the completion of service or a proxy measure for the completed transaction. | X |
| | | |
| | 2. Representative of current period production (Weight = .10) | |
| | <i>Select a. or b.</i> | |
| 50 | a. Emergence of new product lines or critical new product features has not occurred since the index reference period or since sample augmentation last done. | X |
| 0 | b. Emergence of new product lines or critical new product features has occurred since the index reference period or since sample augmentation last done. | |
| | <i>Select c. or d.</i> | |
| 50 | c. Product substitution usually occurs when an item becomes obsolete or, if model pricing applies, the models are regularly updated to reflect changes. | X |
| 0 | d. Product substitution usually does not occur when an item becomes obsolete or, if model pricing applies, the models are not regularly updated to reflect changes. | |



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| | 3. Transaction price (Weight = .25) | |
| | <i>Select the one most prevalent in the industry</i> | |
| 100 | a. The price is the real transaction price or a list price that can always be assumed to be equal to the transaction price. | X |
| 50 | b. The price is a list price not equal to the transaction price. | |
| 100 | c. The price is a unit value for a homogeneous group of products. | |
| 50 | d. The price is a unit value for a non-homogeneous group of products. | |
| 75 | e. The price is a model price. | |
| 50 | f. The price is constructed from input cost plus profit and overhead mark-up. | |
| | | |
| | 4. Output price (Weight = .25) | |
| | <i>Select the one most prevalent in the industry</i> | |
| 100 | a. Recorded price reflects an actual transaction or average of actual transactions. | X |
| 75 | b. Recorded price reflects a model transaction incorporating the pricing of all features found in an actual transaction. | |
| 50 | c. Recorded price reflects a model transaction incorporating the pricing of only some of the features found in an actual transaction. | |
| 50 | d. Recorded price reflects some components of a transaction. | |
| 50 | e. Recorded price reflects input costs plus overhead and profit margins incorporating the pricing of all features found in an actual transaction. | |
| 25 | f. Recorded price reflects input costs plus overhead and profit margins incorporating the pricing of some of the features found in an actual transaction. | |
| 0 | g. Recorded price reflects charge out rates for fixed labor inputs not directly tied to a specific quantity of output. | |
| | | |
| | 5. Timely measure (Weight = .10) | |
| | <i>Select a. or b.</i> | |
| 50 | a. Pricing data reflect the service provision in the current period and are not lagged. | X |
| 0 | b. Pricing data are lagged. | |
| | <i>Select c., d., or e.</i> | |
| 50 | c. Pricing data reflect an average over the entire period. | X |
| 40 | d. Pricing data reflect an average of multiple measurements over a portion of the period. | |
| 25 | e. Pricing data reflect a single point in time. | |
| | | |
| | 6. Constant quality maintained (Weight = .20) | |
| | <i>Select a. or b.</i> | |



| | | |
|-----|---|------------|
| 100 | a. Rapid changes to product specification are not expected or, if they are, a good method to explicitly quality adjust is in use. | X |
| 0 | b. Rapid changes to product specification are expected and no explicit quality adjustment method is in use. | |
| | | |
| | Total = | 100 |
| | | |
| | Type A point range = over 90 | X |
| | Type B point range = 70 to 90 | |
| | Type C point range = less than 70 | |

The survey is designed to collect a shipment price which is representative of current period production. The survey asks for a transaction and output price in a timely manner, and all efforts are made to maintain constant quality through contact and follow-up with the respondent.

However, in the case of wholesaling, there can be tremendous volatility encountered in pricing trade margins that will be aggravated when calculating an index. The behavior of the long-term price relative can be a source of major concern when pricing wholesale trade data, and this can occur for many reasons. One cause can be setting the setting the base price – it is essential to avoid using a sale price as the base price when establishing a new series, rebasing an item that had been delinquent, or taking a non-comparable substitution. Another phenomenon to watch for are sale prices approaching zero – it is not uncommon to encounter a sale price for a margin priced item that approaches zero. This can cause huge fluctuations in the short-term price relative when such a sale price is first encountered and again in the month that the price reverts to normal. Normally, if the price is verified as accurate, then the item is deleted from index calculation that month and not used until the price reverts to a positive value.

8. Quality Adjustment Methodology(s)

The SPPI for wholesale services has been in development for approximately two years. The index collects data at the 5-digit level of NAICS, thereby providing adequate industry detail, but also complying closely with the Wholesale Trade Commodity Survey by Origin and Destination, which plans to provide commodity detail based on the 5-digit NAICS as well.

The current index methodology relies on drawing a sub-sample of the frame of wholesale service providers except agents and brokers (NAICS=41, except 4191) to arrive at the SPPI sample. As mentioned, the service price is the margin price per unit, charged by a wholesaler for a specific item of homogenous product line (i.e. sales price *minus* purchase price). The terms or conditions of the wholesaling service are controlled for (e.g. bulk-breaking) in order to achieve a constant quality price index.



A set of systematized outlier detection procedures are in place to identify outliers and possible reporting errors. For example, a larger than average increase or decrease in one of the items collected triggers a follow-up with the respondent, prior to any editing or imputation.

Respondents are asked provide the reason a selling or purchase price has changed. Options can range from changes in the level or type of wholesaling service offered, changes in the supplier or buyer, changes in product, sale or seasonal prices, inflation, exchange rates and the option of specify other reasons. The respondents might be contacted for further clarification or follow-up if needed.

In the case where there is a change in the level of service provided by the wholesaler, an initial attempt at valuation includes a discussion with the respondent to see if there is some reasonable and objective value that can be assigned. If this is not possible, then the alternative is to simply link to show no change when forced to take a non-comparable substitution.

When the product being priced is replaced, then an evaluation as to whether the new product is a comparable or non-comparable substitution is carried out. If the new product serves the same niche market – for example, a newer version of the same computer – then it is a comparable substitution and the price change is accepted. If it does not – for example, replacing a low-end portable T.V. with a large screen plasma High Definition T.V. (HDTV), then it is a non-comparable substitution. The new T.V. no longer services the same niche market with the same basic functionality. If possible, the quality difference in the two items would be used for quality adjusting the margin price difference; otherwise the item would be linked in with no change.

9. Evaluation of Comparability with Turnover/Output Measures

The level of comparability between the SPPI and turnover data is high. First, both survey programs use the same industry (and soon product) classification system (NAICS, and then NAPCS). Second, the SPPI sample represent a sub-sample of the Annual Wholesale Trade Survey (AWTS) frame, so the same units are defined and covered. This frame ultimately is derived from the Business Register. One difference in comparability however, is that wholesale margin data (turnover) is collected annually, while price data will be available on a monthly basis. Coherence analysis is conducted between the SPPI and turnover surveys to ensure both series are providing reasonable trends. When outliers or anomalies are found (mostly in the sample), they are confronted and discussed with the turnover program analysts.

10. Summary

In Canada, the wholesalers play a key role in the economy. Their impact is widespread as they facilitate the distribution of goods down the distribution chain. The availability of



good turnover data is essential for a strong economic statistics program. Moreover, the introduction of an SPPI for wholesale services greatly benefit the statistics program at STC, as it will feed an important research agenda: it will provide a comprehensive set of industry indicators, it will lead to better estimates of real output and productivity, it will help answer questions related to exchange rate pass-thru effects, and it will add to the import price information currently used to deflate import trade data in Canada.



Appendix A: Breakdown of SPPI Detail by Trade Group/NAICS

| Trade Group | 5-Digit NAICS | Description |
|-------------------------------------|--|---|
| Farm products | 41111 | Live Animal Wholesaler-Distributors |
| | 41112 | Oilseed and Grain Wholesaler-Distributors |
| | 41113 | Nursery Stock and Plant Wholesaler-Distributors |
| | 41119 | Other Farm Product Wholesaler-Distributors |
| Petroleum Products | 41211 | Petroleum Product Wholesaler-Distributors |
| Food, products | 41311 | General-Line Food Wholesaler-Distributors |
| | 41312 | Dairy and Milk Products Wholesaler-Distributors |
| | 41313 | Poultry and Egg Wholesaler-Distributors |
| | 41314 | Fish and Seafood Product Wholesaler-Distributors |
| | 41315 | Fresh Fruit and Vegetable Wholesaler-Distributors |
| | 41316 | Red Meat and Meat Product Wholesaler-Distributors |
| | 41319 | Other Specialty-Line Food Wholesaler-Distributors |
| | 41321 | Non-Alcoholic Beverage Wholesaler-Distributors |
| Alcohol and Tobacco Products | 41322 | Alcoholic Beverage Wholesaler-Distributors |
| | 41331 | Cigarette and Tobacco Product Wholesaler-Distributors |
| Apparel | 41411 | Clothing and Clothing Accessories Wholesaler-Distributors |
| | 41412 | Footwear Wholesaler-Distributors |
| | 41413 | Piece Goods, Notions and Other Dry Goods Wholesaler-Distributors |
| Home and Personal Products | 41421 | Home Entertainment Equipment Wholesaler-Distributors |
| | 41422 | Household Appliance Wholesaler-Distributors |
| | 41431 | China, Glassware, Crockery and Pottery Wholesaler-Distributors |
| | 41432 | Floor Covering Wholesaler-Distributors |
| | 41433 | Linen, Drapery and Other Textile Furnishings Wholesaler-Distributors |
| | 41439 | Other Home Furnishings Wholesaler-Distributors |
| | 41441 | Jewellery and Watch Wholesaler-Distributors |
| | 41442 | Book, Periodical and Newspaper Wholesaler-Distributors |
| | 41443 | Photographic Equipment and Supplies Wholesaler-Distributors |
| | 41444 | Sound Recording Wholesalers |
| | 41445 | Video Cassette Wholesalers |
| | 41446 | Toy and Hobby Goods Wholesaler-Distributors |
| | 41447 | Amusement and Sporting Goods Wholesaler-Distributors |
| 41452 | Toiletries, Cosmetics and Sundries Wholesaler-Distributors | |
| Pharmaceuticals | 41451 | Pharmaceuticals and Pharmacy Supplies Wholesaler-Distributors |
| Motor Vehicles | 41511 | New and Used Automobile and Light-Duty Truck Wholesaler-Distributors |
| | 41512 | Truck, Truck Tractor and Bus Wholesaler-Distributors |
| | 41519 | Recreational and Other Motor Vehicles Wholesaler-Distributors |
| Motor Vehicle Parts and Accessories | 41521 | Tire Wholesaler-Distributors |
| | 41529 | Other New Motor Vehicle Parts and Accessories Wholesaler-Distributors |
| | 41531 | Used Motor Vehicle Parts and Accessories Wholesaler-Distributors |
| Building Supplies | 41611 | Electrical Wiring and Construction Supplies Wholesaler-Distributors |
| | 41612 | Plumbing, Heating and Air-Conditioning Equipment and Supplies Wholesaler-Distributors |
| | 41631 | General-Line Building Supplies Wholesaler-Distributors |



| | | |
|--|-----------------------------------|---|
| | 41633 | Hardware Wholesaler-Distributors |
| | 41634 | Paint, Glass and Wallpaper Wholesaler-Distributors |
| | 41639 | Other Specialty-Line Building Supplies Wholesaler-Distributors |
| Metal Products | 41621 | Metal Service Centres |
| Lumber and Millwork | 41632 | Lumber, Plywood and Millwork Wholesaler-Distributors |
| Machinery and Equipment | 41711 | Farm, Lawn and Garden Machinery and Equipment Wholesaler-Distributors |
| | 41721 | Construction and Forestry Machinery, Equipment and Supplies Wholesaler-Distributors |
| | 41722 | Mining and Oil and Gas Well Machinery, Equipment and Supplies Wholesaler-Distributors |
| | 41723 | Industrial Machinery, Equipment and Supplies Wholesaler-Distributors |
| | 41799 | All Other Machinery, Equipment and Supplies Wholesaler-Distributors |
| Computers and Other Electronic Equipment | 41731 | Computer, Computer Peripheral and Pre-Packaged Software Wholesaler-Distributors |
| | 41732 | Electronic Components, Navigational and Communications Equipment and Supplies Wholesaler-Distributors |
| Office and Professional Equipment | 41791 | Office and Store Machinery and Equipment Wholesaler-Distributors |
| | 41792 | Service Establishment Machinery, Equipment and Supplies Wholesaler-Distributors |
| | 41793 | Professional Machinery, Equipment and Supplies Wholesaler-Distributors |
| Other Products | 41811 | Recyclable Metal Wholesaler-Distributors |
| | 41812 | Recyclable Paper and Paperboard Wholesaler-Distributors |
| | 41819 | Other Recyclable Material Wholesaler-Distributors |
| | 41821 | Stationery and Office Supplies Wholesaler-Distributors |
| | 41822 | Other Paper and Disposable Plastic Product Wholesaler-Distributors |
| | 41831 | Agricultural Feed Wholesaler-Distributors |
| | 41832 | Seed Wholesaler-Distributors |
| | 41839 | Agricultural Chemical and Other Farm Supplies Wholesaler-Distributors |
| | 41841 | Chemical (except Agricultural) and Allied Product Wholesaler-Distributors |
| | 41891 | Log and Wood Chip Wholesaler-Distributors |
| | 41892 | Mineral, Ore and Precious Metal Wholesaler-Distributors |
| | 41893 | Second-Hand Goods (except Machinery and Automotive) Wholesaler-Distributors |
| 41899 | All Other Wholesaler-Distributors | |
| Excluded | 41911 | Farm Product Agents and Brokers |
| Excluded | 41912 | Petroleum Product Agents and Brokers |
| Excluded | 41913 | Food, Beverage and Tobacco Agents and Brokers |
| Excluded | 41914 | Personal and Household Goods Agents and Brokers |
| Excluded | 41915 | Motor Vehicle and Parts Agents and Brokers |
| Excluded | 41916 | Building Material and Supplies Agents and Brokers |
| Excluded | 41917 | Machinery, Equipment and Supplies Agents and Brokers |
| Excluded | 41919 | Other Wholesale Agents and Brokers |