Improving Business Services Price Indexes in Canada

Statistics Canada[1]

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INTRODUCTION

1. As in most developed economies, services have become increasingly important to the Canadian economy relative to goods. In 2003, services-producing industries accounted for 75% of employment and 68% of gross domestic product, up from 67% and 60% in 1980 and from 55% and 57% in 1961. This paper outlines a proposal developed by Statistics Canada to improve business service price indexes as a step towards better measurement of price change, real output growth and productivity trends in the services sector.

2. Current price estimates of GDP and its components are important but it is the constant price measures of these indicators that are the basis for measuring period-to-period real economic growth and productivity change. Productivity in the services sector is a key to economic growth, as the economy becomes more services intensive.

3. Services measurement presents statistical challenges, especially as new, diverse and complex services arise. The consequences of mismeasurement are potentially quite serious. Weaknesses in the available statistics on output volumes and prices of services by industry mean that Canadian studies of productivity, innovation and competitiveness must be substantially qualified. Analysts suspect important gains in productivity may be occurring in certain services industries as a result of new and emerging technologies, better management methods, the rising quality of the labour force and other factors, but these gains are not always reflected with the current methods of measuring services output.

4. The growth of the services economy is clearly an important phenomenon for Canada's economic and business statistics. Statistics Canada has acted to develop its business surveys and administrative data sources for the specific purpose of improving services sector statistics. Much more comprehensive statistics on services value added by industry at current prices are now available relative to a decade ago. However, although much progress has been accomplished in the area of services output at current prices, much remains to be done with regard to measuring the commodity composition of value added and splitting current dollar services statistics into distinct price and volume components.

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FOCUS ON BUSINESS SERVICES

5. Statistics Canada has studied how it could expand the collection of services price data and the production of associated price and output volume indexes. A multi-year approach is proposed involving up to 83 services commodity categories for which price and volume measures would eventually be developed. Together, they would enable the production of a comprehensive Services Product Price Index (SPPI) covering business services industries.

6. The proposal is about expanding the number of price indexes for those service commodities produced primarily in the business (private) sector and explicitly excludes health, education and public administration. About 55% of the services sector represents business services. Personal services are excluded since they are already measured in the CPI program to a considerable extent. Public administration is excluded due to the absence of observable prices. At least some market prices are observable for health and education but our current proposal excludes these sectors on the basis of practicality. Statistics Canada feels that more basic research on the conceptual issues involved for these services sectors is needed before workable indexes can be developed.

7. Business services are divided into five sub-components in this proposal: Wholesale and retail trade; Transportation and warehousing; Finance, insurance, leasing, real estate, and business management services; Scientific, technical and professional services; and Information, communication and cultural services.

8. Producer price indexes already exist or will soon for some business services. Over the past decade price indexes have been developed in the areas of informatics services, telecommunications, traveller accommodation, accounting services, data processing services and software publishing. Work is well advanced to develop price indexes for non-residential rents, for-hire trucking and couriers. Consumer Price Index component indexes exist for urban transit, taxi transportation, residential rent and cable subscription programming services.

9. Where no services price indexes are presently available, for the purposes of the national accounts, real output is assumed to be proportional to the level of employment, the number of hours worked or some other variable believed to be closely related to value added at constant prices. Clearly, when an input variable is used as the basis of the estimate of real output, the ability to measure productivity change is compromised. In one important case, financial services, the total CPI is used to deflate value added and this undoubtedly causes measurement biases, although of unknown size and direction.

10. The United States has a much larger program for services price indexes and new funding in the US for quarterly surveys of services-producing industries will further improve statistical capacity there. The fact that countries are at different stages of development with respect to the measurement of services real output means that international comparisons of growth and productivity are distorted. This is a matter of considerable concern in Canada, especially vis-à-vis the US.

GENERAL STRATEGY

11. Our experience to date suggests that developing and maintaining reasonable quality services price indexes is in most cases more expensive than for goods. In many instances, the output is more difficult to define. Services, like goods, are highly differentiated and the number of specific, identifiable services commodities is immense. For practicality, our strategy involves the choice of a relatively small number of representative services commodity categories, distributed fairly widely over the various industries of the services sector. Production of many business services is dispersed over a large number of small producers whereas goods production is often highly concentrated. Thus, services price indexes have a need for higher sample sizes for equivalent coverage. Tracking services consistently over time involves more complex methods and problems than for goods.

12. We propose to select services commodity categories around which a systematic plan to develop price indexes can be developed and implemented. Aiming for a continuous stream of results, the development of various price indexes would be phased in, with indexes for hard-to-measure commodities being developed concurrently with those of easier-to-measure commodities.

13. A list (at the end of this paper) has been compiled of 83 services commodity groups that would comprise a Services Producer Price Index. Nine indexes, representing 13% coverage, are already available. Our goal is eventually to cover all 83 groups although various reduced-scale scenarios have also been developed.

14. Four criteria were adopted as the basis for ranking the business services categories: First, importance—the more important the commodity group in terms of its contribution to GDP, the higher the score. Second, the state of the current national accounts volume estimates for that commodity group—the poorer the current estimates, the higher the score. Third, the expected degree of difficulty in developing an accurate price index based on experience, expert knowledge, review of literature and international experiences—the more difficult the category, the lower the score. Finally, the distribution of commodities over the major industry groups—the aim is to cover a wide range of commodities.

15. In some instances, such as financial services, it is anticipated that one development and implementation strategy can be applied consistently. Similar data sources and methodologies may make it possible to exploit economies of scale to reduce costs. However, while there are only 83 commodity categories, there are a great many more specific service commodities within each of these categories. To be representative of a category as a whole, a price index must weight estimates for different commodities within the category. Recognizing this, the scale of the project is considerably larger than 83 commodities and it is likely, in fact, to produce more detail than this.

16. Weights for each of the 83 services commodity groups were calculated as the share of total services value added in 2000, from the national input-output tables. Two judgement-based scores were assigned to each of the 83 groups, a quality score (1 = high, 2 = medium, 3 = low) of the method now used for estimating the annual change of real production of the commodity in Statistics Canada's estimates of real GDP by industry and an expected complexity score (1 = low, 2 = medium, 3 = high) for developing a price index.

17. An overall priority score was then derived based on the weight in the I-O tables and the quality and complexity scores. For instance, a commodity with a large sector weight, a 'low' quality rating, and a 'low' degree of complexity will generate a high priority score. By contrast, commodities with a lower share of the services sector, for which reasonably good quality volume indicators already exist, and for which good price indexes are difficult to implement, will score weakly on the priority scale. The overall priority scale is an attempt to suggest an approximate relative ranking of importance or urgency.

18. Two of the commodity groups—wholesaling margins and retailing margins—together account for a quarter of the total weight and these commodities are assigned the top priority. Truck transportation, telephone and other communications and non-residential rent are the next three highest-ranking commodity groups and again, their large sector weight is the dominant factor. Other services products, although less important in terms of their weight, also score relatively high on the priority scale because their quality or complexity scores are low. Most of the services categories under the Finance, insurance, leasing, real estate and business management heading, and many of those under the Scientific, technical and professional services category get fairly high priority despite high complexity, because existing methods for estimating output volume are considered to be relatively weak and, in some cases, because the sector weights are substantial.

19. Statistics Canada has estimated costs of this proposal based on its practical but somewhat limited experience to date in developing and maintaining services price indexes, as well as the U.S. experience in this area. Development costs were estimated to develop and implement each of the services indexes on the list. Those service groups expected to be

relatively easy to produce—with a complexity score of 1—are also expected to be the least costly to develop and implement in our budgeting model. Estimates of the annual cost of updating and maintaining each price index have also been made based on current experience in Canada and the U.S. In general, the more complex the index, the more it is likely to cost to maintain on an on-going basis.

20. The costing models that Statistics Canada has developed take into account complexity of the service products, the relative degree of heterogeneity of the service category in the Canadian market, the nature of each industry in terms of the number and turnover of firms and products in the market, the degree of market concentration and target levels of geographic detail required.

NEXT STEPS

21. Statistics Canada is now considering in more detail the methodological options for producing each of the services commodity price indexes. For many services, much discussion with industry officials and research remains to be done. At this stage, only preliminary plans on expected methodologies are feasible. Based on our current understanding of the services and the experiences of other countries as reflected in the OECD-Eurostat 2003 Inquiry on National Collection of Services Producer Prices, we have identified various pricing methods we expect to use. Examples of methods include 1) actual transaction pricing 2) mark-up pricing or input pricing and 3) model pricing.

22 Research and consultation with other countries about their experiences in the development and production of services price indexes will be necessary. Many of the conceptual and methodological difficulties that have characterised the measurement of services prices have been addressed at Voorburg group meetings, the Brookings Institute workshops and in other professional research. These initiatives have provided many of the ideas needed for measuring the prices and outputs of these services. Statistics Canada will use this existing body of knowledge as its starting point in this initiative.

23. The next steps on this proposal will be to discuss it with interested potential data users. Priorities need to be validated and methodology and costs considered in greater detail. Work continues in estimating required sample sizes and in evaluating the degree of inadequacy of existing methods in estimating real output. It is not clear at this time whether funding to initiate this project can be obtained.

Service Price Indexes Proposed for the New Services Product Price Index

Service	Service sector weight, 2000	Quality score	Complexity score	Priority rating	Available	In progress	To do
Distributive trades							
1 Wholesaling margins	12.62%	3	2	1			√
2 Retailing margins	12.48%	2.5	2	2			√
3 Retailing services	1.23%	2	1	14			√
4 Rental of office equipment	0.31%	3	2	42			√
5 Computer lease and rental (hardware)	0.37%	2	2	53			√
Transportation and warehousing							
6 Truck transportation	3.53%	2	1	3		√	
7 Air transport, passenger	1.11%	2	1	8			√
8 Courier services	0.62%	3	1	12		√	
9 Rail transport, freight	1.20%	2	1	13			√
10 Postal services	0.89%	2.5	1	15			√
11 Pipeline transportation of natural gas	0.97%	2.5	1	17			√
12 Services incidental to water transport	0.28%	3	1	23			√
13 School bus and other transportation	0.35%	3	1	27			√
14 Crude oil and other pipeline transportation	0.33%	3	1	30			√
15 Other services incidental to transport	0.42%	2	1	32			√
16 Services incidental to air transport	0.32%	2	1	38			√
17 Air transport, freight	0.11%	3	1	39			√
18 Water transport, other	0.10%	3	1	47			√
19 Other storage and warehousing	0.26%	3	2	50			√

20 Water transport, freight	0.16%	3	2	52		√
21 Aircraft service and repairs	0.09%	2	1	54		√
22 Highway and bridge maintenance	0.11%	3	2	57		√
23 Grain storage	0.12%	3	2	58		√
24 Air transport, specialty	0.04%	3	1	59		√
25 Rail transport, passenger	0.05%	2	1	65		√
26 Bus transport, interurban and rural, passenger	0.05%	2	1	67		√
27 Services incidental to rail transport	0.04%	2	1	68		√
28 Water transport, passenger	0.04%	2	1	70		√
29 Bus transport, interurban and rural, parcel express	0.01%	2	1	72		√
30 Scenic and sightseeing transportation, bus	0.00%	3	1	73		√
31 Urban transit	0.70%	NA	NA	NA	√	
32 Taxicab transportation	0.18%	NA	NA	NA	√	
Finance, insurance, leasing, real estate, and business mgmt.						
33 Non-residential rent	5.16%	2	2	5	√	
34 Rental, other machinery and equipment including construction	1.27%	3	2	9		√
35 Rental of automobiles and trucks	0.91%	2	1	16		√
36 Paid charges, banks and other deposit accepting intermediaries	1.54%	2.5	2	19		√
37 Real estate commissions and management fees	1.66%	2	2	20		√
38 Non-life insurance	2.40%	3	3	21		√
39 Other securities, funds, and related services	1.13%	3	3	22		√
40 Management fees of companies and enterprises	1.71%	3	3	25		√
41 Commissions, investment banking and securities dealing, and brokers	1.45%	3	3	26		√
42 Mutual funds	0.99%	3	3	29		√
43 Rental, video and recreation equipment	0.41%	2.2	1	31		√
44 Implicit chgs, deposits, banking and other depos. credit intermed. services	2.08%	2.5	3	33		√
45 Implicit chgs, loans, banking and other depos. credit intermediary services	2.04%	2.5	3	34		√

46 Life insurance	1.21%	3	3	37	√
47 Insurance commissions	1.14%	2.5	3	41	√
48 Implicit charge, non-depository credit intermediation	0.42%	3	3	43	√
49 Royalties and license fees (excluding natural resource royalties)	0.50%	3	3	46	√
50 Other non-depository credit intermediary services	0.54%	3	3	51	√
51 Paid charges, credit unions and Caisses populaires	0.18%	3	2	55	√
52 Implicit charges, deposits, local credit unions	0.24%	2.5	3	64	√
53 Implicit charges, loans, local credit unions	0.18%	2.5	3	66	√
54 Trustee pension funds	0.11%	2	3	69	√
55 Central bank	0.04%	3	2	71	√
56 Gross paid residential rent	5.24%	NA	NA	NA	√
Scientific, technical and professional services					
57 Other professional, scientific and technical services	2.28%	3	2	6	√
58 Other administrative and support services	4.35%	3	3	7	√
59 Services to buildings and dwellings	0.94%	3	2	18	√
60 Architectural and scientific services	1.53%	2	3	35	√
61 Advertising services	1.17%	3	3	24	√
62 Legal services	1.50%	3	2	11	√
63 Investigation and security services	0.54%	3	2	36	√
64 Photographic services	0.24%	3	2	45	√
65 Travel agents, tour wholesaler and operator services	0.47%	2	2	48	√
66 Veterinary fees	0.18%	2	2	60	√
67 Accounting services	1.50%	NA	NA	NA	√
68 Computer systems design and related services	1.79%	NA	NA	NA	√
69 Engineering services	1.53%	NA	NA	NA	√
70 Software products development	1.20%	NA	NA	NA	√
71 Data processing services	0.39%	NA	NA	NA	√
Information, communication and cultural services					

72 Telephone and other telecommunications*	4.54%	3	2	4	√
73 Advertising in print media	0.80%	2	2	28	√
74 On-line information services	0.18%	3	2	44	√
75 Motion picture, audio, and video prod. and distribution	0.46%	3	3	49	√
76 Radio and television broadcasting, except cable	0.47%	2.5	3	56	√
77 Other information services (including news syndicates, microfilm, etcetera)	0.04%	3	3	63	√
78 Cable and other subscription programming	0.56%	NA	NA	NA	√

Other

79 Services incidental to mining	1.29%	3	2	10	√
80 Services incidental to forestry	0.16%	3	2	40	√
81 Services incidental to animal production	0.04%	2	2	61	√
82 Services incidental to crop production	0.06%	2	2	62	√
83 Specialized publishing service	0.08%	2	2	74	√

Total (top 30 services commodity groups)	70.7%
Total (top 40 services commodity groups)	79.5%
Total (top 50 services commodity groups)	83.6%
Total (top 60 services commodity groups)	85.9%
Total (top 70 services commodity groups)	86.7%
Total (All services commodity groups "to do" or " in progress")	86.8%
Available	13.2%
Total (All services commodity groups)	100.0%

NA: Not applicable as these indexes are already in production.
***** Currently, there is only one price index representing this commodity category, the *Telecommunication Services Price Index* (or TSPI). The TSPI is a quarterly price index measuring the change over time in prices for wired long distance telephone services provided by telecommunications carriers to Canadian-based business clients. However, this important commodity class has several additional communication services not appropriately represented by the TSPI (e.g., wired and wireless local telephone services, and Internet access services). Additional index series need to be developed in order to have a more accurate and representative price index for the commodity category.