

**VOLUME MEASURES IN ISIC 8 and 9 SERVICE INDUSTRIES:**

**Country Practices as a Basis for International Guidelines**

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### INTRODUCTION

1. This report summarises countries' descriptions of the price indexes and volume measures that are used in the measurement of value added at constant prices of the following kinds of activities; namely, financing and insurance, business services, education services, health services and public administration.

2. The descriptions of price indexes and volume measures are drawn from responses to a UNSO questionnaire that asked countries to indicate whether the constant-price value added of the above mentioned service activities was derived by the methods of deflation of current value added, double deflation and extrapolation. Countries were also requested to provide brief descriptions of the deflators and volume indicators used. UNSO received responses from 42 countries comprising 25 developing and 17 developed countries. However, this report will focus mainly on 10 countries that provided greater details in their descriptions of price and volume measures. The countries are Australia, Canada, Finland, Germany, Hong Kong, Korea, Norway, New Zealand, United Kingdom and United States of America.

## I. FINANCING AND INSURANCE

A. Financing

3. The questionnaire breaks down the finance industry into 3 activity groups comprising Monetary institutions (8101), Other financial institutions (8102) and Financial services (8103). The institutions that are classified to these activity groups provide various financial services such as lending, deposit facilities, foreign exchange operations, bonds and stocks trading, investment advice, etc. In the Manual on National Accounts at Constant Prices, it is noted that usually there is no difficulty in identifying the services rendered but there are problems in finding suitable volume measures.

4. Countries' methods of estimating the real output of monetary institutions, other financial institutions and financial services are described as volume measures obtained mostly by deflating service charges; changes in the volume of transactions in various financial services as well as base-year output extrapolated by movements in employment.

5. The volume measures reported by Canada, Finland, Germany, Japan and Korea were derived from the deflation of service charges. The methods of real output measurement use a range of deflators that include margin rates (Canada, Finland); general price indexes (Germany, Korea), unit value indexes (Japan) and

input prices (Finland). The volume measures are described as follows.

#### Canada

6. The Canadian SNA practice to deflate imputed bank services for the annual programme is to obtain details on various kinds of loans and on their respective interest rates as well as details on the various kinds of deposits and on their interest rates. This is followed by an attempt to match as closely as possible each category of loan with a "corresponding" deposit category. The difference between the deposit rates and the loan rate is estimated to be the margin that the financial institutions charge and in principle these should be equal to the measurement of imputed services of banks. For current years the base-year margin rates are applied to the corresponding loans by category to measure the deflated output of imputed services.

#### Finland

7. Imputed service charge	The deflator is the product of the index of net rates and the weighted average of the CPI and the price index of capital goods.
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Explicit service charge	The deflator is based on input prices.
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Germany

8. Imputed service charge	Extrapolation of base year charge by volume indicator. The volume indicator is computed by deflation of the sum of credits and debits of financial institutions by the price index of national final uses.
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Korea

9. Actual service	Deflation of current values by wholesale price index.
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Imputed service	Extrapolation with real increase rate of financial assets and liabilities
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10. The measurement of real output of financial services on the basis of transaction values was reported by Hong Kong, New Zealand, and United Kingdom. The volume measures are as follows.

Hong Kong

## 11. Monetary institutions

Gross output and imputed bank services at constant prices are obtained by extrapolation based on a composite volume index of constant dollar loans and employment index.

## Financial services

Volume index derived from the stock exchange turnover deflated by stock price index for brokers and dealers in stocks and shares.

New Zealand12. Financial institutions  
and services

Volume of services is measured by a composite of the number of transactions and the deflated value of average funding and average claims. The deflators are the composites of the producer price index and the consumer price index items.

United Kingdom

13. Monetary institutions	Volume measures are based on the number of transactions; deposits/loans deflated by the Retail Price Index and adjusted for exchange rate change and labour productivity.
Other financial institutions	Total liabilities/debt; value of transactions or holdings;
Financial services	deflated by retail price index or specific index.

14. The above procedures suggest some broad areas to be taken into consideration in formulating guidelines on approximate methods of the real output of financial services. These are: (1) the identification of the items of the assets and liabilities that are relevant for purposes of extrapolation; (2) the appropriate deflators of service charges and balance sheet components; and (3) the availability and use of quantity data on financial services.

## B. Insurance

15. In the Manual on National Accounts at Constant Prices, it is stated that the output of insurance in real terms clearly consists of the amount of insurance written - i.e. of the number of insurance policies of different kinds and values which are taken out each year. Descriptions of the direct measurement of insurance output are provided by two countries, Canada and Finland. Specifically, Canada described the measurement of real output as 'policies sold and in force multiplied by base-year price plus change in assets deflated with CPI'. Finland reported that 'the number of insurances is used as a volume indicator when possible'. In other countries the methods of measuring the output of insurance in real terms are sometimes based on volume measures obtained by deflation.

16. Volume measures of the output of insurance are reported by Germany, New Zealand, United Kingdom and United States of America. The types of volume measures include insurance benefits, consumers expenditures at base-year prices, sums assured as well as net premiums. The countries' descriptions of volume measures are as follows.



Germany

17. Volume indicators are obtained by the deflation of insurance benefits.

- |           |   |
|-----------|---|
| (a) Life  | deflation by general consumer price index.                  |
| (b) Other | deflation by special indices according to kind of benefits. |

United Kingdom

18. The volume indicators of life and other insurance are:

- |           |  |
|-----------|--|
| (a) Life  | consumers' expenditures at 1980 prices.                |
| (b) Other | total net premiums deflated by a specific price index. |

New Zealand

19. The volume measure consists of the deflated annual sums assured for life, fire and accident. The deflators are composites of the CPI and components of the capital expenditure price indexes.

United States of America

20. The volume indicators of life and other insurance are:

(a) Life                      deflated net health benefits and  
constant dollar personal  
consumption expenditures  
(carriers) and the number of  
policies sold (agents).

(b) Other Net premiums data deflated with consumer prices (carriers) and net premiums written weighted by commission rates and deflated by consumer prices (agents).

21. The procedures for estimating the volume of insurance services suggest that guidelines on approximate methods of estimating real insurance output would have to consider such aspects as (1) the use of quantity data on insurance policies issued; (2) the significance of payments of benefits; (3) the relevance of consumers' expenditures; and (4) the appropriate deflators of premiums and benefits.

## II. BUSINESS SERVICES

22. The questionnaire asked for descriptions of the deflators and volume indicators used in the measurement of the value added at constant prices of legal services (8321); accounting, auditing and bookkeeping (8322); data processing services (8323); engineering, architectural and technical services (8324); advertising services (8325); and machinery and equipment rental and leasing services (833).

23. A general practice is to estimate the real output of the various groups of business services on the basis of the movement in employment e.g. numbers of persons engaged and hours worked. However, some countries reported that their practices also involved volume measures obtained mostly by the method of deflation and occasionally, on the basis of quantity data. Deflation methods were used by Canada, Federal Republic of Germany, Finland, Japan, Norway and to a lesser extent, United Kingdom and United States of America.

24. Different types of deflators were used in measuring the real output of business services. The deflators may represent either input prices, wage rates or specific prices. Input prices and wage rates are typically used in the measurement of the real output of legal services; accounting, auditing and bookkeeping; data processing services; as well as engineering, architectural

and technical services. The deflators are described as input prices for intermediate consumption (Japan); wage rates (Norway, Finland); indexes of average earnings (Canada, United States); as well as combined input price indexes and wage indexes for value added (Germany, Korea).

25. It was also reported by Japan and Canada that specific prices were used for measuring the real output of advertising services (8325) and machinery and equipment rental and leasing services (833). The deflators used by Canada are described specifically as 'rates for private and electronic media' and 'all items domestic machinery and equipment price index' (Canada) and more generally, as unit value indexes (Japan).

26. A few countries reported the use of volume indicators in measuring the real output of business services such as legal services (8321); accounting, auditing and bookkeeping (8322); data processing services (8323); advertising services (8325); and machinery and equipment rental and leasing services (833).

27. Volume indicators of the real output of business services were reported by Canada, Hong Kong, Finland, United Kingdom and United States of America. In brief, the volume indicators of the real output of legal services may be constructed directly from quantity data on court cases and proceedings, property transfers and the numbers of mortgage advances. Alternatively, the volume

measure may be constructed by deflating personal consumption expenditures for legal services. As regards accounting, auditing and bookkeeping as well as data processing services, the United Kingdom obtained volume measures by deflating turnover by indexes of earnings and consumer prices respectively. In addition, the United Kingdom measured the volume of output of machinery and equipment rental and leasing services on the basis of both quantity data and deflation of current values. The volume indicators are described as comprising the construction industry index of output; miscellaneous transport index of output; road haulage tonne-kilometers as well as consumer expenditures on hire cars at base-year prices.

28. Business services are emerging as a particularly important area of statistical investigation. The guidelines on the volume of business services should reflect developments in output identification, reliability of turnover figures, the use of quantity data and specific price indexes as well as price indices of the intermediate consumption of business services.

### III. EDUCATION SERVICES, HEALTH SERVICES AND PUBLIC ADMINISTRATION

29. The products of health, education and public administration services are not usually quantified and countries' descriptions of volume measures and deflators tend to focus on the costs, over time, of providing real output of services. In general, employment is most often used as an indicator of real output of education services, health services and public administration.

30. The responses show that countries measure the real output of education services primarily with reference to the numbers of persons engaged but also on the basis of deflated personal consumption expenditures and employees compensation. Volume measures based on student enrollment are seldom used for measuring the real output of education services.

31. The measures of the real output of health services are mostly based on persons engaged and sometimes hours worked. Occasionally, real output is estimated from volume measures such as the number of professional consultations; examinations, treatments and calls; and hospitals stays. Alternatively, volume measures may be derived indirectly by deflating personal consumption expenditures; receipts; medical benefits as well as health services costs (comprising wages and salaries and capital consumption). The range of price deflators include special

indexes of fees and remunerations, appropriate components of the CPI for medical care and medical goods and services as well as wage rates.

32. Public administration services at constant prices are computed most often from the cost side with or without adjustments for changes in labor productivity. The estimates may represent either employees compensation at base-year wage rates; or, employees compensation and consumption of fixed capital; and sometimes including intermediate consumption. Compensation of employees is deflated by wage indexes according to groups of employees. In other instances, the base-year compensation of employees is extrapolated by a weighted index of government employees classified according to characteristics such as activity, rank, grade, experience and length of service.

## IV. IMPLICATIONS FOR THE DRAFT GUIDELINES

33. The summary of the methodology of volume measures for services illustrates the diversity of the procedures employed and would therefore suggest the need to formulate guidelines that recognize approximate methods of measurement.

34. In practice, very few countries have the basic data to implement the double deflation method. The commonest approximation is the use of a general price index or input indexes to deflate current price value added. Value added deflators are also constructed to take into account the movements of both input and output prices and these are applied to current price value added. Quantity indexes, multiplied by base-year prices may be substituted for either output or input series.

35. At its 26th session in February 1991, the Statistical Commission endorsed a UNSO proposal of activities for the 1992-1993 biennium that includes the commencement of work on establishing an agreed format for the presentation of the draft guidelines on volume measures for services. The starting point for the developmental work is Norway's proposed format for the presentation of guidelines in respect of wholesale and retail trade; hotels and restaurants; transport, storage and communications.



36. The format proposed contains the following characteristics:

- draft guidelines for activities and products (i.e. for industries and services) are presented together in a combined way.
- identification and valuation are made explicit in a three-way presentation: by presenting contents, current price valuation basis and valuation in volume terms.
- main deflation method by activity (for value added) is indicated.
- type of volume indicator is indicated.
- main focus on volume measures and volume indices, rather than price measures and price indices.
- price indices specified as deflators in most cases, otherwise implicit when direct volume measures are used (extrapolation).

37. Following the Voorburg Group's discussions of Norway's proposed format, UNSO plans to initiate work on the preparation of draft guidelines on volume measures for financing and insurance; business services; education services, health services and public administration. For this purpose, UNSO hopes to draw on national experiences as well as the collaborative efforts in research activities among the Voorburg Group participants in respect of the constant price measurement in the complex areas of government, business services, banking and insurance.