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INDICES USED IN THE OECD AREA TO DERIVE CONSTANT PRICE VALUE ADDED IN SERVICES

INTRODUCTION AND PART 1

Contribution to the Seventh Meeting
of the Voorburg Group on Service Statistics

by

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* The views expressed in this paper are those of the author and do not necessarily reflect those of the OECD or its Member Governments.

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INTRODUCTION

1. This document constitutes a follow-up to the document "The measurement of value added at constant prices in service activities/industries" (Ref.STD/SERV(92)3/PART3) presented at the OECD Meeting of Service Statistics Experts held in Paris on 17-19 June 1992. The processing of the responses to the questionnaire on the measurement of value added at constant prices in service activities/industries (Ref.ESD/STAT/SERV(91)6/REV1) of September 26, 1991, provided by 20 Member countries, has now been completed.

2. The document is set out in two parts: Part 1 contains general comments on results shown in Part 2 in which methods and indices used for each market and non-market service identified separately are reviewed.

3. The Table presented in Part 2 shows ISIC Rev.3 (hereafter referred to as ISIC) major categories at the "letter" level, from G to P, separately. Market and non-market services are reported separately, even though this distinction is not made in ISIC, because methods used to derive constant price value added for both types of services often differ. Within each major category, items are classified according to the broad method used to derive constant price value added, i.e. double deflation, double extrapolation, deflation/extrapolation, direct deflation of value added, extrapolation of base year value added and lastly other methods which do not fit into any of the previous categories. The ISIC code(s) is/are given in the first column, the ISIC heading in the second, the index used to deflate or extrapolate is described in the third column. When double indicator methods are used, the index described in column 3 relates to gross output. The country applying the method is identified in the fourth column by two-letter initials. Country initials are spelled out in Annex 1, and the ISIC classification of services is reproduced in Annex 2.

4. Within this broad classification framework, items and countries have been grouped to the extent that the method and the indices used to derive constant price value added are the same. Indices have been described with as much detail as available in questionnaire responses. It was felt useful, at this stage, to report in extenso the information provided by countries, as a basis for discussion and critical assessment of methods, requested by some participants at the June 1992 meeting. This restricts the amount of grouping between countries and items, since the detailed construction of indices often differ from one country to another, though the type of index may be the same. For instance an output volume index can be obtained in a variety of ways; when the latter are described and are different, items or countries are shown separately.

5. Some interpretation of answers has been necessary andumber of questions are addressed to countries in order to verify the correctness of interpretations and to clarify specific methodological issues. The questions are given in Annex 3.

PART 1 : GENERAL COMMENTS

6. As shown in Part 2, methods differ considerably between countries and service categories. This variety of approaches amongst Member countries allows nevertheless to distinguish between those which exclusively (or extensively) apply double indicator methods and those for which single indicator methods are the rule (or predominantly used).

A. SUMMARY BY COUNTRY

7. **Japan** and **Denmark** use double deflation for all service activities market and non-market. **Italy** uses double deflation for all market services except trade, freight transport and insurance to which an extrapolation/deflation method is applied; for non-market services (excluding private households with employed persons) extrapolation/deflation is used. **Norway** applies double indicator methods throughout the service sector, either double deflation, double extrapolation or extrapolation/ deflation.

8. **The United States** uses double indicator methods for almost all market services except post and courier activities, other real estate activities, most business services, and non-market services; for these activities, single indicator methods are used, mainly extrapolation of value added by an index of numbers employed. **Germany** uses double deflation for all market services except trade where value added is extrapolated by an output volume index. Single indicator methods are used for non-market services with value added being deflated by a wage rate index. **France** uses double deflation for all market services except trade and transport for which extrapolation/deflation is used; single indicator methods are applied to non-market services either extrapolating or deflating value added. **Canada** uses double indicator methods, mainly double deflation for market services except for some sub-items of transport and telecommunications and single indicator methods for non-market services based on extrapolation of value added except for social work and membership organisation activities; for these activities value added is deflated. **The Netherlands** use double deflation for most market services, except business services, part of human health activities, sewage and refuse disposal, for which an intermediate price index, or more frequently, a wage rate index is used to deflate value added. Value added for several recreational and cultural activities is extrapolated on the basis of numbers employed. A wage rate index is used to deflate value added of public administration, defence, compulsory social security. **Sweden** applies double indicator methods, either double deflation or extrapolation/deflation proper to market services, whenever complete data on gross output and on intermediate consumption are available. When they are not, a "special" double indicator approach is used. Items for which value added is obtained in this manner are reported under "other method : controlled double deflation or extrapolation/deflation" in the Table of document 2. Single indicator methods are applied to non-market services for which an index of the number of hours worked is used to extrapolate value added.

9. **The United Kingdom, Iceland, Luxemburg, Switzerland, Australia** and **New Zealand** use exclusively single indicator methods. For market services, **the United Kingdom** uses output price, output volume or physical quantity output indices to deflate or extrapolate value added, except for research and development and other business services, education, health and personal services; for these activities an index of numbers employed is used to extrapolate value added. An index of numbers employed is also applied to non-market services, though often together with other types of indices. **Iceland** uses an output price index to deflate value added in market services except financial intermediation, for which a composite index of deflated wage bill and of numbers employed is used and business services, health services, recreational and cultural activities, for which both an output price index and an index of numbers employed are used. Value added of non-market services is extrapolated by a deflated wage bill index. **Luxemburg** uses output volume or physical quantity output indices to extrapolate value added for market service activities except financial intermediation; in this case, double and single indicator methods are combined; market education is treated in the same way as non-market services, for which indices of numbers employed are used to extrapolate base year value added. **Switzerland** uses an output volume or a physical quantity output index for most market services; exceptions are insurance, for which an intermediate consumption volume index is used and real estate, other business services and health to which a deflated wage bill index is applied. Value added in non-market services is extrapolated with an output volume index. **Australia** applies output volume or physical quantity output indices or hours worked to market and non-market services. **New Zealand** uses output volume or physical quantity volume indices for most market services; exceptions concern a few sub-categories of transport and storage, the Reserve Bank, business services and non-market services except human health activities for which an output price index, or an index of numbers employed is used.

10. **Austria** uses single indicator methods for most market services except for rail, other land and air transport; for these activities, double extrapolation is used. Single indicator methods are applied to all non-market services. **Belgium** uses single indicator methods, deflation of value added by an output price index for market services except trade, transport, real estate, human health activities excluding hospitals, and by a wage rate index for non-market services. **Finland** uses single indicator methods for market services except trade, hotels and restaurants, financial intermediation, dwellings, human health activities and sewage and refuse disposal; for these activities, double indicator methods are used, mainly double deflation. Value added for non-market services is deflated with a wage rate index. **Spain** uses both double and single indicator methods for market services and single indicator methods for non-market services.

B. SUMMARY BY TYPE OF SERVICE

11. For **wholesale and retail trade, repair of motor vehicles, motor-cycles and personal and household goods** double indicator methods are used by 11 countries, double deflation by 9 and extrapolation/ deflation by 2 of them, though the index used to deflate or extrapolate gross output varies between countries and items. Single indicator methods are applied by 9 countries and deflation or extrapolation of value added is achieved through a variety of indices.

12. Constant price value added for **hotels and restaurants** is derived through double indicator methods (mainly double deflation) by 10 countries; the index used to deflate gross output is, in most cases, derived from the consumer price index. The 10 countries using single indicator methods to deflate or extrapolate value added apply a wider variety of indices.

13. **Transport activities** have been sub-divided into passenger and freight transport, even though ISIC does not introduce this distinction, because most countries use different indices to estimate value added at constant prices according to whether people or goods are being carried. The various modes of transport are also often treated differently within the same country. When double deflation is used, the most frequent deflator for gross output is an implicit output price index. A consumer price index is also used in several cases. Double extrapolation is rarely used. Extrapolation/deflation is used by France for all transport activities. The extrapolator applied to gross output or to base year value added is most often a physical quantity output index usually based on tonne-kilometres or passenger-miles. More rarely, an output volume index is applied to base year value added.

14. For **communications** double deflation or extrapolation of value added are the most frequently used methods. The deflator of gross output is often a consumer price index, the extrapolator often a physical quantity output index. Extrapolation/deflation is used by two countries only, and deflation of value added by three.

15. For **financial intermediation** the methods used are mainly double deflation and extrapolation of value added, though extrapolation/deflation is used by Norway and Finland, and by Germany and Italy for part of these activities, and deflation of value added is the method applied in Belgium, the Netherlands and Spain, and in the United Kingdom for part of the category. The indices used as deflators or extrapolators vary considerably between countries and between component activities within this category.

16. For **real estate activities** double deflation or extrapolation of value added are mainly applied. A consumer price index is used as deflator of gross output in several cases. The indices used as extrapolators for value added are usually various types of output volume or physical quantity indices. The other methods are seldom used.

17. For **renting and business activities** seven countries use double deflation and seven countries extrapolate value added. Deflation of value added is used by most other countries. The types of indices used as deflators or extrapolators are extremely diverse.

18. Double deflation is applied to market **education services** by eight countries often using composite price indices. About as many countries extrapolate value added often using an index based on numbers employed, or numbers of pupils and students, or some combination of both. Extrapolation/deflation and deflation of value added are seldom used.

19. The two main methods used for **health and social work** are again double deflation or extrapolation of value added. Countries either use a consumer price index or a composite price index as deflator. The variety of indices used to extrapolate value added is greater, and nearly each country applying this method uses a different indicator.

20. Double deflation or extrapolation of base year value added are the most frequently used methods for **other community, social and personal service activities**. A consumer price index is often used as deflator of gross output, and output volume indices or physical quantity indices are often used to extrapolate base year value added.

21. Deflation or extrapolation of value added are much more frequently used to derive constant price value added for **non-market services** than any other method. Various forms of indices based on wages or wage rates are used to deflate value added in most cases. Extrapolators are of a more diversified nature, based on quantity inputs of labour (numbers employed, hours worked which may, or may not, be adjusted for labour productivity change), on deflated wage bill indices, or on output volume indices. A variety of price indices are used to deflate wages or output.

22. Several countries adjust indices to take into account labour productivity change: the United Kingdom for monetary intermediation, research and development, architectural, engineering and other technical activities, education and human health market services, sewage and refuse disposal and other service activities, Germany for government operated non-market services , Canada for defence, Austria for computer and related activities, research and development and other business activities, Luxemburg for all non-market services, the Netherlands for social work activities and Sweden for financial intermediation.