

Development of an Index of Producer Prices for Services in the UK

- *The Office for National Statistics (ONS) is developing a new index of producer prices for services.*
- *Publication of component indexes for individual industries will commence at the end of 1996.*
- *This paper describes the scope of the new index, and discusses issues that arise in the measurement of price movements for services.*

1 Introduction

- 1.1 Service industries have come to play an increasing role in the UK economy, and services (including those provided by government), now account for around two-thirds of gross domestic product. In common with the position in other countries, less statistical information has traditionally been available in the UK for service industries than for production industries. The ONS is therefore responding to the needs of its customers, both in government and the wider community, by improving statistical coverage of the sector.
- 1.2 This article describes the planned development of an index of producer prices for service industries, which will cover the prices of services sold by businesses to non-private customers (including customers in government). Prices of services sold directly to private customers are covered by the Retail Prices Index (RPI). Developments in the two areas will be coordinated to ensure that the burden on contributors is minimised.
- 1.3 Work on producer prices for services aims to meet three needs:
 - The index will contribute to the battery of statistics used to monitor and predict inflation.
 - The component indexes will be used to deflate current price turnover data for specific service industries, and thus produce indicators of turnover at constant prices. Such indicators are employed as proxies for value added in the calculation of gross domestic product by the output method. (For industries with both private and non-private customers, combined deflators will be produced using information from the new index and the RPI.)
 - Information on price movements for services will be useful to businesses, for instance in the indexing of contracts.

2 Issues

2.1 Developing price indexes for services is difficult. Most of the obstacles are present in some industries in the production sector; what is different is the extent and severity:

- Many service industries produce "one-off" outputs. For instance, a particular building is only ever designed once. This makes it difficult to obtain comparable prices in different periods.
- Some service industries produce outputs which are hard to measure. For example, the services of management consultants may often be difficult to quantify, or even to identify precisely.
- Where one-off services are produced, it is particularly difficult to monitor, and adjust for, changes in quality.
- Many professionals charge on the basis of an hourly fee rate. Whilst this is relatively easy to monitor, the measuring of prices requires additional information on the hourly output (productivity), which is much more difficult to obtain.

2.2 Despite these difficulties, experience in the UK and in other countries, particularly the USA and Japan, shows that it is possible to make progress. In doing this a balance must be struck between what is desirable from a narrowly theoretical perspective and what is achievable and affordable in practice. In the absence of a measure of output price movements, something else - perhaps input prices - may be used. The ONS believes that the developments proposed for service sector prices offer a significant advance over such practices. There will, however, undoubtedly be scope for continuing refinement of the methods adopted.

3 Measuring prices

3.1 The first step in developing a price index for the products of an industry is to review published research on the industry's outputs, costs and prices. This is followed by wide consultation with professional and trade bodies. The objective is to identify the structure of the industry and to determine the best methods for monitoring prices.

3.2 Identifying the structure correctly is important both to ensure that sub-indexes are meaningful to contributors and customers in the industry, and to maximise the accuracy of the overall results. There will tend to be less variance of price movements within market segments than between segments. Such segments may be defined with respect to objective features of the service provided, and, in certain circumstances, the geographical point of delivery or the characteristics of the customer (for example, whether the customer belongs to the public or private sectors). The general approach is pragmatic, and considerable weight is placed upon the advice of industry experts.

- 3.3 Official classifications offer little guidance on the best analysis to be adopted below broad industry headings. The standard industrial classification (SIC) is considerably less detailed for services than for production. The EU Classification of Products by Activity can often serve as a starting point, but international differences in business practice, and the ambiguities of definition for many services, mean that it is often necessary to go beyond this source. These factors also cast some doubt on the utility of developing prescriptive classifications for the sector.
- 3.4 A range of approaches to monitoring prices has been adopted. The objective is always to monitor realised prices, that is, after allowing for any discount. The selection of approach in each case depends upon the pricing practices in the industry and the availability of data. An underlying objective is to minimise the burden on contributors. The data monitored may include:
- Actual prices, that is prices recorded for transactions actually carried out during the period.
 - Contract prices, including a representative mix of prices levied under continuing contracts and renegotiated contracts.
 - List prices, which are appropriate where discounting is not prevalent.
 - Model prices, where contributors provide prices for specified services whether or not they are actually provided during the period.
 - Indicators of hourly fee rates, supplemented where available by measures of productivity change.
- 3.5 The use of contract prices means that the index cannot be regarded as exclusively an indicator of current inflationary pressure. On the other hand, it does mean that the index is well-suited to its use as a deflator.
- 3.6 Price quotations are collected from suppliers, not customers. This reflects the fact that a sampling frame is not available for customers. In principle, however, there may be advantages in monitoring the prices paid by customers. This is particularly the case where contract prices are collected, as price movements for a particular task could be followed through a change in contract. The ONS proposes to investigate further the feasibility of developing sampling frames based on customers, and to give further consideration to the merits of such an approach.
- 3.7 The basic sampling frame used at present is the Inter-Departmental Business Register (IDBR). This has the drawback that firms are classified on the register by their main activity. Some suppliers will therefore be omitted from the sampling frame. The ONS attempts to remedy this deficiency by supplementing the IDBR with information supplied by Trades Associations, where available.
- 3.8 Stratified random sampling is used. Accuracy will be reviewed once the index is established, and the sample size adjusted accordingly. In view of the high incidence of small businesses in the service sector, a priority will be to examine whether there is evidence to show that the trend movement in prices for large

and small businesses is similar, and thus justify reducing the sample of the latter.

- 3.9 In line with practice of the existing Producer Price Index (PPI), contributors are asked to supply price quotations which are representative of their price movements for the sub-index areas in which they do business. Where necessary, more than one price quotation may be provided.
- 3.10 Data for weighting price quotations and subindexes are sought initially when contributors are recruited. These data cover sales by sub-index area. There is at present no regular source of such data. The ONS will investigate the relative merits of updating the initial information on a regular basis, and of adapting an existing inquiry to fulfil a similar role. A move to chain linking would probably require the latter option.
- 3.11 In each industry, the top level index is parent to a family of component indexes. The lowest level indexes are constructed as weighted arithmetic means of price relatives (that is, prices expressed relative a base year value of 100). Higher level indexes are calculated as weighted arithmetic means of lower level indexes. The structure for freight transport by road (one of the simpler industries) is illustrated in figure 1.
- 3.12 Indexes are currently produced quarterly. Where contributors need to draw on their internal accounting information, for instance to determine average hourly fee rates, collection is one quarter in arrears. The ONS has been advised by professional bodies that more frequent collection is impractical in such cases. In other industries, more frequent collection - even where practical - would add considerably to the compliance burden. In view of the infrequency of price revisions in some service industries, there are considerable grounds for doubting whether monthly collection would be worthwhile.
- 3.13 Initially, indexes will be produced on a national basis. The possibility of producing regional estimates will be examined in the longer term. This would probably require an expansion of the sample size beyond that currently authorised.

4 Coverage

- 4.1 Data on five industries have been collected since 1991-92 (see Table 1). These industries are:
- freight transport by road
 - industrial cleaning
 - waste disposal
 - hire of buses and coaches (with driver)
 - educational services.
- 4.2 Data are collected quarterly. Data were originally obtained on a voluntary basis,

but in 1995, collection became statutory in line with the PPI. The indexes were also re-sampled and re-weighted in 1995.

- 4.3 For both **freight transport by road** and the **hire of buses and coaches**, price quotations are received for a mixture of actual prices, contract prices and model prices. Contributors notify us of any change in the quantity or quality of the service provided. Adjustments are made for such changes on the basis of information they supply. This information may take the form of details of a change in prices based on current market rates. For example, a move to a larger coach might be accompanied by the information that such coaches are hired out at a rate 10% higher than the previously quoted model. Where information on prices is not available, the adjustment may be based on the change in the supplier's costs.
- 4.4 The **educational services** index covers services provided to business customers. It includes the provision of training courses of various kinds. Prices are generally quoted per student, and are provided after the deduction of any discounts. Some aspects of quality change are taken into account in the same way as with road haulage and bus and coach hire. However, the less tangible aspects of quality (for instance the quality of the teacher) are more difficult to incorporate.
- 4.5 For **industrial cleaning**, contract prices are collected. Again adjustments are made for any change in the quantity or quality of service provided under the contract. When a contract is lost, the contributor is asked to provide a replacement, and estimate the movement in prices that has taken place for representative new contracts over the intervening period. There is clearly a subjective element in this estimate, but its omission would produce bias.
- 4.6 Accuracy requires that new products are introduced into an index as soon as possible. There may therefore be a concern with a base-weighted index where it is only practicable to update the weights infrequently. Consultation with industry representatives suggests, however, that this has not been a major problem in practice in these industries.
- 4.7 Data are now also being collected on a provisional basis for five additional industries:
- courier services
 - security services
 - sewerage services
 - accountancy services
 - consulting engineering services.
- 4.8 For **courier services**, quotations are collected on the basis of list prices (discounted where appropriate) and contract prices. For **security services**, the basis is contract prices, with hourly rates for some activities, such as the provision of body guarding. The principles and procedures are the same as for

the established indexes described above.

- 4.9 The index for sewerage services is based on the costs of collection and disposal of sewerage and trade effluent from business customers. Costs for trade effluent are based on effluent of a representative strength, and the calculation employs data on charges supplied by the economic regulator of the water industry, Ofwat.
- 4.10 The problems raised by **accountancy services** and **consulting engineering services** are typical of a range of industries which produce one-off services.
- 4.11 An option which is attractive in theory is to seek well-specified model prices. Unfortunately the ONS received strong advice from professionals in the industries concerned that the widespread adoption of this approach was impractical. The costs of realistically re-estimating a model assignment would be very great. Either the survey would attract considerable opposition, or the estimates provided would be cursory. In particular, there was doubt about whether model prices would reasonably reflect current market conditions, rather than the notional figures used in creating initial estimates.
- 4.12 As a result, the ONS has decided to seek to monitor separately hourly fee rates and productivity.
- 4.13 The approach adopted to monitor hourly fee rates will need to vary to reflect the particular circumstances of the industry covered. These circumstances include both pricing methods and the practices adopted for recording data on fee income. In all cases, it is important to obtain figures that reflect current market realities rather than notional charge-out rates. The approach adopted for accountancy services and consulting engineering involves monitoring realised average hourly fee rates for a range of activities. The structure adopted for accountancy services is shown in figure 2. (Note that the opportunity is taken to monitor related activities performed by businesses classified to accountancy.) The mix of staff by grade is monitored separately as a partial proxy for the quality of output.
- 4.14 This approach involves a measure of averaging. This is undesirable from the viewpoint of the theory of pure price indexes. However, the way in which records are kept in the industry severely limits the data that can be collected, particularly if the emphasis is to be on realised rather than notional rates. It is also the case that for many professional services the unit for pricing is the customer rather than the basket of individual services provided. Thus an accountant may not care too much about the balance of charges between accountancy, auditing, and tax consultancy, so long as adequate fee income is received in total from the customer in question. In these circumstances, monitoring average charges may be the best available option.
- 4.16 It is clear, however, that a complete measure of price movement requires that the index of movement in hourly fee rates be supplemented by an index of

productivity change. In view of the difficulty of collecting model prices on a widespread basis, the ONS is exploring the feasibility of a restricted annual survey of productivity change. This work, which is at an early stage, would involve the annual re-estimation of the hours required to complete representative projects. The output would be a long run measure of productivity change specific to the industry covered, which could be used to modify the index of hourly fee rates.

- 4.17 It is worth bearing in mind that even if the indicator in these industries were confined to a measure of realised hourly fee rates, this would represent a considerable advance over the input cost measures currently available. First, the new indicator is dis-aggregated, and relevant to individual industries. Data on wages and other inputs are often not available on this basis. Second, the measure includes profit, which is relatively variable across the economic cycle.

5 Next Steps

- 5.1 Coverage will be expanded to the bulk of the sector by the end of 1998. The industries which it is planned to cover are shown in Figure 3. Sales to business customers by these industries accounted for around 13% of GDP in 1990. (Some smaller, more difficult and heterogenous industries will not be covered.) It is also intended to extend coverage to banking and insurance (which will add a further 4-5% of GDP), but the measurement of charges for these industries raises difficult conceptual issues which require further consideration.
- 5.2 Regular publication of the five established indexes will commence in December 1996. New indexes will be monitored for at least one year, and published as soon as practicable.
- 5.3 The options will be reviewed for obtaining weighting information to compile high level indexes of output and input prices for the service sector. In the longer term, the ONS will explore the scope for combining service sector input indexes with input PPIs and data on wages and salaries to create combined cost indexes for both whole sectors and individual industries.
- 5.4 Further work is also proposed to develop the approach to monitoring productivity change in those industries where it is natural to monitor hourly fee rates, and to refine the procedures for monitoring, and adjusting for, quality change.

FIGURE 1

Freight transport by road

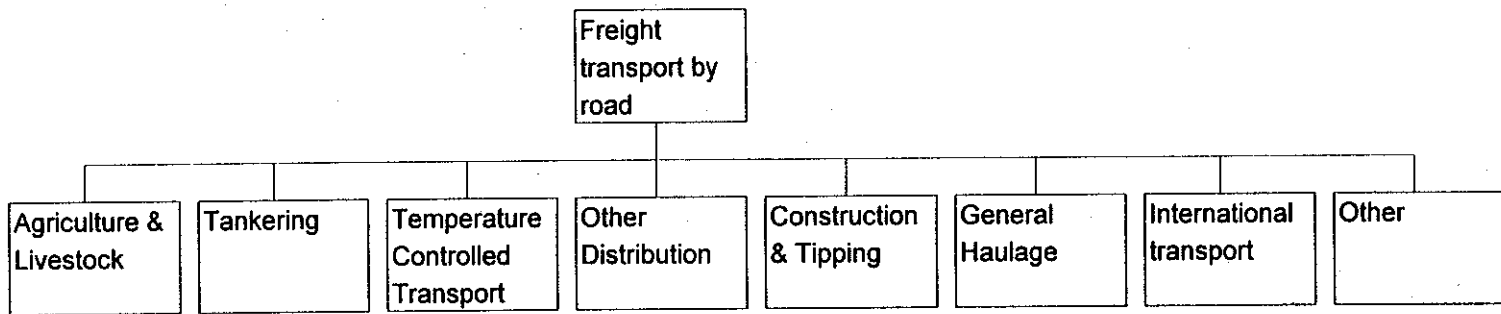
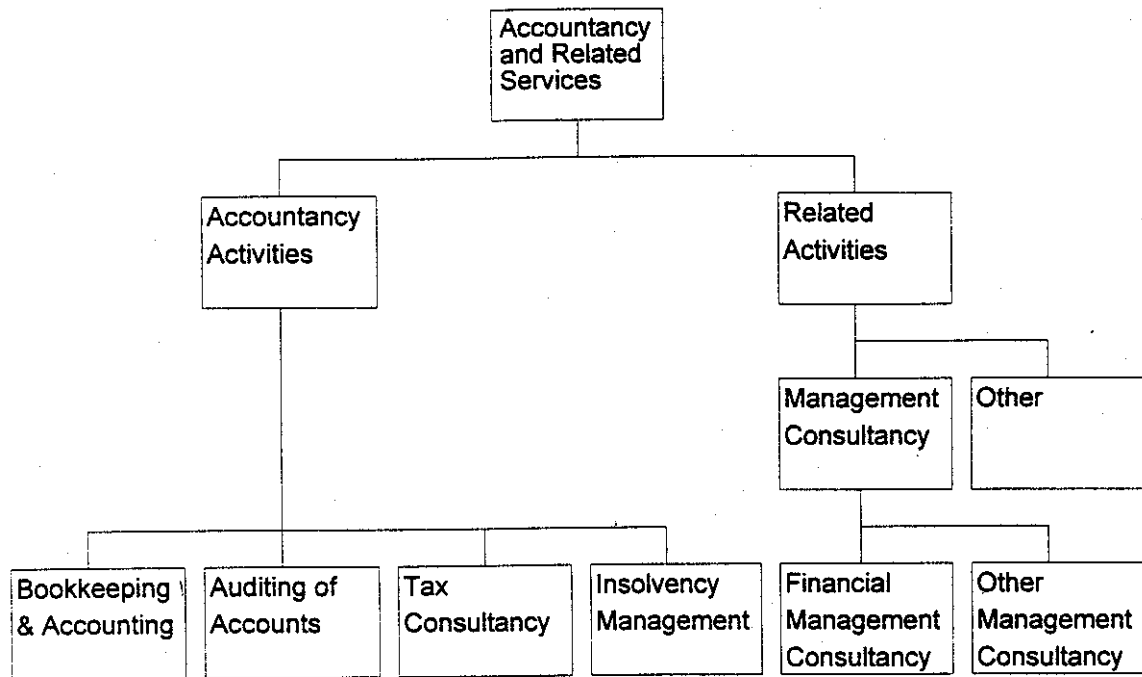


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FIGURE 2

Accountancy Services



Service Sector Price Index: Established Indices

1990 = 100

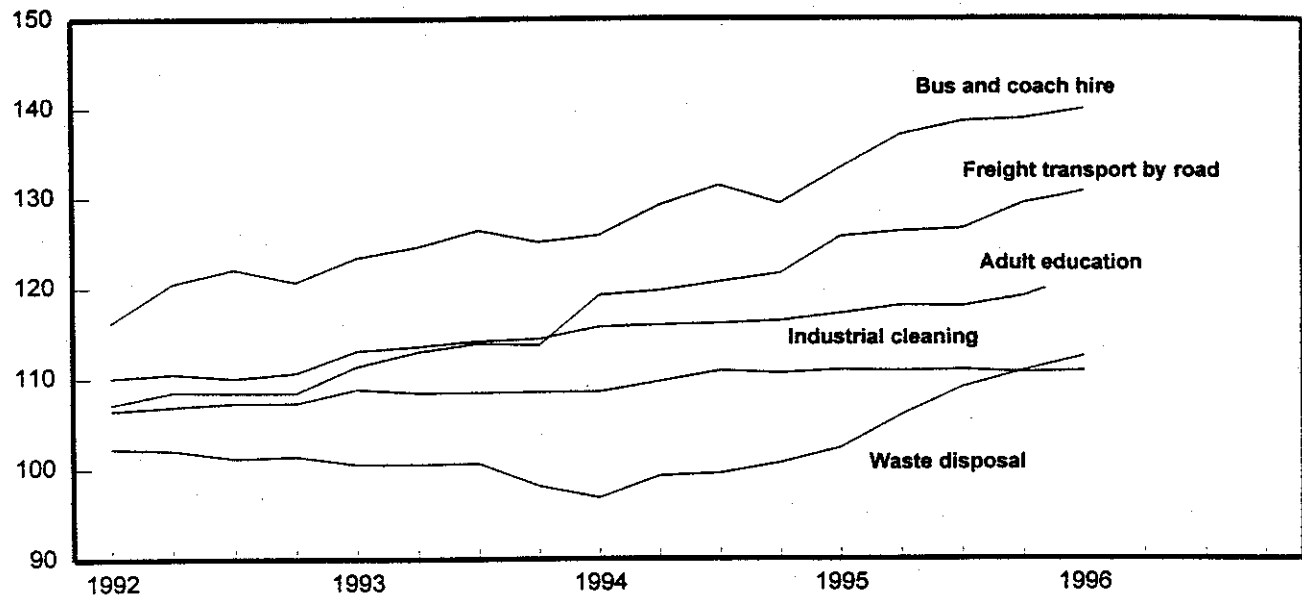


TABLE 1

Service sector producer prices

Established indexes

1990 = 100

Price indexes	Bus and coach hire	Industrial cleaning	Freight transport by road	Adult education	Waste disposal
	4802300000	4747000000	4802400000	4804200000	4902000000
1992 Q1	116.2	106.5	107.2	110.1	102.3
Q2	120.4	106.9	108.5	110.5	102.1
Q3	122.0	107.3	108.4	110.0	101.2
Q4	120.6	107.3	108.4	110.6	101.4
1993 Q1	123.3	108.8	111.3	113.0	100.5
Q2	124.5	108.4	112.9	113.5	100.5
Q3	126.3	108.4	113.8	114.1	100.6
Q4	125.0	108.5	113.6	114.3	98.1
1994 Q1	125.7	108.5	119.1	115.6	96.8
Q2	129.1	109.6	119.6	115.8	99.2
Q3	131.3	110.8	120.6	116.0	99.5
Q4	129.3	110.5	121.5	116.3	100.6
1995 Q1	133.3	110.9	125.6	117.1	102.3
Q2	137.0	110.8	126.2	118.0	105.9
Q3	138.5	110.9	126.5	117.9	109.0
Q4	138.8	110.6	129.3	119.0	110.8
1996 Q1					
Q2					
Q3					
Q4					

Percentage movement over year	Bus and coach hire	Industrial cleaning	Freight transport by road	Adult education	Waste disposal
	4802300000	4747000000	4802400000	4804200000	4902000000
1993 Q1	6.1	2.2	3.8	2.6	-1.8
Q2	3.4	1.4	4.1	2.7	-1.6
Q3	3.5	1.0	5.0	3.7	-0.6
Q4	3.6	1.1	4.8	3.3	-3.3
1994 Q1	1.9	-0.3	7.0	2.3	-3.7
Q2	3.7	1.1	5.9	2.0	-1.3
Q3	4.0	2.2	6.0	1.7	-1.1
Q4	3.4	1.8	7.0	1.7	2.5
1995 Q1	6.0	2.2	5.5	1.3	5.7
Q2	6.1	1.1	5.5	1.9	6.8
Q3	5.5	0.1	4.9	1.6	9.5
Q4	7.3	0.1	6.4	2.3	10.1
1996 Q1					
Q2					
Q3					
Q4					

Weighted response rates (%)*	Bus and coach hire	Industrial cleaning	Freight transport by road	Adult education	Waste disposal
	4802300000	4747000000	4802400000	4804200000	4902000000
1993 Q1	100.0	95.9	98.3	99.2	100.0
Q2	100.0	95.9	98.3	99.2	100.0
Q3	99.1	95.9	98.3	99.2	100.0
Q4	99.1	91.1	98.3	97.6	100.0
1994 Q1	98.7	92.5	93.4	87.3	100.0
Q2	99.7	85.2	94.0	81.2	100.0
Q3	55.0	81.7	94.9	77.3	100.0
Q4	63.2	75.7	92.3	79.8	100.0
1995 Q1	63.2	75.7	92.3	83.5	100.0
Q2	94.4	89.7	82.9	80.4	100.0
Q3	100.0	100.0	100.0	81.1	100.0
Q4	99.9	100.0	100.0	100.0	97.6
1996 Q1					
Q2					
Q3					
Q4					

* Response rate weighted by contribution of item to index.

FIGURE 3
Service sector producer prices:
Industries to be covered

SIC(92) Code	GDP Weight 1990
55 Hotels and Restaurants	
55.11/1 Licensed hotels and motels, with restaurant (business rates)	4.2
60 Land transport; transport via pipelines	
60.10/1 Inter-city services (business travel)	2.5
60.10/2 Other transport via railways (freight transport)	
60.22 Taxi operation (business custom)	0.3
60.23 Other passenger land transport (hire of buses and coaches)	0.8
60.24 Freight transport by road	13
61 Water transport	
61.10/1 Passenger sea and coastal water transport (commercial vehicle ferries)	0.9
61.10/2 Freight sea and coastal water transport	
62 Air transport	
62.10/1 Scheduled passenger air transport	2.75
62.10/2 Other scheduled air transport (air freight)	
62.20/2 Other non-scheduled air transport (air freight)	
63 Supporting & auxiliary transport activities; travel agencies	
63.11 Cargo handling	5.7
63.12 Storage and warehousing	2.8
63.21 Other supporting land transport activities	4.9
63.23 Other supporting air transport activities	
64 Post and telecommunications	
64.11 National post activities (business post)	3.2
64.12 Courier activities other than national post activities	1
64.20 Telecommunications (business telecoms)	13.6
70 Real estate activities	
70.31 Real estate agencies	2.65
70.20/1 Letting of conference and exhibition centres	
70.32 Management of real estate	
71 Renting of machinery and equipment without operator	
71.10 Renting of automobiles	0.9
71.32 Renting of construction and civil engineering m & e	3.6
71.33 Renting of office machinery and equipment inc computers	0.1
71.34 Renting of other machinery and equipment nec	1.7
72 Computer and related activities	
72.10 Hardware consultancy	11.5
72.20 Software consultancy and supply	
72.30 Data processing	
72.40 Data base activities	
72.50 Maintenance / repair of office, accounting & computing machinery	
72.60 Other computer related activities	
74 Other business activities	
74.11 Legal activities	9.1
74.12 Accounting, book-keeping & auditing activities; tax consultancy	8.3
74.13 Market research and public opinion polling	23.9
74.14 Business and management consultancy activities	
74.20 Architectural and engineering activities and rel. tech. consultancy	
74.30 Technical testing and analysis	
74.40 Advertising	
74.50 Labour recruitment and provision of personnel	
74.60 Investigation and security activities	
74.70 Industrial cleaning	
74.81 Photographic activities (film processing)	
74.82 Packaging activities	
74.83 Secretarial and translation activities	
74.84 Other business activities nec	
80 Education	
80.42 Other adult and other education nec	0.9
90 Sewage and refuse disposal, sanitation and similar activities	
90.00/1 Sewerage	2.1
90.00/2 Refuse disposal, sanitation and similar activities	1.5
92 Recreational, cultural and sporting activities	
92.12 Motion picture and video distribution	3.5
92.20 Radio and television activities	
92.32 Operation of arts facilities	
92.40 News agency activities	
92.61 Operation of sports arenas and stadiums	
93 Other service activities	
93.01 Washing and dry cleaning ...	1.6
Total	127

Note

GDP weights are parts in one thousand. They are the estimated implicit weights on services provided to business customers. The estimates should be regarded as illustrative.