

# The Journey of the Index of Services from Experimental to National Statistic Status

## Introduction

The Index of Services (IoS) has, over the last 2 years, been subject to a trailblazing and robust evaluation process to determine if the IoS and its sub-components are suitable to become National Statistics; this process has helped establish a benchmark for the development of other statistics in the ONS. The methods and data sources used to measure each of the 2 digit Standard Industrial Classification (SIC) divisional level industries and broad industry categories (called sections) were documented and the performance of the methods were analysed by the IoS team. Topics and analyses covered included:

- Conceptual appropriateness of the data sources and methods used; this included an assessment against international guidelines
- Coverage of the data sources
- Response rates
- Contribution to key estimates from imputed values
- Revisions performance
- Are the statistical methods sufficiently robust to suit the circumstances material to their use e.g. robustness of computer systems and data quality assurance procedures
- Speed of publication compared to reference period being published
- User feedback on usefulness and credibility of the statistics produced

A report was written for each division which was then reviewed by a quality assurance team (comprising of experts in index numbers, prices and deflation, time series and sample design and estimation) created from ONS' Methodology Directorate (MD). Decisions were then made regarding each division's appropriateness to become a National Statistic.

The following is an outline of the final evaluation report submitted for the Total Index of Services. It provides an overview of the:

- [Background of the IoS](#)
- [Conceptual basis for the IoS](#)
- [Data sources used to measure the IoS](#)
- [Quality assurance procedures and interactions with Quarterly National Accounts](#)
- [Evaluation of the IoS to determine suitability to be a National Statistic](#)
- [Outstanding issues](#)

## Summary

### Proportion of the IoS classified as National Statistic

81 per cent of the IoS is classified as a National Statistic.

### **Assessment against international deadlines**

80 per cent of the data sources and methods used to measure the IoS are classified as carrying either an ideal 'A' or an acceptable 'B' Eurostat rating. All data sources, adjustments, basic methodologies and systems used are entirely consistent with the quarterly GDP(O) estimate for Services (already a mainstream statistic) and conform to national and international standards. Of the 20 per cent unacceptable 'C' methods, just under half (9 per cent) comes from Other Business Activities; here it has been agreed that the 'C' methods used within this division are very close to being acceptable 'B' methods (due to the fact that the more specific Average Earnings Index (AEI) deflator which would constitute a 'B' method is very close to the more general AEI deflator actually used).

### **Significant methodological improvements**

The IoS has undergone an extensive industry review programme over the last 6 years which has improved the data sources and methodologies used to compile the IoS. These reviews have ensured that the data sources and methodology currently used are the most optimum available at this time. Indeed, the UK is now viewed as a world leader in the short term measurement of the service sector.

There are still industry reviews due to be implemented in June 2007 but these reviews only account for 3 per cent of Total IoS and/or will only be implemented forwards (and thus not cause any revisions to back data). The implementation of these reviews are not expected, therefore, to have a significant impact on the output of Total IoS. Any changes recommended as a result of the Industry Review process are implemented in both the IoS and GDP(O) systems simultaneously.

### **Data Periodicity**

57 per cent of the data feeding into the IoS is currently comprised of monthly data.

- **Market sector:** It is generally accepted that it is more important to use monthly data in the measurement of the market sector. In this sector the IoS has 70 per cent monthly data.
- **Non market sector:** Of the 43 per cent non-monthly data over half (23 per cent) is used to measure Government Activities (i.e. Public Administration & Defence, Education and Health and Social Work). During the evaluation for these Government Activities, it was agreed that, given the nature of these activities and the measurement of collective services in general, that monthly data is not significant for these industries. It is acknowledged, however, that certain areas within these industries (e.g. fire services data, adult education) may exhibit more month on month fluctuations than others.

Standard (MD recommended) ONS processes are used to transform quarterly and annual data into monthly data.

### **Level of detail published in the IoS**

The level of detail, from the September 2005 IoS Release, was significantly expanded to include twenty two (of the twenty seven) service sector divisions. These twenty two divisions equates to 94 per cent of the service sector. Users now have available a far greater breakdown of the service sector; this significantly improves their ability to analyse and understand this ever increasing important sector of the economy. As a result of the IoS development programme, divisional level data are also now first

published one month earlier in the quarterly GDP releases i.e. in the UK Output, Income & Expenditure First Release rather than the Quarterly National Accounts First Release.

### **Revisions**

Revisions for the IoS on both a month on month and 3 month on 3 month basis are relatively small and are comparable with the (already mainstream) Index of Production.

## **Overview of the IoS**

The monthly IoS has been developed to provide a timely indicator of growth in the output of service industries. The demand, from key users of economic data, for a monthly IoS came about due to the fact that the service sector now accounts for 74 per cent of UK Gross Domestic Product (GDP); there is a long-standing indicator which measures the production output of the economy (the Index of Production (IoP) - which accounts for 19 per cent of the economy), but there was no such indicator for the much larger service sector. The IoS programme has been overseen by a Steering Group with representatives from the Bank of England, HM Treasury and DTI.

The IoS project was initiated in early 1999 and one of the first tasks was to consult users and to draw up a user requirement. In a nutshell, the aim of the project was to get as close as is practicable to producing for services what had existed for production industries since 1948 (i.e. the monthly IoP).

The IoS was first published as an experimental index (via the National Statistics website) in December 2000 following consultation with the Treasury and the Bank of England. Publication as an experimental series gave the opportunity to obtain user comment, inform users of progress made and the planned work programme and to help familiarise potential users with the series. The experimental label also allowed an extensive development programme to be undertaken without publishing large revisions to a mainstream statistic.

Users wanted consistency between the IoS and the existing quarterly measure of services within the output approach to GDP (GDP(O)), so the IoS uses exactly the same data sources and basic methodology as the corresponding services part of GDP(O). An IoS development programme has reviewed, industry by industry, the data sources and methods used to estimate the monthly IoS, making improvements to the methodology and incorporating more monthly data sources where possible. To date 88 per cent of the IoS (by 2003 GVA weight) has been reviewed. This figure is set to rise to 100 per cent by June 2007. Any improvements to methods or data sources have been, and will continue to be implemented in both the IoS and GDP(O) at the same time.

At present, 57 per cent of the IoS is comprised of true monthly data with 33 per cent being comprised of quarterly data and 10 per cent annual data.

## **Conceptual Basis for the IoS**

The IoS aims to measure the change in the gross value added (GVA) of the service sector.

GVA is defined as:

outputs	<i>less</i>	inputs
or		
turnover	<i>less</i>	purchases for intermediate consumption
	<i>plus</i>	changes in inventories
	<i>plus</i>	own account capital formation

GVA is also known as net output

Due to the large amount of data required, however, it is impracticable to measure GVA on a monthly (or even quarterly) basis. A number of proxies are therefore used to produce estimates of monthly change in GVA. This assumes that the relationship between inputs and outputs at chained volume measures are stable in the short term; this is an accepted method of measuring changes in GVA in the short term.

The section below describes the data sources and methods used to measure the IoS.

### Data Sources used to Measure the IoS

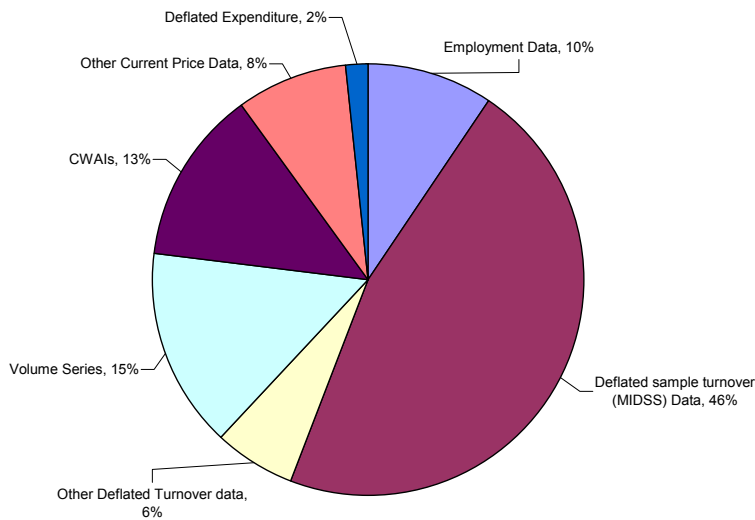
As mentioned earlier, it is impracticable to measure GVA on a monthly (or even quarterly) basis. The IoS therefore use a wide variety of different data, from many sources to meet this challenge. Some of the indicators are derived using current price turnover deflated by a suitable price index. Others use direct volume measures that do not need to be deflated and some use other proxies, such as employment numbers. Some input data are delivered in raw component form, i.e. all the lowest level 'building blocks', and assembled within the IoS system. Others come already 'partially assembled', as aggregates or constant price derivatives, and are input at a later stage in the system.

In order of preference, the following types of indicator are used:

- The European System of Accounts (ESA) 'preferred' type of output indicator is one that measures deflated gross output (or turnover) for an industry. These use an appropriate price change estimator to remove the effects of inflation and will take account of quality changes where these are significant.
- The use of volume indicators is also acceptable under ESA regulations. These require no deflation but will usually miss quality changes, or changes in the mix of outputs.
- Other types of indicator, which measure inputs to an industry, are regarded as acceptable for non-market collective services but not satisfactory for market sector output. The most obvious and widely used of these is employment.

The pie chart below shows the percentage breakdown of the various types of indicator used to compile Total Services

### Figure 1: Indicator Types



Examples of other deflated turnover include:

- Value Added Tax (VAT) returns
- Bank of England Bank fees and commission income
- Investment Property Databank (IPD) net income received

Examples of other Current Price (CP) data include

- Sterling/non sterling loans/deposits to the public/private/overseas sector
- Funds held in Unit Trusts
- Funds held in Investment Trusts
- Total Financial Assets of insurance and pension funds

Examples of volume series include:

- Number of passenger miles travelled
- No of first/second class letters sent
- No of season tickets sold
- Volume of freight moved

Cost weighted activity Indices (CWAIs) are output indices which are used primarily to measure the Government output within the IoS. The creation of a cost weighted activity index (CWAI) involves the following steps:

- a list of activities are produced that are considered to cover all or most of the work of that area.
- for each activity, a volume measure is found that describes how the amount of work involved in that activity is changing over time. If the activity is homogeneous, a good volume measure is a count of the number of incidents or cases in each time period.

- these measures are weighted together to produce an aggregate measure for the whole area. The weights should be proportional to expenditure on that activity in the base year.

Within the IoS and GDP(O), indicators used to estimate short-term change are selected for their:

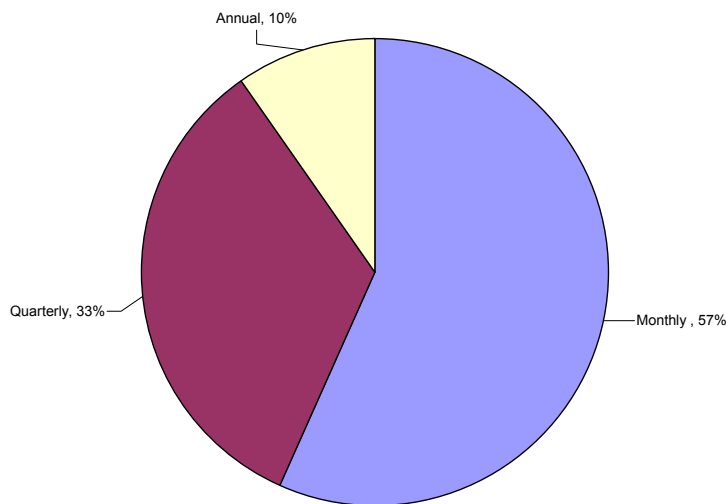
- appropriate industrial coverage;
- consistency over time; and
- suitable quality and timeliness.

The data used to compile the IoS is described in more detail on the National Statistics website: [http://www.statistics.gov.uk/iosmethodology/source\\_data.asp](http://www.statistics.gov.uk/iosmethodology/source_data.asp)

### **Periodicity of Data**

The pie chart below shows the percentage breakdown of the different data periodicities used within Total Services:

**Figure 2: Periodicity**



Of the 43 per cent non monthly data, over half (23 per cent) comes from the Government Activities divisions (i.e. Public Administration & Defence, Education and Health and Social Work). During the evaluation for these Government Activities, it was agreed that, given the nature of these activities and the measurement of collective services in general, monthly movements are not significant for these industries. It is acknowledged, however, that certain areas within these industries (e.g. fire services data, adult education) may exhibit more month on month fluctuations than others.

It is widely recognised that monthly movements in the market sector are more significant. 70 per cent of the market sector is measured using monthly data. It is worth noting that, before the Industry Review

programme started, 83 per cent of the indicators used for non-market were only available annually, whereas now, non market is made up of 70 per cent quarterly data.

Standard (MD recommended) processes are used to transform all quarterly or annual data into monthly series using a cubic spline to interpolate the series.

## **Quality Assurance Procedures and Interactions with Quarterly National Accounts**

### **Quality Assurance in the lead up to the IoS Launch in December 2000**

An initial quality assurance of the monthly Index of Services data was carried out during 2000, as part of the run-up to launching the experimental index in December of that year. In this process all of the input time series from 1995 were examined to identify any anomalies, e.g. step changes in the data or unusually extreme peaks and troughs. These anomalies were investigated with data suppliers and the reasons, where found, were documented. Where appropriate, e.g. where the anomaly was found to be caused by an error or by a change in survey methodology, quality adjustments were made to the data.

### **Current Quality Assurance Procedures**

Since that time, ONS has put in place regular monthly quality assurance procedures to augment the quarterly quality assurance procedures that were already in use. The purpose of these procedures is to understand and be able to explain movements in the data, to allow quality adjustments to be made in an informed and evidence based manner and to check that the computer system is calculating the published indices correctly.

All of the time series that are inputs to the system are examined graphically to identify anomalies, as are higher level aggregates up to and including the headline IoS. Tables of data and revisions to data, showing index numbers and growth rates, are also used to help identify unusual movements. Briefing information is supplied each month for the ONS' Monthly Inquiry into the Distribution and Service Sector (MIDSS), data which are used in the IoS. Similar, but less detailed, information is available on request from other data suppliers. In addition, a monthly economic briefing is provided by an ONS economist, giving information about movements in comparable data sources and major news stories that might affect services' output.

### **Interaction between IoS and GDP(O)**

The monthly Index of Services and the equivalent quarterly indicator of services' output within the output measure of Gross Domestic Product, GDP(O), use a consistent approach to making quality adjustments. Criteria for making adjustments have been agreed by the IoS and GDP(O) Statisticians and regular meetings are held to agree on specific quality adjustments for both monthly and quarterly data, drawing on the information sources listed above. These criteria are described briefly as part of the IoS Methodology documentation on [Quality Adjustments](#) on the National Statistics website and in more detail in [Annex E](#) of this documentation.

The monthly IoS data is benchmarked to quarterly GDP(O) so that the arithmetic mean of the 3 months of a quarter within the IoS will always equal the quarterly service index published as part of GDP(O). ONS experts in time series conduct the annual seasonal adjustment reviews for IoS and quarterly GDP(O) as joint exercises and recommend the optimum seasonal adjustment. The latest review

concluded that the optimal seasonal adjustment for 40 per cent of the IoS and GDP(O) services data was for monthly seasonal adjustment over quarterly; monthly IoS data, therefore takes primacy over the quarterly GDP(O) data for this 40%. This means that rather than IoS' monthly seasonally adjusted series being benchmarked to the GDP(O) quarterly seasonally adjusted series, the GDP(O) series is derived as an average of the IoS' seasonally adjusted months (i.e. using the same method as the production components of GDP(O)). For the data that are benchmarked, comparisons are made between the data before and after benchmarking, in order to check that the monthly path has not been significantly distorted. Any significant differences are investigated, since they could be the result of a processing error in one or other of the (independent) systems. There is also a series of automatic system checks carried out each month to ensure that all procedures are functioning correctly.

As the IoS conforms to the National Accounts framework, it is subject to the same revisions policy and quarterly and annual coherence adjustments as the output measure of GDP(O). More information on the Quarterly National Accounts framework and its relationship with the IoS can be seen on the National Statistics website: [http://www.statistics.gov.uk/iosmethodology/national\\_accounts.asp](http://www.statistics.gov.uk/iosmethodology/national_accounts.asp)

### **Evaluation of the IoS to Determine Suitability to Become a National Statistic**

The IoS was evaluated against a set of internally agreed assessment criteria for changing from an experimental to a mainstream National Statistic. This evaluation has been a robust and trailblazing process which has helped establish a benchmark for the development of other statistics in the ONS. The evaluation included the following topics/analyses:

#### **The defined development phase has ended**

The IoS has been reviewed on an industry by industry basis to improve the data sources and methodologies used to compile the IoS. To date 88 per cent of the IoS (by 2003 GVA weight) has been reviewed. This figure is set to rise to 100 per cent by June 2007. The industry reviews were implemented in:

<b>Industries Reviewed</b>	<b>Date Implemented</b>
Air Transport	Blue Book 2006
Financial Intermediation	
Insurance & Pension Funding	
Activities Auxiliary to Financial Intermediation	
Membership Organisations nec	
Other Service Activities	
Productivity Adjustment	
Supporting & Auxiliary Transport Services	Blue Book 2005
Water Transport	
Real Estate (part 2)	
Public Administration & Defence (part 2)	
Education (part 2)	
Health & Social Work (part 2)	Blue Book 2004
Recreational, Cultural & Sporting Activities	

Public Administration & Defence (part 1)	
Education (part 1)	
Health & Social Work (part 1)	
Sewage & Refuse Disposal	
Real Estate (part 1)	
Land Transport (part 1)	
Retail (excluding Motor Trades)	Blue Book 2003
Computer Services (part 1)	
Hotels & Restaurants	
Business Services (part 1)	
Post & Telecommunications	
Motor Trades	Blue Book 2002
Wholesale	

Industry Reviews still to be implemented in June 2007 include Renting, Research & Development, Business Services (pt 2) and the erratic billing review. In addition, new methodology for measuring Financial Intermediation Services Indirectly Measured (FISIM) is still to be implemented.

The industry review process is fully documented and the full reports of all of the Industry Reviews undertaken can be seen on the National Statistics website at:

[http://www.statistics.gov.uk/iosmethodology/future\\_improvements.asp](http://www.statistics.gov.uk/iosmethodology/future_improvements.asp).

**The statistical methods have proved sufficiently robust to suit the variety of circumstances material to their use**

The WinCSDB computer system used to calculate the monthly Index of Services is a monthly replica of the quarterly GDP(O) system. Where quarterly or annual data sources are used, additional calculations are used to produce monthly data using a cubic spline. This procedure follows standard WinCSDB procedures which have been approved by the Time-series Analysis Branch of ONS' Methodology Directorate. WinCSDB is the standard National Accounts timeseries/ production tool.

The ONS standard benchmarking function has also been added to the IoS computer system to ensure coherence between the IoS and GDP(O) measures. It benchmarks the monthly indices so that the arithmetic mean of the three months is equal to the quarterly services index published as part of GDP(O) (which is well established and regarded as the best short-term measure of GDP). The indices are benchmarked at the group level (for certain monthly series where monthly data do not take primacy), 2 digit SIC level, published section and total IoS.

The processes used to produce the IoS dataset are all fully documented and published; they can be accessed via the National Statistics website at:

[http://www.statistics.gov.uk/iosmethodology/time\\_series\\_methods.asp](http://www.statistics.gov.uk/iosmethodology/time_series_methods.asp)

**Coverage reaches a sufficient level**

As mentioned earlier, IoS uses a wide variety of different data, from many sources and it is therefore difficult to determine the coverage for the IoS as a whole as coverage varies from one data source to another. Outlined below, however, are some of the main data sources used by the IoS:

### **Monthly Inquiry into the Distribution and Service Sector (MIDSS) & Retail Sales Inquiry (RSI) Data**

39 per cent of the data feeding into the IoS are derived from the MIDSS survey which collects turnover and employment data from a wide range of industries within the Distribution and Service Sector in Great Britain. A further 7 per cent are derived from the RSI survey. All of the contributors that comprise the MIDSS and RSI based series are held on the Interdepartmental Business Register (IDBR). The IDBR is the standard ONS sampling frame used by both the MIDSS and MPI (Monthly Production Inquiry - which supply data to IoP) surveys. Contributors to the MIDSS and RSI surveys are stratified by number of employees with all contributors with more than 100 employees being fully enumerated. Due to the sheer number of contributors within the industries, however, only a sample of contributors with fewer than 100 employees can be surveyed. These samples are then 'weighted' using standard, MD approved methods to reflect what is happening in the whole industry.

### **Cost Weighted Activity Indices (CWAIs)**

13 per cent of the data feeding into the IoS are derived from CWAIs and are used to measure certain elements of the government component of the IoS. These CWAIs are constructed by the UK Centre for Measurement of Government Activity (UK CeMGA). These data are primarily comprised of administration data and represent censuses or near censuses of the data being collected. Geographical coverage varies from series to series with some series using England data as a proxy for the UK, others collecting data for Great Britain and other collecting data for the whole of the UK. Product coverage is generally very good.

All of the CWAIs that feed into the IoS have been subject to the 2004 Atkinson Review of government output and productivity which led to a number of improvements in scope and coverage being implemented into the IoS and GDP(O) systems for Blue Book 2005. The full Atkinson Review can be found on the National Statistics website at:

[http://www.statistics.gov.uk/about/data/methodology/specific/PublicSector/Atkinson/final\\_report.asp](http://www.statistics.gov.uk/about/data/methodology/specific/PublicSector/Atkinson/final_report.asp)

### **Household Expenditure Data**

12 per cent of the data feeding into the IoS are derived from Household Expenditure data. The largest single data source within the Household Expenditure data that is used within the IoS is the Expenditure and Food Survey (EFS) in which each member of a sampled household keeps a diary of his or her spending on goods and services for two weeks. Regular outgoings, such as rent and mortgage payments, and large infrequent expenses, like new vehicles, are recorded in an interview with the entire household. Data are collected throughout the year from a rolling random sample of 12,000 households per year. The response rate from these 12,000 households is 58 per cent.

Other data sources used by the Household Expenditure branch include data from the Retail Sales inquiry (see above), HM Revenue and Customs (see below), the International Passenger Survey (which collects information about fares (amongst other things) in face to face interviews with a systematic random sample of passengers taken from selected sea crossings) and various other data sources. The IPS data covers 0.2 per cent of all travellers as they enter or leave the UK.

### **Employment Data**

The ONS Employment data (which accounts for 10 per cent of Total IoS) are sourced from a number of ONS surveys including the MIDSS and Quarterly Public Sector Employment Surveys (QPSES).

### **Bank of England Data**

6 per cent of the data feeding into the IoS are derived from the Bank of England (BoE). The Bank of England collect data on directly charged fees and commissions on their quarterly Profit & Loss (post 2004) and A3 forms (pre 2004). Although the Profit and Loss form is technically a survey, the response rates are close to 100 per cent and so, as the survey is also collected by the BoE, a regulator of the industry covering 98 per cent of the UK Banking industry and has almost complete coverage of fees, the survey can be considered to be almost a census.

### **HM Revenue and Customs (VAT) Data**

4 per cent of the data feeding into the IoS are derived from VAT turnover data. VAT turnover data consists of a census of all VAT registered companies who have returned their forms.

The above data sources account for 91 per cent of the data feeding into the IoS.

### **User feedback indicates that the statistics are useful and credible**

When the IoS project was initiated in early 1999, one of the first tasks was to consult users and to draw up a user requirement. This user documentation outlines the key users of the the IoS along with their needs and requirements.

The user requirement was re-assessed in 2001 following the IoS launch as an experimental series.

A summary of those requirements met and those still outstanding can be seen in the table below:

Met
• 1995 weighted Laspeyres volume index
• Value added weights to be used, as in the national accounts
• Data back to 1995
• To cover the entire service sector, including both private and public sector services
• Monthly index, seasonally adjusted, at constant prices
• IoS to be coherent with other ONS economic indicators: resulting monthly output series to aggregate to quarterly totals, consistent with the corresponding quarterly national accounts' output series.
• IoS series to take national accounts adjustments and follow national accounts revisions policy
• As far as possible, IoS to be consistent with annual surveys (turnover surveys are not benchmarked to annual totals at present but GDP(O) [and therefore IoS] is benchmarked to annual current price input-output tables that, in turn use annual survey data)
• Individual 2 digit SIC monthly indices to provide quarterly component of GDP(O)
• A preference for deflated output indicators with price indices adjusted for quality changes where possible

<ul style="list-style-type: none"> <li>• Price indices to be specific to the output indicator being deflated where possible</li> </ul>
<ul style="list-style-type: none"> <li>• Index to be published down to the 2 digit SIC level</li> </ul>
<ul style="list-style-type: none"> <li>• The IoS to meet EU requirements for chainlinked and harmonised constant price data</li> </ul>
<ul style="list-style-type: none"> <li>• All the methodologies used in the development and production of the IoS to be clearly documented and technical manual to be available to users</li> </ul>

Not Met
<ul style="list-style-type: none"> <li>• Where possible, current price equivalents of IoS series to be produced and made available to users.</li> </ul>
<ul style="list-style-type: none"> <li>• The IoS and IoP should both be covered in a common policy over the application of national accounts balancing adjustments (this is more of an issue for the IoP as the IoS currently apply national accounts balancing adjustments whereas the IoP do not).</li> </ul>
<ul style="list-style-type: none"> <li>• Where adjustments have been applied, these should be identified to users</li> </ul>
<ul style="list-style-type: none"> <li>• Output indicators to include an adjustment for work in progress where appropriate</li> </ul>

There are still a small number of outstanding medium to long term requirements not yet met. These requirements are due, however, to be considered as part of the Monthly GDP re-engineered system. The one exception is the use of a work in progress adjustment, which is dependent on the development of a single Monthly Business Survey. No plans exist to develop this.

The IoS programme is overseen by a Steering Group with representatives from the Bank of England, HM Treasury and DTI (IoS' key users). The Steering Group meets bi-annually to discuss key decisions about such things as methodology and the direction of the development work undertaken. This provides the opportunity for the IoS to keep stakeholders and key users informed of progress to date and also allows these users to have an input into the way the IoS development is taken forward. Feedback from members of the Steering Group on the progress of the IoS development has been positive.

All changes in data, methodologies or processing need to be agreed by the Steering Group and also undergo a Peer Group Appraisal (PGA) by National Accountants before being implemented.

### **It is judged that the statistics meet the quality standards of National Statistics**

A summary of the main key quality measures can be seen below:

#### **1. Overall unit response rates**

Again, due to the range of different data sources feeding into the IoS it is difficult to determine the overall unit response rates for the IoS as a whole as response rates vary from one data source to another. Below, however is an outline of the typical response rates of the main data sources outlined in the above section:

#### **MIDSS/RSI**

The average MIDSS turnover response rate (by number of forms) for 2005 is 81 per cent.

The average RSI turnover response rate (by number of forms) for 2005 is 65 per cent

### **CWAIs**

Response rates are not applicable for the ONS CWAI data used due to the fact that the data are sourced from administrative sources.

### **Household Expenditure**

For the Household Expenditure data, the response rate for the Expenditure and Food Survey is 58 per cent (from a sample of 12,000 households) whereas the response rates are not applicable for the International Passenger Survey.

### **Employment**

The average response rate for the MIDSS Employment data is 78 per cent

The target response rate for the QPSES Employment data is 80 per cent

### **Bank of England**

The response rate for the Bank of England Fees data (derived from the Profit & Loss form) are close to 100 per cent

### **HMRE (VAT)**

Response rates are not applicable for the HMRE due to the data consisting of a census of all of the companies registered for VAT who have returned their forms.

## **2. Total contribution to key estimates from imputed values**

### **MIDSS/RSI**

The total contribution to key estimates from imputed values for the MIDSS based data for 2005 is 14 per cent.

The total contribution to key estimates from imputed values for the RSI based data for 2005 is 12 per cent.

### **CWAIs**

Imputed values are not applicable for the ONS CWAI data used due to the fact that the data are sourced from administrative sources.

### **Household Expenditure**

The household expenditure data sourced from the Expenditure and Food Survey covers 12,000 households. This assumes, therefore that these 12,000 households are representative of the total number of households in the UK. Similarly, the household expenditure data sourced from the IPS survey covers 0.2 per cent of all travellers as they enter or leave the UK. The use of this IPS data therefore assumes that the 0.2 per cent of travellers sampled are representative of the total number of travellers as a whole.

### **Employment**

The contribution from imputed values for the ONS employment data are not available at present.

### **Bank of England (BoE)**

Imputed values are not applicable for the Bank of England data due to the response rate for the Profit and Loss form is close to 100 per cent.

### **HMRE (VAT)**

Imputed values are not applicable for the HMRE due to the data consisting of a census of all of the companies registered for VAT who have returned their forms.

### **3. Editing rate**

Selective editing has been implemented for MIDSS and RSI sourced data (which accounts for 46 per cent of the IoS). This means that only suspect data that would have a significant impact on the survey estimates are queried. On average, 12 per cent of MIDSS forms are 'cleared' through selective editing. This means that 12 per cent of the forms received by the MIDSS Data Validation Branch (DVB) are considered to have a minimal impact on the total estimates and so are passed on to the Results and Publication (RAP) team without any validation by the DVB. This frees up more time for the DVB to validate series which have more of a significant impact on the total estimates. The use of selective editing was recommended by MD following a pilot study of the impact of selective editing on the MPI survey, where it was found that selective editing had no adverse effects on the data quality but could reduce the number of edits made by 30-36 per cent.

The MIDSS and RSI data also undergo an automatic editing process whereby any returned forms which fail the initial DVB validation checks (i.e. when the figures returned fall outside a pre-determined range) are examined. Any errors present are then corrected before being passed to the RAP whereas those forms showing genuine, confirmed movements are cleared without change.

### **4. An estimate of the likely revision between provisional and final estimates**

The revisions performance of Total Services is difficult to interpret due to the implementation of the large number of methodological improvements over the last 6 years (the latest of which were implemented in June 2006). This means, therefore, that the data have been subject to large 'one off' revisions.

Revisions analysis for the Total IoS (on both a month on month and a 3 month on 3 month basis) are, published on the National Statistics website at:

[http://www.statistics.gov.uk/downloads/experimental/IoS\\_Revisions.zip](http://www.statistics.gov.uk/downloads/experimental/IoS_Revisions.zip)

The revisions analyses starts from August 2000 (which corresponds with the first time the IoS was published as an experimental series in December 2000) and goes up to the month prior to the current month being published (e.g. the revisions analysis for the December 2006 round contains analysis for August 2000 up to November 2006).

A summary of the month on month and 3 month on 3 month revisions performance between first publication & publication 12 months later, over the last 5 years, along with a comparison with the IoP can be seen in the table below:

**Table 1: Revisions Performance of the IoS**

	Average Revision		Absolute Average Revision	
	Month on Month	3 Month on 3 Month	Month on Month	3 Month on 3 Month
Index of Services	0.06	0.1	0.22	0.22
Index of Production	0.01	0.03	0.26	0.26

As it can be seen, even with the large one off revisions as a result of Industry Review implementations, the overall revisions over the last 5 years are still relatively small and are comparable with those published by the Index of Production. The IoS revisions do not show any significant bias over the last 5 years.

**5. Statement of the national/ international agreed definitions and standards used**

The UK economic accounts are based on the European System of Accounts (ESA) which in turn is based on world-wide guidelines on national accounting, (the System of National Accounts (SNA)). As part of the UK economic accounts, the IoS therefore conforms to ESA regulations.

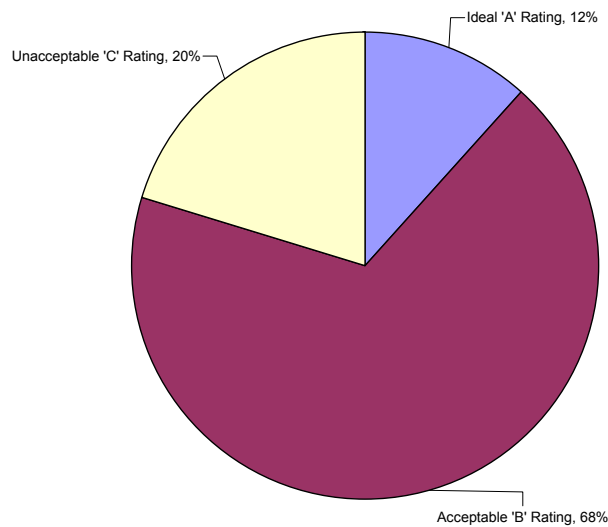
The IoS also conforms well to Eurostat guidance on measuring price and volume. The Eurostat 'Handbook on price and volume measures in national accounts' outlines a number of criteria which can be used to assess the appropriateness of an indicator. These criteria consider:

- the completeness of the coverage of the product heading by the indicator. For example, whether the indicator covers all of the products under the heading or just a selection of them.
- the valuation basis of the indicator. For example basic prices rather than purchasers prices or input prices
- the indicator should take quality changes into account
- the conceptual consistency between the indicator and the national accounts concepts

Indicators satisfying all four criteria will generally constitute an 'ideal' A method. If one or more criteria are not satisfied, the methods will become either 'acceptable' B methods or 'unacceptable' C methods according to how far away the method is from an A method.

The pie chart below shows the percentage breakdown of the different Eurostat Ratings within Total Services:

**Figure 3: Eurostat Rating**



This shows that 80 per cent of the data feeding into Total Services have either an ideal 'A' or acceptable 'B' Eurostat rating.

Of the 20 per cent unacceptable methods, almost half (9 per cent) comes from Other Business Activities where it has been argued that the 'C' methods used within this division are very close to being acceptable 'B' methods (due to the fact that the more specific AEI deflator which would constitute a 'B' method is very close to the more general AEI deflator actually used).

It is also worth noting that the IoS and its associated development programme has been recognised as being a world leader in measuring monthly service sector growth. This has resulted in organisations such as the Organisation for Economic Co-ordination and Development (OECD) asking the IoS to present seminars on how we produce monthly service sector growth to a number of different countries. The UK also played a large role in the drafting of an OECD Index of Services Production Handbook.

## **6. Time lag reference period to release of final output**

The IoS Release, is published on the ONS website 8 weeks after the end of the reference month. This release is published on the same day as the GDP Preliminary and Income, Output and Expenditure releases and a day after the Quarterly National Accounts release. The IoS is a leading indicator every one month in three where data are published for one month beyond the current GDP quarter.

There are Eurostat regulations on the timeliness of quarterly National Accounts (currently 45 days after the end of the reference period) but, as the UK is currently the only European country to produce a monthly Index of Services there are, as yet, no regulations on the timeliness of a monthly IoS.

The IoS monthly indicator is currently among the fastest monthly indicator of service sector growth in the world.

## **Summary of the conclusions reached by the evaluation process**

The result of the evaluation process is that 81 per cent of the IoS is now classified as a National Statistic. This includes 14 divisions which have been granted full National Statistics status, 2 further divisions (Health & Social Work and Recreation, Cultural and Sporting Activities) which have been granted partial National Statistics status and 9 which have not been deemed robust enough to have their experimental labels dropped.

Tables 2 and 3 below show for each broad industry category and division whether the industry is a National Statistic and is currently published as part of the IoS Release:

**Table 2: Section Level Breakdown**

Description	Weight within IoS	National Statistic	Date became a National Statistic	Published
Distribution	17%	Yes	May 2001	Yes
Hotels & Restaurants	4%	Yes	November 2005	Yes
Transport, Storage & Communication	10%	Yes	June 2006	Yes
Business Services & Finance	37%	No	-	Yes
Government & Other Services	32%	Yes	December 2006	Yes

It was recommended that the experimental label for Business Services and Finance is not dropped at this time primarily due to the fact that there are still significant methodological improvements that are likely to affect this section including the implementation of the new methodology for measuring Financial Intermediation Services Indirectly Measured (FISIM).

**Table 3: Divisional Level Breakdown**

Due to time pressures and delays in the IoS development Programme, Renting and Research and Development (accounting for 2 per cent of IoS) have not yet been evaluated; the two divisions will be evaluated during April 2007.

Currently 81 per cent of the IoS has been deemed suitable for classification as a mainstream National Statistic.

The twenty seven 2 digit level SIC industries which comprise IoS are:

SIC Division	Description	Weight within IoS	National Statistic	Date became a National Statistic	Published
50	Motor Trades	3%	Yes	May 2001	Yes
51	Wholesale	6%	Yes	May 2001	Yes
52	Retail Trades	8%	Yes	May 2001	Yes
55	Hotels & Restaurants	4%	Yes	November 2005	Yes
60	Land Transport	3%	Yes	November 2005	Yes
61	Water Transport	1%	No	-	No

62	Air Transport	1%	Yes	March 2006	Yes
63	Supporting & Auxiliary Transport Activities	2%	Yes	March 2006	Yes
64	Post & Telecommunications	4%	Yes	November 2005	Yes
65	Financial Intermediation	7%	No	-	Yes
6x	Financial Services Adjustment	-6%	No	-	Yes
66	Insurance & Pension Funding	2%	No	-	No
67	Activities Auxiliary to Financial Intermediation	1%	No	-	No
70	Real Estate Activities	3%	No	-	Yes
71	Renting of Machinery & Equipment	1%	No	-	No
72	Computer & Related Activities	4%	No	-	Yes
73	Research & Development	1%	No	-	No
74	Other Business Activities	13%	Yes	December 2006	Yes
75	Public Administration & Defence	7%	Yes	March 2006	Yes
79	Letting of Dwellings	10%	Yes	March 2006	Yes
80	Education	8%	Yes	March 2006	Yes
85	Health & Social Work	9%	Market component (78%) – Yes Non market component (22%) - No	September 2006	Yes
90	Sewage & Refuse Disposal	1%	Yes	March 2006	Yes
91	Activities of Membership Organisations nec	1%	No	-	Yes

92	Recreational, Cultural & Sporting Activities	4%	Radio & Television and Betting & Gaming (45%) – No  Remaining series (55%) - Yes	June 2006	Yes
93	Other Service Activities	1%	Yes	September 2006	Yes
95	Private Households with Employed Persons	1%	No	-	Yes

## Outstanding Issues and Concerns

### Outstanding Industry Reviews/Changes

As has been stated previously the Industry Reviews for Renting, Research & Development, Business Services (pt 2) and erratic billing are still to be implemented in June 2007. Collectively, however, the Industry Reviews for Renting, Research & Development and Business Services (pt 2) only account for 3 per cent of the Total Services and are not, therefore, likely to have a significant impact on the aggregate IoS output when implemented. In addition, the erratic billing review will only be implemented *forwards* and so will not cause any revisions to back data at implementation. The implementation of the erratic billing review also has the potential to reduce revisions by allowing IoS to better handle those industries where activities tend to take place in one period but the subsequent payment for these services are made in another period.

In addition, there will be an impact with the implementation of the new methodology to measure FISIM.

### Proportion of Unacceptable Methods

20 per cent of the data feeding into Total Services have an unacceptable 'C' rating. Of this 20 per cent, just under half (9 per cent) comes from Other Business Activities; here it has been agreed that the 'C' methods used within this division are very close to being acceptable 'B' methods (due to the fact that the more specific AEI deflator which would constitute a 'B' method is very close to the more general AEI deflator actually used).

## Conclusion

This report marks the conclusion of a hugely successful development programme which has met the aims that were set out at the end of 2000. An exhaustive development programme has seen:

- the conceptual quality of the indicators almost double
- the proportion of monthly data reach almost 60 per cent

- the increased use of ONS survey data
- an increase in industrial detail that is published
- the speeding up of the publication of the IoS
- the IoS being a leading economic indicator for every one month in three

With the dropping of the experimental status of the IoS, users are now faced with having monthly indicators for 93 per cent of the economy. As part of the re-engineering of the national accounts (see Aldin and Tuke 2004), a monthly estimate of GDP will be produced which will bring together the IoS, IoP and GDP(O) systems into one integrated system. As well as being a leading indicator in its own right, the system will also continue to be a key provider of output and deflators for central systems in national accounts and in particular the proposed quarterly supply and use system.

The ONS will continue developing service sector data sources and methods as part of the wider methods developments for re-engineering the national accounts.