Introducing a New Estimator for the Producer Price Index

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Summary

- The Producer Price Index (PPI) has been undergoing a major redevelopment that will significantly improve the methodology used. A new method of estimation is to be introduced as the culmination of this redevelopment – the biggest change to the PPI for over 40 years.

- A lengthy parallel run has been undertaken to fully assess the difference in current and new estimator results and quality assure results produced on the new estimator basis. This found little difference between current and new estimator results at the aggregate level with larger differences for the detailed level indices.

- Other areas of methodological development have also been considered as part of the project. These include the need for an outlier detection method and producing estimates of accuracy (sampling errors) for new estimator results.

- It is planned that the new estimator will be introduced for the September 2001 PPI, to be published in early October 2001.

Introduction

This article is a follow-up to a December 1998 article, which outlined changes being made (and planned) to improve the quality of the Producer Price Index (PPI). These included introduction of a new sample design, annual rotation, a new method of estimation and production of sampling errors. For completeness, some of the issues discussed in the previous article are included here.

Good progress has been made since the previous article was published. A number of improvements have already been introduced including a random sample based on an optimal allocation and annual rotation. Work has also proceeded in other areas: the testing of a new estimator and the calculation of sampling errors. This article provides a brief summary of progress in each area of development, but focuses on the next key change to be implemented: the introduction of a new method of estimation.

The article:
- Outlines progress made since publication of the previous article;
- Considers the benefits of the new estimator and discusses the main differences between the current and new methods;
- Discusses the practicalities of introducing the new estimator;
- Provides a summary of the parallel run results;
- Discusses progress in other areas of development work;
- Outlines plans for introducing the new estimator.

Background to the PPI Redevelopment Project

What is the PPI?
The PPI measures the change in prices of goods bought and sold by UK manufacturers. Both input and output indices are produced. The output PPI measures the change in price of goods sold to the UK market as they leave the factory gate, whilst the input PPI measures the change in price of materials and fuel bought by manufacturers that are used within the manufacturing process, both materials used in the final product and those required for the normal day to day running of the company. The PPI covers manufacturing and some other industries such as mining.

Index calculation
For the output series, around 9,000 price quotes are collected each month from some 3,200 contributors. In addition some prices are obtained from administrative sources, such as other government departments and trade publications, for example electricity and coffee prices.
Basic output PPIs are calculated at a fairly detailed product group (six digit) level, with the products which fall into each PPI defined by the European ‘Classification of Products by Activity’ (CPA) which in turn is based on the 1992 Standard Industrial Classification. Indices produced for around 1,400 detailed product groups are then grouped together using the ‘family tree’ structure of the CPA to produce 240 industry (four digit) level series. The industry level series are then grouped to give 23 division level (two digit) indices, which in turn are grouped into the ‘all-manufacturing’ index. The table below illustrates the PPI index structure.

Table 1: PPI Index Structure

<table>
<thead>
<tr>
<th>Level</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>All manufacturing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Division (PPI two digit)</td>
<td>15</td>
<td>Manufacture of Food Products and Beverages</td>
</tr>
<tr>
<td>Industry (PPI four digit)</td>
<td>15.31</td>
<td>Prepared and preserved potatoes</td>
</tr>
<tr>
<td>Product (PPI six digit)</td>
<td>15.31.11</td>
<td>Potatoes, frozen (e.g. oven ready chips)</td>
</tr>
<tr>
<td>Prodcam product (eight digit level)</td>
<td>15.31.11.00</td>
<td>Frozen potatoes</td>
</tr>
<tr>
<td></td>
<td>15.31.12</td>
<td>Potatoes, preserved</td>
</tr>
<tr>
<td></td>
<td>15.31.12</td>
<td>Potatoes, preserved</td>
</tr>
<tr>
<td></td>
<td>15.31.12</td>
<td>Potato flour, meal, flakes and granules</td>
</tr>
<tr>
<td></td>
<td>15.31.12</td>
<td>Frozen potatoes, prepared or preserved</td>
</tr>
<tr>
<td></td>
<td>15.31.12</td>
<td>Potatoes in the form of flour, meal or flakes prepared or preserved</td>
</tr>
<tr>
<td></td>
<td>15.31.12</td>
<td>Other preserved potatoes</td>
</tr>
</tbody>
</table>

There is no direct price collection of input prices from companies. Output PPIs and import price indices are used as proxies in the calculation of the input series.

Index calculation (current method)
At the detailed (six digit) level the index is a weighted sum of the price relatives, where the price relative is the current price of an item divided by the price of the item in the base year (currently 1995). The weights are based on the value of the reporting unit’s sales of products within the six digit product group relative to the sales of products within the product group of other reporting units included in the sample. The formula is:

\[
\text{Index value} = \frac{\sum_i \text{sales}_i \cdot PR_i}{\sum_i \text{sales}_i}
\]

where \(PR_i\) represents the average price relative for enterprise unit \(i\); \(sales_i\) represents the sales value for company \(i\); and \(i\) counts the number of reporting units within the six digit index.

Information on the value of a reporting unit’s sales of products is obtained from the Prodcam survey, which collects sales information on around 4,400 products from approximately 29,000 contributors each year. Prodcam (eight digit) product definitions are based on the 1992 Standard industrial classifications and can be aggregated to the CPA six digit classification (see table 1). The latest available Prodcam survey data has been used in the calculation of contributor weights since the new sample was introduced in 1999. The item level weights are updated on an annual basis (see section on annual rotation below).

Index to index weights
The PPIs are Laspeyres (base weighted) where the base year and index level weights are updated every five years to reflect changes in the sales and purchasing patterns of industry. The weights used to combine the detailed product level indices to calculate the broader industry, division and all-manufacturing level are also based on Prodcam sales figures. In this case, as the PPI is a measure of price movements of products sold to the UK market, the Prodcam total sales values are adjusted, using information supplied by Customs and Excise, to remove the proportion of sales exported. This information is not available at the detailed company level to adjust item weights in a similar way. The weights at industry level are simply the homesales value for the particular product group divided by the total homesales of all product groups within the industry (and similarly for the division and all-manufacturing series).

For the input series index level weights are based on Input-Output data on industry purchasing patterns.

Uses
Approximately 750 indices are published each month (in one of three Business Monitors and on the National Statistics website). The PPI is an important macroeconomic indicator used to monitor inflation and another key use is in the deflation of National Accounts e.g. in the calculation of the Index of Production. The PPIs are also used extensively by business users to price long-term contracts.

History of the PPI methodological developments
This panel shows how the methodology for the PPI has developed over time since the index was first published in 1903. Table 2 provides a brief history of the index and shows that the current programme of developments are among the most significant improvements in methodology since the index was introduced, and certainly are the biggest change since the 1950s.
In 1996 the ONS began a major programme of development work to significantly improve the methodology of the PPI. This redevelopment project involved the ONS working with Southampton University and Social and Community Planning Research (SCPR). It began with a review of methods with the aim of identifying any deficiencies in procedures. User consultation on the findings of the review included a presentation to the Royal Statistical Society (RSS).

Five main areas for improvement were identified, the main recommendations being:

i. **New sample from Prodcom:** The PPI sample should be randomly drawn from companies selected for Prodcom. This would replace a panel based sample design and ensure that where companies are recruited information is available on products produced and level of sales for these products.

ii. **Optimal allocation:** The sample should be selected using a method of optimal allocation so that whilst the same number of price quotes (9,000) would be retained, the sampling errors of the PPIs would be minimised.

iii. **Rotation:** The sample should be updated on an annual basis to systematically pick up new products and share the form-filling burden for smaller companies across a wider number of firms.

iv. **New estimator:** weights given to products when they are combined to form the six digit index should take into account the likelihood of selection for the sample as well as the level of sales for a contributor.

v. **Sampling errors:** introduction of a random sample means that, for the first time, it would be possible to calculate sampling errors to give a better understanding of the quality of the indices.

Significant progress has been made in each area of development and many of the improvements – the random sample, optimal allocation and annual sample rotation – have already been introduced (see next section below). The next key change is the introduction of the new estimator.

### Recommendations implemented to date

#### Introduction of the new sample

The first stage of the project concentrated on the introduction of the new random sample selected from Prodcom. The sample was allocated in an optimal way so as to retain the same number (9,000) of price quotes whilst minimising the sampling error of the all-manufacturing index and providing high quality four digit indices (this is the level at which the PPI is used to deflate the national accounts). The move from the old-style panel of contributors to this random sample resulted in large-scale changes. More quotes from smaller companies were included in the sample and there was a redistribution of quotes across industries to better reflect the relative importance of products in the current economy. As a result the sample selected within hi-tech industries such as computers has increased, whilst there has been an offsetting decrease in the number of quotes for industries such as navigation instruments whose relative importance (in terms of value of sales) has decreased.

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### Table 2: History of PPI methodological developments

<table>
<thead>
<tr>
<th>Year</th>
<th>PPI Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1903</td>
<td>The first official PPI (formerly Wholesale Price Index) is prepared by the Board of Trade. Prices are mainly derived from trade accounts and weights are estimated values of different commodities used or consumed in the country. The index is based on just 45 commodities, mainly materials and foodstuffs.</td>
</tr>
<tr>
<td>1921</td>
<td>A new weighting method is introduced. Weights are derived from the first Census of Production. The main interest continues to be centred on the aggregate index rather than any individual component.</td>
</tr>
<tr>
<td>1935</td>
<td>The Index is reweighted using weights derived from the 1930 Census figures. The main interest continues to be centred on the aggregate index.</td>
</tr>
<tr>
<td>1958</td>
<td>The objective changes from one of deriving an overall index for the manufacturing sector to one of producing a family of index numbers for each of the industrial sectors. A system is derived based on individual monthly price quotations supplied voluntarily by manufacturers for a wide range of individual closely specified goods produced in the UK for the home market. Information is supplemented by the collection of price quotations for a number of imported commodities, mainly raw materials. Weights continue to be based on Census of Production.</td>
</tr>
<tr>
<td>1983</td>
<td>The Wholesale Price Index is renamed the Producer Price Index and reclassified from the 1968 Standard Industrial Classification to the revised 1980 version.</td>
</tr>
<tr>
<td>1991</td>
<td>The collection of data becomes statutory under the Statistics of Trade Act 1947 (since 1993 data collection has also been statutory in Northern Ireland under Article 5 of the Statistics of Trade and Employment Order 1988).</td>
</tr>
<tr>
<td>1999-2001</td>
<td>The recommendations of the PPI Redevelopment Project are implemented. A random sample design is introduced with companies selected from contributors sampled for Prodcom using an optimal allocation. A new unbiased estimator introduced which gives more weight to smaller companies and the sample is updated on an annual basis.</td>
</tr>
</tbody>
</table>
There are a number of issues that impacted on (successful) recruitment of the new sample, most significantly that the reallocation resulted in 7,000 of the 9,000 price quotes being replaced. Recruitment of new quotes is a time-consuming process to ensure that a sufficiently detailed specification is provided and the representative product selected by the contributor is appropriate for inclusion in the PPI. To make this a manageable process, a phased approach was adopted given the size of the task. Recruitment was split into four phases, with each phase comprising a number of four digit series. In total recruitment and introduction of the new sample took some 20 months to complete. Table 3 below summarises the timing for introduction of each phase of the sample.

**Table 3: Timing of introduction of each recruitment phase**

<table>
<thead>
<tr>
<th>Date</th>
<th>Phase introduced</th>
<th>Percentage of all-manufacturing PPI included in the phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 1999</td>
<td>Phase 1</td>
<td>44</td>
</tr>
<tr>
<td>October 1999</td>
<td>Phase 2</td>
<td>11</td>
</tr>
<tr>
<td>February 2000</td>
<td>Phase 3</td>
<td>20</td>
</tr>
<tr>
<td>May 2000</td>
<td>Phase 4</td>
<td>25</td>
</tr>
</tbody>
</table>

As the new sample was introduced a factor was applied to match the index value calculated on the new sample basis to the index value calculated on the old sample basis in the link month. This link factor would continue to be applied in all subsequent months, until a further sample update took place and the link factor was reworked. On completion of recruitment for each sample phase, a short parallel run of the existing and new sample was completed to assess the impact of sample changes on results in the months following the link month. For each recruitment phase, the parallel run showed, at the all-manufacturing level, that differences were minimal (0.1 index points or less).

Other factors affecting recruitment of the new sample relate to achieving the number of quotes specified by the optimal allocation. Past experience of recruitment has shown that when the PPI sample is selected from Prodcom, some of the products will be unsuitable for inclusion; for example because the product is not sold to the UK market, there has been a change in a company’s product range since information was supplied to Prodcom and a particular product is no longer manufactured or the company has ceased trading. To compensate for the anticipated drop-out a sample based on 11,000 price quotes was selected. In some industries the drop out rate was higher than expected and as a result there is a slight shortfall in the achieved sample size. Through the process of annual rotation the sample size is working back steadily to the level of 9,000 items.

### Annual rotation

Whilst introduction of the new sample represented a big improvement over the old panel, in time the sample will gradually diminish as companies cease trading or stop manufacturing particular products. As new products come onto the market and demand for other products changes, the sample will also become less representative of the current economic position. To ensure that the sample remains representative, it is being updated on an annual basis by selecting the sample afresh each year from the latest available Prodcom sample. This annual rotation also helps to spread the form-filling burden for smaller companies.

The approach to rotation adopted means that around a third of the sample will be updated each year. Recruitment of the first year rotated sample was again, for operational reasons, completed in a phased approach with the final phase introduced for the February 2001 PPI. Work is already underway to recruit the next rotated sample.

### The new estimator

Calculation of item weights for the new estimator requires information on the value of products sold by each company, i.e. a sample selected from Prodcom. It was therefore necessary for the new sample to be introduced before the impact of the proposed change in estimation procedure could be assessed. Once sample recruitment and rotation aspects of the project were fully operational (around May 2000), the focus of the development work moved to the introduction of the new estimator.

The main difference between the current and new estimator is the increased weight given to smaller companies. The current method of estimation as shown in Equation 1 weights together price relatives based only on the value of the company’s sales of products within the particular six digit product group relative to the sales of other companies included in the sample.

Companies included in the sample are only taken to be representative of themselves, not of other companies within the same sample stratum that were not chosen for inclusion in the PPI sample. This means that the current estimator would be biased if price movements for small companies differed significantly from those of larger companies.

The new estimator addresses this deficiency by giving proper weight to the smaller companies within the sample. It introduces an unbiased method of estimation, which takes into account a company’s probability of selection for the sample (both the probability of initial selection for Prodcom and subsequent selection for PPI from companies selected for Prodcom). The formula is:
Equation 2
\[
\text{Index value} = \frac{\sum_{g} \sum_{h} w_{g} \sum_{i} \text{sales}_{i} \text{PR}_{i}}{\sum_{g} \sum_{h} w_{g} \sum_{i} \text{sales}_{i}}
\]

Where sales represent the sales in the year of sample selection by the reporting unit, \( w_{g} \) represents the weight for selection for Prodcom in stratum \( g \), \( w_{h} \) represents the weight for selection for PPI in stratum \( h \), \( \text{PR}_{i} \) represents the average price relative for company \( i \), \( i \) counts the number of quotes selected from Prodcom stratum \( g \) and PPI stratum \( h \) and the weights are calculated as expansion weights as follows:

Equation 3
\[
w_{g} = \frac{\text{Total number of companies in stratum } g}{\text{Number of companies selected for Prodcom from stratum } g}
\]

Equation 4
\[
w_{h} = \frac{\text{Total number of contributors manufacturing products in PPI stratum } h}{\text{Number of contributors manufacturing products selected for PPI from stratum } h}
\]

Redistribution of item weights

The effect of the change in estimator has, as expected, been a shift in the distribution of item weights, with less extreme (large or small) item weights and a more even distribution across the sample. Chart 1 below illustrates the effect of the change in estimator on the distribution of item weights and shows that, whilst under the old estimator design there were a significant number of items having minimal effect on index movements, with a weight of less than one per cent of the six digit index total, this proportion has been significantly reduced under the new estimator design. A large proportion (around 34 per cent) of item weights now account for between 5 per cent and 20 per cent of the six digit index. There are also fewer large weights - single items with a weight of 60 per cent or more of a six digit index.

Given the change in weighting pattern, it is possible that the two methods of estimation could produce different results for the PPI if price movements of smaller companies differed from those of larger companies. To fully assess the impact of change in item weights, a detailed investigation of differences in index values derived based on current and new estimator methods has been carried out as a parallel run. This is described further in the next section.

Practicalities of introducing the new estimator

While the new method of estimation should be sound from a theoretical point of view, given the potential for significant changes to the PPI, a parallel run of results produced on the current and new estimator basis was completed to fully assess the impact of the changes before switching to the new method. The parallel run began in May 2000 and was carried out using data for up to a two year period. For PPI indices included in the early phase of sample recruitment, data back to May 1999 were available for inclusion in the parallel run, whilst for later phases of recruitment the parallel run had fewer months available. Precisely the same input data were used for the existing and new estimators; any differences observed in results would then be solely due to the differences in weights.
A considerable volume of results (for some 1,500 or more indices) were considered during the parallel run analysis. A formal project management process was employed to manage the work and ensure that any potential problems with the new estimation method were identified and resolved. Following consultation with a range of PPI users and ONS methodologists, a set of criteria were specified against which parallel run results would be assessed. Results for the range of PPI indices (i.e. at all levels of aggregation) were considered against these criteria which compared differences in current and new estimator index levels, growth and volatility.

**Summary of the parallel run results**

Whilst the change in estimator could potentially lead to differences in current and new estimator results, the parallel run showed at the aggregate level little change between the old and the new estimator series. Where significant differences did occur, investigations revealed that there was a valid reason for the change. Differences were more noticeable at the more detailed level, but again thorough investigations identified valid reasons for the differences and gave no cause for concern with new estimator results. In summary the results showed:

**All manufacturing level**

At the all-manufacturing level gross and net sector output and input series were compared and showed no major difference in index values calculated on the current estimator and the new estimator. Chart 2 shows the difference in current and new estimator index levels for each of the all-manufacturing series over the two year parallel run period. For example, the index calculated for Gross Sector Output for April 2000 was 0.07 index points higher on the new method than the current method.

For the early periods, differences are based on a subset of PPI series, those four digit series included in the early sample recruitment phases. As the parallel run progressed, more and more indices were included in the comparison as further recruitment phases were brought live (Table 2 provides details of when each recruitment phase was introduced). Whilst differences are greater as more and more component indices are included in the analysis, they remain relatively small for the duration of the parallel run. The results show that even when all component indices are included in the analysis (from May 2000 onwards), differences between the current and new estimator results continue to be minimal; less than 0.2 index points in any one month. There is also no evidence to suggest that the current and new estimator series are starting to steadily diverge.

**Division level**

The change in estimation method is likely to produce bigger differences at the more detailed levels where the effects of re-weighting will be more significant as company prices change and the weights of individual items are greater. At divisional level the parallel run results show, as expected, larger differences than the all-manufacturing level, but in turn much less than the lower level four digit and six digit series. There is no general trend in the differences, i.e. the new estimator does not produce indices that are consistently higher/lower than current estimator index values.

All division level differences of 0.1 index points or more were investigated during the course of the parallel run and again there were valid reasons for the differences in current and new estimator index values, with no problems identified with the performance of the new estimator. Chart 3 summarises absolute division level parallel run differences. Again the chart shows that differences increase as more indices are included in the parallel run (further recruitment phases are introduced). The majority of division level differences remain small - 0.5 index points or less.

**Detailed level differences**

At the more detailed industry (four digit) and product (six digit) level, as might be expected, the rates of divergence increase throughout the parallel run period. Typically a six digit level index might be based on perhaps five price quotes and where prices change over time re-weighting of prices within indices can have a significant impact on results. As the parallel run comparison moves further away from the link month, more prices are likely to change and differences in index values are likely to increase. Chart 4 shows the percentage of six digit indices that have absolute differences of one index point or more between current and new estimator index values in each month of the parallel run analysis from the link month (where current and new estimator index values will match) onwards. Similar results were observed for the four digit series, although in this case differences were, as expected, slightly smaller.

In summary, the parallel run results showed:
- some quite significant differences in detailed (six digit level) series, but an acceptable explanation for the difference (re-weighting of the items within the index) and no cause for concern with new estimator results - there was also some evidence to suggest that new estimator results are less volatile than current estimator results (see section on outlier treatment below);
- differences continue to be apparent when the six digit series are aggregated to four digit level but again there was no cause for concern with the behaviour of the new estimator;
**Chart 2**
Difference between current and new estimator all-manufacturing index values

**Chart 3**
Summary of absolute differences in new estimator division level index

**Chart 4**
Summary of absolute differences in new and current estimator six digit index values
much smaller differences were observed in the division level and all-manufacturing series. In particular there were minimal differences in the all-manufacturing series (0.2 index points or less).

Testing the impact of high inflation
A further area of work was to consider the impact of higher inflation rates on the performance of the new estimator. Conclusions on whether to adopt the new method of estimation drawn from the parallel run comparison will be made using data from a period when the overall output producer price inflation was less than 3 per cent. A more detailed analysis has been carried out considering the impact of the introduction of the new estimator on indices that are subject to a higher rate of inflation.

Characterising all six digit indices according to inflation level, measured as the mean monthly movement in index over the period, this part of the study considered only indices displaying the largest increases and decreases in prices. The results were generally in line with the findings of the general analysis of volatility (carried out as part of the outlier study - see below) indicating that if anything the new estimator displays slightly less volatility than the current estimator for such indices.

Other Areas of Work

The work on the new method of estimation is just part of a wider body of work looking to improve the methodology of the PPI. Over the last year, other areas of development have also been investigated. These include introduction of an outlier detection method and calculation and publication of sampling errors.

Outlier treatment
No form of outlier treatment is currently used within the PPI, since each unit in the sample is weighted to represent the value of its own sales within the index total. Given the increased weights given to smaller companies under the new estimator design, there was a possibility that the volatility of indices might increase. If the most extreme price movements of these smaller companies could not be taken to be representative of other small companies, then it would be necessary to introduce an outlier detection method to identify and reduce the impact of these extreme observations within the results.

A review was carried out comparing the new and current methodology to see if there was a need to introduce a method of outlier detection. The review considered volatility of indices calculated using the two estimation methods, where volatility was measured as the standard deviation of monthly index movements for the parallel run period. The analysis concluded that at all levels of aggregation results were very similar with the new estimation method appearing to produce results that were less volatile than the existing method. Though this is thought to be due to the less extreme large weights being given to a single item within the index. Results appear in Chart 5 for the six-digit analysis.

The chart shows the frequency of differences in standard deviations of month to month movements between the new and current estimator for six digit indices and shows that there are slightly more six digit indices with negative differences. A six digit index will have a negative difference if the standard deviation of the new estimator is less than the standard deviation of the current estimator and a positive difference if the standard deviation of the new estimator is bigger than the standard deviation of the current estimator.

Sampling errors
Introduction of a random sample means that, for the first time, sampling errors can be calculated and published, providing information on the accuracy of results and informing decision on the appropriate use of indices. Work to date has concentrated on developing a system to produce sampling errors of monthly changes. Good progress has been made, with work in this area almost complete. Further modifications to methodology are required (to take account of link factors applied at the time of sample updates) before sampling errors of year on year changes can be produced. Current plans are to complete work on this aspect of the project after the new estimator has been introduced (end 2001/early 2002).
Introducing the changes

Introduction of the new estimation method and other improvements associated with the project require significant procedural and system changes. The whole project has been run using formal project management tools, and care has been taken to consult users regarding any of the results found during the course of the project.

Based on the findings of the parallel run and other areas of the project the decision was taken to implement the new estimator. The new estimator will be linked in for August 2001, although results will not be published on the new estimator until the September PPI due to the amendments that need to be carried out to procedures and IS systems. All data series will use a common link month of July 2001.

A decision was also taken after consultation not to revise back data. One possibility would have been to revise data back to June 2000 and link in the new estimator, with June 2000 being a common link month for the series. This option was decided against, as it would require huge amounts of processing and produce only small differences for the high level series. It would also cause confusion and difficulties for many users.

Conclusion

This article has provided an update on implementing the programme of development work to improve the methodology of the PPI, in particular concentrating on the introduction of a new method of estimation. The impact of the change in estimation method was thoroughly assessed during a lengthy parallel run, the main points to note being:

- There were minimal differences in current and new estimator results at the aggregate level and larger differences at the more detailed level. At each level of aggregation the new estimator produced satisfactory results.
- Other methodological developments - introduction of an outlier detection method and impact of high/low inflation rate - have also been considered. There was some limited evidence that new estimator results are slightly less volatile than results produced on the current estimator basis.
- Progress has also been made on calculation and publication of sampling errors and this work will continue when the new estimator has been introduced.
- With the introduction of the new estimator there will be no revisions to back data, a common link month of July 2001 will be used and data on the new basis will be published for the first time in September 2001.

References