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Cross Cutting Topics:

CPI use in PPI context

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1. Why use CPI in PPI?

Since the Consumer Price Index (CPI) measures changes in prices paid by consumers for goods and services, there is potential for this data to be used to estimate the consumer component of the a Producer Price Index (PPI). Using data that is already collected for a national CPI not only reduces the cost to the National Statistics Institute (NSI) of collecting this data, but it can also reduce the level of burden placed on respondents to PPI questionnaires.

The use of CPI to measure the price of sales to households is of particular interest for producers of the Services Producer Price Index (SPPI) within Europe, where the Short Term Statistics regulation currently only requires NSIs to produce SPPIs on a business to business basis. The introduction of the Framework Regulation Integrating Business Statistics (FRIBS) means that European countries will be required to produce SPPIs on a business to all basis and using CPI to estimate the prices associated with sales to consumers represents a potentially cost effective way of extending the coverage of existing SPPIs without the need to amend existing data collection.

2. Where could CPI be used?

The proportion of turnover generated by service providers as a result of sales to consumers will vary between service industries. Information on the importance of sales to consumers can be obtained from the input-output supply use tables by considering the amount of demand for a particular service that comes from the household sector. Table 1a shows the five service industries where consumer demand is highest in the UK with the five industries where consumer demand is lowest shown in Table 1b. This information suggests that it may be useful to use CPI data as a proxy for an SPPI or to extend the coverage of an existing SPPI for service industries such as veterinary activities and food and beverage service activities but there may be little value for doing this for services such as scientific research and development and management consultancy.

Table 1a. Top five service industries with the largest proportion of household demand. United Kingdom, 2011.

Industry	% demand from households
Veterinary Activities	87.4
Food and beverage service activities	84.0
Gambling and betting activities	74.7
Rail transport services	73.3
Other personal services	73.1

Table 1b. Bottom five service industries with the smallest proportion of household demand. United Kingdom, 2011.

Industry	% demand from households
Scientific research and development services	0.0
Activities of head offices; management consultancy activities	0.0
Information services	0.0
Computer programming, consultancy and related activities	0.1
Employment services	0.1

3. Difference between CPI and PPI

3.1 Price basis

A Producer Price Index measures changes in the price received by a company for the provision of a good or service where a Consumer Price Index captures changes in the price paid by the consumer for a good or service. Generally speaking, the main difference between the price received by a company and the price paid by a consumer will be due to the addition of taxes and fees that are not retained by the producer of the good or service.

3.1.1 Explicit fees

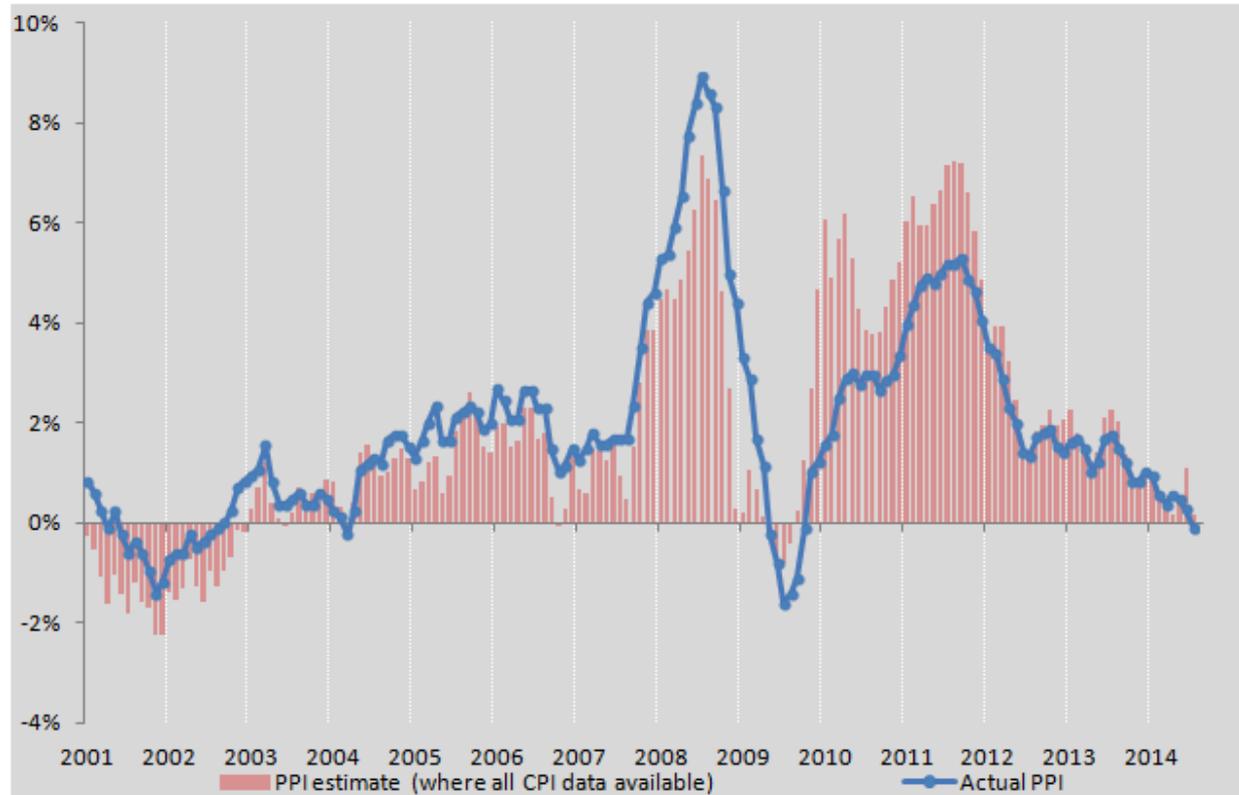
A number of different types of tax will be payable by the consumer when purchasing a good or service which are not retained by the producer. As a result, these taxes will be included in the price collected for use in a CPI but would need to be excluded from a PPI. Taxes include general taxes added to the price at the point of sale – sales or value added tax, and excise duties that are specific to particular services such as Air Passenger Duty that is added to air transport fares and taxes that are applied to insurance premiums.

Taxes tend to be calculated as a percentage of the overall price so it is relatively straightforward to remove their effects from the price. However, for CPI data to be used in PPIs, changes in the rate of tax would need to be monitored so that adjustments can be made for any changes in the rate of tax.

At ONS, we have carried out some analysis to produce an estimate of PPI using CPIs by mapping CPI data from the COICOP classification onto the UK Standard Industrial Classification. Figure 1 gives a comparison of the UK PPI for all manufacturing with the estimate of PPI derived from CPI.

In January 2010 the rate of UK value added tax (VAT) was increased from 15 to 17.5% with a subsequent rise to 20% in January 2011. These increases in tax rate are shown clearly in Figure 1 as the measure based on CPI deviates from the PPI. Since the chart shows an annual rate of inflation, it takes a year for the effect of this rate change to disappear.

Figure 1. Comparison of annual rate of inflation for all manufacturing using UK PPI and UK CPI mapped onto UK Standard Industrial Classification.



3.1.2 Implicit fees

Additional fees may also be charged to a consumer that are not retained by the producer of the good or service but which are included implicitly in the price. Such fees may include charges for freight, insurance and interest charges for credit agreements. Since these fees are variable and are included in the final price paid it is likely to be difficult to identify and remove these from the CPI for use in a PPI. Further analysis would be required to establish how important the removal of such fees would be when using CPI in a PPI context.

3.2 Imported Services

While a PPI measures changes in the prices received for services provided by domestic companies, a CPI measures price change for all services available to a consumer which will include services purchased from overseas. The presence of these imports in CPI data will only pose a problem if prices of imported services change at a different rate the equivalent domestic services.

Using the analysis mentioned above, we have compared the difference between the annual rate of inflation for PPIs and the estimated PPIs produced using CPI data with the percentage of supply that has been imported into the UK, using the input-output supply use tables. Figure 2 shows a comparison of the annual rate of inflation in June 2013 for existing PPIs and the equivalent estimated PPIs produced using CPI data.

Figure 2. Annual inflation rates for PPI and CPI on a comparable basis, by SIC division, United Kingdom, June 2014.

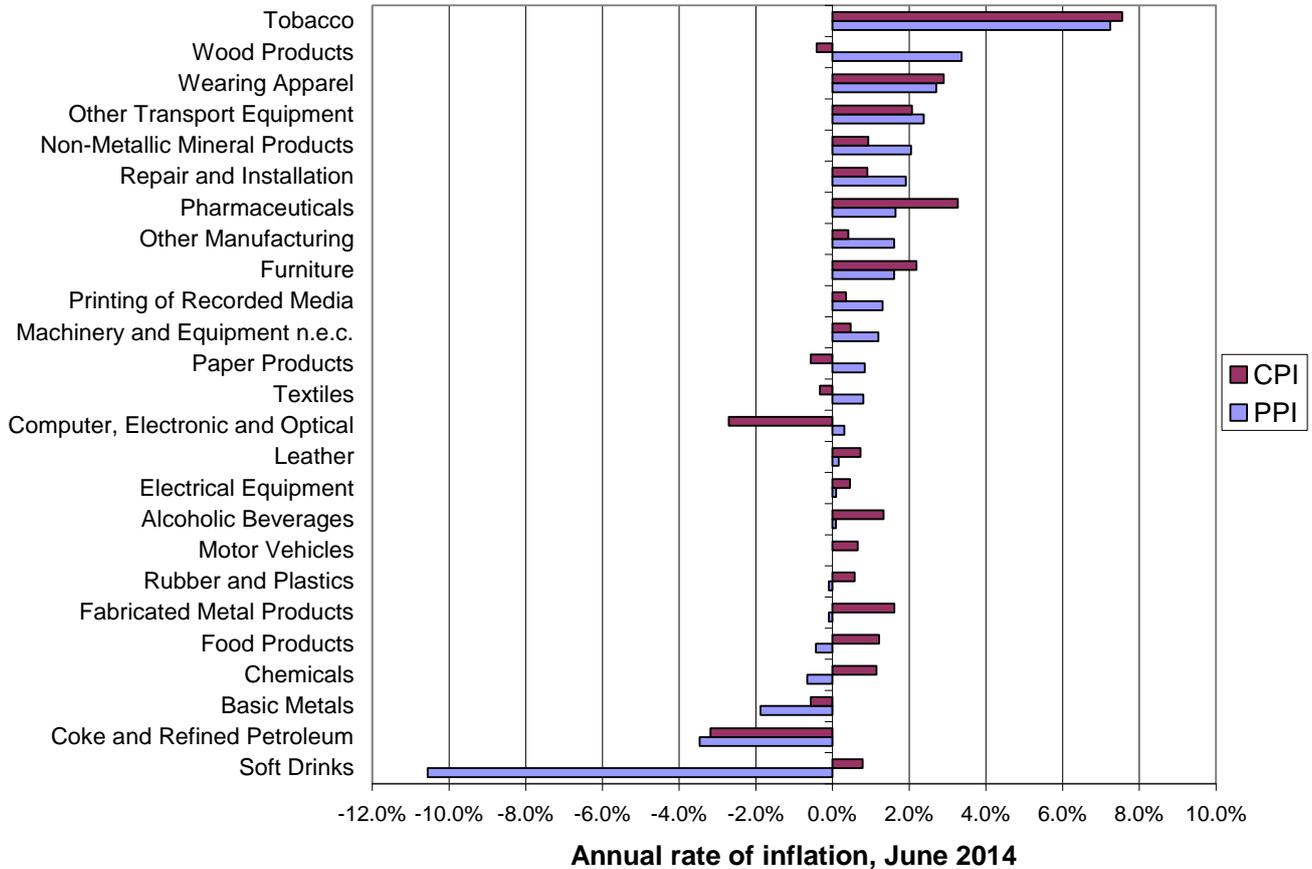
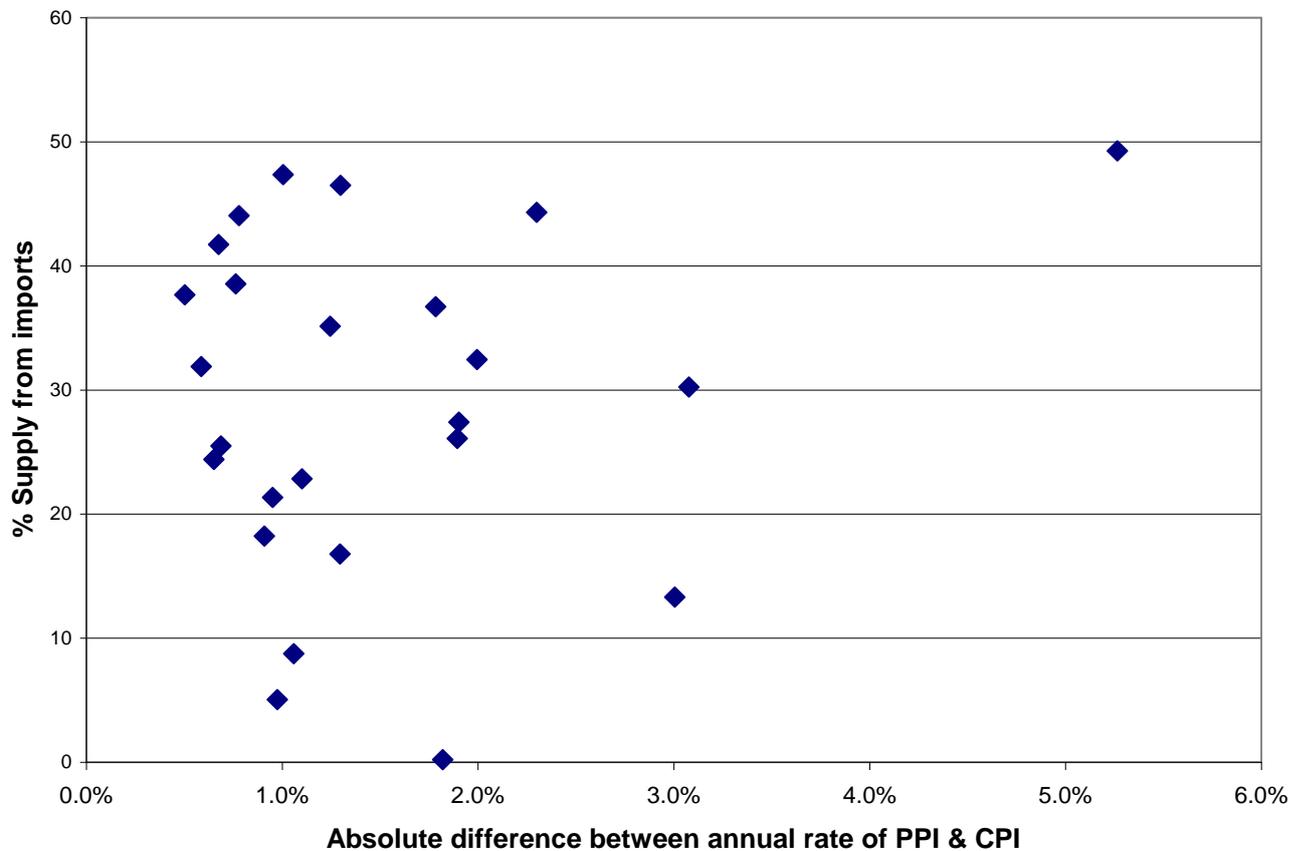


Figure 2 shows that the inflation rates of the two measures is similar for many industries such as manufacture of tobacco and clothing, but there is a large diversion for other industries such as manufacture of soft drinks, wooden products and computer, electronic and optical equipment. To try to determine whether these differences are due to the presence of imports in the estimate of PPI produced using CPI data, the absolute difference between the two rates, averaged over 6 months, has been plotted against the percentage of UK supply that has been imported, using the input-output supply use tables. The results of this, shown in figure 3, suggest that there is a positive relationship between the difference in the annual rate of inflation and the proportion of supply that comes from imports, but this relationship is quite weak and largely the result of a few industries.

Figure 3. Relationship between percentage of 2011 supply that is imported and the difference in the annual rate of inflation for 2013 between PPI and CPI on a comparable basis.



3.2 Classifications

The final key difference between PPIs and CPIs is the classification used to compile them. This difference means that using a CPI to estimate a PPI isn't as straightforward as simply adjusting a CPI to account for any taxes and then using the index as it is to approximate a PPI. Instead, the CPI will need to be mapped over to the classification used to compile the PPI.

4. Conclusions

The use of CPI to extend the coverage of an existing PPI to represent goods and services sold to the household sector seems to be a viable proposal although it may not be suitable for all industries.

CPI data will need to be adjusted to remove charges paid by the consumer when purchasing the good or service that do not represent the price received by the producer. In the case of explicit fees such as taxes, this adjustment should be relatively straightforward but for implicit fees such as transport costs and insurance, identifying the adjustment that needs to be made may prove difficult. The importance of any implicit fees on the price index should be examined on a case by case basis.

Considering manufactured goods only, the fact that CPIs will include imports doesn't seem to have a great impact for the majority of goods although there are some exceptions. As a result, it's recommended that CPIs aren't used to estimate the household component of PPIs where there is a large amount of imported supply.