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How does the Producer Price Index differ from the Consumer Price Index?

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It is often assumed that the direction and size of price change in the Industrial Producer Price Index (PPI) for finished or manufactured goods anticipates a similar change in the All Items index of the Consumer Price Index (CPI). When this assumed relationship is contracted by the actual movements of the two series, as is often the case, many users of these indices ask why the PPI and CPI show different price movements.

The answer is that there are methodological (i.e. conceptual and definitional) differences between the PPI and CPI; differences that are consistent with the uses of the two indices; and they contribute to the differences in their price movements. An important use of the PPI is to deflate income and expenditure levels in order to measure real growth in output. The adjustment of income and expenditure levels for changes in the cost of a basket of consumer goods and services is an important use of the CPI. The different uses cause definitional differences that can be categorised into two critical areas: (1) the composition of the set of goods and services they include and (2) the types of prices collected for these items.

Compositional differences

Goods and services included. While both the PPI and CPI measure price change over time for a fixed set of goods and services, the goods and services eligible for inclusion differ. The target set of goods included in the PPI is the entire market output of Irish producers (manufacturers). This set includes goods purchased by other producers as inputs to their operations or as capital investment, as well as goods purchased by consumers either directly from the producer or indirectly through retailers. Since the PPI target is Irish Production, imports are excluded. In contrast, the target set of items included in the CPI is the set of goods and services purchased for personal consumption by private and institutional households and foreign tourists on holiday in Ireland. This set includes imports.

Although consumer goods are finished goods, the PPI finished goods price indices and the All Items CPI do not measure price change for a comparable set of items; they differ in two major respects. First, the finished goods indices include price changes for producers' durable equipment, which is not purchased by typical consumers and, therefore, is not included in the CPI. Second, the All Items CPI includes services, which are not reflected in the finished goods price indices. PPI coverage of service outputs of the Irish economy is gradually increasing. In the future, as PPI service coverage nears completion, the CSO plans to compile a new aggregate PPI that combines both goods and services.

In terms of product coverage, the most comparable indices are the PPI finished consumer goods indices and the CPI goods index.

Weighting. An additional difference in the PPI finished consumer goods indices and the CPI All Items indices is that the item components are weighted differently. PPI weights are based on gross output figures as reported in the Census of Industrial Production, currently 2005 and the product (commodity) group weights are based on sales values figures for the given product group as reported in the Prodcom Inquiry, currently 2005. CPI item weights reflect expenditures reported by households for the Household Budget Survey (HBS), currently 2009/2010, while the CPI sub-index weights are calculated using

National Accounts *Household Final Monetary Consumption Expenditure* (HFMCE) data, currently 2011 (introduced in the January 2013 index). Thus, government purchases and exports of furniture, and other goods are included only in the PPI weights. Also, as noted above, consumer purchases of imported vehicles, apparel, and other goods will be included only in the CPI weights.

Differences in the type and timing of prices collected

Sales and excise taxes. The price collected for an item included in the PPI is the revenue received by its producer. Sales and excise taxes are not included in the producer price because they do not represent revenue to the producer. The price collected for an item included in the CPI is the out-of-pocket expenditure by a consumer for the item. Sales and excise taxes are included in the price because they are necessary expenditures by the consumer for the item. As a consequence, changes in the tax rates on cigarettes or alcoholic beverages, for example, can cause the CPI to move differently to the PPI.

Distribution costs. The price (revenue) received by a producer for a particular product may differ from the price paid by a consumer for that same product for important reasons besides taxes. The product in question, such as food or clothing, may have followed a distribution path from producer through wholesaler and retailer before its final sale to the consumer. In this case, the price paid by the consumer for the product likely reflects intermediate mark-ups to cover the costs of shipping it from one party to another, as well as the costs of doing business by both the wholesaler and retailer.

Timing of collection. Another possible source for discrepancies in price movements between the PPI and CPI is the differences in the timing of data collection in the two programmes. The PPI uses a mail survey, which is sent to respondents on a monthly basis. In contrast, the CPI collects monthly price quotes by telephone, e-mail, postal enquiries in conjunction with internet price collection and personal visits by CSO representatives.

The PPI targets the price of goods on a specific date, the 15^{th} day of each month. CPI prices are collected during the week containing the second Tuesday of each month and up to the third Tuesday of the month.

In addition, different methods may be employed for the introduction of new models of priced goods. In the PPI, a new model is priced when the producer stops selling the previous model. Most items in the CPI are priced at the retail outlet until they are no longer available for sale, although for some items, such as computers, the new model is first priced when it becomes more popular (i.e. outsells the previous model). Therefore, in some cases, a new model might be priced in the PPI long before it shows up in the CPI.

"Pass through" of price change from the PPI to the CPI

Some assume that a price change recorded in a particular component of the PPI will eventually and directly be seen in the same or most similar component of the CPI. In reality, it is difficult to project whether, in what magnitude, or when an increase in the PPI will "pass through" to the CPI. A retailer may not pass on an increase in the price paid to a producer for a good if, for example, competitive conditions in the retail market preclude such an action. Alternatively, the retailer may increase the selling price for the good in question, but not by the full extent of the increase in the price paid to the producer. In this case, for example, the retailer may be realising efficiencies in operations that allow a reduction in mark-up. This particular example also illustrates that, because of the possibility of change in the cost to transport wholesale or retail products, the CPI for a given component may change even though there has been no change in the PPI for the same component.

Should retailers pass on all or part of an increase in producer prices, the time lag between changes in the PPI and CPI for comparable products can vary considerably. For some products, such as petrol, where producers own or franchise many of the retail outlets, there could be a fairly immediate price pass-through from the PPI to the CPI as producers pass on their cost increases directly to consumers. For other products, such as pharmaceuticals, which are usually distributed through wholesalers, there is an expected time lag for price transmission. While the PPI will change when the new drugs are produced, the corresponding CPI will not show the change until those pharmaceuticals reach the stores.

Summary. The conceptual and definitional differences of the PPI and CPI are consistent with the uses of these two major economic indicators. The PPI is used to deflate revenue to measure real growth in output, while the CPI is used to adjust income and expenditures for changes in the cost of consumer goods and services. In brief, the CPI includes services, imports and sales taxes, whereas the PPI excludes them. Distribution costs are included in the CPI prices while PPI prices include only producers' costs; and finally the PPI includes capital equipment while the CPI does not.

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