

July 2007

Methodological Adjustments to the Median and 16 Percent Trimmed-Mean CPI Estimators

Trimmed means have been found to be useful in identifying underlying trends in the aggregate price data. For example, Bryan and Cecchetti (1994) showed that trimmed means of consumer price data, notably the 16 percent trimmed mean and median CPI, produce superior forecasts of the future CPI trend. More recently, Bryan (2007) argues that these statistics help expediently identify small changes in the inflation trend.

However, a potential problem of using trimmed means arises when one of the components in the inflation aggregate has an unusually large weight, such as the 24 percent relative importance given to the Owners' Equivalent Rent (OER) component of the CPI. The influence of this component can grow disproportionately as the proportion of extreme changes "trimmed" from the data increases. Indeed, the influence of the OER component on the median CPI can be seen in table 1, which documents that since 1998, OER was the median component 64 percent of the time.

Table 1: Frequency at which a Component Has Been the Median Component, January 1998–July 2007

Component	Relative importance*	Percent Prior	Revised
Cereals and bakery products	1.10	3.48	1.75
Meats, poultry, fish, and eggs	2.11	0.00	1.75
Dairy and related products	0.82	0.87	0.88
Fresh fruits and vegetables	0.96	0.00	0.00
Processed fruits and vegetables	0.25	0.00	0.00
Nonalcoholic beverages and materials	0.91	1.74	0.00
Other food at home	1.74	0.00	1.75
Food away from home	5.99	6.96	10.53
Alcoholic beverages	1.11	1.74	0.00
Rent of primary residence	5.93	6.09	5.26
Lodging away from home	2.65	0.87	0.00
Tenants' and household insurance	0.37	0.00	0.00
Fuel oil and other fuels	0.34	0.00	0.00
Gas (piped) and electricity	4.03	0.00	0.00
Water, sewer, and trash collection	0.90	0.87	0.88
Household furnishings and operations	4.65	1.74	2.63
Men's and boys' apparel	0.89	0.00	0.00
Women's and girls' apparel	1.59	0.87	0.88
Footwear	0.75	0.00	0.00
Infants' and toddlers' apparel	0.18	0.00	0.00
Jewelry and watches	0.33	0.00	0.88

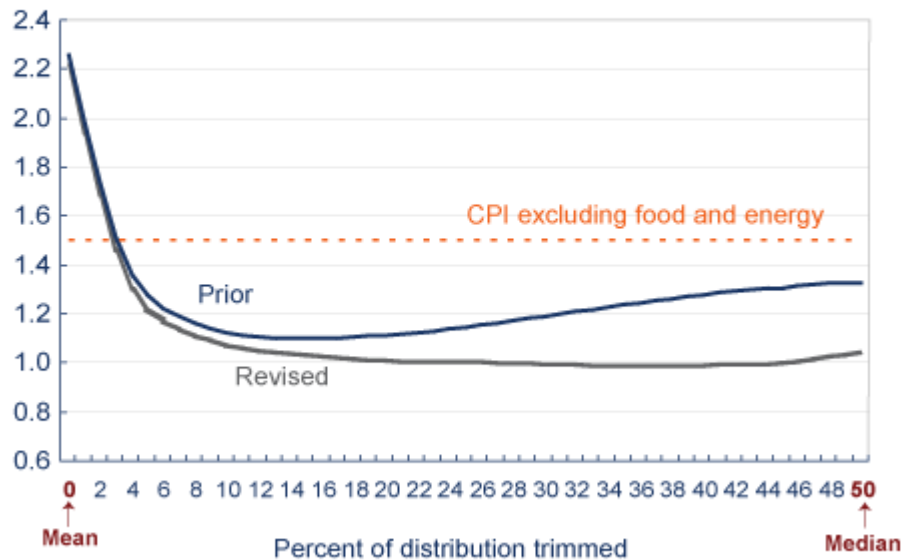
Component	Relative importance*	Percent	
		Prior	Revised
New vehicles	4.98	0.00	2.63
Used cars and trucks	1.72	0.00	0.00
Car and truck rental	0.09	0.00	0.00
Motor fuel	4.35	0.87	0.88
Motor vehicle parts and equipment	0.37	0.00	0.00
Motor vehicle maintenance and repair	1.15	0.00	2.63
Motor vehicle insurance	2.26	0.00	1.75
Motor vehicle fees	0.48	0.00	0.88
Public transportation	1.06	0.00	0.00
Medical care commodities	1.45	0.87	0.88
Medical care services	4.83	5.22	1.75
Recreation	5.55	1.74	7.02
Education	3.08	0.00	0.00
Communication	2.96	0.00	0.00
Tobacco and smoking products	0.71	0.00	0.00
Personal care products	0.71	0.00	0.00
Personal care services	0.68	0.87	1.75
Miscellaneous personal services	1.19	2.61	0.88
Miscellaneous personal goods	0.19	0.00	0.00
Leased cars and trucks	0.60	0.00	0.00
Owners' equivalent rent of primary residence	23.83	64.35	51.75
OER, Northeast Urban Region	5.55	NA	11.40
OER, Midwest Urban Region	4.83	NA	8.77
OER, South Urban Region	7.23	NA	20.18
OER, West Urban Region	6.22	NA	11.40

*Relative importance value from December 2006.

Following the recommendation of Brischetto and Richards (2007) of the Reserve Bank of Australia, we have recently begun to produce experimental measures that promise to reduce the influence of the OER component on the computation of the trimmed-mean (and median) CPI statistics by breaking OER into four regional subindexes. Confirming the results of these authors, we find that reducing the influence of OER in this way improves the inflation signal coming from the trimmed-mean CPI estimators. Figure 1 shows how trimmed means computed from the component CPI data provide an improved prediction of the future CPI trend over either the CPI or the traditional ex-food and energy core CPI measures. More importantly, reducing the influence of the OER component by breaking it into its four regional subindexes (as in the experimental methodology), improves the ability of the trimmed-mean measures to predict the future CPI trend, as greater percentages of the extreme components are trimmed from the data. In fact, this experimental methodology reduces the proportion of times an OER component is the median component from 64 percent to 52 percent (table 1).

Figure 1. Prior vs. Revised Trimmed-Mean Measures

Root-mean squared error



*Calculated from January 1983 to June 2004 using 36-month-forward CPI inflation.

Other Methodological Issues

The four regional OER components used in the revised method are the four census regions (Northeast, Midwest, South, and West), each weighted by their appropriate share in the overall CPI. Although the Bureau of Labor Statistics does not currently seasonally adjust these regional OER subcomponents, statistical tests confirm the existence of seasonality in these data. We have therefore seasonally adjusted the OER subcomponents using the Census's X-12 procedure. The revised median CPI is available beginning in 1983.

Other minor changes to the trimmed-mean CPI measures introduced with this report include the introduction of the leased cars and trucks component (code CUSR0000SETA03) with the data starting as of February 2002, and four seasonally adjusted components that earlier had been reported only on an unadjusted basis.

For the current BLS code list used to construct the prior or revised series, as well as any questions about the construction of the series, please contact Joel Elvery at [216.579.3140](tel:216.579.3140) or [Joel Elvery](mailto:Joel.Elvery). For historical data, view the Latest Indicators box at right.

References

Bryan, Michael F. 2007. "Monitoring Inflation in a Low-Inflation Environment," paper presented at the Conference on Price Measurement for Monetary Policy, May 24-25, 2007, jointly sponsored by the Federal Reserve Banks of Cleveland and Dallas.

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