

Should the Fed Ignore the Most Important Bias in the CPI?

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In the United States, there is an ongoing debate about the possible adoption of an explicit numerical inflation target for the Federal Reserve. An important facet of this debate regards what numerical value such a target should have. Bernanke et al. (1999, p. 28-30) discuss four reasons why an inflation targeting central bank should target a positive inflation rate: 1) CPI-based measures of inflation may be biased upward by 0.8 to 1.6 percentage points per year (Boskin et al., 1996). 2) Downward nominal wage rigidity may imply that a positive inflation rate could lower the “natural” rate of unemployment by facilitating real wage declines in declining industries (Akerlof et al., 1996). 3) Due to the zero lower bound on nominal interest rates, low inflation may constrain the central bank’s ability to stimulate the economy in the event of a recession (Summers, 1991). 4) Undershooting a zero inflation target may be more costly than overshooting such a target by the same amount due to liquidity and solvency problems in the financial system (Bernanke and James, 1991). The later three of these four possible reasons for a positive inflation target are hotly debated. However, there seems to be a widespread consensus that if measured inflation is biased upward the inflation target of the central bank should be shifted upward relative to what is decided to be an optimal level of “true” inflation by the amount of this bias. This consensus view was clearly stated by Ben Bernanke in his speech on November 14th 2007 that introduced changes to the communication strategy of the Federal Open Market Committee. In that speech Bernanke said:

“Were price stability the only objective mandated for the Federal Reserve, the FOMC presumably would strive to achieve zero inflation, properly measured—that is, the optimal measured inflation rate would deviate from zero on average only by the amount of the estimated measurement error in the preferred inflation index. ” (Bernanke, 2007)

We argue that this consensus view needs to be qualified in an important way. To the extent that the cost of inflation are attributable to price rigidity, an optimally chosen inflation target should *not* be adjusted for the bias in the CPI that is due to quality change and the introduction of new products.

1 The New Goods Bias in the CPI

The introduction of new products and the improvement of existing products is common in the modern economy. Each month, approximately 3% of all products that the BLS samples prices for disappear and are replaced by substitute products. This large amount of product turnover creates a difficult measurement problem for the BLS since the difference in the price of the new products versus the old products is partly due to a difference in quality.

For roughly half of these product substitutions, the BLS is able to find “comparable” products and the substitution is deemed to involve no quality change. For the majority of the “non-comparable” substitutions, the new product is “linked-into” the index, meaning that it is dropped from the index in the period when the upgrade occurs. This implies that any price change and any quality change between the last observation of the old product and the first observation of the new product is not used to calculate changes in the CPI. For a relatively small set of product categories, the BLS produces estimates of the quality difference between the new products and the old products. The main reason why the BLS doesn’t do such adjustments on a larger scale is that it is difficult to create objective measures of quality change in many product categories (Abraham et al., 1998).

An even more difficult problem arises when entirely new products are introduced into the economy (such as the personal computer, the cell phone and the microwave oven). These new product categories are usually not incorporated into the CPI until they have existed for some time. This implies that any benefit that consumers derive from these new products in terms of lowering the cost of maintaining a certain level of utility is missed by the CPI until they are incorporated into the index.

In 1996, the Boskin Commission estimated that quality change and the introduction of new goods caused a 0.6 percentage point per year bias in CPI inflation (Boskin et al., 1996).¹ This “new

¹See also, Boskin et al. (1998).

goods bias” accounted for over half of the total bias estimated by the Boskin Commission. This result of the Boskin Commission is not uncontroversial. Moulton and Moses (1997) and Abraham et al. (1998) argue that the Boskin Commission overestimated the new goods bias. Triplett (1997) and Hobijn (2002) point out that it can actually lead to a downward bias in the CPI under certain circumstances.

On the other hand, Bils and Klenow (2001), Hausman (2003), Pakes (2003) and Bils (2005) emphasize the importance of quality bias in the CPI.² Nordhaus (1998) argues that the new goods bias is in fact substantially larger than the Boskin Commission concluded. The growing expenditure share of health care and the particular difficulty of assessing quality change in that sector suggests that the new goods bias is if anything a growing problem. It seems likely that the most important bias in the CPI today is the new goods bias.

2 The Cost of Inflation Due to Price Rigidity

A basic premise of inflation targeting is that inflation is costly and that central banks should conduct monetary policy to minimize the costs of inflation. One of the reasons why inflation is costly is that prices adjust infrequently. In an inflationary environment, price rigidity causes inefficient fluctuations in relative prices. The costs of price rigidity are minimized by a monetary policy that minimizes firms’ desires to change prices. A large recent literature has discussed conditions under which this logic implies that it is optimal for the central bank to aim for zero inflation (see, e.g., Woodford, 2003). The models used in this literature do not incorporate quality change or new goods. It is therefore not clear from this literature whether the central bank should target zero change in the true cost of living or an index of existing products.

While price rigidity may not be the only reason that inflation is costly, it is the main friction considered in the majority of recent academic work on optimal monetary policy. In keeping with this literature, we abstract from other costs of inflation and ask whether a central bank that seeks to minimize the cost of price rigidity should adjust its target inflation rate upward by the amount of new goods bias in published inflation statistics. In other words, we ask whether such a central bank should target stability in the “true” inflation rate or the measured inflation rate.

²Shapiro and Wilcox (2006) summarize a large body of older literature on this point.

3 New Goods and the Cost of Price Rigidity

The point we seek to make can most easily be made with a two good example. Consider an economy that produces Coca Cola and light bulbs. The characteristics of Coke are stable over time, while new and improved light bulbs are introduced periodically. Labor is the only input into the production of these two goods and wages are equalized across sectors. Wages are proportional to the money supply, which is controlled by the central bank. The prices of both goods are sticky. The price of Coke changes once a year. The price of a particular light bulb never changes. But new and improved light bulbs are introduced once a year and light bulb makers can set new prices for the new light bulbs. Each new light bulb is of 2% higher quality than the light bulb it replaces but has the same marginal cost of production. Consumers spend half their income on Coke and half on light bulbs.

First, consider a monetary policy that keeps the money supply constant. Call this policy A. Policy A implies that wages and therefore also desired prices will be constant. Each time the makers of Coke have an opportunity to change their price they decide not to. And each time the makers of light bulbs introduce a new type of light bulb they set the price of the new light bulb equal to the price of the old light bulb. The measured inflation rate in this economy is therefore equal to zero. The true inflation rate—i.e. the rate of change in the true cost of living—however is falling by 1% per year because of the improved quality of light bulbs.

Now consider a monetary policy that increases the money supply by 1% per year. Call this policy B. Policy B implies that wages are rising by 1% per year. Each time the makers of Coke have an opportunity to change their price they decide to increase their price by 1%. And each time the makers of light bulbs introduce a new type of light bulb they set the price of the new light bulb equal to 1% more than the price of the old light bulb. The measured inflation rate in this economy is therefore 1%. The true inflation rate is, however, zero because of the improved quality of light bulbs.

Which policy minimizes the cost of price rigidity? Clearly policy A does. Under policy A, all prices are equal to the firms' desired prices at every point in time. Another way to say this is that all prices are always equal to what they would be if they were completely flexible. In contrast, under policy B both the price of Coke and the price of light bulbs are drifting away from their makers' desired prices over the course of the year. Rather than undoing the distortions created by

the price rigidity, policy B is aimed at stabilizing the true cost of living. But in this simple example there is no reason why the central bank should care about stability in the true cost of living.

This example calls into question the notion that inflation targeting central banks should adjust the target level of measured inflation they seek to bring about by the bias caused by the introduction of new and improved products. The crucial characteristic of newly introduced products that leads to this conclusion is that firms set a new price whenever they introduce a new product. The introduction of the new product therefore does not create a wedge between the firm's price and its desired price even though it does lead to a change in the true cost of living.

4 Conclusion

The consensus view among central bankers and monetary economists is that the appropriate level of measured inflation for inflation targeting central banks to target should be adjusted upward by the amount of the bias in measured inflation relative to a true cost of living index. We argue that in so far as the costs of inflation are due to price rigidity and the bias in measured inflation is due to new goods bias this consensus view is mistaken. Since new goods are introduced with new prices, the improved quality of the new goods does not cause a discrepancy between the prices firms set and their desired prices. The appropriate policy for minimizing the cost of price rigidity is to ignore the bias in the CPI caused by the introduction of new and improved products and instead focus on the inflation rate for existing products.

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