

FRBSF ECONOMIC LETTER

Number 2006–20, August 11, 2006

Would an Inflation Target Help Anchor U.S. Inflation Expectations?

Particularly now that we are in the general range of price stability, I believe that quantifying what the FOMC means by price stability would provide useful information to the public and lend additional clarity to the policymaking process....

Although communication plays several important roles in inflation targeting, perhaps the most important is focusing and anchoring expectations.

—Ben Bernanke (2003)

Since the October 2005 nomination of Ben Bernanke to become Chairman of the Federal Reserve Board, there has been increasing speculation in the financial press that the Federal Open Market Committee (FOMC) might soon adopt an explicit numerical objective for inflation. However, skeptics of inflation targeting have maintained that this would constrain the FOMC and might provide little benefit in return—after all, it has been argued, haven't inflation expectations in the U.S. been well anchored since the early to mid-1990s?

In this *Economic Letter*, I discuss recent research on whether inflation expectations in the U.S. have been well anchored over this period and whether an explicit numerical objective for inflation might help to “focus and anchor” those expectations. These are important questions which we have only recently begun to be able to answer using high-frequency financial market data from a variety of countries.

Using inflation compensation to assess anchoring of expectations

Many countries, including the U.S., have issued government-backed bonds that are indexed for inflation. The yield spread between nominal government bonds and inflation-indexed government bonds then represents the return that investors require as compensation for expected inflation and inflation risks over the lifetime of the bonds. For example, if the yield on a 10-year nominal U.S. Treasury note is 5% and the yield on a 10-year inflation-indexed Treasury note is 2%, then

investors are implicitly demanding a 3% premium to hold the nominal security in order to compensate them for expected inflation and the risks of unexpected inflation over the 10-year lifetime of the bonds. This yield spread, which we will call “inflation compensation,” then provides a publicly observable and very timely measure of financial market concerns about inflation.

To investigate the anchoring of inflation expectations, then, it is natural to examine the behavior of inflation compensation. For example, we might start by comparing the daily volatility of long-term inflation compensation in the U.S. to that in some other country which has an explicit numerical inflation target, such as the U.K. From January 1997 to June 2006, the period for which inflation-indexed bond data for the U.S. are available, this comparison does indeed suggest that long-term inflation compensation in the U.S. has been more volatile than in the U.K.—the standard deviation of daily changes in 10-year inflation compensation in the U.S. over this period was about 4.34 basis points, compared to 3.50 basis points in the U.K., implying that long-term inflation compensation in the U.S. was about 25% more volatile than in the U.K.

There are problems with this first-pass comparison, however, because inflation compensation can sometimes fluctuate for reasons other than changes in market concerns about future inflation. For example, low liquidity in the inflation-indexed bond market can cause those securities to trade at a discount relative to their fundamental value and can cause indexed bond prices to fluctuate more in response to large, idiosyncratic trades. Moreover, the amount of liquidity and the price premium attached to liquidity in the U.S. and U.K. markets are likely to differ across the two countries and may also vary over time. As a result of these types of confounding factors, it is not clear that the daily volatility of inflation compensation is really very informative about whether inflation expectations in the U.S. or U.K. are well anchored or not.

Fortunately, we can work around these difficulties by focusing attention on *systematic* changes in inflation compensation, as proposed by Gürkaynak, Sack, and Swanson (2003, 2005). Their essential insight is the following. If investors had very firm expectations about what inflation would be in the long run and had a high degree of confidence in those expectations, then a one-off surprise in the CPI today should not cause them to revise their views about the long-term inflation outlook going forward. By contrast, if investors' long-term inflation expectations were not perfectly anchored, then they might expect some partial pass-through (or some risk of such pass-through) from near-term inflation to the long-term inflation outlook. For example, a surprisingly high CPI number released today might, in the case of unanchored inflation expectations, cause investors to revise upward somewhat their concerns regarding the long-term inflation outlook.

This systematic relationship suggests a formal econometric test for whether inflation expectations in a given country are well anchored or not. If we know the dates of major economic data releases, then we can test whether changes in long-term inflation compensation on those dates have any systematic relationship to the data releases themselves. Put simply, does a surprisingly high CPI announcement have any systematic effect on long-term inflation compensation in a given country, or not?

Gürkaynak, Sack, and Swanson (2003, 2005) perform essentially this test, with a few additional technical refinements that improve the test's power. For example, the authors analyze both nominal interest rates and inflation compensation, because the former is available for a longer sample than the latter for the U.S. and because both series should be insensitive to economic news at long enough horizons under standard assumptions. Also, they are careful to focus on the surprise component of economic announcements rather than on the announcements themselves, because bond markets should not respond to the component of economic announcements that are already expected.

Are inflation expectations in the U.S. well anchored?

Gürkaynak, Sack, and Swanson (2003, 2005) apply the above test to the U.S. and find that, in fact, long-term interest rates and inflation compensation in the U.S. have varied quite systematically in response to economic news. In other words, long-term inflation expectations in the U.S. do not ap-

pear to be completely anchored, at least not over the 1990–2002, 1994–2002, or 1998–2002 samples that they consider. As the intuition above would suggest, long-term interest rates and inflation compensation in the U.S. rise in response to higher-than-expected inflation announcements and fall in response to lower-than-expected announcements. The authors also find that positive surprises in GDP and employment, for example, cause long-term interest rates and inflation compensation to rise as well, consistent with the idea that a robust economy puts upward pressure on prices and that bond markets in turn become concerned that some of this pressure will pass through to long-term inflation. Finally, and most interestingly, they document an inverse relationship between long-term inflation compensation and surprises in the federal funds rate, so that surprise monetary policy tightenings by the Fed typically cause long-term inflation compensation to *fall* in response. In other words, bond markets appear to have interpreted monetary policy tightenings in the 1990s as indicative of greater Fed resolve to keep inflation low in the future and relaxed their concerns about the long-term inflation outlook in response.

To be sure, the magnitude of the sensitivity of long-term inflation compensation that Gürkaynak, Sack, and Swanson estimate is not large, amounting to changes of just a few basis points per standard deviation surprise in an economic announcement. (It would indeed be quite a problem if long-term interest rates gyrated wildly in response to every economic news release!) Nonetheless, the magnitudes of these responses are almost as large as the magnitudes of *short-term* interest rate responses to these economic announcements, suggesting that there is a substantial degree of pass-through from short-term inflation to bond market concerns about the long-term inflation outlook. Thus, from this perspective, long-term inflation expectations in the U.S. do not appear to have been particularly well anchored, even since the mid-1990s.

Are inflation expectations in other countries better anchored?

Even if long-term inflation expectations in the U.S. are not perfectly anchored, are there any countries in which inflation expectations are better anchored? Perhaps surprisingly, the answer appears to be yes—there are several such countries.

Gürkaynak, Levin, and Swanson (2006) and Gürkaynak, Levin, Marder, and Swanson (2006) extend the analysis described above for the U.S. through the end of 2005 and apply it also to the

U.K., Sweden, and Canada. Besides being highly industrialized, the U.K., Sweden, and Canada provide natural comparisons to the U.S. for two reasons: first, all three countries have issued inflation-indexed debt since at least the mid-1990s, which allows us to compare the behavior of inflation compensation across countries; and second, all three nations have had an explicit numerical objective for inflation over this same period, providing us with a natural experiment that contrasts with the U.S.

The striking finding of these studies is that, in contrast to the U.S., long-term inflation compensation in the U.K., Sweden, and Canada does not respond systematically to economic news over this period. A natural interpretation of this finding is that the presence of an explicit numerical inflation objective has indeed helped to “focus and anchor” private sector and financial market inflation expectations in these countries. Since there is no reason to think that financial markets in the U.K., Sweden, and Canada are fundamentally different from those in the U.S., the experience of these countries provides support for the view that an explicit numerical inflation objective would improve the anchoring of long-term inflation expectations in the U.S.

Summary and conclusions

Recent research using high-frequency financial market data suggests that inflation expectations in the U.S., even since the mid-1990s, have not been as well anchored as in some other countries. Long-term U.S. interest rates and inflation compensation have responded systematically to economic news in a way that suggests financial markets see some pass-through (or some risk of pass-through) from short-term inflation to the long-term inflation outlook. In contrast to the U.S., several countries with explicit long-run inflation objectives seem to have achieved a better anchoring of long-term inflation expectations over this period.

These findings are exciting. They suggest that, despite the generally superb performance of the U.S. economy and U.S. monetary policy over the past 15 years, there is still potential for improvement. A better anchoring of inflation expectations in the U.S. could have many benefits, such as more stable

and lower long-term interest rates, which would increase the ability of firms to make efficient investment decisions, and more stable and predictable inflation, which would improve the efficiency of firms’ pricing decisions. Although there is no guarantee that the U.S. would realize large gains in these areas, these efficiency improvements would nonetheless help to allocate workers to firms with the best long-term prospects and lead to a more productive and stable U.S. economy.

Eric Swanson
Research Advisor

References

[URLs accessed August 2006.]

- Bernanke, Ben. 2003. “A Perspective on Inflation Targeting.” Speech at the Annual Washington Policy Conference of the National Association of Business Economists. Washington, DC. March 25, 2003. Text available at <http://www.federalreserve.gov/boarddocs/speeches/2003/20030325/default.htm>
- Gürkaynak, Refet, Andrew Levin, Andrew Marder, and Eric Swanson. 2006. “Inflation Targeting and the Anchoring of Long-Run Inflation Expectations in the Western Hemisphere.” Forthcoming in *Series on Central Banking, Analysis and Economic Policies X: Monetary Policy under Inflation Targeting*, eds. Frederic Mishkin and Klaus Schmidt-Hebbel. Santiago, Chile: Banco Central de Chile.
- Gürkaynak, Refet, Andrew Levin, and Eric Swanson. 2006. “Does Inflation Targeting Anchor Long-Run Inflation Expectations? Evidence from Long-Term Bond Yields in the U.S., U.K., and Sweden.” FRBSF Working Paper 2006-09. <http://www.frbsf.org/publications/economics/papers/2006/wp06-09bk.pdf>
- Gürkaynak, Refet, Brian Sack, and Eric Swanson. 2003. “The Excess Sensitivity of Long-Term Interest Rates: Evidence and Implications for Macroeconomic Models.” Federal Reserve Board *Finance and Economics Discussion Series* 2003-50. <http://www.federalreserve.gov/pubs/feds/2003/200350/200350abs.html>
- Gürkaynak, Refet, Brian Sack, and Eric Swanson. 2005. “The Sensitivity of Long-Term Interest Rates to Economic News: Evidence and Implications for Macroeconomic Models.” *American Economic Review* 95(1), pp. 425–436.

ECONOMIC RESEARCH
FEDERAL RESERVE BANK
OF SAN FRANCISCO

PRESORTED
STANDARD MAIL
U.S. POSTAGE
PAID
PERMIT NO. 752
San Francisco, Calif.

P.O. Box 7702
San Francisco, CA 94120
Address Service Requested

Printed on recycled paper
with soybean inks



Index to Recent Issues of *FRBSF Economic Letter*

DATE	NUMBER	TITLE	AUTHOR
12/23	05-37	The Diffusion of Personal Computers across the U.S.	Doms
12/30	05-38	Do Oil Futures Prices Help Predict Future Oil Prices?	Wu/McCallum
1/27	06-01	2006: A Year of Transition at the Federal Reserve	Yellen
2/24	06-02	Productivity Growth: Causes and Consequences, Conference Summary	Wilson
3/3	06-03	Postal Savings in Japan and Mortgage Markets in the U.S.	Cargill/Scott
3/10	06-04	External Imbalances and Adjustment in the Pacific Basin	Glick/Spiegel
3/17	06-05	Enhancing Fed Credibility	Yellen
4/07	06-06	What Is the Federal Reserve Banks' Imputed Cost of Equity Capital?	Barnes/Lopez
4/14	06-07	Security Analysts and Regulatory Reform	Marquez
4/21	06-08	Job Matching: Evidence from the Beveridge Curve	Valletta/Hodges
4/28	06-09	Prospects for the Economy	Yellen
5/12	06-10	Bank Diversification, Economic Diversification?	Strahan
5/19	06-11	Central Bank Capital, Financial Strength, and the Bank of Japan	Cargill
6/2	06-12-13	Monetary Policy in a Global Environment	Yellen
6/23	06-14	International Financial Integration and the Current Account Balance	Cavallo
6/30	06-15	Residential Investment over the Real Estate Cycle	Krainer
7/7	06-16	A Monetary Policymaker's Passage to India	Yellen
7/21	06-17	Labor Markets and the Macroeconomy: Conference Summary	Dennis/Williams
7/28	06-18	Property Debt Burdens	Doms/Motika
8/4	06-19	Performance Divergence of Large and Small Credit Unions	Wilcox

Opinions expressed in the *Economic Letter* do not necessarily reflect the views of the management of the Federal Reserve Bank of San Francisco or of the Board of Governors of the Federal Reserve System. This publication is edited by Judith Goff, with the assistance of Anita Todd. Permission to reprint portions of articles or whole articles must be obtained in writing. Permission to photocopy is unrestricted. Please send editorial comments and requests for subscriptions, back copies, address changes, and reprint permission to: Public Information Department, Federal Reserve Bank of San Francisco, P.O. Box 7702, San Francisco, CA 94120, phone (415) 974-2163, fax (415) 974-3341, e-mail sf.pubs@sf.frb.org. **The *Economic Letter* and other publications and information are available on our website, <http://www.frbsf.org>.**