

# FRBSF WEEKLY LETTER

Number 95-32, September 29, 1995

## Inflation-Indexed Bonds

A number of industrial countries have recently started issuing inflation-indexed government securities: that is, bonds with yields that rise and fall with inflation. The U.K. was among the earliest, inaugurating such bonds in 1981, followed by Australia in 1986, and by Sweden and Canada in the early 1990s; New Zealand is expected to join the ranks in the near future. Whether or not the U.S. also will offer such bonds is a matter of ongoing public discussion. A congressional hearing on the topic in 1992 was the most recent example.

This *Weekly Letter* examines the basic mechanics of inflation-indexed bonds and their purported benefit in aiding monetary policymakers. With a stock of indexed bonds outstanding, the nominal cost of the government's debt financing automatically increases as inflation goes up. This feature of indexed bonds makes them a good mechanism for enhancing the credibility of a government's commitment to a low-inflation policy in the future. Indeed, this feature might be an important reason for the recent popularity of inflation-indexed bonds among industrial economies.

### How inflation-indexed bonds work

A typical long-term government security is redeemed at its face value at maturity, and periodic coupon payments are fixed in nominal terms. So at any date, its real yield at maturity is uncertain, as inflation and thus the purchasing power of money in the future is uncertain. In comparison, an inflation-indexed bond guarantees holders a real rate of return by compensating them for the eroded purchasing power of nominal payments due to inflation. For example, consider the U.K. version of indexed bonds, which are called "indexed gilt." Their semiannual coupon payments are based on the inflation-adjusted face value of the bond over time. The adjustment for inflation is made using the Retail Price Index (RPI) with an eight-month lag. At maturity, the redemption value also is adjusted for the actual inflation between the initial indexation date and eight months prior to the maturity date. Because of this indexation lag, an indexed gilt will be exposed to inflation

risk in the final eight-month period. However, this does not appear to be crucial, since many indexed gilts have maturities of over fifteen years.

At a theoretical level, the provision of an asset that is free from inflation risk should improve the general welfare, both on the buyers' side and on the sellers' side. On the buyers' side, such an asset offers a means of adjusting portfolios for individual investors with different risk and return preferences. For example, investors, such as pension funds, that want to secure a predictable flow of real cash payments could include indexed bonds in their portfolios. Indeed, when they were first issued in 1981, indexed gilts were offered only to pension funds. This restriction was lifted in 1982, but data from 1994 show that pension funds and insurance companies still held close to 50 percent of the outstanding stock of indexed gilts.

On the sellers' side, the issuing government may end up with lower borrowing costs in certain situations. For example, long-term government bonds generally sell at a discount, which reflects the yield the market demands. The discount will be deeper after a high-inflation period, because markets assess a large premium in interest rates for expected inflation, as well as a premium for an inflation risk for holding a nominal asset whose real value is uncertain over time. Such a premium might be unacceptably high for a government that genuinely intends to impose monetary and fiscal discipline in order to bring about and maintain low and stable inflation. This situation is like that faced by the Thatcher administration in 1981, when it started issuing inflation-indexed bonds (Woodward 1990, de Kock 1991, Shen 1995).

### Inflation-indexed bonds and the effectiveness of monetary policy

One of the key benefits of having inflation-indexed bonds in addition to conventional nominal bonds is that together they offer a means of measuring markets' expectations about future inflation. The problem with obtaining such a

# FRBSF

measure from the yield on conventional bonds alone is that the yield consists of expected inflation, an inflation risk premium, and the expected real rate—and it is very difficult, if not impossible, to measure one separately from the other. But since the yield on indexed bonds reflects only the expected real interest rate, the problem is solved, theoretically, at least (that is, assuming that inflation risk is small and well-behaved over time): One can simply take the difference between the yields on indexed and nominal bonds with the same maturities, and the result is a measure of inflation expectations. Such a measure of inflation expectations can aid a monetary authority by offering timely, market-based feedback regarding the inflationary consequences of its actions. Presumably, changes in this difference would convey valuable information on changes in expected inflation that could be incorporated in determining short-term monetary policy.

In practice, however, the problem is not so easy to solve. Certain preconditions need to be met for policymakers to use information from indexed bonds in this way. First, the nominal bonds and indexed bonds have to have similar characteristics, such as maturity and coupon rate. Thus it would be preferable to have a variety of indexed bonds that match the characteristics of current U.S. Treasury securities. This would afford a more precise reading of markets' expectations at different horizons (Hetzel 1992).

Second, there has to be sufficient liquidity in the indexed bond market. The usefulness of indexed bonds as an indicator hinges on how correctly changes in their prices reflect changes in the underlying inflation expectations. Therefore, it is imperative that the market have sufficient depth and breadth so that non-fundamental factors will not cause large changes in their yields.

Third, the quality of the price indexes used for inflation indexation must be high; that is, the candidate price index has to reflect changes in the purchasing power of money accurately. It would be especially problematic if the bias in the price index varied over time. For example, there is currently some concern about potential bias in the U.S. Consumer Price Index. A bias arises due to imprecise measurement of improvements in the quality of goods, the introduction of new goods, or substitution on the part of consumers between different goods and retail outlets (Wynne and Sigalla 1993). This could become

an issue concerning indexed bonds, if and when they come into being in the U.S.

## **Indexed bonds as a commitment mechanism**

When a government issues inflation-indexed bonds, it is signaling its intention to control inflation in the future, since the nominal cost of debt financing automatically increases as inflation goes up. For example, with ordinary nominal bonds a government faces a stream of known, fixed, nominal obligations whose real burden can be reduced by future inflation. With indexed bonds, the government faces unknown nominal obligations that will balloon with higher future inflation. This automatic escalation of indexed-debt costs offers a potentially binding mechanism committing the government to non-inflationary policies in the future.

This appears to be an important element of the move by the U.K., Australia, Sweden, and Canada to begin issuing inflation-indexed bonds. At least two out of the following three characteristics applied to those countries when they started issuing indexed bonds: (1) a recent history of a high inflation and large government deficits, (2) a relatively new and fiscally conservative government that supported lowering inflation, (3) a central bank with relatively less institutional independence.

Under such circumstances, issuance of inflation-indexed bonds was perhaps a practical way to signal the governments' commitment to low inflation in the future. For example, a much more difficult way to send the signal would have been to make the central bank more independent. According to studies such as Cukierman, Webb, and Neyapti (1992), in industrialized countries there is a negative correlation between the degree of a central bank's institutional independence and a country's inflation rate. But changing the institutional structure of a country's central bank would involve a major legislative effort. Clearly, providing indexed bonds as an incentive to keep inflation under control would be much easier to accomplish.

The experiences of the U.K. and Canada seem to support this view. In the U.K., the Conservative party won the election in 1979, following a decade marked by both high inflation and substantial government budget deficits. The Thatcher administration implemented policies aimed at cutting government spending and debt and controlling inflation, which were the subject of ran-

corous disagreement, even within the ruling party. Hence, negotiating a drastic change in the traditional relationship between the government and the Bank of England might have been out of the question. Indexed bonds may have offered a more practical solution.

Canada is another interesting case. Though its economy was stable throughout the 1980s, there was a strong effort to establish price stability as the official, single goal of monetary policy. A legislative initiative to do so was pushed forward by the Conservative administration, though it eventually failed in Parliament in the fall of 1991. The first issuance of indexed bonds immediately followed at the end of 1991.

### Conclusion

The provision of inflation-indexed government bonds appears to be a useful innovation. First, it would provide an indicator of the markets' assessment of the monetary authority's commitment to low inflation when indexed and nominal bonds with matching characteristics coexist, and this could be valuable in aiding short-run monetary policy deliberations. Second, it could play an important role in signaling governments' commitment to policies of low inflation in the future. The existence of indexed bonds adds to the credibility of the commitment, since the government's cost of debt financing automatically escalates in tandem with inflation.

**Chan Huh**  
Economist

### References

- Cukierman, A., S. B. Webb, and B. Neyapti. 1992. "Measuring the Independence of Central Banks and Its Effect on Policy Outcomes." *The World Bank Economic Review* (September) pp. 358-398.
- de Kock, G. 1991. "Expected Inflation and Real Interest Rates Based on Index-Linked Bond Prices: The U.K. Experience." *Federal Reserve Bank of New York Quarterly Review* (Fall) pp. 47-60.
- Hetzel, R. 1992. "Indexed Bonds as an Aid to Monetary Policy." *Federal Reserve Bank of Richmond Economic Review* (January/February) pp. 13-23.
- Shen, P. 1995. "Benefits and Limitations of Inflation Indexed Treasury Bonds." *Federal Reserve Bank of Kansas City Economic Review* (Third Quarter) pp. 41-56.
- Woodward, G. T. 1990. "The Real Thing: A Dynamic Profile of the Term Structure of Real Interest Rates in the United Kingdom, 1982-1989." *Journal of Business*, 63, pp. 373-398.
- Wynne, M. and F. Sigalla. 1993. "A Survey of Measurement Biases in Price Indexes." *Federal Reserve Bank of Dallas Research Paper No. 9340*.