BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM
DIVISION OF MONETARY AFFAIRS

Date: June 5, 2001

To: Mr. Kohn

From: Antulio N. Bomfim

Subject: Deriving Equilibrium Real Interest Rate Measures from Yields on Treasury Inflation-Indexed Securities

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This memorandum summarizes a simple financial-market-based approach to measuring equilibrium values of short-term real interest rates. The equilibrium concept examined here can be thought of as being primarily related to the medium-run dynamics of the economy, a time frame that seems most relevant for the conduct of monetary policy. In particular, while the equilibrium real rate measure discussed below is not intended to capture the full long-run (steady-state) equilibrium of the economy, it is not designed to reflect short-run economic imbalances either. Indeed, such imbalances may well lead the FOMC to temporarily set the intended funds rate at a level consistent with a non-zero spread between the actual and equilibrium real rates.

I use yields on the Treasury's inflation-indexed securities (TIIS) to construct the market-implied measure of the equilibrium real rate. Theory tells us that TIIS yields can be thought of primarily as reflecting market participants' expectations of future real short-term interest rates. As a result, long-dated TIIS yields should reflect investors' views of where real short rates will be after temporary macroeconomic imbalances have worked themselves through. Nonetheless, simply interpreting TIIS yields as the market's perception of the equilibrium real rate could be misleading because investors discount cash flows in the more distant future more heavily than cash flows in the near term. Thus, even long-dated TIIS yields can be more importantly affected by expectations of where real short-term interest rates might be in the very near future than by forecasts of where those rates are expected to settle down in the medium to long term.

One possible approach to circumvent the relatively short-horizons embedded in TIIS yields is to focus only on the long end of the yield curve. For instance, one might look at the forward rate implied by ten- and thirty-year TIIS.[1] Abstracting from term, liquidity, and convexity premiums, such a forward rate would correspond to market participants' expectations of average short-term real interest rates ten to thirty years from now. (While the term premium would make such a forward rate an overestimate of market participants' expectations, the convexity premium would lead to a bias in the opposite direction.)

One can then adjust the TIIS-implied equilibrium real rate for tax and risk premium effects to obtain an estimate of the equilibrium real fed funds rate. The tax effect stems from the fact that interest earned on Treasury securities is tax-exempt at the state level, but earnings in the federal funds market are not. Assuming that investors are taxed at a marginal rate of 11 percent at the state level, which has been roughly the marginal tax rate for New York residents in recent years, I computed a taxable-equivalent equilibrium real rate. This computation took account of the fact that taxes are paid on nominal, rather than real returns. I further adjusted the resulting taxable-equivalent equilibrium real rate further by adding to it the average spread—computed over the 1962-2000 period—between the taxable-equivalent yield on three-month Treasury bills and the (annualized) federal funds rate. I called the resulting series the TIIS-implied measure of the equilibrium real federal funds rate.

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1. The forward rate computation follows the spirit of the approach described in R. Shiller, J. Campbell, and K. Schoenholtz, 1983, "Forward Rates and Future Policy: Interpreting the Term Structure of Interest Rates," Brookings Papers on Economic Activity 1, 173-223.