 Monetary Trends

reported yields. These yields are smoothed by fitting the regression suggested by Nelson and Siegel (1987):

\[ r(t) = a_0 + a_1 \text{e}^{-b_1 t} + a_2 \text{e}^{-b_2 t} + \text{error} \]

and forward rates are calculated from these smoothed yields using equation (a) in table 13.1 of Shiller (1990).

\[ (fn) = \left[ \text{D}(t+n) - \text{D}(t-1) \right] / \left[ \text{D}(t) - \text{D}(t-1) \right] \]

duration where approximation is R = \left(1 - \text{e}^{-b1t}\right) / \left(0 \right)

These ratios are the closest approximations to the true instantaneous forward rates; see Shiller (1990). For a discussion of the use of forward rates as indicators of inflation expectations, see: Sharpe (1997). Real...Eurodollar Futures and Rates on Selected Federal Funds Futures Contracts trace through the years on the three specific contracts. Rates on Federal Funds Futures on Selected Dates display a single-day’s snapshot of yields for contracts expiring in the months shown on the horizontal axis. Inflation-indexed Treasury Securities...are yields on the most recently issued inflation-indexed securities of 10- and 30-year original maturities. Inflation-indexed 10-Year Government Notes show the yield of an inflation-indexed note that is scheduled to mature in approximately but not greater than 10 years. The current French note has a maturity date of 7/25/2013, the current U.S. note has a maturity date of 6/15/1903, and the current U.S. note has a maturity date of 1/15/2005. Inflation-indexed Treasury Inflation-Protected Securities and Inflation-indexed 10-Year Government...spreads equal the difference between the yields on the most recently issued inflation-indexed securities and the standard security yields of similar maturity.

Page 12: Velocity (for MMZ and M2) equals the ratio of GDP, measured in current dollars, to the level of the monetary aggregate. MMZ and M2 Own Rates are weighted averages of the rates received by households and firms on the assets included in the aggregates. Prior to 1982, the 3-month T-bill rates are secondary market yields. From 1982 forward, rates are 3-month constant maturity yields.

Page 13: Real Gross Domestic Product is GDP as measured in chained 2000 dollars. The Gross Domestic Product Price Index is the implicit price deflator for GDP which is defined by the Bureau of Economic Analysis, U.S. Department of Commerce, as the ratio of GDP measured in current dollars to GDP measured in chained 2000 dollars.

Page 14: Investment Securities are all securities held by commercial banks in both investment and trading accounts.

Page 15: Inflation Rate Differentials are the differences between the foreign consumer price inflation rates and year-over-year changes in the U.S. all-items Consumer Price Index.

Page 17: Treasury Yields are Treasury constant maturity notes as reported in the Board of Governors of the Federal Reserve System’s H.15 release.

Sources

Agence France Towere: French note yields.
Bank of Canada: Canadian note yields.
Bureau of Economic Analysis: GDP.
Bureau of Labor Statistics: CPI.
Chicago Board of Trade: Federal funds futures contract.
Chicago Mercantile Exchange: Eurodollar futures.
Congressional Budget Office: Potential real GDP.

Federal Reserve Bank of St. Louis: Adjusted monetary base and adjusted reserves, monetary services index. MZM own rate, own-year forward rates.
Organization for Economic Cooperation and Development: International interest and inflation rates.


References


Note: Available on the Internet at research.stlouisfed.org/publications/review/.

Is the Bond Market Irrational?

Recently, financial commentators and central bankers have labeled the failure of long-term rates to rise in the face of an upward trending federal funds rate a “conundrum.” Because consumption decisions by households and investment decisions by firms depend on long-term interest rates, the ability to control these rates has been considered an important policymaking tool. The implicit assumption is that bond yields ought to react to changes in yields of short-term instruments. In fact, a common benchmark model holds that simple market forces should make long-term interest rates a weighted average of the short-term interest rates expected to prevail during the period covered by the bond. I analyze data on 1- and 10-year bond yields and a notion of the short-term rate controlled by the Fed for the period January 1962-May 2005. I find a number of episodes in which long-term rates failed to adjust to changes in short-term rates. Even similar to those in 2004-05 occurred in 1975-78 and 1986-89. Therefore, although unusual, the recent behavior of long-term rates is far from unprecedented. Scatter plots in the chart show the reaction of both short-term (left panel) and long-term (right panel) bond yields to changes in the Fed target. Each circle corresponds to a change in the Fed target, matched to a bond maturity within a period of five trading weeks. Regression lines capture the average reaction.

One would expect to find circles only in quadrants I and III: Changes in the short-term Fed operating target ought to cause changes of the same sign in bond yields. Moreover, since long-term bond yields should equal weighted averages of current and future short-term rates, such an effect should be stronger on money market instruments than on long-term bonds. The chart shows that short-term interest rates react more to changes in the Fed target than long-term rates do, but, unexpectedly, quadrants II and IV contain many observations. In particular, for more than a third of 204 target changes, the 10-year Treasury note yield moved in the opposite direction of the Fed target.

Should the recent failure of long-term interest rates to react to changes in short-term rates cast a shadow on the prospects of the U.S. economy? An analysis of the data is reassuring. Periods in which there is a concentrated lack of response do not precede any particular phase of the business cycle or specific trends in inflation. Per se, a lack of reaction in long-term yields does not imply an inverted term structure or an impending recession. Moreover, neither the level nor the volatility of interest rates correlates or reacts to periods in which bond markets fail to react. Does this mean that U.S. bond markets are irrational? A simple extension of the benchmark model of the term structure of interest rates recognizes that investors are averse to risks. In this extended model, long-term rates are a weighted average of expected short-term rates plus a compensation for risk. A policy change may then raise current and future expected rates but, at the same time, reassure investors by implying smaller perceived volatilities. In these situations the Fed target and long-term yields may move in opposite directions.

In fact, the data suggest that recent volatility in long-term bond markets has been low, between one-half and one-third of historical levels, exactly what one would expect in a framework in which anti-inflationary hikes of Fed target rates cause compensation for risk to be revised downward. Perhaps this is a virtuous mechanism on which trust in long-run price stability immediately translates into stable bond prices. The recent behavior of U.S. bond markets may rationally reflect markets’ understanding and trust in the Fed’s goal of long-run price stability.

—Massimo Guidolin

Views expressed do not necessarily reflect official positions of the Federal Reserve System.
Definitions
M1: The sum of currency held outside the vaults of depository institutions, Federal Reserve Banks, and the U.S. Treasury; traveler's checks; and demand and other checkable deposits issued by financial institutions (except demand deposits due to the Treasury and depository institutions), minus cash in transit in process of collection and Federal Reserve float.

M2(Mnez): money, narrow maturity
M2 minus small-denomination time deposits, plus institutional money market mutual funds that are included in M2 but excluded from M1. The measure of M2(Mnez) is calculated by Federal Reserve Bank.

M3: M1 plus savings deposits (including money market deposit accounts) and small-denomination (under $100,000) time deposits issued by financial institutions and held in retail money market mutual funds (funds with initial investments under $50,000) net of retirement accounts.

M2plus large-denomination ($100,000 or more) time deposits; repurchase agreements issued by depository institutions; Eurodollars, deposits, specifically,-dollar-denominated deposits due to nonbank U.S. addresses held by foreign offices of U.S. banks worldwide and all banking offices in Canada and the United Kingdom; and institutional money market mutual funds (funds with initial investments of $50,000 or more).

Bank Credit: Unsecured, insured, and noninsured, commercial banks.

Domestic Nonfinancial Debt: Total credit market liabilities of the U.S. Treasury; federal, state, and local governments; households, and nonfinancial firms. End-of-period basis.

Adjusted Monetary Base: The sum of currency outside depository institutions and demand deposits held by depository institutions; and the adjustment for the effects of changes in statutory reserve requirements on the quantity of base money held by depositories. This series is a simple chain index; see Anderson and Rauscher (1996, 2001, 2003).

Adjusted Reserves: The sum of vault cash and Federal Reserve Bank deposits held by depository institutions and an adjustment for the effects of changes in statutory reserve requirements on the quantity of base money held by depositories. This spliced chain index is numerically larger than the “Bank of Governors” measure, which excludes cash and credit to satisfy statutory reserve requirements and Federal Reserve Bank deposits used to satisfy required clearing balance contracts; see Anderson and Rauscher (1996, 2001, 2003).

Monetary Service Index: An index that measures the flow of monetary services received by households and firms from their holdings of liquid assets; see Anderson, Jones, and Neumann (1997). Indexes are shown for the assets included in M2, with additional data at research.stlouisfed.org/economist.html.

Note: M1, M2, M3, Bank Credit, and Domestic Nonfinancial Debt are constructed and published by the Board of Governors of the Federal Reserve System. For details, see Statistical Supplement to the Federal Reserve Bulletin, tables 1.21 and 1.20. M2(Mnez), Adjusted Monetary Base, Adjusted Reserves, and Monetary Service Index are constructed and published by the Research Division of the Federal Reserve Bank of St. Louis.

Notes
Page 3: Readers are cautioned that, since early April 1994, the level and growth of M1 have been depressed by retail sweep programs that redirect transactions deposits (demand deposits and other checkable deposits) as savings deposits (now called savings deposits) by reducing bank’s required reserve reserve; see Anderson and Rauscher (2003) and research.stlouisfed.org/агрегаты/wiki.html. Primary Credit Rate, Discount Rate, and Included Federal Funds Rate shown in the chart Reserve Market Rates are plotted as of the date of the change, while the Effective Federal Funds Rate is plotted as of the end of the month. Interest rates in the table are monthly averages of the Board of Governors' (H15 Statistical Release). The Treasury Yield Curve shows constant maturity yields calculated by the U.S. Treasury for securities with 3 months and 1, 2, 3, 5, 7, and 10 years to maturity. Daily and data descriptions are available at research.stlouisfed.org/fred2.
Inflation and Inflation Expectations

The shaded region shows the Humphrey-Hawkins CPI inflation range. Beginning in January 2003, the Humphrey-Hawkins inflation range was reported using the PCE price index and therefore is not shown on this graph. See notes on page 19.

Treasury Security Yield Spreads

Yield to maturity

Real Interest Rates

Percent, Real rate = Nominal rate - CPI inflation

Gross Domestic Product

Percent change from year ago

Dashed lines indicate 10-year moving averages.

Real Gross Domestic Product

Percent change from year ago

Dashed lines indicate 10-year moving averages.

Gross Domestic Product Price Index

Percent change from year ago

Dashed lines indicate 10-year moving averages.

M2

Percent change from year ago

Dashed lines indicate 10-year moving averages.