

May 14, 1982

## Interest Rates: How Much Is Real?(I)

Proper implementation of monetary policy requires an evaluation of whether private markets perceive policy as being too tight, too easy, or about right. For example, what does the current environment of exceptionally high nominal interest rates imply about monetary policy? If those high rates are due to high and rising inflation expectations, the markets may believe that monetary policy is too easy. On the other hand, if high market rates are due to high real rates, monetary policy may be too tight. In this and next week's *Weekly Letters*, we evaluate developments in the stock and bond markets in an attempt to determine how financial markets view high long-term interest rates—in terms of high inflation expectations or high real rates.

For the purpose of this analysis, we will define the real interest rate as equal to the market interest rate when the expected rate of inflation is zero. If the expected inflation rate is positive, then the real interest rate would equal the nominal rate when the principal (and coupon) value of the underlying security is indexed to the price level. On this basis, the real interest rate would equal the market rate less the expected inflation rate—the latter including any risk factors resulting from the failure to realize the expected inflation rate.

Inflation risk is not symmetrical between suppliers and demanders of corporate debt. Corporations who sell bonds face the risk that the actual rate of inflation will be less than they had expected, so that they may pay too high a rate. They have some protection against this risk from the "call" provision, i.e. repaying debt before maturity. But bond purchasers, unlike sellers, face the potential risk that the actual rate of inflation will exceed the expected rate, so that they may receive too low an interest rate in compensation. There is no parallel to the seller's call provision to protect buyers from this risk. As a result, the demand for corporate bonds tends to fall with

a rise in inflation risk, which simultaneously raises the inflation-risk premium in interest rates and reduces the volume of transactions.

Inflation risk should be added to the inflation premium rather than the real interest rate because it has opposite implications for monetary policy. If real interest rates go up because of a shortage of liquidity or increased business-cycle risk, monetary policy may be too tight and probably should be eased. On the other hand, if interest rates go up because of rising inflation risk, monetary policy may be too easy and probably should be tightened.

### Short-term rates...

Short-term real interest rates are relatively easy to determine because of the relative ease of measuring short-run (6 to 12 month) inflation expectations.

- The actual inflation rate of the last 6 to 12 months is a good proxy for the expected inflation rate over the next 6 to 12 months.
- Because of the lags between monetary-policy changes and inflation, past money growth will be the dominant factor in influencing inflation over the next 6–12 months.
- Major supply-side shocks, such as sharp oil-price increases, can affect the general price level relatively predictably over the subsequent 6–12 months.

### ...and long-term rates

Real interest rates on long-term securities—our primary focus here—are more difficult to measure because of the lack of any clear-cut way to measure long-run inflation expectations. First, there is no necessary link between past inflation and the expected inflation rate over the next 5 to 15 years. Second, future—not past—monetary policy will determine the rate of inflation over periods of that length.

Given the substantial theoretical and empirical problems involved in measuring long-run inflation expectations, it may be useful to measure real long-term interest rates more

Research Department  
Federal Reserve  
Bank of  
San Francisco

Opinions expressed in this newsletter 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.

---

directly—perhaps through the stock yield (current dividend divided by current stock price). In the economics literature, the stock yield is sometimes used for this purpose because stock ownership is a claim on a corporation's real property. Generally, however, financial analysts believe it is inappropriate to compare stock and bond yields, because bond yields measure the total return to bonds, while stock yields measure only a part of the total return to stocks, the remainder including growth expectations for future earnings and dividends. But yield comparisons would be valid if we could treat stock yields as a proxy for *real* yields, in the same way that bond yields measure normal *market* yields. That would be reasonable where changes in the expected inflation rate lead to proportional changes in the expected growth of dividends. When the value of an investor's holdings is roughly indexed to inflation, the current stock yield would not need to rise with inflation expectations or inflation risk.

#### **Dividends and inflation**

Expected dividend growth reflects, first, expected real growth, i.e., the volume of real sales projected in the future. Second, it reflects the price at which those sales will be transacted, i.e., the expected inflation rate. For the economy as a whole, the expected real growth rate is relatively stable and changes only slowly. However, inflation expectations are high and can change rapidly, so we can assume that changes in dividend expectations will be dominated by changes in inflation expectations. Three separate pieces of evidence support the proposition that they move proportionally, which means that the stock yield is a real yield.

The divergence between industrial and utility stock yields during the recent period of inflation strongly supports this thesis (see chart). The S&P bond yield increased from 3 percent to 4 percent in the mid-1950's, remained relatively stable until 1965, and then gradually rose again with the actual and expected rate of inflation. The industrial-stock yield declined from 4 percent to 3 percent in the

mid-1950's and then fluctuated in a narrow range around 3 percent until 1973. However, the utility-stock yield generally moved closely in line with the industrial-stock yield until 1965—a period of low and stable expected inflation—but then moved with the bond yield as the expected inflation rate rose after 1965. This divergent behavior on the part of the two stock yields reflects the money illusion exhibited by public-utility commissions at least until 1973. (See our article in the Spring 1976 issue of the *Bell Journal of Economics*.) When the expected inflation rate went up, commissions refused to permit regulated utilities to obtain higher growth of nominal earnings and dividends. As a result, utility stocks behaved just like bonds, with a parallel drop in prices and parallel rise in yields to reflect higher inflation expectations. The typical, unregulated industrial corporation did not suffer from this problem, however, so that industrial-stock yields as a group did not incorporate an inflation premium.

Second, if a stock yield is free of inflation expectations, it measures the real return on equity and thus moves roughly in line with the real return on other securities. We find evidence of this in the significant degree of correlation between monthly changes in stock yields and the real Treasury-bill rate during the 1970's.

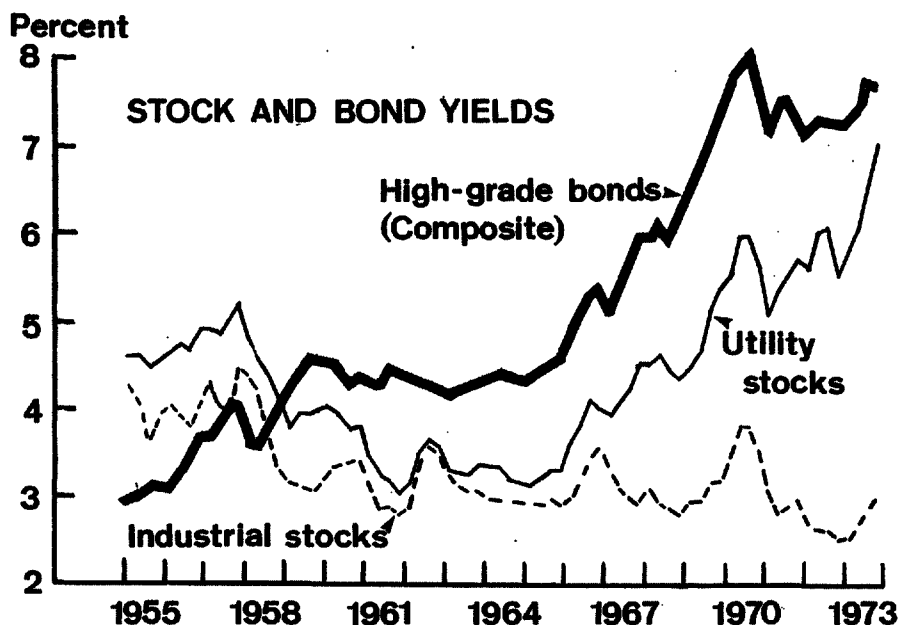
Third, we have at least indirect evidence of a parallel movement in dividend expectations and inflation expectations. Actual dividend growth has moved in line with the actual inflation rate since inflation started to accelerate in 1965. Furthermore, the return to equity multiplied by earnings retention (earnings minus dividends)—a good measure of internally-generated earnings growth—has risen roughly in line with the inflation rate over time. On this basis, the total return to stocks (current yield plus expected dividend growth) has increased from about 7 percent in the first half of the 1960's, when the inflation rate was low and stable, to almost 18 percent in the early 1980's, when the inflation rate reached double digits.

## Measure of real rates

All of these tests independently make the same point: stock yields are a measure of real rates, just as bond yields are a measure of nominal rates. This does not mean that stock yields will always move in line with real bond yields, because stock yields are more sensitive to business-cycle risks and probably have a higher average value than real bond yields. However, relative stability in stock yields would suggest parallel stability in the real yields on bonds.

Our analysis thus suggests that (1) changes in stock yields are a good indication of changes in real interest rates and of changes in business-cycle risk, and (2) changes in bond yields relative to stock yields are a good indication of changes in inflation expectations and inflation risk. In our next *Weekly Letter*, we will evaluate the information content of current stock and bond yields to determine what the financial markets see as the major current risks in the economy.

**Michael W. Keran**



# FIRST CLASS

Alaska • Nevada • Oregon • Utah • Washington  
Idaho • California • Hawaii

## San Francisco Bank of Federal Reserve Research Department

FIRST CLASS MAIL  
U.S. POSTAGE  
PAID  
PERMIT NO. 752  
San Francisco, Calif.

### BANKING DATA—TWELFTH FEDERAL RESERVE DISTRICT (Dollar amounts in millions)

Selected Assets and Liabilities Large Commercial Banks	Amount Outstanding 4/28/82	Change from 4/21/82	Change from year ago	
			Dollar	Percent
Loans (gross, adjusted) and investments*	159,543	313	11,281	7.6
Loans (gross, adjusted) — total #	138,559	678	12,590	10.0
Commercial and industrial	42,653	164	5,338	14.3
Real estate	57,132	27	5,139	9.9
Loans to individuals	23,504	77	559	2.4
Securities loans	2,346	203	854	57.2
U.S. Treasury securities*	6,014	352	540	8.2
Other securities*	14,970	13	748	4.8
Demand deposits — total#	37,262	2,310	3,336	8.2
Demand deposits — adjusted	26,694	1,388	2,276	7.9
Savings deposits — total	30,401	994	91	0.3
Time deposits — total#	91,945	1,191	14,719	19.1
Individuals, part. & corp.	82,587	1,168	14,433	21.2
(Large negotiable CD's)	33,887	840	3,625	12.0
<b>Weekly Averages of Daily Figures</b>	<b>Week ended 4/28/82</b>	<b>Week ended 4/21/82</b>	<b>Comparable year-ago period</b>	
<b>Member Bank Reserve Position</b>				
Excess Reserves (+)/Deficiency (-)	102	35	32	
Borrowings	105	198	330	
Net free reserves (+)/Net borrowed(-)	3	163	298	

\* Excludes trading account securities.

# Includes items not shown separately.

Editorial comments may be addressed to the editor (William Burke) or to the author . . . Free copies of this and other Federal Reserve publications can be obtained by calling or writing the Public Information Section, Federal Reserve Bank of San Francisco, P.O. Box 7702, San Francisco 94120. Phone (415) 544-2184.