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Federal Reserve
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September 23, 1977

Business & Financial Letter

# Taxes, Inflation, Interest Rates

The pain of paying taxes often seems unbearable when part of the interest on savings that you've managed to squirrel away after taxes must also be turned over to Uncle Sam. And if paying direct taxes on interest isn't bad enough, there's also the inflation tax to be paid on the small remainder. Of course, on the other side of the ledger are the write-offs in interest payments on your home and various other consumer goods. But taken together, the effects of inflation and taxes could readily lead a person to ask. "Why Save?"

One cannot think long about interest rates without pondering the effects of these factors. Indeed, as early as 1896, Irving Fisher formalized the relationship between inflation and interest rates with the famous Fisher Hypothesis: that nominal interest rates should reflect a real component that is independent of the rate of inflation and an inflation component that incorporates both borrowers' and lenders' expectations of inflation. Higher expected inflation brings higher interest rates and lower expected inflation brings lower rates. When inflation is expected to rise, lenders will demand more interest dollars to protect the purchasing power of their sacrifice in current consumption.

In Fisher's day, inflation was an occasional problem, but income taxes were essentially nonexistent. Hence, Fisher focused on the inflation premium in rates, while ignoring tax effects. But because income taxes are now a way of life, newer theories of interest rates have taken a hard look at the added impact of taxes.

**Are interest rates high?**

Viewed in historical perspective, nominal interest rates today are high. But are interest rates really high after taking taxes and inflation into account? In looking at the record it is important to use a "riskless" rate of interest—one that measures the time value of money only and abstracts from additional risk factors. The three-month Treasury bill rate provides a close approximation, for T-bills are nearly free of default risk and they can be "rolled over" to produce a continual investment. (Instruments such as longer-term corporate bonds often return higher rates, but the higher yield should not be confused with the pure interest rate because it reflects added factors, such as the expected future path of short-term rates and liquidity and default-risk premia.)

The nominal rate of interest on T-bills has trended upward over the past two decades (see chart). But now consider the nominal rate after taxes, calculated on the basis of a marginal income-tax rate of 33 percent. The yield now is much lower, and more important, the basis-point gap between the nominal before-tax and after-tax yields is directly proportional to the level of

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the nominal rate. In other words, the tax bite is larger in absolute terms when nominal yields are higher.

Finally, consider what the T-bill rate looks like after taxes *and* inflation. Deducting the actual rate (as measured by the consumer price index) from the after-tax yield, we obtain an *after-tax real rate of interest,* which is often negative, especially in recent years. If we were to use the rate on passbook savings accounts in place of the T-bill rate, the story would be even worse, because of the rate ceilings imposed on savings in that form. Although savers may have expected somewhat higher after-tax real rates (because they expected less inflation), such rates turned out to be anything but high.

**Double-edged inflation tax**

The inflation premium hypothesized by Fisher is a major factor in interest rates—but the income tax then introduces an additional variable. Furthermore, with higher rates of inflation, and hence higher inflation premia, income taxes take on added significance because they tax the inflation premium as well as the real return.

Taxes will amplify the effect of inflation on interest rates. To see this, suppose borrowers and lenders are subject to the same 33-percent marginal tax rate, with interest payments deductible for borrowers but interest income taxable for lenders. Assume that both borrowers and lenders are satisfied with a 1-percent (riskless) real after-tax interest rate. Then, if (expected) inflation is 5 percent, without taxes, borrowers and lenders should be satisfied with a 6-percent rate. But with taxes, they should both be willing to agree on a 9-percent rate. The borrower would be able to write off the 9-percent interest payment, thereby receiving one-third back from the government and effectively paying 6 percent after taxes, while the lender would pay one-third of the 9-percent rate in taxes so that his after-tax yield would also be 6 percent. With taxes, therefore, a change in the inflation premium (to 5 percent in the example) should result in an amplified change in the nominal interest rate (to 9 percent in the example).

Recent theories of interest rates have added tax effects to Fisher's early analysis, and have hypothesized the kind of amplified relation between inflation and interest rates illustrated above. According to these theories, the T-bill rate should be somewhere around 9 percent today, when in fact it is only about 6 percent. Why are rates so low? One reason may be that higher levels of uncertainty that often accompany higher inflation tend to increase saving in the short term. Such increased saving tends to have a negative impact on interest rates, and thereby offsets part of the positive impact that a rise in expected inflation has on rates. Also, tax effects elsewhere in the economy—such as the deferral of income taxes by pension funds and retirement plans—tend to keep

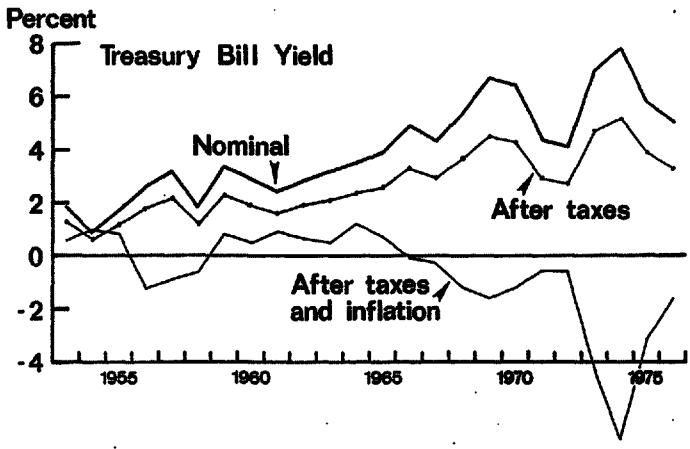
market rates from reflecting the full impact of taxes. Finally, institutional incentives to hold T-bills and interest-rate ceilings on savings deposits, tend to limit increases in these rates.

**Implications for savers**

Households today, particularly those with small amounts of savings, find it nearly impossible to receive a positive rate of interest—after inflation and taxes—without investing in riskier longer-term securities. Even then, their after-tax real yields are not very high. For the same reason that it pays tax-sheltered plans to invest in interest-earning securities, it pays individuals to invest their non-tax-sheltered dollars in commodities such as antiques and works of art—and most important, homes. Interest payments for such items are tax-deductible, service flows are essentially nontaxable "income," and capital gains are taxed at the capital-gains rate (and are sometimes avoided altogether). The accelerating appreciation in the value of homes, for which capital-gains taxes are easily deferred, is certainly attributable in part to present tax laws.

In a period of high rates of inflation, existing tax policy tends to discourage traditional forms of savings. Although tax-sheltered retirement plans provide viable alternatives for some persons, acquisition of physical assets becomes increasingly attractive. Removing incentives for such distortions is a complex task. The most obvious solution would be to reduce the rate of inflation. Another solution would be to revamp the tax system so that the inflation returns on physical and financial assets receive more comparable treatment—admittedly, a long-term proposition because of all the practical difficulties involved in tax reform. Such tax changes would lessen some of the problems caused by inflation, but they should be followed in parallel with increased attempts to reduce the rate of inflation.

**Jack Beebe**



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## BANKING DATA—TWELFTH FEDERAL RESERVE DISTRICT

(Dollar amounts in millions)

| Selected Assets and Liabilities Large Commercial Banks | Amount Outstanding 9/7/77 | Change from 8/31/77 | Change from year ago Dollar | Change from year ago Percent |
|---|---|---|---|---|
| Loans (gross, adjusted) and investments* | 101,069 | + 1,159 | + 11,579 | + 12.94 |
| Loans (gross, adjusted)—total | 78,449 | + 1,112 | + 10,632 | + 15.68 |
| Security loans | 2,748 | + 1,038 | + 1,137 | + 70.58 |
| Commercial and industrial | 23,722 | + 37 | + 1,925 | + 8.83 |
| Real estate | 25,290 | + 78 | + 4,617 | + 22.33 |
| Consumer instalment | 13,660 | + 27 | + 2,062 | + 17.78 |
| U.S. Treasury securities | 8,347 | − 71 | − 680 | − 7.53 |
| Other securities | 14,273 | + 118 | + 1,627 | + 12.87 |
| Deposits (less cash items)—total* | 98,588 | + 384 | + 9,693 | + 10.90 |
| Demand deposits (adjusted) | 28,171 | − 60 | + 2,667 | + 10.46 |
| U.S. Government deposits | 411 | + 198 | + 23 | − 5.93 |
| Time deposits—total* | 67,981 | + 9 | + 6,507 | + 10.58 |
| States and political subdivisions | 5,270 | − 31 | − 108 | − 2.01 |
| Savings deposits | 31,713 | + 9 | + 4,591 | + 16.93 |
| Other time deposits‡ | 28,959 | + 0 | + 2,382 | + 8.96 |
| Large negotiable CD's | 11,382 | + 92 | + 564 | + 5.21 |

| Weekly Averages of Daily Figures | Week ended 9/7/77 | Week ended 8/31/77 | Comparable year-ago period |
|---|---|---|---|
| **Member Bank Reserve Position** | | | |
| Excess Reserves (+)/Deficiency (−) | + 91 | + 58 | − 16 |
| Borrowings | 35 | 124 | 4 |
| Net free(+)/Net borrowed (−) | + 56 | − 66 | − 20 |
| **Federal Funds—Seven Large Banks** | | | |
| Interbank Federal fund transactions | | | |
| Net purchases (+)/Net sales (−) | − 52 | − 146 | − 730 |
| Transactions with U.S. security dealers | | | |
| Net loans (+)/Net borrowings (−) | + 359 | + 576 | + 337 |

*Includes items not shown separately. ‡Individuals, partnerships and corporations.

**Editorial comments may be addressed to the editor (William Burke) or to the author. . . . Information on this and other 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) 544-21184.**