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Why Are Real Interest Rates So High?

The very high level of real interest rates on long-term bonds in recent years may be largely the result of a substantial increase in the volatility of bond prices. In **Why Are Real Interest Rates So High?** *NBER Working Paper No. 1141*, authors **Zvi Bodie**, **Alex Kane**, and **Robert L. McDonald** argue that the greater volatility of bond prices has caused investors to demand a higher risk premium on long-term debt instruments.

The behavior of real interest rates and the very flat term structure of rates over the last few years have been a major puzzle. Throughout the 1970s, analysts assumed that historically high nominal interest rates simply reflected rising inflation, and that real interest rates were still at their relatively low historic levels. But nominal rates remained high and climbed even higher as inflation declined in the early 1980s. As a result, real rates rose to extremely high levels. Many analysts have argued that long-term rates remained high because long-term inflation expectations, which cannot be measured, stayed high.

Bodie, Kane, and McDonald offer a different explanation. As they see it, a significant portion of the rise in long-term real rates is caused by the risk premium on long-term bonds, which apparently resulted from an increase in the volatility of interest rates after the Federal Reserve changed its operating procedures in October 1979. The three economists arrive at their conclusion by examining bond prices in the context of the "capital asset pricing model." In rudimentary terms, the model says that assets are priced so that the mean expected return is commensurate with their risk as measured by their covariance with the return on the market. As risk rises, price falls until the mean

expected return reaches the appropriate level. With bonds, as the volatility of interest rates rises, so does their covariance with the market, and the *average* level of interest rates should rise as well to compensate investors for the greater risk.

The capital asset pricing model has become the standard financial model of the capital market equilibrium, but the authors believe theirs is the first effort to use it to explain macroeconomic phenomena. Standard macro approaches do not account for the possibility that changes in variability of the return on bonds can affect real rates and do not explain shifts in the term structure of rates. Bodie, Kane, and McDonald's empirical results do not explain the high level of real short-term rates, but they do explain high long-term rates quite well.

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In estimating the risk premiums on different classes of assets, the capital asset pricing model uses the covariance between returns on one class and returns on a portfolio of all assets. Bodie, Kane, and McDonald restrict to ten the classes of assets they study: stocks, Treasury bills, and bonds with durations of one through

eight years. Duration is very different from maturity. It is the length of time until the average payment to bondholders occurs, while maturity is the time when the last payment is made. The distinction can be crucial when comparing assets with different payment streams. As interest rates and yields rise, more of the total payments of a bond are spread over the annual interest payments, and duration declines.

The authors estimate the covariances of the ten assets using monthly real rates of return. The accuracy of variance and covariance estimates is improved by using frequent observations, and monthly periods are the shortest ones for which inflation data are available. The measure of inflation they use is the consumer price index excluding the cost of shelter. The periods studied are January 1973 to September 1979 and January 1980 through December 1981. The break point between the two—the fourth quarter of 1979—is when the Fed changed its operating procedures.

The standard deviation of returns on stocks and Treasury bills changed very little from the first period to the second. But the standard deviation of returns on bonds increased dramatically. In the case of the longest bonds, the increase was fourfold, and the standard deviation of returns in the later period actually exceeded the standard deviation of returns on equities.

Next, Bodie, Kane, and McDonald use a matrix of covariances to compute risk premiums for each class of assets. The results are striking. The increase in the variability of returns on long-term bonds from the 1970s to the 1980s raises the risk premium—or the required real rate of return—by at least 110 basis points and possibly by 700 basis points or more. (The actual amount of increase depends on the level of aggregate risk aversion among investors, a factor that cannot be measured.) However, the results also show that the risk premium on short-term debt instruments actually declined in the later period. Thus, changes in covariances cannot explain the increase in real short-term rates.

Bodie, Kane, and McDonald interpret the results as consistent with the supposition that the Fed's tightening after October 1979 pushed up short-term real rates for conventional reasons. The tightening may also have reduced long-term inflation expectations, but the increase in the risk premium on long-term bonds more than offset any reduction in the inflation premium.

Finally, the authors use their results to examine the potential impact on capital formation of changes in government debt management. An important strand in macroeconomic thought for the last 20 years has been that the government, by manipulating the maturity mix of its debt, can affect relative yields on long- and short-term instruments and, more important, the required return on equity. The covariance estimates indicate that any power of the government's to alter capital costs has increased in

the 1980s. The covariance between stocks and long-term bonds increased in the later period. Since the covariance is higher, a change in the supply of long-term bonds should have a greater effect on required returns on both bonds and equities. Even so, the estimates indicate that a rather large shift in the term structure of government debt would reduce the risk premium on equity by no more than 15 basis points.

AE

Delayed Childbearing and Permanent Childlessness

During the 1970s, the number of American women having their first child declined relative to previous decades. In **What Are the Determinants of Delayed Childbearing and Permanent Childlessness in the United States?** *NBER Working Paper No. 1140*, David E. Bloom and T. James Trussell ask whether this development is explained by a trend to delay childbirth, or by an increase in permanent childlessness, or both. The answer, they find, is "both." They also ask: what are the characteristics of the women who are delaying childbirth or choosing to remain permanently childless? They find that education is the most important factor, while race, religion, and place of residence as a child (urban versus rural) have little effect.

The authors use three different sets of data: the National Survey of Family Growth; the National Longitudinal Survey of Young Women, 14-24; and the Current Population Survey. The first involves personal interviews with 8611 women age 15-44 in 1976. The second survey has been conducted yearly since 1968, starting out with 5159 women age 14 to 24; Bloom and Trussell use 1978 data. The third is a nationwide sample survey of about 60,000 households conducted monthly by the Bureau of the Census; the authors consider June 1980 figures. The results of the analysis prove "remarkably consistent" across the three data sets.

Bloom and Trussell find, for example, that delayed childbearing is less prevalent among black women than among nonblack women. Also, the higher a woman's level of education, the more likely she is to delay having a child. This is especially true for women who have continued their education beyond high school.

The impact of education, which tends to raise the age at which a woman first gives birth, is particularly strong for groups of younger women—those in their twenties versus those in their thirties, for instance. So, Bloom and Trussell conclude, the importance of education is growing in the decisions of women to

delay having a first child. Education, then, has a two-fold effect: more women pursue higher education and their childbearing patterns reflect its importance more.

The authors also find that as the level of education of women increases, the age at which they have their first child is more likely to vary across women. This "heterogeneity of age" for women giving birth for the first time is greater among younger women than older women. Members of these younger groups of women are more likely to have babies either as teenagers or when they are in the 30- to 35-year age bracket than the older groups of women who tended to have their first child between the ages of 20 and 25. Among older women who have had their first child, one in four (25 percent) gave birth when 25 to 34 years old; among the younger cohorts, one in three (33-1/3 percent) had (or are projected to have) their first child in that more senior age bracket.

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Race, it turns out, has an insignificant effect on childlessness if education and other factors are taken into account. However, since black women have a lower level of education than nonblack women on average, they are more likely to have children than are nonblack women.

Just as with delayed childbirth, permanent childlessness is more likely among women with higher levels of education than others. This is strikingly the case for the younger cohorts, whereas there is almost no indication of this being the case for women 35 years old at the time of the various surveys. Projections in this study indicate that some 25 percent of women around 25 years old in 1980 will remain childless. That percentage is closer to 10 percent for those in the considerably older groups. DF

The Effect of Housing Subsidies

In *NBER Working Paper No. 1161, Housing Subsidies: Effects on Housing Decisions, Efficiency, and Equity*, Research Associate **Harvey S. Rosen** analyzes two housing policies: the implicit subsidy in the federal income tax code and the provision for

low-income housing for families at below-market cost. After surveying the literature and doing empirical work, Rosen concludes that these policies have led to a level of consumption of housing that is not efficient and probably to a distribution of income that is less equal than otherwise.

"The income tax treatment of owner-occupied housing and the public provision of low-income housing have substantially increased the consumption of housing services."

There are six provisions in the federal income tax code that involve housing: (1) exclusion of net imputed rent (for owner-occupied homes); (2) deduction of mortgage interest; (3) deduction of local property taxes; (4) deferral of capital gains on home sales; (5) one-time exclusion of up to \$125,000 in capital gains on home sales for those age 55 or older; and (6) exclusion of interest from tax-exempt mortgage bonds. Rosen estimates that the taxation of net imputed rent alone would decrease the average incidence of owner-occupied housing by 4.4 percent. It would also "tend to distribute income away from high-income groups, although at the very bottom end of the scale, disposable incomes would fall by small amounts."

All six tax provisions combine to lower the cost of owner-occupied housing relative to renting. Rosen reports that "about one-fourth of the 16 percent increase in home ownership between 1945 and 1974 can be attributed to . . . tax factors." Moreover, according to estimates of the Congressional Budget Office, if all of the tax preferences associated with housing (except the inclusion of imputed rent) were eliminated, it would be possible to lower all personal marginal tax rates by 10 percent without sustaining any revenue loss.

Housing assistance programs, the largest of which is the provision of public housing, began in 1937. Although such programs are well entrenched, the United States relies far more heavily on the private housing market than, for example, its European counterparts do. Nonetheless, a projection by the Congressional Budget Office for 1982 estimated that the federal government would spend nearly \$10 billion on a variety of programs for low- and moderate-income households.

Public housing programs have come under attack for producing housing services inefficiently. One study of these programs finds the ratio of the market value of public housing to its resource cost to be 0.82. On the consumption side, the program has

stimulated housing demand. One study shows that "on average, the subsidy increased housing consumption by about 95 percent over what it would have been otherwise." However, some estimates indicate that a shift away from public housing to an equivalent cash grant would lower total costs by about 34 percent.

In conclusion, Rosen states, "There appears to be

widespread agreement that in the United States the income tax treatment of owner-occupied housing and the public provision of low-income housing have substantially increased the consumption of housing services. In the process, economic efficiency has decreased." Finally, the tax provisions cited in the paper appear to have led to a more unequal distribution of income than would have existed otherwise.

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