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Social Security and Labor Supply Incentives

"The Social Security program on net in the past has provided a large subsidy to labor supply, which for many people effectively offset the personal income tax," according to Research Associate **Roger H. Gordon**. That subsidy has been declining steadily over time, though, Gordon adds in *NBER Working Paper No. 986, Social Security and Labor Supply Incentives*.

It is well known that certain aspects of the Social Security program, along with the personal income tax, can affect an individual's incentive to work for an extra dollar. In his paper, Gordon sets out to estimate the extent of this effect; he calls his measure the net tax rate on labor supply. Every additional dollar earned is reduced by the worker's marginal income tax rate and (in most cases) the Social Security payroll tax. On the other hand, higher current earnings result in higher future Social Security benefits; this acts as a subsidy to labor supply.

If the worker is already collecting Social Security benefits, then he faces an earnings test: every dollar earned over \$5500 (as of the 1981 law) reduces benefits by 50 cents. But the system provides an actuarial adjustment: if current benefits are reduced because of earnings in excess of \$5500, then future benefits will be increased.

Gordon considers all of these factors in calculating the net tax rates, at various points in their lives, for male and female workers and their spouses born in 1910, 1920, and 1940. He finds, first, that Social Security provides a net subsidy to labor supply throughout the individual's working life. That is, until a worker reaches age 65, his net tax rate is less than his personal tax rate (for most workers). The subsidy rate

from Social Security is scheduled to drop dramatically from 1975 to 1985, though, as a result of the 1977 amendments to the system.

Gordon further finds that for the sample group turning 65 in the year 2005, the subsidy will have disappeared (mostly) for those who receive both worker's and spouse's benefits, and there will be a net tax on those who receive only worker's benefits. According to his calculations, female workers fare slightly better than male workers in terms of their net tax or subsidy, but in all cases workers face a net tax at age 65. The net tax after age 65 for married men with working wives was quite small prior to 1977 but has risen substantially since then. For single workers, the tax rate after age 65 was and still is very high.

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Another observation is that, since 1977, the Social Security law has provided an incentive to postpone registering for benefits until age 65. That is, the gain from higher future benefits outweighs the loss in current benefits. Finally, Gordon finds that eliminating the earnings test and the actuarial adjustment (of unused benefits to be paid in the future) leads to lower tax rates in general and a smoother distribution of tax rates across age groups.

Federal Reserve Policy, Interest Rate Volatility, and the U.S. Capital Raising Mechanism

When interest rates bounce about like a rubber ball, does this impair the ability of the nation's financial markets to raise money for long-term investments in plant and equipment modernization or expansion? That's the basic question examined by NBER Research Associate **Benjamin M. Friedman** in *Working Paper No. 917, Federal Reserve Policy, Interest Rate Volatility, and the U.S. Capital Raising Mechanism*. His answer is, yes. Increased volatility probably has led nonfinancial corporations to finance less of their external funds requirements at long term than they would otherwise have done. It probably also has prompted underwriters of high-grade corporate bonds to increase the spread of yield on typical new issues over the prevailing market yield on comparable bonds already outstanding. In this way, the underwriters protect themselves to some degree from rapid changes in the prices of new bonds they hold but have not yet sold. But there is little firm basis to conclude, at least from this research, that the increased volatility in particular has yet affected investors' portfolio behavior in the bond market.

Since the Federal Reserve System instituted a new monetary policy on October 6, 1979, the nation's financial markets have seen much greater interest rate volatility. When Congress first established the Fed in 1913, acting in response to a history of financial market disorders that had periodically depressed business activity, it charged the new central bank "to provide an elastic currency" to accommodate the economy's financing needs. That prescription led the Fed, through most of its existence, to pursue a policy aimed at stabilizing interest rate movements. By 1970, however, an era of rapid and volatile price movements had become apparent. In response, the Fed shifted from focusing its monetary policy on nominal interest rates to targeting growth rates for selected monetary aggregates—including especially the narrow money supply. There was some increase in short-run interest rate volatility. Still, volatility remained limited, in part because the Fed used a short-term interest rate (the federal funds rate—the interest rate commercial banks charge each other when one lends surplus reserves to another that is short of reserves) as the instrument by which it sought to control the monetary aggregates.

Under this procedure, however, the Fed often missed its targets, and, according to critics, worsened the business cycle. So on that October weekend it decided to use the quantity of nonborrowed bank reserves—not interest rates—as the instru-

ment for controlling the monetary aggregates. The result was an immediate and sharp increase in the short-run volatility of short-term interest rates. In addition, Friedman notes, the short-run volatility of long-term interest rates increased. Indeed, the amplitude of interest rate swings during the one-and-a-half business cycles that have occurred since October 1979 has been unprecedented in U.S. financial experience. Moreover, the volatility of interest rates over shorter time horizons—month-to-month, day-to-day, and even within the trading day—has increased dramatically.

Friedman points out that if this volatility had purely financial effects without any nonfinancial counterparts, it would hardly constitute grounds for choosing one monetary policy framework over another. But what if increased volatility impairs the market mechanism for raising long-term capital for business fixed investment? "If true," he writes, "that would be a very important effect indeed. The U.S. economy's capital markets are unique in their ability to provide borrowers with long-term funds. The nonfinancial corporate business sector in particular relies heavily on external funds to finance its investment in new plant and equipment, and historically the great bulk of such external funds have come from borrowing at long term. Especially now that increased physical capital formation to spur the U.S. economy's productivity and international competitiveness has become a widely accepted goal of public policy, any significant erosion of the market system's ability to provide the requisite financial capital would present cause for serious concern."

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Because of the short time span since the 1979 change in policy and substantial changes in many relevant factors, Friedman does not attempt to find an answer to this issue by looking at actual physical investment and other nonfinancial economic activity. Rather, he focuses on the long-term capital raising mechanism.

In a first section, Friedman seeks to determine whether U.S. nonfinancial business corporations have raised less of their external funds in the form of long-term debt since the period of interest rate volatility. To do this he constructs a model that explains the data on corporate bond financing before October 1979. Then he checks to see if the model explains the data after that date. The answer is that it does. Since October 1979, business reliance on short-term debt has been unusually high, both absolutely and in

comparison to the model's predictions. Friedman concludes that interest rate volatility has probably had something to do with this shift.

In a second section, Friedman examines whether corporations have had to pay more for the underwriting and initial distribution of long-term debts since October 1979 because of the new interest rate volatility. He finds that the spread between the yields at which investment banking syndicates buy new securities from issuers and sell them to investors has remained essentially fixed for many years (on issues priced by negotiation at \$8.75 per \$1000 of par value) and usually varies for largely independent reasons on issues priced by competitive bidding. However, the spread between the yield (price) at which underwriting syndicates sell new bond issues to investors and the yield (price) at which comparable issues already outstanding are then traded has increased, on average, from minus 4 basis points before October 1979 to plus 38 basis points thereafter. (A basis point is one-hundredth of 1 percent.) This spread survives various adjustments for tax and other effects made by Friedman.

In a third section of the paper, Friedman seeks to determine whether the pattern of distribution of long-term corporate borrowing has changed since October 1979. Some contend that because of greater interest rate volatility, the U.S. long-term market has become a vehicle more for "speculation" than for "investment." In other words, participants are acting on the basis of expectations of capital gain (or fears of capital loss) over a short time instead of assessing prevailing interest rates in the context of longer-run portfolio objectives. Friedman looks at the distribution of net purchases of corporate bonds by various sectors, including households, life insurance companies, private pension companies, commercial banks, mutual savings banks, brokers and dealers, mutual funds, and foreign interests. He finds an unprecedented liquidation of bond holdings by households, and an unprecedented absorption of bonds by securities brokers and dealers, and similarly by foreign investors, during the second and third quarters of 1981. The households, he concludes, were probably establishing tax losses before the 1981 legislation that lowered marginal tax rates went into effect, rather than acting because of any aversion to interest rate volatility, which produces bond price volatility. So he figures that there is no solid evidence that this volatility has altered behavior on the lenders' side of the U.S. corporate bond market.

Friedman warns that his three conclusions should be treated with "substantial caution" because of the short time span examined. Nonetheless, he concludes that because the potential economic consequences of significantly impairing the capital raising mechanism are great, even his tentative conclusions "should serve both as a warning of caution for public policy and as a spur to further research." DF

Taxes, Firm Financial Policy, and the Cost of Capital

NBER Research Associate **Alan J. Auerbach**, in **Taxes, Firm Financial Policy, and the Cost of Capital: An Empirical Analysis**, *Working Paper No. 955*, has developed a new model of corporate financial behavior that may explain why corporations pay dividends even though the practice imposes unnecessary taxes on their shareholders. Auerbach's theory, and empirical tests as well, indicate that companies treat new stock issues as a more expensive source of capital than retained earnings. Moreover, the perceived cost of new issues varies from one company to another depending on the personal tax rates faced by a company's shareholders.

Corporate financial behavior, especially the practice of paying dividends in the face of unfavorable tax treatment, has been an enigma for several decades now. The question of why corporations pay dividends is an important one because the answer has strong implications about tax policy. The purpose of Auerbach's paper is to develop a model of corporate behavior that is consistent with the maximization of shareholder welfare and with observed behavior.

While there are several explanations for the ways that companies handle leverage, explaining the payment of dividends is more difficult. Two theories that offer possible explanations deal with constraints on corporate behavior. One, which Auerbach calls the "capitalization" theory, holds that if companies are inhibited from repurchasing their own shares or the shares of other companies, so that they can pass earnings out of the company only in the form of dividends, the market should recognize this fact. Since earnings retained and reinvested must ultimately be paid out as dividends, the dividend tax can never be avoided. In that event, the cost of the dividend tax would be capitalized in the value of a company's stock. A problem with the capitalization model is that some companies do repurchase their shares, and others issue new shares while continuing to pay dividends.

Another explanation could be what Auerbach terms the "double-tax" theory. It holds that companies are constrained from changing their dividend policies in the short run. Thus, companies might be forced to issue new shares to raise funds in periods of high investment. A problem with the double-tax theory is that firms issue new shares infrequently.

Past studies of the effect of taxes on financial structure have taken one of two forms: those that look at the market response to company behavior, and those that deal directly with the behavior of companies. Auerbach's study takes the latter approach. He de-

vises a model of company behavior based on the maximization of shareholder wealth. Then, using inflation-adjusted data, he uses time-series analysis in an attempt to control for differences among companies. His data consist of balance-sheet and income figures for 274 companies for the 20 years from 1958 through 1977.

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It was unnecessary to perform sophisticated regressions to get a general idea of the equity policies firms use in financing investments. That behavior doesn't correspond neatly with either the capitalization or the double-tax theory. Companies rarely issue new shares, but they still pay out dividends in the years when they do. In fact, less than 10 percent of all the companies that issued shares in years following ones in which they hadn't sold stock cut their dividends from the prior year. More than two-thirds actually increased their dividends 5 percent or more in the years when they sold stock.

One explanation of such behavior is that firms can adjust their borrowing power to cover short-run fluctuations in earnings or investment needs. But borrowing in that way can be sustained without frequent new stock issues only if the dividend is fundamentally in accordance with the company's earnings. Auerbach performs a regression analysis that supports this view. The results are consistent with a theory that is a hybrid of the capitalization and double-tax theories, incorporating both the short-run rigidity of dividends and the aversion to selling new shares.

Under Auerbach's model of corporate financing and investment behavior, companies attempt to maximize shareholder welfare by undertaking all invest-

ment projects that have aftertax returns greater than the riskless rate of interest, reduced by the tax rate that shareholders face on interest income. The model suggests that companies will never choose to issue new shares when they can retain earnings. They will select between debt and retained earnings to finance investments, in part according to whether the tax rate faced by their stockholders on interest income—which is the minimum of their own tax rate or the implicit tax on tax-exempt securities—is greater or less than the corporate tax rate.

The model also holds that companies choose debt-equity ratios to minimize the cost of capital. The cost of capital itself is a weighted average of the cost of debt and the cost of equity. The model suggests that in periods when firms are observed to use more expensive forms of financing, the projects they undertake should have a higher return. These higher returns should be observed in subsequent years.

Auerbach's empirical tests of the model are based on the relationship among returns, the historical values of investment, and the cost of capital. He uses both before tax and aftertax earnings as measures of returns. The results support the hypothesis that new shares are perceived by companies to be more expensive than retained earnings as a source of capital. Moreover, the systematic variation of the cost of retained earnings with respect to indirect estimates of the personal tax rates of company shareholders suggests that this differential is related to tax considerations.

Auerbach concludes that the results are inconsistent with the view that personal taxes don't matter. They also are inconsistent with the theory that companies always behave as if they were on the margin of issuing new shares, as the classical or double-tax theory would suggest. The results do support the theory that companies, facing various constraints, must in the short run behave in a manner that isn't optimal in the long run—namely, issuing new shares and, perhaps, too much debt instead of cutting dividends.

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