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THE TAX ADVANTAGES OF PENSION
FUND INVESTMENTS IN BONDS

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The Tax Advantages of Pension Fund Investments in Bonds

ABSTRACT

I believe that every tax-paying firm's defined benefit pension fund portfolio should be invested entirely in bonds (or insurance contracts).

Although the firm's pension funds are legally distinct from the firm, there is a close tie between the performance of the pension fund investments and the firm's cash flows. Sooner or later, gains or losses in pension fund portfolios will mean changes in the firm's pension contributions.

Shifting from stocks to bonds in the pension funds will increase the firm's debt capacity, because it will reduce the volatility of the firm's future cash flows. Shifting from stocks to bonds in the pension funds will give an indirect tax benefit equal to the firm's marginal tax rate times the interest on the bonds. There is no indirect tax benefit if the pension funds are invested in stocks.

Fully implementing the plan will mean shifting all of the stocks in the pension fund to fixed income investments, and putting all new contributions into fixed income investments. Shifting \$2 million from stocks to bonds has a present value for the firm's stockholders of about \$1 million.

Shifting from stocks to bonds in the pension funds will reduce the firm's leverage. To offset this, the firm can issue more debt than it otherwise would have issued. The money raised can be invested in the firm or used to buy back the firm's stock.

This version of the plan, with more bonds in the pension fund and more debt on the firm's balance sheet, is equivalent to the following transactions: (1) sell a portfolio of stocks on which no taxes are paid, and buy the firm's stock on which no taxes are paid; and (2) issue the firm's bonds at an after-tax interest rate, and buy other firm's bonds at a before-tax interest rate.

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BACKGROUND

Legally, a firm's pension fund is separate from the firm. The fund's trustees act first in the interest of the fund's beneficiaries.

Still, the performance of the pension fund investments affects the firm more than it affects the fund's beneficiaries. If the fund's performance is good, the firm's contributions will sooner or later be lower than they would have been. If the fund's performance is bad, the firm's contributions will sooner or later be higher than they would have been.

Thus pension fund performance affects the firm's cash flows, earnings, and stock price. The effects of changes in the value of the fund's investments will probably show up fairly quickly in the firm's stock price, especially when these changes are due to overall market movements. But earnings figures generally won't be affected for some time, because of the smoothing procedures used in figuring contributions to the pension fund.

An extra dollar earned on the pension fund investments means a dollar that the firm won't have to contribute. The extra dollar may grow over time, too, so if it is used to reduce a distant future contribution, that contribution will probably be reduced by more than a dollar.

In fact, the change in the value of the pension fund investments is the present value of the change in the future contributions, no matter how long the firm waits to change its contributions, so long as the pension benefits are not affected by the value of the pension fund.

Thus greater volatility in the pension fund investments will mean greater volatility in the present value of the firm's contributions,

and greater volatility in the value of the firm. Stocks in the pension fund mean more uncertainty about the firm's future cash flows than bonds in the pension fund.

In some firms, good returns on the pension fund investments means pressure for greater pension benefits, while bad returns do not make reductions in benefits possible. In those firms, the beneficiaries have a kind of option on the fund. If the fund does well, the beneficiaries share in the gains, while if the fund does badly, the firm bears all the losses.

Normally, though, the pension benefits are independent of the pension fund performance. Gains and losses in the pension fund are borne entirely by the firm.

In sum, there is a close tie between the performance of the pension fund investments and the firm. It's almost as if the pension fund investments were assets of the firm. Changing the risk of the pension fund's investments is like changing the risk of the firm's assets.

LEVERAGE

Leverage, as I define it, is the sensitivity of a firm's performance to economic conditions. A firm with high leverage will do very well when conditions are good, and very badly when conditions are poor.

Financial leverage comes from a high debt-equity ratio. In defining the debt-equity ratio, it makes sense to measure debt as fixed dollar liabilities minus fixed dollar assets.

Operating leverage comes from fixed costs other than interest costs. Costs that are fixed in the short run contribute to operating leverage, even if they are variable in the long run.

Pension costs can be worse than fixed costs. If pension liabilities are independent of economic conditions, while pension fund assets are worth more when times are good and less when times are bad, pension costs will be lower when times are good and higher when times are bad.

Often this effect will be offset by the sensitivity of pension liabilities to economic conditions. Still, the effect of common stocks in the pension fund is to add to the firm's leverage.

Bonds in the pension fund work like bonds held directly by the firm. In figuring the debt-equity ratio for a firm, it would be sensible to subtract something from the firm's debt if its pension fund contains an unusually large investment in bonds, and to add to the firm's debt if its pension fund contains an unusually small investment in bonds.

Shifting from stock to bonds in the pension fund will reduce the firm's leverage. It will reduce the variability in the firm's earnings, the risk of the stock, and the risk of default on the firm's bonds. The bond interest rate will fall, and if the shift is substantial, the firm's bond ratings should ultimately go up.

DEBT CAPACITY

There are many measures of debt capacity. I like to think of debt capacity in market value terms. I use the market value of a firm's equity cushion and the variability of that market value to define the firm's debt capacity.

Other measures make use of the book debt-equity ratio. The firm's holdings of bonds can be subtracted from its liabilities in figuring the debt-equity ratio.

Another important measure of debt capacity is the earnings coverage of interest charges. A more variable earnings stream will mean less effective coverage.

Shifting from stocks to bonds in the pension fund will increase the firm's debt capacity, sooner or later. It will reduce the variability of the market value; it will reduce the ratio of net debt to equity; and it will reduce the variability of earnings.

With stocks in the pension fund, if times are bad for the economy and the firm at the same time, required contributions to the pension fund may be high just when the firm can least afford to pay them. Bonds in the pension fund will make it easier for the firm to avoid default on its own bonds when times are bad all over.

Thus a firm that is expanding by investing more than its retained earnings can create debt capacity, no matter how it is defined, by selling stocks and buying bonds in the pension fund. The more the pension fund lends, the more the firm can borrow.

BENEFIT SECURITY

Shifting from stocks to bonds in the pension fund will make the benefits more secure (assuming that insurance has not already made them perfectly secure), even though stocks are expected to return more than bonds.

For example, suppose that the plan is fully funded, and that the assets are sufficient to pay the benefits if the assets are in bonds. If the assets are in stocks, there will be some chance that they will not be worth enough to pay the benefits when due.

Having the assets in stocks will reduce the expected contributions by the firm, but can only make the pension beneficiaries less secure. It reduces the present value of any defined set of benefits.

The same is true when the plan is not fully funded. Just as an increase in the risk of a firm's assets that doesn't change the firm's value will make the bondholders less secure, so an increase in the risk of the pension fund assets that doesn't change the fund's value will make the beneficiaries less secure.

Since investing pension fund assets in bonds makes the beneficiaries more secure than investing in stocks, it should make the trustees more secure too.

PENSION FUND ALGEBRA

Pension fund contributions are deductible for both federal and state income taxes. A higher contribution means a lower tax, and a lower contribution means a higher tax.

If the marginal tax rate is 49%, it costs the firm only \$.51 to make an extra \$1.00 contribution to the pension fund. The other \$.49 comes from reduced taxes.

Similarly, a reduction of \$1.00 in the pension fund contribution gives the firm only \$.51 after taxes. The other \$.49 goes to higher taxes.

Thus we can imagine that assets can be swapped between the fund and the firm on a \$1.00/\$.51 basis. \$1.00 in the fund is equivalent to \$.51 in the firm.

Thus a gain of \$1.00 in the value of the pension fund is worth only \$.51 to the firm after taxes, while a loss of \$1.00 in the fund costs the firm only \$.51 after taxes.

Even the increased debt capacity brought by bonds in the pension fund is modified by taxes. An extra \$1.00 of bonds in the pension fund will mean only about \$.51 in extra debt capacity in the firm. The risk brought by stocks in the pension fund translates to a smaller risk, after taxes, in the firm.

THE BASIC PLAN

The simplest form of my plan involves selling stocks in the pension fund and buying bonds with the money received, plus issuing the firm's debt and buying back the firm's stock with the money received. There is no change in the current pension fund contribution.

If the marginal income tax rate is 49%, then every \$1.00 switched from stock to bonds in the fund is matched with \$.51 of the firm's bonds issued and \$.51 of the firm's stock bought back.

Interest income in the fund is tax exempt, while interest expense for the firm is tax deductible. The firm borrows directly at the after-tax rate, and lends through the fund at the before-tax rate.

Neither dividends nor changes in the value of the pension fund stock portfolio have any direct tax consequences. Transactions in the firm's own stock don't have any direct tax consequences either. There isn't any tax arbitrage when the firm has stock outstanding and owns stocks in the pension fund.

In effect, the plan involves (1) selling the stocks in the pension fund and putting the money in the firm's own stock; plus (2) borrowing by the firm to finance tax-free lending by the pension fund. The firm gains if its own stock does better than the pension fund stocks sold, and it gains by the spread between the before-tax and after-tax interest rates.

Suppose the interest rate on the firm's bonds and on the bonds held by the pension fund is R , while the firm's marginal tax rate is T . If $\$X$ of stocks in the pension fund are sold and replaced by bonds, $\$X(1-T)$ of the firm's debt will be issued and the same amount of the firm's stock will be bought back.

The added deduction will be $\$X(1-T)R$, so the taxes saved each year will be $\$X(1-T)RT$. This tax saving is nearly certain, so long as the firm stays healthy enough to pay income taxes in most years. So it should be discounted at the after-tax interest rate $(1-T)R$. If the tax saving lasts indefinitely, its present value will be $\$XT$.

As the pension fund grows, through income and added contributions, there will be added amounts that may be put into bonds rather than stocks. The present value of the tax saving including these added amounts is much greater than the present value assuming the firm and the pension fund remain at their current size.

On the other hand, it is possible that the firm will eventually have troubles that eliminate its income taxes, or that the tax laws will be changed to eliminate the benefits of the plan. These possibilities reduce the present value of the tax saving from the plan.

Assuming that the plan's benefits continue, the present value of the tax saving at the firm's current size is thus $\$XT$, where T , including both federal and state taxes, is close to 50%. The amount of debt issued by the firm is $\$X(1-T)$, which is approximately equal to the present value of the tax saving. Thus it's as if the firm issued the debt at close to a zero interest rate, and without having to repay it. It's as if the debt issued by the firm were free.

A YEAR AT A TIME

One way to see how the plan works is to assume that all pension benefits will be paid at the end of the next year. If the assets of the plan are more than sufficient to pay the benefits, the difference will go to the firm. If the assets are not sufficient, the firm will make up the difference.

Assume that the interest rate on one year bonds is 10%, and that the firm's marginal tax rate is 50%. Assume that the stocks the pension fund might hold will do exactly as well over the next year as the firm's stock.

Suppose that the benefits to be paid total \$220 million, while the funds assets are initially invested in stocks worth \$200 million. The firm's stock starts the year at \$100 per share, and ends the year at \$Y per share.

If the pension fund is invested entirely in stocks that do exactly as well as the firm's stock, then the value of the pension fund portfolio at the end of the year will be \$2Y million. The fund will return to the firm $\$2Y - 220$ million. After taxes, this will be worth $\$Y - 110$ million.

If my plan is used instead, the \$200 million in stocks will be sold and \$200 million will be put into one year bonds. The firm will issue \$100 million in one year bonds and buy back one million shares of stock.

At the end of the year, the bonds in the fund will be just sufficient to pay the pension benefits. The firm can sell the million shares of stock again and can pay off its bonds for \$100 million plus interest. The net gain to the firm will be $\$Y - 110$ million plus the tax saving from \$10 million of interest deductions.

With my plan, the firm ends up exactly as it would have, except that it earns an extra \$5 million after taxes for the year. The capital structure change has been reversed, and the pension benefits have been paid.

Except for the fact that the firm's stock may do better or worse than the stocks in the pension fund portfolio, it's a pure arbitrage. We are adding a tax saving to a stream of cash flows for the firm and the pension fund together without changing those cash flows in any other way.

An actual pension plan that lasts many years works like this in each of its years. We can just take the initial investment in the pension fund each year to be the ending investment for the last year plus the current year's contribution.

The analysis also works if we imagine that the pension fund performance has no effect on contributions to the fund until pension benefits are paid many years later. This would be like the one year analysis with a higher interest rate.

DIVERSIFICATION

In effect, my plan substitutes investments in the firm's stock for a diversified portfolio of stocks, and investments in a portfolio of bonds for the firm's bonds.

If the firm issues bonds like the bonds bought in the pension fund, the bond substitution is probably of little consequence. But the firm's stock may do much better or much worse than a diversified portfolio, so we should look at the stock substitution more closely.

When my plan is implemented, the firm's stock will follow more closely the firm's operations. It will not depend as much on the performance of other firms.

The firm's stock will be less well diversified. Investors who hold the firm's stock in large portfolios will not be sensitive to this, since their portfolios provide diversification. A stockholder with a large concentrated holding may be more sensitive to diversification within the firm.

Keep in mind, though, that when the interest rate is 10%, the after-tax gain is 5% per year of the amount of the firm's stock bought back. I doubt that many investors would pay 5% per year for diversification within their holdings of a single firm's stock.

If the diversification is important, another version of the plan can be used. The firm can issue bonds and invest the proceeds in shares of a mutual fund that converts capital gains to dividends.

Such a mutual fund tries to realize its capital gains while they are still short term gains. The mutual fund's dividends are the dividends on the shares it holds plus interest income plus short term capital gains.

A corporation will pay a tax on 15% of the mutual fund's dividends, so its tax rate on that income will normally be around 7.5%. That rate is higher than the zero tax the firm pays if it buys back its own shares, but it is still much lower than the potential gains from my basic plan of around 50% of the income.

DEBT RATING

The rating agencies do not yet pay much attention to the mix of investments in a firm's pension fund.

They give some weight to a firm's unfunded liabilities, but will rarely consider, at least on their own, the way the pension fund is invested. In a marginal case, though, the firm is likely to be in close touch with the agencies. A firm using my plan will be able to point out to the agencies the stabilizing effects of having bonds in the pension fund.

The plan will also have indirect effects on the firm's debt rating. Over time, these effects should be beneficial even without any suggestions to the rating agencies.

The most important of these effects will be the added profitability of the firm. This will mean both higher earnings and a higher value for the firm.

Also, having bonds in the pension fund will give stability to the firm's pension contributions and earnings that will offset, at least in part, the instability that would otherwise come from an increase in the debt/equity ratio.

I expect that using my plan is unlikely to hurt the firm's debt rating, even though one part of the plan involves higher debt than the firm would otherwise have. If it were to hurt the debt rating, I expect that the firm's interest rate would not go up much, because the market would recognize the stability brought by bonds in the pension fund.

Even if the firm is forced to pay a higher interest rate on some future issue of bonds because of this plan, it's likely that the tax

saving from the plan will be far greater than the added interest expense it causes.

If the new bond issue is large, the plan won't have a material effect on its interest rate; while if the new bond issue is about the same size as the debt issued under my plan, the tax saving (5 percentage points when the interest rate is 10%) will be far greater than any conceivable effect it might have on the interest rate on the new bond issue.

THE SOURCE OF THE GAIN

The simplest version of my plan has two parts: a change from stocks to bonds in the pension fund, and a change from stock to bonds in the firm's capital structure. Which part of the plan gives the bulk of the saving?

On the surface, it seems that the tax saving comes from the firm's added debt, so the benefit must come from the capital structure change, whether or not the pension fund investments are changed. But a capital structure change alone has disadvantages that at least partly offset the saving in corporate taxes.

More debt alone means a greater chance that the firm will someday find its fixed charges burdensome, and that its flexibility in raising more capital by issuing debt will be impaired. More debt alone will increase the risk of the firm's outstanding debt, the volatility of its stock, and the variability of its earnings.

If the benefits of greater debt outweigh the costs, then the firm should issue more debt than my plan calls for. It should move to an optimal debt/equity ratio whether or not it adopts my plan.

Suppose, then, that the firm is at an optimal debt/equity ratio when it considers my plan. That means it will be indifferent to one more dollar of debt or one less dollar of debt. The benefits and the costs of an added dollar of debt are equal.

After implementing the simple version of my plan, the firm will still be at a roughly optimal debt/equity ratio. The added bonds in the pension fund will support the added borrowing by the firm.

This means that the firm can reverse the capital structure part of the plan without changing the benefits significantly. At the optimal capital structure, a small change in the capital structure makes no difference.

But the plan without the capital structure change is simply the change in the pension fund investments. The benefits of the plan come from earning the before-tax interest rate after taxes on the bonds in the pension fund.

FULL FUNDING

Buying bonds in the pension plan gives the firm after-tax interest at a before-tax rate. This suggests that the firm may want to keep its contributions to the plan at the maximum level allowed by the Internal Revenue Service.

Higher contributions may reduce reported earnings, but this can be offset by showing higher contributions for tax purposes than for financial statement purposes. Higher contributions means an added drain on the firm's cash flows, but it should be possible to raise money to make investments as profitable as added contributions to the pension plan.

Note, though, that full funding of the pension plan gives tax benefits only to the extent that the fund is invested in bonds. The benefits of added contributions are lost if they are invested in stocks.

This seems odd, because added contributions (up to the IRS maximum) do mean added deductions. But higher contributions now mean lower contributions later, and thus higher taxes later.

When the fund is invested in bonds, there's a saving from deferring these taxes equal to interest on the taxes. When the fund is invested in stocks, there is no saving. Assuming the firm's stock does as well as the pension fund stocks, an investment in the firm's stock would be just as good as an investment in stocks through the pension fund.

Thus the benefits of full funding are being wasted unless the added contributions to the pension fund are invested in bonds.

ACCOUNTING FACTORS

When both parts of my plan are implemented, and when the firm's stock does as well as the stocks that might be held in the pension fund, the firm's cash flows will be higher in almost every state of the world than they would be if the plan were not implemented. To me, that is the most important consideration.

That's the argument used when firms switch from FIFO to LIFO for inventory accounting. So long as the firm is paying taxes and the prices of the items used in inventory are rising, LIFO will give lower taxes and thus higher cash flows than FIFO.

Since a firm that switches to LIFO for tax purposes must also switch in its financial statements, a firm that switches to LIFO will reduce its reported earnings in the short run. In the long run, the tax saving will give the firm higher earnings than it would have had with FIFO.

A change in the pension fund investments only will have no short run effect on reported earnings. A shift from stocks to bonds in the pension fund will make future earnings more stable. If stocks do very well, the shift will make future earnings lower than they would have been; while if stocks do very badly, the shift will make future earnings higher than they would have been.

A change in the pension fund investments combined with a change in the firm's capital structure will increase reported earnings per share whenever the initial earnings-price ratio is greater than the after-tax interest rate.

For example, a before-tax interest rate of 12% means an after-tax interest rate of about 6%. A price-earnings ratio of 9 means an earnings-price ratio of about 11%. When the firm is in this situation, implementing the plan will increase earnings per share. The lower the price-earnings ratio, the larger the increase in earnings per share will be.

When the earnings-price ratio is equal to the before-tax interest rate, the earnings increase times the price-earnings ratio will equal the present value of the tax saving at the firm's current size. In the example above, a price-earnings ratio around 8 will do it. In this case, the full value of the tax saving comes in the form of higher earnings.

In other cases, some of the value of the tax saving will come in the form of even higher future earnings per share, so there will be an increase in the price-earnings ratio, now or when the effects become known, as well as an increase in earnings per share. The two effects combined will give the present value of the tax saving.

While some of the benefits of my plan come in the form of a higher price-earnings ratio, some of the benefits normally come in the form of higher earnings per share. Thus my plan may be easier to accept than a switch from FIFO to LIFO.

The plan is not as likely, though, to increase book equity per share. Issuing debt to buy back stock will increase book equity per share only when the stock is bought below book value. And issuing debt to buy back stock will always reduce total book equity.

Finally, the plan increases cash flows in the sense that it makes more cash available for dividends, repurchase of the firm's liabilities, or investments. If we look at the firm without including the pension plan, and if we think of dividends as fixed in the short run, then the plan may reduce short run cash flows.

Cash flows defined this way will go up in the short run only if the dividend yield is higher than the after-tax interest rate on the firm's bonds. If the yield is 4% and the after-tax interest rate is 6%, short run cash flows will go down. Even in this case, though, the plan will improve long run cash flows. It may cause a high growth rate in dividends, for example.

BOND INDENTURES

The firm can change its capital structure only in ways that are consistent with its bond indentures. Bond indentures generally restrict the amount of added debt a firm can take on.

The benefits of the plan are great enough, though, that a firm may want to look beyond the limits imposed by its bond indentures when those limits seem binding. One solution to this problem can be to issue junior debt that is not restricted by the indentures.

The interest rate differential between junior and senior debt will rarely be as large as the differential between before-tax and after-tax interest rates. And the differential will be offset if the pension fund invests in debt securities like those issued by the firm.

Moreover, a junior debt issue will not have much impact on the ratings for the firm's senior debt. It is a way around a rating constraint, if one is felt to exist.

Another way to deal with restrictive indentures is to refinance, buying back the existing debt and issuing new debt with more appropriate restrictions. The new restrictions might take the firm's pension fund investment policy into account, at least implicitly.

The simplest solution to the problem of a restrictive bond indenture is not to make the capital structure change at all. The expected benefits of the plan come mostly from the change in the pension fund investments.

SHARES OUTSTANDING

Selling stocks and buying bonds in the pension plan increases the optimal amount of debt in the firm's capital structure. If the firm completes the plan by issuing its own bonds and buying back its stock, the number of common shares outstanding will be reduced.

Reducing the number of shares outstanding without changing the risk of the shares may have advantages beyond the tax-saving benefits of the plan. In fact, empirical studies suggest that buying back stock increases a firm's stock price significantly even when it does change the risk of the shares.

Buying back stock may push up the price even when there is no tax saving because the firm is buying from people who are willing to sell. These people are either neutral about the company or think it is a poor investment. In this sense, stock is being removed from unfriendly hands. Having more of the stock remain in friendly hands may increase the price, at least temporarily.

Buying back stock may also increase the firm's bargaining power in case of a tender offer. Having a larger percentage of the stock in friendly hands should increase the premium that would be needed to make the tender offer successful.

VARIATIONS ON THE PLAN

If the capital structure of the firm is changed, what's important is that the firm have more debt outstanding and less stock outstanding than it would have had.

If the firm is issuing securities, it can use more debt and less common stock than it would have used. If the firm is retiring securities, it can retire more common stock and less debt than it would have retired.

Issuing debt to make an investment can be as effective a way to implement the plan as issuing debt to buy back common stock.

The firm can even issue debt to buy shares of a mutual fund that converts capital gains to dividend income. The firm will owe taxes on 15% of the mutual fund's dividends, but this strategy will match more closely the performance of the stocks sold in the pension fund.

Moreover, as noted above, the change in the firm's capital structure is not the important part of the plan. The change in the pension fund investment strategy is the important part.

If the only change is selling stocks in the pension fund and buying bonds with the money, the present value of the plan will be about the same. The tax saving will be indirect, in the form of a tax free investment in bonds, rather than direct, in the form of added interest deductions.

While the present value of the plan depends mainly on the change in pension fund investments, the firm that omits the capital structure change may regret it. If stocks are switched to bonds in the pension fund, and the stock market takes off, the firm may wish it had waited to make the change.

PUBLISHED PAPERS

Several published papers present ideas related to my plan.

Irwin Tepper and Robert Paul have a paper in the November-December, 1978 Harvard Business Review called "How Much Funding for Your Company's Pension Plan?" They argue that speeding up contributions to a pension plan saves taxes. They use examples in which the added contributions are invested in bonds.

Myron Scholes has a paper in the Proceedings of the May, 1979 Seminar on the Analysis of Security Prices called "Executive Compensation, Pension Funding, Signalling and Taxation." He shows that a firm does not gain from issuing its own stock to make contributions to a pension plan that invests the money in other firms' stock.

Ronald Masulis has a forthcoming paper in the Journal of Financial Economics called "The Effects of Capital Structure Change on Security Prices: A Study of Exchange Offers." He finds that when firms offer to exchange debt for stock, the stock price goes up an average of 10% when the offer is announced.

I have a paper in the January/February, 1976 Financial Analysts Journal called "The Investment Policy Spectrum." It emphasizes the fact that most of the risk in a defined benefit plan's pension fund portfolio is borne by the stockholders of the sponsoring firm, not by the beneficiaries.

William Sharpe has a paper in the June, 1976 Journal of Financial Economics called "Corporate Pension Funding Policy." He points out that if we ignore tax factors, a firm's stockholders may not care how the pension fund investments are divided between bonds and stocks.