



THE COST OF DEBT AS A SOURCE OF CAPITAL

The agribusiness industry is not, of course, unique in its use of various forms of debt as a source of capital. My own research has shown that the agribusiness industry's use of debt changed significantly during the decade of the 1960's. One sector of the Washington industry, for example, was found to have exactly reversed its debt to equity complexion between the years 1964 and 1969. Of critical importance to management, of course, is, first, its ability to accurately assess the cost (implicit and explicit) of each alternative form of debt and, second, its ability to assemble the "least cost mix" of equity and the various forms of debt capital.

During the normal course of business, management must make decisions which have a direct impact on capital sources used and the complexion of the capital structure itself. Such decisions may range in complexity from minor modifications in the firm's use of operating debt to a major recapitalization program. Regardless, each increment of capital involves an increment of cost, which then has an effect on the cost of the total capital structure. Care, therefore, must go into management's determination of the "optimal mix" of debt and equity in a firm's capital structure; i.e., a firm requires enough low-cost debt to boost the owners' return (by applying debt capital to projects earning more than the cost of acquiring the funds required to finance them) but not too much debt to endanger the owners' return and the firm's solvency during periods of low earnings. Because agriculture is particularly susceptible to economic cycles, this concurrent variation in earnings makes debt-to-equity decisions especially critical to the agribusiness industry.

This paper is designed to provide the reader with an improved ability to accurately assess the cost

of debt. We shall concentrate on those increments of capital involved when a firm incurs additional debt (operating and term) and compare them to similar increments secured via a broadened base of equity ownership.

Forms of Debt Capital

Debt, incurred in the course of normal business activity, may take many different forms. It may range from standing trade obligations (accounts payable) to long-term mortgage loans or debenture (bond) issues. It may include simple notes payable to banks or individuals, tax payments owed to various governmental agencies, wages due, installment payments due, and even lease obligations. These many forms of debt (and others not mentioned) can be easily evaluated as to the explicit cost associated with them, i.e., most carry a specific interest payment provision. It must be remembered, however, that interest is tax deductible for business corporations and that, as a result, the implicit cost to the corporation will be the fraction of the annual interest charge multiplied by a factor of "one minus the marginal tax rate." For example, if a business pays 6 percent per annum on the principle of a note payable and its effective tax rate rests at 48 percent, the implicit cost of this debt to the firm will be:

$$6\%(1 - .48) = 3.12\% \text{ (after taxes)}$$

It should be noted that as a source of capital, most forms of debt differ in this regard from the normal equity sources of capital.

The Cost of Operating Debt

Accounts Payable: Operating debts are generally defined as those short-term revolving obligations incurred in the ordinary, everyday operations of a business. Some of this debt capital owed to suppliers, customers, etc., may be provided free of any explicit cost under trade terms generally prevailing in a given industry. Foremost in this

category would be accounts payable due a supplier and are incurred under standard industry terms such as 2/10, n/30. A firm, under these terms, may withhold payment on the account for up to 30 days after the date of billing without incurring a direct interest charge. By extending payment beyond the discount period (2 percent up to 10 days), however, an opportunity cost is incurred by the firm in the form of a cash discount sacrificed. Hence the opportunity cost of withholding payment for 20 days past billing under the above terms amounts to 2 percent in cash discounts lost, or an annual rate of:

$$\frac{360\text{days}}{20\text{days}} \times 2\% \text{ lost} = 36\% \text{ (before taxes)}$$

Again, however, the corporation does not report as taxable income the discount he would have otherwise earned. Hence, the explicit opportunity cost (above) must be reduced by taxes saved. The net implicit cost of the capital then becomes:

$$2\% (1 - .48) = 1.04\% \text{ (after taxes)}$$

Converting this to an annual rate, the cost becomes:

$$\frac{360\text{days}}{20\text{days}} \times 1.04\% \text{ lost} = 18.72\% \text{ (after taxes)}$$

Some businesses, especially small or struggling enterprises, make it a practice to rely heavily on accounts payable as a source of capital. They unilaterally exceed the outside limits of the industry terms. They are encouraged to do so, because in the absence of an interest charge levied by the trade creditor, the explicit cost calculated above declines as payments are further delayed. Regardless, from the standpoint of credit worthiness and the reputation of the firm, it is poor practice, in my opinion, to regularly extend payment beyond the credit period stipulated in the terms.

Installment Credit: A second form of operating debt is the short-term note or an installment contract in which an interest charge is deducted in advance or added to the amount of principle

stated in the contract. For example, a \$1,000 note which carries a 6 percent interest charge may provide the debtor with only \$940 if the terms stipulate a one-year period and the discount procedure. Under such conditions, the explicit cost is higher than the stated interest since the borrower pays \$60 for the privilege of using only \$940 for a year, e.g.:

$$\frac{\$60}{\$940} = 6.39\% \text{ (before taxes)}$$

Converting this explicit cost to an annual implicit cost is accomplished in the identical manner as shown before. Note, however, that as the number of installments specified in the terms increase, so does the effective interest charge increase. For example, if the \$1,000 note were to be repaid in equal monthly installments, the average amount outstanding drops to about one-half the original principle and our interest calculation becomes:

$$\frac{\$60}{\$500} = 12\% \text{ (before taxes)}$$

The Cost of Long-Term Capital

Earlier, our discussion concentrated on operating debt and the cost of various forms of short-term obligations. Even more important, however, is the cost and proportion of debt capital in the more permanent form. When dealing with alternative forms of long-term capital, decisions involving cost and the amount of debt must be made relative to investments in expanded or diversified firm activities. At times, these decisions may even involve refinancing or recapitalization. Hence, all such decisions have a long-lasting and far-reaching impact on the firm's resultant capital structure.

The basic objective and obligation of corporate management is to provide adequate earnings to the stockholders and to maintain or enhance their investment. By accepting this obligation and by using a hypothetical firm for illustration, we will now describe cost determination procedures for the three most common sources of long-term capital.

The 1972 earnings results for our hypothetical firm are shown below. To appraise ourselves of the current position of Agri-Service

stockholders, we would identify earnings per share (E.P.S.) in the manner shown:

Agri-Services Incorporated
1972 Earnings Result
(\$000)

E.B.I.T. (Earnings Before Interest and Taxes)	10,000
I.C.L.TD. (Interest Charge on Long-Term Debt)	- 0
E.B.T. (Earnings Before Tax)	10,000
F.I.T. (Federal Income Tax - 48%)	- 4,800
EA.T. (Earnings After Tax)	5,200
P.D. (Preferred Dividends)	- 0
E.A.C.S. (Earnings Available for Common Stock)	5,200
C.S.O. (Common Stock Outstanding-number of shares, \$10 @ par value)	(1 million)
E.P.S. (Earnings Per Share)	5.20
D.P.S. (Dividends Per Share)	-2.50
R.E.P.S. (Retained Earnings Per Share)	2.70
T.R.E. (Total Retained Earnings)	2,700

In addition, let's assume that a dividend payout of 40 to 50 percent of earnings has continued for several years and meets with the corporate policy the stockholders have come to accept and expect. Furthermore, let's assume that Agri-Services' stock commands a price of \$60 to \$65 per share in the current stock market.

Long-Term Debt: Now let us further assume that Agri-Services is in need of \$10 million in order to market a new product recently developed in its own R. & D. laboratory. To secure the needed capital, the firm decides to sell debenture bonds issued on its general corporate credit standing. The bonds would carry an interest rate of 6 percent, be due 20 years from the date of issue, and carry a sinking fund provision of \$400,000 per year beginning with the fifth year and a final payment of \$4 million due at the end of the 20 years. Your marketing personnel suggest that after the new product has been successfully introduced, it should increase company earnings before interest and taxes by 20 percent, with little risk of obsolescence or adverse competition for the next 10 to 15 years.

What is the implicit and explicit cost of this long-term debt? What impact will the debt capital have on the stockholders' position expressed in terms of earnings, dividends, and the firm's capital structure? To answer these questions, the E.P.S. calculation shown earlier will again be employed, except that two opposing situations will be shown; i.e., first the immediate impact of the debt, and second the impact after the growth in earnings resultant from the \$10 million investment has been secured.

As shown below, the immediate impact of the debt is to reduce E.P.S. to common stockholders. This so-called "immediate dilution" is the result of the interest cost entering the earnings pattern of the firm. The explicit cost of capital in this case becomes 52 percent (1 - marginal tax rate) of the 6 percent interest charge, or 3.12 percent. Or, looking at it another way, earnings after interest and taxes have dropped by \$312,000 as a result of the \$10 million investment.

We then observe, however, that after the new product has been successfully marketed, the addition to earnings more than offsets the explicit cost of the debentures, and thereby, boosts common stock earnings per share by 14 percent. The existence and use of a favorable leverage situation has resulted in a favorable impact on the stockholders' position.

Before concluding our discussion on the cost of term debt, however, we should not overlook the sinking fund obligation which creates a per share debt burden of 3.40 per year beginning in 1967. Similarly, some consideration should be given to the risk associated with the possibility that the enhancement to earnings will actually be less

than the 20 percent predicted. Finally, before proceeding with this means of generating the necessary capital, management should consider how the term debt might affect the long-range flexibility of the firm.

Preferred Stock: What is the cost of adding preferred stock to the firm's capital structure and how does this cost compare to the cost of term debt calculated above? To answer these questions, we shall proceed with a third E.P.S. calculation, only this time our calculations will be based on the generation of the needed \$10 million through the sale of 7 percent preferred stock at \$100 per share net proceeds to the issuing corporation.

Agri-Services Incorporated
1973 Potential Earnings Results
(\$000)

	Immediate	Postinvestment
E.B.I.T	10,000	12,000
I.C.L.T.D.	<u>- 600</u>	<u>- 600</u>
E.B.T.	9,400	11,400
F.I.T.	<u>- 4,512</u>	<u>- 5,472</u>
E.A.T.	4,888	5,928
P.D.	<u>- 0</u>	<u>- 0</u>
E.A.C.S.	4,888	5,928
C.S.O.	(1 million)	(1 million)
E.P.S.	4.89	5.93
D.P.S.	<u>- 2.50</u>	<u>- 2.50</u>
R.E.P.S.	2.39	3.43
T.R.E.	2,390	3,430
O.E.P.S. (Original E.P.S.)	5.20	5.20
C.E.P.S. (Change in E.P.S.)	- .31	+ .73
% C.E.P.S.	- 5.9	+ 14.0

Agri-Services Incorporated
1973 Potential Earnings Results
(\$000)

	Immediate	Postinvestment
E.B.I.T	10,000	12,000
I.C.L.T.D.	<u>- 0</u>	<u>- 0</u>
E.B.T.	10,000	12,000
F.I.T.	<u>- 4,800</u>	<u>- 5,760</u>
E.A.T.	5,200	6,240
P.D.	<u>- 700</u>	<u>- 700</u>
E.A.C.S.	4,500	5,540
C.S.O.	(1 million)	(1 million)
E.P.S.	4.50	5.54
D.P.S.	<u>- 2.50</u>	<u>- 2.50</u>
R.E.P.S.	2.00	2.04
T.R.E.	2,000	2,040
O.E.P.S.	5.20	5.20
C.E.P.S.	- .70	+ .34
% C.E.P.S.	- 13.4	+ 6.5

The results above reflect a sizeable drop in the earnings under the initial conditions and a reduced positive increase in earnings after the new product is introduced as compared to the term debt alternative. The stated 7 percent dividend rate is the culprit, of course, as it is higher than the 6 percent bond interest, and crucially so since the dividend is not tax deductible. Under this capital-generating option, the immediate dilution amounts to 70 cents per share and the eventual increase is smaller at only 34 cents per share. Nonetheless, a positive or favorable leverage is evident again. Compared with term debt, however, you will note that a minimum E.B.I.T. of \$600,000 is needed with the term debt before positive leverage exists, while a minimum of \$1,346,154 E.B.I.T. (\$700,000/.52) must be achieved before a favorable leverage situation arises under the preferred stock option.

Again, some consideration must be given by management of the repayment of this capital if provisions for a "call" of the stock have been made or if retirement of the stock is preferred. Risk is also evident in that the "prior claim" of preferred dividends may reduce common stock dividends to zero during a low earnings year. As before, flexibility of the firm has been affected by the imposition of another layer of claimants on the capital structure.

Common Stock: To complete our analysis of all alternative sources of capital, we shall now consider the cost associated with the operation of the \$10 million needed through the issuance of 200,000 shares of common stock at an assumed price of \$50 per share to the corporation net of underwriters' fees and related legal expenses. This discount from the current \$60 market price should insure the success of the issue. Now we must, once more, recalculate the impact on E.P.S. You will note on page 5 that there is no direct measurable cost associated

with this issue, as compared to the interest on the bonds and the dividends on the preferred stock. Yet issuing stock with no obligatory dividends does not mean that this stock has no cost to the firm. In fact, any action which jeopardizes or materially changes the stockholders' expectations about a particular firm should be deemed costly. In this case, the purchasers of the 200,000 shares of newly issued stock were acting on the basis of an expected earnings per share of about \$5.20. If any management action were to result in an actual

1973 earnings of less than that expected, a negative leverage would become apparent. In our example, a net dilution of 86 cents is exerted at the time of the stock issuance. The explicit cost of the issue could be judged by considering the \$5.20 per share earnings expected in light of the \$50 per share net benefits received, i.e.:

$$\frac{\$5.20}{50} = 14\% \text{ (after taxes)}$$

Agri-Services Incorporated
1973 Potential Earnings Results
(\$000)

	Immediate	Postinvestment
E.B.I.T	10,000	12,000
I.C.L.T.D.	<u>- 0</u>	<u>- 0</u>
E.B.T.	10,000	12,000
F.I.T.	<u>- 4,800</u>	<u>- 5,760</u>
E.A.T.	5,200	6,240
P.D.	<u>- 0</u>	<u>- 0</u>
E.A.C.S.	5,200	6,240
C.S.O.	1.2 million	1.2 million
E.P.S.	4.33	5.20
D.P.S.	<u>-2.50</u>	<u>- 2.50</u>
R.E.P.S.	1.83	2.70
T.R.E.	1,830	2,700
O.E.P.S.	5.20	5.20
C.E.P.S.	- .86	+ 0.0
% C.E.P.S.	- 16.5	+ 0.0

As shown above, the increase in earnings expected as a result of the new product introduction was just adequate to cover this cost.

E.P.S. Recap

The E.P.S. calculations for 1972 and the three alternative means of generating needed capital for 1973 are shown on page 7.

The calculations would suggest that when comparing the alternatives, term debt would be

favorable to preferred and common, and preferred would be favorable to common at all levels of earnings. This is not true, as all the above data are based on a 1973 earnings increase of 20 percent over the 1972 volume. To eliminate this comparison difficulty, we must proceed into a so-called "Zero E.P.S. Calculation" and then construct an "E.P.S. Chart" for all levels of earnings.

The E.P.S. chart has E.P.S. on the vertical axis and E.B.I.T. on the horizontal axis. Lines

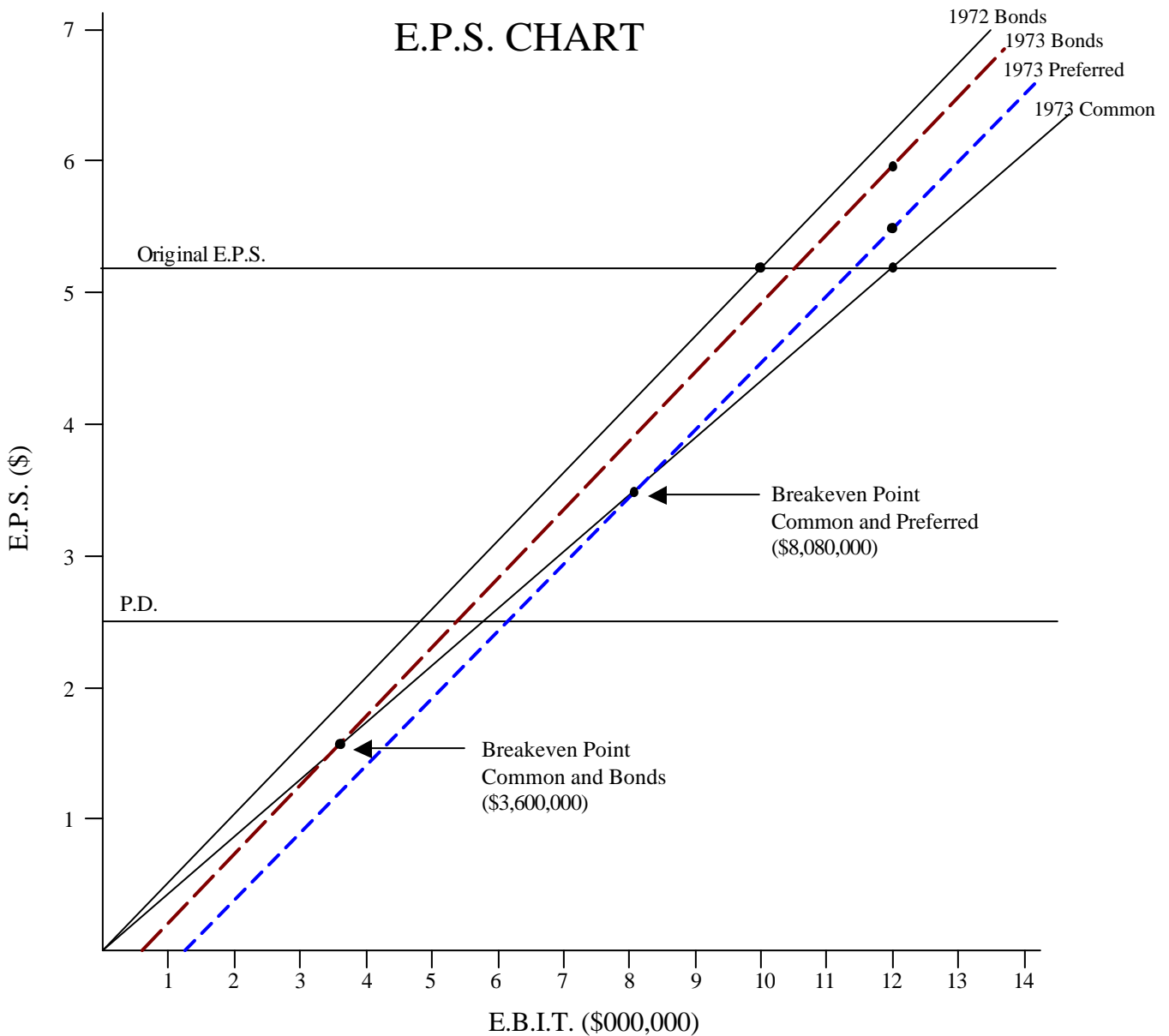
indicative of the three capital-generating alternatives can be drawn once two points have been generated for each. The 1973 data provide one of these points and the Zero E.P.S. Calculations provide the other. The Zero E.P.S. data are acquired easily by simply forcing E.P.S. to be zero and working in reverse order through our earlier calculations, (see page 6 calculations).

Our E.P.S. Chart (on page 8) reveals what we have long suspected; i.e., the choice of capital changes, depending on actual level of E.B.I.T.

achieved. For example, if the new product introduction proves so unsuccessful that 1973 E.B.I.T. drop below 33.6 million, the common stock issue would be the least damaging to E.P.S. If actual 1973 E.B.I.T. were \$3.6 to \$8.08 million, bonds would be less damaging than the stock issue. If actual 1973 E.B.I.T. exceeds \$8.08 million, the preference order would be identical to that uncovered in the E.P.S. Recap shown below.

	E.P.S. Recap			
	1972	Bonds	1973 Preferred	Common
E.P.S.	\$5.20	\$5.93	5.54	5.20
D.P.S.	<u>- 2.50</u>	<u>- 2.50</u>	<u>- 2.50</u>	<u>- 2.50</u>
R.E.P.S.	2.70	3.43	2.04	2.70
T.R.E.	\$2,700	3,430	2,040	2,700
Original Dilution (%)	0	-5.9	-13.4	-16.5
Final E.P.S. Charge (%)	0	+14.0	+6.5	0
Explicit Cost (%)	0	3.12	7.0	14.0

	Zero E.P.S. Calculations (\$000)			
	1972	Bonds	1973 Preferred	Common
E.P.S.	0	0	0	0
C.S.O.	(1 million)	(1 million)	(1 million)	(1.2 million)
E.A.C.S.	0	0	0	0
P.D.	0	0	700	0
E.A.T.	0	0	700	0
F.I.T.	0	0	646	0
E.B.T.	0	0	1,346	0
I.C.L.T.D.	0	600	0	0
E.B.I.T.	0	600	1,346	0



Summary

The use of debt as a source of capital presents two significant problems to agribusiness managers. First, they must select that form of debt with the lowest explicit cost and least damaging impact on the firm and its stockholders. Second, they must assemble a total capital structure which is composed of the least cost mix of both debt and equity capital. This paper discusses the various forms of operating and term debt capital. It also describes a means for accurately assessing the costs (explicit and

implicit) associated with each debt capital source. Finally, alternative sources of equity capital are also discussed and compared with the debt capital sources insofar as they affect stockholder returns, firm security, and management flexibility.

Sincerely,
Ken D. Duft
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 Extension Economist