PURDUE COLUMN

The Search for an Optimal Capital Structure

Using Debt Effectively

By Josh Detre, Michael Gunderson, Brian Briggeman, and Michael Boehlje, Ph.D.

You're looking over your income statement and come to the interest expense entry … you immediately know that money goes straight to the bank, never having an opportunity to hit the bottom line. You wonder if it is wise to carry debt on the balance sheet at all. If the firm has the necessary free cash, shouldn't the agribusiness always use it to finance new projects instead of debt capital?

Actually, the short answer is no! Debt carries benefits with it that would otherwise be unattainable if the firm was entirely equity financed. Carrying debt can act as a tax shield, provide financing flexibility to grow, and improve Economic Value Added (EVA). Let's consider each of these benefits and how debt can improve financial performance of your seed business.

Why Debt Can Be Good

Debt is an allowable expense under the U.S. corporate tax system. Dividends and retained earnings are not. Thus, debt can serve as a tax shield for an agribusiness. This shield can be calculated by taking the amount of interest paid and multiplying by the marginal corporate tax rate. Effectively, an agribusiness is able to reduce the government's share of pre-tax income. Doing so increases the retained earnings and the value of the firm (the sum of its debt and equity values) by the amount of the tax shield. For an example on how to calculate a tax shield, we will use the firm from Table 1, which has 60 percent of its assets financed via debt. The firm has a corporate tax rate of 35 percent on profits and pays interest on the debt of seven percent. The effective tax shield is $14,700 (the cost of debt multiplied by the corporate tax rate or $42,000 X 35%).

The flexibility associated with debt capital comes from the fact that the firm has the ability to expand more aggressively and structure the terms of the debt – length of maturity, interest, payment schedule, and amount borrowed – in accordance with the expected cash flows of the business. In addition, for a fixed-rate loan, the interest repayment cost is known. When dealing with a variable rate loan, the borrower will have to pay interest at some known margin above a benchmark rate of interest so the cost of interest will vary with financial market conditions. The opportunity cost of equity also changes with market conditions, making its cost volatile.

The interest rate for the seed company in Table 1 is seven percent, which is lower than the required return to equity for the company of 15 percent – an indication that debt is a cheaper source of capital. Notice how EVA improves as more of the cheaper debt and less of the expensive equity is used to finance the business, keeping the asset base constant. Thus, the seed business that currently operates at the zero and 30 percent debt levels should consider increasing their proportion of debt and expanding or growing the business by investing money in other projects that can generate the 15 percent return. (For a more detailed explanation of EVA, please see our article in the May issue of *Seed World*.)

TABLE 1: The Principle of Increasing Risk

	Leverage=(nonequity capital)/(equity capital)		
Capital Structure	No Debt	30% Debt	60% Debt
Equity capital used in business	$1,000,000	$700,000	$400,000
Nonequity capital used in business	$0	$300,000	$600,000
Total capital used in business	$1,000,000	$1,000,000	$1,000,000
Leverage	0.00%	30.00%	60.00%
PANEL A			
ROE when ROA is 15%			
Operating Income	$150,000	$150,000	$150,000
Interest Cost (7%)	$0	$21,000	$42,000
Income before Taxes	$150,000	$129,000	$108,000
Taxes (35%)*	$52,500	$45,150	$37,800
Net Income	$97,500	$83,850	$70,200
ROE	9.75%	11.98%	17.55%
Cost of equity capital (15%)	$150,000	$105,000	$60,000
Economic value added (EVA)	-$52,500	-$21,150	$10,200
PANEL B			
ROE when ROA is -15%			
Returns to total capital used	-$150,000	-$150,000	-$150,000
Cost of nonequity capital (7%)	$0	$21,000	$42,000
Total return on equity capital used	-$150,000	-$171,000	-$192,000
Taxes (35%)	-$52,500	-$59,850	-$67,200
Net Income	-$97,500	-$111,150	-$124,800
ROE	-9.75%	-15.88%	-31.20%
Cost of equity capital (15%)	$150,000	$105,000	$60,000
nomic value added (EVA)	-$247,500	-$216,150	-$184,800

But Debt Can Be Bad

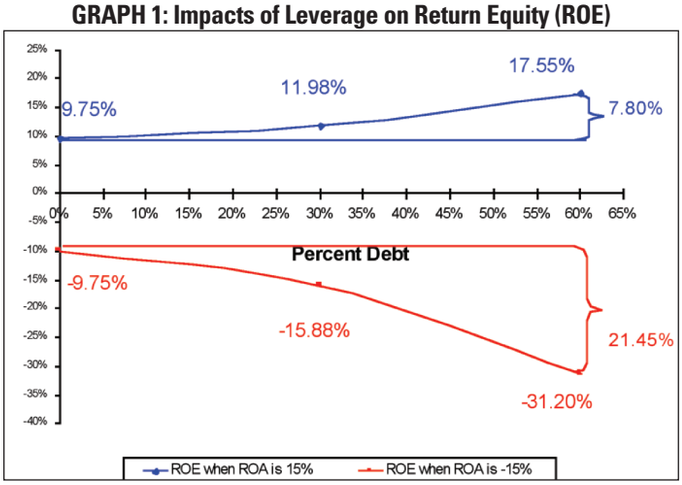
The use of non-equity capital–whether it is acquired by borrowing, leasing, or some other contractual agreement–creates a fixed financial commitment in the form of interest payments, lease payments, bond repayment, or other obligations. From Table 1, we can see that as a higher proportion of the firm's capital structure is made up of debt, the larger the fixed commitment. This commitment to the supplier of non-equity capital results in financial risk. As leverage (the amount of non-equity capital relative to equity capital) increases, the financial commitment as well as financial risk increases.

The tendency for total risk to increase at a growing rate as the relative amount of non-equity capital used in a business expands is referred to as the principle of increasing risk. This principle clearly indicates the possible

disastrous financial consequences of more leverage – the potential loss with increased leverage is larger than the potential gain. Graph 1 shows an example of this principle. When Return on Assets (ROA) is positive 15 percent, ROE exhibits a 7.8 percent increase as the proportion of debt increases from zero to 60 percent of the firm's capital structure. However, when ROA is negative 15 percent, ROE decreases by 21.45 percent for the same change in capital structure.

Yet, some firms safely use more debt and leverage than others. Are they lucky or is there an approach to borrowing that captures the benefits, but reduces or mitigates the risk?

GRAPH 1: Impacts of Leverage on Return Equity (ROE)



Managing Increased Financial Risk

There are techniques that can be used to capture the benefits of borrowing while reducing its risk. Buying insurance, hedging, derivatives, diversification, and contracts are all approaches to managing operating risk. If a firm can withstand only a given amount of total risk, it must manage more aggressively the operating risk as it borrows larger amounts, incurring more financial risk. The firm must balance operating and financial risks so that its sum does not exceed the total risk-bearing capacity of the business.

Seed companies with large net incomes and/or superior operating risk management strategies will be better equipped to handle increases in financial risk. Therefore, these firms can be more highly leveraged than their peers and reap the benefits in the form of increased EVA. These risk management tools allow a firm to truncate the downside exposure associated with increased financial leverage, while maintaining the upside potential associated with the increased leverage. The implications of the principle of increasing risk are clear: if a business is going to use increased leverage, it must manage operating risk to limit total risk exposure.

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