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DEBT CAPITAL:
A LARGER RISK THAN
EVERYONE MAY REALIZE



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Since 1979, agricultural producers and financial institutions have been buffeted by volatile interest rates. The uncertainty created by the deregulated environment has caused many agricultural bankers to re-evaluate their lending practices. Increasingly, agricultural lenders are using variable interest rate loans and differential pricing to shift the risks of uncertain interest rates to producers.

Variable interest rate loans enable banks to maintain the interest rate spread between the interest rates they must pay to obtain loanable capital and the interest rates they charge their borrowers. As the interest rate increases or declines on their loanable capital, the variable interest rates on loans can be altered to reflect the change.

Differential pricing of loans implies charging different interest rates to different borrowers. Interest rates charged on a loan are based on the costs of the loan to the lender and the loan's contribution to profits. High risk customers are charged higher interest rates because of their greater potential for loan default and higher loan servicing costs.

This newsletter will examine: (1) the prevalence of these two lending practices among South Dakota

agricultural bankers and (2) the implications of differential pricing on the ability of farmers and ranchers to carry specific levels of debt.

Prevalence of Variable Interest Rates and Differential Pricing

The majority of the South Dakota bankers surveyed by Mark Edelman, Diane Kolmer, and the authors in November 1984 are using both differential pricing and variable interest rates on their agricultural operating loans (Table 1). Further, nearly 80 percent of the 123 banker respondents were using at least one of these lending practices for their agricultural operating loans.

Table 1. Prevalence of Selected Lending Practices by South Dakota Banks, November 1, 1984.

Lending Practices Used	Number of Banks	Percent of Total
Differential Loan Pricing	20	16.3
Variable Interest Rates	15	12.2
Both Differential Loan Pricing and Variable Rates	63	51.2
Fixed Rates only	25	20.3
Total	123	100.0

Use of these lending practices does affect the producer's ability to safely borrow money and the lender's ability to safely lend money. These lending practices alter the cost of debt capital for the producer and the survivability of the farming/ranching operation.

Variable interest rates make a producer's cash flow more uncertain, since the interest rate can change on the loan. Because agriculture does not always boom with the rest of the economy, interest rates can go up without a corresponding improvement in farm prices. Based on historical evidence, producers and lenders should not necessarily expect agricultural prices to improve when interest rates increase.

Combine this fact with differential interest rates for agricultural operating loans, and the risk of debt capital to the producer can increase significantly. The producer must now carry both the risk of changing interest rates and the financial risk of his or her failure in agriculture. On the other hand, if interest rates do decline or if the producer's financial situation improves, these lending practices will lower the producer's loan interest rate. The producer does receive this potential benefit for carrying the risk.

To gain a perspective on the risks of carrying debt capital, let us first examine differential interest rates being charged by South Dakota bankers in November of 1984.

Differential Interest Rates Charged

Agricultural bankers were asked to report the annual percentage rate (APR) that they were charging on agricultural operating loans by risk class. APR represents the actual or the true rate of interest for the year.

Table 2. Annual Percentage Rate (APR) Charged for Operating Loans, November 1, 1984 for Banks Using Differential Pricing.

Description	Northeast	Southeast	West River
Average APR Charged for Lowest Risk Class	13.63%	13.54%	13.38%
Average Difference in APR between Highest and Lowest Risk Class	2.63%	2.16%	3.07%
Average APR for Highest Risk Class	16.26%	15.70%	16.45%

The average APR for the lowest risk class was fairly uniform across South Dakota (Table 2). The average APR for the lowest risk class borrowers ranged between 13.63 percent in the Northeast and 13.38 percent West River.

However, the average difference between the lowest and highest APR charged varied considerably among regions. For West River, the average difference between the lowest risk class and highest risk class was 3.07 percent. This would imply that the lowest risk borrower would have an interest rate of 13.38 percent, while the high risk borrower would have an interest rate of

16.45 percent. For all regions, the highest risk borrower would, on average, be paying interest rates in excess of 15.50 percent. Furthermore, nearly 25 percent of the banks using differential loan pricing had differences of at least 3.00 percent.

The implications of this type of interest rate structure to producers are illustrated via a hypothetical case study farm with different levels of debt for a specified financial structure.

Assumptions of the Case Study Farm

For this case study farm, we will assume the following conditions concerning the profitability of the farm, its debt level and the lender's use of differential pricing:

1. The case study farm has \$200,000 in sales, and a gross margin of \$25,000 before interest expense and income taxes.
2. The total amount of debt as a percentage of assets is varied for the case farm at the following levels: 15 percent, 30 percent, 45 percent, 60 percent and 75 percent. Total assets are fixed at \$500,000.
3. Associated with each of the five debt to asset percentages is a different degree of financial risk for the lender. To compensate the lender for the greater financial risk of increased leverage, the assumed interest rate is increased 0.75 percent for each step-up in the debt to asset percentage.
4. Actual differential interest rate systems are based on a broader set of credit factors than simply the debt to asset ratio. Also, the size of the step-up in interest rates and the number of risk classes will vary among lenders.

For comparison purposes, the differential interest rate structure is compared to an interest rate structure where the same interest rate is charged to the case study farm independent of the farm's debt to asset ratio.

Profitability Under Constant Interest Rates

Assume in all five debt to asset situations that the case farm is charged an interest rate of 13.50 percent (Panel B, Table 3). Earnings after income taxes and interest expenses range from \$12,644 with a 15 percent debt to asset ratio to -\$25,625 with a 75 percent debt to asset ratio.

Return to owners equity equals the earnings after interest expense and income taxes divided by owners equity. This represents what the owner of the farming operation would be earning on his or her investment. The owner of a case farm with a 15 percent debt to asset ratio would realize a 2.98 percent return to their investment. With 75 percent debt, the return to the owner declines to -20.50 percent. The adverse impact of greater debt on a producer's returns is readily apparent.

A critical question to ask is, "What does the additional debt capital cost the case study farm as the debt to asset ratio changes?" For each step-up in the debt to asset ratio, the case farm substitutes \$75,000 of additional debt capital for \$75,000 of equity capital. With a constant interest rate, the additional interest expense simply equals the interest rate of 13.50 percent times the \$75,000 of additional debt capital or \$10,125. The additional debt capital costs the producer 13.50 percent as the debt to asset ratio increases.

Implications of Differential Interest Rates

With differential rates, the lowest rate assumed is 12.50 percent. Typically, banks using a differential interest rate system offer a lower APR to the lowest risk borrower than banks using uniform interest rates. The APR

Table 3. Cash Flow Analysis of a Case Study Farm at Various Debt to Asset Ratios when a Differential Interest Rate System Is Not Used and Used

A: Financial Structure of Case Study Farm					
BALANCE SHEET					
Total Debt to Total Assets	15%	30%	45%	60%	75%
Total Assets	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000
Total Debt	\$75,000	\$150,000	\$225,000	\$300,000	\$375,000
Owners Equity	\$425,000	\$350,000	\$275,000	\$200,000	\$125,000
SALES AND GROSS MARGIN					
Total Sales	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
-Production Costs	\$175,000	\$175,000	\$175,000	\$175,000	\$175,000
Gross Margin	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
B: Cash Flow Without Differential Interest Rates					
Gross Margin	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
-Interest Expense	\$10,125	\$20,250	\$30,375	\$40,500	\$50,625
-Income Taxes	\$2,231	\$713	\$0	\$0	\$0
Earnings After Income Taxes and Interest Expense	\$12,644	\$4,036	-\$5,375	-\$15,500	-\$25,625
Return to Owners Equity *	2.98%	1.15%	-1.95%	-7.75%	-20.50%
Additional Capital Borrowed	N.A.	\$75,000	\$75,000	\$75,000	\$75,000
Additional Interest Expense	N.A.	\$10,125	\$10,125	\$10,125	\$10,125
Additional Cost of Debt Capital **	N.A.	13.50%	13.50%	13.50%	13.50%
Interest Rate Charged on Total Debt	13.50%	13.50%	13.50%	13.50%	13.50%
C. Cash Flow With Differential Interest Rates					
Gross Margin	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
-Interest Expense	\$9,375	\$19,875	\$31,500	\$44,250	\$58,125
-Income Taxes	\$2,344	\$769	\$0	\$0	\$0
Earnings After Income Taxes and Interest Expense	\$13,281	\$4,356	-\$6,500	-\$19,250	-\$33,125
Return to Owners Equity *	3.13%	1.24%	-2.36%	-9.63%	-26.50%
Additional Capital Borrowed	N.A.	\$75,000	\$75,000	\$75,000	\$75,000
Additional Interest Expense	N.A.	\$10,500	\$11,625	\$12,750	\$13,875
Additional Cost of Debt Capital **	N.A.	14.00%	15.50%	17.00%	18.50%
Interest Rate Charged on Total Debt	12.50%	13.25%	14.00%	14.75%	15.50%

* Return to owners equity equals earnings after income taxes and interest expenses divided by owners equity.
 ** Cost of additional debt capital equals additional interest expense divided by additional debt capital borrowed.

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was assumed to increase to 15.50 percent for the debt to asset ratio of 75 percent (Panel C, Table 3). Earnings with a 75 percent debt to asset ratio are -\$33,125 or nearly \$8,000 less than in the constant interest rate situation. However, at a 15 percent debt to asset ratio, earnings after taxes and interest expense are \$13,281.

Differential interest rates cause a rapid deterioration in the financial position of the case study farm as the debt to asset ratio increases. At the 75 percent debt to asset ratio the return to owners equity is now -26.50 percent. The prospect for financial survival is slim if the producer is unable to increase the operation's profitability or decrease the interest rate paid.

Additional Cost of Additional Debt Capital

Differential interest rates increase the interest rates charged on all debt capital borrowed. The cost of substituting debt capital for equity capital becomes increasingly more expensive as the case study farm increases its leverage. In moving from

60 percent to 75 percent debt, the additional \$75,000 of debt capital increased the case farm's interest expense by \$13,875. If we divide \$13,875 by \$75,000, this additional debt had a cost of 18.50, percent not 15.50 percent.

Producers must realize that the cost of additional debt capital is higher than the interest rate being charged under differential interest rate systems. Interest rates do not decline or stay constant for the producer experiencing financial difficulty, rather they generally will increase. The additional debt capital will become increasingly more expensive.

Conclusions

Extreme caution must be exercised by producers if they plan to increase their debt levels when their lender is using variable interest rates and a differential interest rate system. If the operation begins to experience financial difficulty, corrective action must be taken immediately. Additional debt capital will become more expensive and may further erode the financial strength of the operation.