The Cost of Capital in Agribusiness Firms

Frank J. Smith, Jr.

Determining the rate of return that must be achieved to make an investment proposal minimally acceptable is a major function of agribusiness managers. But this function frequently does not receive the attention it deserves. In many rural based agricultural marketing and supply firms, the decision of whether or not to invest frequently is more related to the manager’s intuition than to a carefully thought out minimum requirement. Though intuition plays an important role in decision making, total reliance on it can be disastrous for rural based agribusinesses where investment outlays of up to $1 million are becoming commonplace.

The purpose of this article is to help agribusiness managers formulate workable standards for judging investment alternatives. Of course, there are many conceptual as well as measurement problems associated with determining the cost of capital, so what is presented here cannot be regarded as the final word. Our intention is to present the major considerations in a systematic way.

The cost of capital — also commonly referred to as the cutoff, hurdle, target, or minimum rate of return — usually is thought of in a percentage or rate sense. If, for example, the cost of capital for a particular firm is estimated to be 10 percent, only projects promising to yield 10 percent or more would be considered feasible alternatives.

In estimating the cost of capital, two factors must be taken into account — quality considerations and the composition of capital used. Quality means the result of the bargaining between the owners of capital and the firm seeking it and entails such matters as risk, claims on assets and earnings, voting rights, tax considerations, control, and income.

The composition of the capital used — the capital structure — also affects the cost of capital. Different proportions of equity and debt can be used to satisfy long term capital needs. Within limits, the total cost of capital can be varied by varying these proportions.

Quality Aspects

Suppliers of capital try to maximize returns from the funds they allow others to use while attempting to minimize loss probabilities. On the other hand, the users of capital — business firms — try to obtain it at minimum costs and with a minimum of restrictive agreements imposed by suppliers. These two points of view create a gap that is bridged either by direct negotiation or through impersonal market transactions.

If the suppliers of capital negotiate for features to enhance their safety, they may (1) be forced to settle for a lower yield, (2) restrict the amount they are willing to offer at a given yield, or (3) impose other conditions related to the repayment period, the security required, etc. If, on the other hand, the firm demands a flexibility feature that reduces the supplier’s

Table 1. Major features of basic securities with respect to risk and other factors affecting quality

<table>
<thead>
<tr>
<th>Features</th>
<th>Term loans, bonds, and other debt instruments</th>
<th>Preferred stock</th>
<th>Common or residual equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Due date</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Claims on earnings</td>
<td>First</td>
<td>Second</td>
<td>Third</td>
</tr>
<tr>
<td>Claims on assets</td>
<td>First</td>
<td>Second</td>
<td>Third</td>
</tr>
<tr>
<td>Tax deductible claim on earnings</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Voting status</td>
<td>None</td>
<td>Limited</td>
<td>Yes</td>
</tr>
<tr>
<td>Returns variability</td>
<td>Fixed</td>
<td>Relatively fixed</td>
<td>Variable</td>
</tr>
<tr>
<td>Risk level: Supplier Firm</td>
<td>Low High</td>
<td>Intermediate</td>
<td>High Low</td>
</tr>
<tr>
<td>Risk modifications: Pledge of assets, agreed on debt limits, amortization or sinking fund plans, dividend restrictions</td>
<td>Sinking funds, voting rights under specified conditions</td>
<td>Preemptive rights that protect against possible dilution of existing stock by new issue</td>
<td></td>
</tr>
<tr>
<td>Repayment linked to earnings, accelerated maturity</td>
<td>Voluntary retirement</td>
<td>Residual claim on income and assets</td>
<td></td>
</tr>
<tr>
<td>Cost to firm</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
</tbody>
</table>
greater reward. The cost of debt capital to the firm would approach and eventually equal that of equity capital. Further, lenders would demand greater management control and at some point would demand all of it.

Assuming that proper attention has been paid to the qualitative aspects, determination of the combination that minimizes the cost of capital depends on the ability of the firm to identify and measure the cost associated with each source. It is to this problem that we now turn.

MEASURING THE COST OF CAPITAL

Fixed Payment Obligations

Perhaps the easiest of all costs of capital to estimate are those related to fixed payment obligations. Such obligations normally specify in precise terms the total amount involved and the associated interest (or dividend) costs. In the case of a debt obligation, the repayment plan and the due date also are specified.

Term Loans. The problem of estimating the cost of a term loan centers around identifying the effective interest rate (what is actually paid) as opposed to the quoted or published rate. For example, if we borrow $5,000 from a bank for 1 year at 5 percent interest, the lender may deduct the interest charge at the outset. We would then receive a net of $4,750. Since the interest payment is $250, the effective rate of interest would be $250/$4,750 = 5.3 percent. The effective rate is 0.5 percent higher than the published rate. Similarly, should a bank require that a compensating balance—a minimum deposit in relation to the loan outstanding—be maintained, the effective rate also would be higher than the published rate.

For firms subject to corporate income taxes, a second consideration enters. Interest expense is tax deductible. The cost of debt capital is reduced by the amount of tax saving involved. If the firm in the above example paid out 40 percent of its income in federal taxes, its net interest cost would be:

\[
\text{Interest cost} = \text{effective rate} \times \left(1 - \text{tax rate}\right)
\]

\[
= 5.3\% \times (0.6) = 3.18\%
\]

Preferred Stock. The computation of the cost of preferred stock also is relatively simple. Here, as in the case of borrowed capital, the payment—now a dividend—usually is specified. If the net amount (after flotation costs) of an issue of 6 percent $25 par value preferred stock received by the company is $23 per share and the dividend payment is $1.50 per year, then the effective rate is $1.50/23 = 6.5 percent. Since dividends are not tax deductible, this net cost to the company is in sharp contrast to the tax benefits associated with debt capital.

Cost of Residual Equity

Residual equity capital is generated either by retaining part or all of the firm's earnings or by selling common stock. Retained earnings constitute the largest part of the residual equity used in agricultural marketing and supply firms. But at times these firms may find it useful or necessary to sell common stock.

New Common Stock. When a stockholder purchases a share of stock, he is in a sense buying revenue. The cost of capital to the firm is the amount it must pay to induce him to part with his money. But unlike fixed return securities, which involve firmly stipulated interest or dividend payments, we are dealing with stockholders' expected earnings. It is conventional to think of the cost of old common as equal to the expected earnings per share divided by the market price. If, for example, the expected earnings per share are $8 per year and the market value of the stock is $80, then the cost of old capital is $8/$80 or 10 percent.

To estimate the cost of new capital, we need a somewhat different formulation. Since the issuance of new stock can dilute the net worth of present stockholders through its impact on earnings per share of existing shares, we need a measure that will identify proposals that would cause such dilution. One such measure is the expected future earnings per share from the enterprise if the investment proposal is not undertaken divided by the net price per share of the new issue.

If, for example, expected earnings per share without the proposed investment were $3 and the net proceeds per share ($30 market price less $3 flotation cost) were $27 for the new issue, the cost of the new issue would be $3/$27 = 11.1 percent. In an all equity firm, this would be the cutoff rate. If stock buyer attitudes toward the new issue were such that the net proceeds per share were only $20, the cost would be $3/$20 = 15 percent. Conversely, if the net proceeds were $50, cost of the new issue would be reduced to 10 percent. Because earnings on share are not tax deductible, the costs so calculated are automatically after tax. Dilution problems can be largely avoided by the judicious use of debt, which also has a tax advantage, as well as other senior securities.

A formula that is useful for calculating the effective rate of interest for more complicated loans is:

\[
\text{Effective rate} = \frac{\text{Total finance charges}}{\text{Half of original loan}} \times \frac{\text{Number of payments}}{\text{Number of years}} \times \frac{1}{\text{(Number of payments + 1)}}
\]

Retained Earnings. The largest single source of equity capital for agricultural marketing and supply firms is derived from retained earnings. Despite the contrary belief among proprietary and cooperative organization managers, retained earnings do have a cost. When a firmbetween its own purposes, it automatically denies these funds to its stockholders or owner-patrons for their personal use. Thus, while there is no money cost to the firm associated with retaining earnings, there is an opportunity cost to the owners that must be taken into account. If we assume that we are dealing with stockholders who have identical risk preferences and alternative investment opportunities and pay no personal income tax, estimation of the opportunity costs of retained earnings is no problem. If the best rate of return our homogeneous group of investors could obtain from alternative opportunities is 7 percent, then the firm would have to earn at least this much by reinvesting earnings to justify not returning them to the stockholders.

The personal income tax factor complicates estimation of an opportunity cost applicable to a group. In a proprietary corporation, stockholders pay no income tax on retained earnings but do pay on dividends. Insofar as retained earnings are reinvested profitably by the firm, the stockholder will enjoy a capital gain (the tax rate on such gain is at least 50 percent less than on dividends) and the tax payment is deferred until the stock is sold. Thus, for example, if expected earnings per share divided by the market price is 7 percent, and an individual stockholder is in the 50 percent personal income tax bracket, a payout of the entire earnings would net him only 3.5 percent (7 percent x 0.5). Further, since most retained earnings are earned but not received this year really are earned but not received this year really are earnings of the prior year, the retained earnings is lower than it would be if there were no personal income tax.

Because of the wide variation in stockholder income and, therefore, tax brackets, designating some income tax rate that would satisfy all stockholders in estimating the cost of retained earnings is impossible. A minimum 20 percent rate, though unsatisfactory from the point of view of many investors, may be close enough.

The estimation of the cost of retained earnings in cooperative corporations presents somewhat different problems than those encountered in proprietary organizations. Because, unlike the proprietary stockholder, the owner-patron pays taxes on retained earnings (when they are duly allocated to him as book credits) as though they were cash, there is no personal income tax advantage. Further, since most retained earnings move through a revolving fund, there is the question of how much a dollar earned but not received this year really is worth in today's terms. For example, if an owner-patron could earn 6 percent on investments, today's value of a dol-
lar received 10 years from now would be only 55.8 cents. Since there is no trading in cooperative residual equity issues, which are paid off at face value, there is no opportunity for offsetting capital gains on retained earnings.

Looking, then, at the owner-patron and the organization as completely separate entities, it is easy to see potential conflicts of interest when choosing between financing the cooperative from patronage dividends or reinvesting them in the organization. The patron’s preference for a bird in the hand is quite understandable. Indeed, if the revolving period is long enough, a patron may discount his share in the revolving fund to the point where he considers it negligible and may question whether or not he is deriving enough benefits to justify the organization’s existence.

This way of looking at the matter may be dangerous, since it assumes that the owner-patron can obtain marketing services and supplies at prices comparable to those existing when the cooperative was in business. Many argue that a cooperative can make its greatest contribution to members through its important but difficult to document police role. Since how well an individual cooperative performs it; police role can be objectively tested only in its absence, the member may have hard put to value it on this. This is not a grave problem in cooperatives that price competitively and produce adequate margins that are revolved in reasonably short periods. But there are some well run and effective organizations there, by virtue of their peculiar competitive environment, are unable to produce significant margins, and there are those who use the police role as a cover up for poor performance. Distinguishing between the two may present the greatest difficulty in evaluation.

The difficult to measure dimensions of competitive benefits accruing to owner-patrons complicate the evaluation of the cost of retained earnings in cooperatives. However, this complication does not constitute grounds for ignoring these costs.

Though owner-patrons of farm supply and marketing cooperatives by no means have identical incomes, alternative opportunities, or tax brackets, they are a great deal more alike than stockholders in a proprietary firm. Most of their investments are in farm related activities. They use roughly the same credit facilities and their personal costs probably are quite similar. While no personal opportunity cost would fit the entire group, dispersion around some chosen parameter probably would not be an great as with a proprietary firm’s stockholders.

A cooperative could, for example, estimate the rate of return to a member-patron on an additional $100 investment in a farm that is typical of those in the area. Or it might examine the cost of various types of credit to its farm patrons, which reflect the opportunity cost of having his earnings retained. Out of the feasible alternatives, some rate—tempered with an evaluation of the effectiveness of the organization in its police role—could be selected to represent the cost of retained earnings.

Noncash Expenses. Another major source of investable capital is the total revenue available after deducting earnings and cash expenditures from total revenue. This difference represents noncash expenses, of which the prime example is depreciation expense. Capital from noncash expenses usually represents substantial sums. In theory, at least, the same kind of criterion used for other internally generated funds is applicable here. As a practical matter the firm normally finds a use for these funds. They usually are invested before internally generated earnings and always before new debt or external equity sources are sought.

Some Modifications. We have assumed that residual equity securities offered by firms were actively traded and that values were determined in a free and open market. But most proprietary and cooperative corporations serving agriculture do not have actively traded stocks. Since market value is an integral part of the cost of residual equity, evaluation becomes a problem. One way of meeting this problem is to use an appraised value of the securities we are dealing with. An appraised value does not mean that the stock can be sold for the appraised price, but rather that the stock is worth that price if a buyer can be found. The appraised value can and should be modified by what is known about market conditions.

Generally speaking, as the marketability of a stock declines, the flexibility a stockholder has also declines, and he assumes greater risk. Other things being equal, the cost of residual equity capital under these conditions would be greater if it were freely marketable. In any case, once a value has been placed on a security, the same procedure used to determine the cost of freely marketable equity capital applies.

Overall Cost of Capital

However imperfect the means, a manager can and should arrive at some estimate of the costs of various types of capital to his firm. When he has done so, calculating the overall cost of capital (the cutoff rate used in the investment decision process) becomes a matter of arithmetic. It is simply the weighted average of the cost of the several sources employed. The process is illustrated in the table below. The weighted average overall cost of capital in the example is 6.6 percent. It reflects the proportion and cost of each type of capital used. In this case, investment projects promising a return of less than 6.6 percent would be rejected. This figure is the screening rate for the firm. Of course, the proportions and costs of capital used in the example are purely illustrative and should by no means be considered standards.

The question of whether or not this is the least cost combination of debt, preferred, and residual equity now arises. Since long term debt clearly is the least cost for their risks (3 percent), why not use more of this and less of retained earnings (7 percent)? It appears that for each $100,000 of debt the firm takes on, its cost of capital increases by 0.3 percent ($100,000 × 3% ÷ $1,000,000), while for each $100,000 of retained earnings released, cost of capital is reduced by 0.7 percent ($100,000 × 7% ÷ $1,000,000), for a net reduction in the cost of capital of 0.4 percent. If the firm could acquire the additional debt at no or a minimal increase in the interest rate, it would clearly pay to do so. As suggested earlier, lender risk is one of the reasons firms don’t move entirely to debt financing. Another reason is that as the proportion of debt capital goes up, risks to the residual equity holders also increase because of their last place claims on income and assets. They too would demand greater rewards for their risks and the cost of equity capital would rise, increasing the overall cost of capital.

Table: Overall Cost of Capital

<table>
<thead>
<tr>
<th>Type of Capital</th>
<th>Amount Used</th>
<th>Proportion, percent</th>
<th>After tax cost, percent</th>
<th>Weighted cost, percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long term debt</td>
<td>$300,000</td>
<td>30</td>
<td>x 3</td>
<td>0.9</td>
</tr>
<tr>
<td>Preferred stock</td>
<td>$100,000</td>
<td>10</td>
<td>x 8</td>
<td>0.8</td>
</tr>
<tr>
<td>Common stock</td>
<td>$100,000</td>
<td>10</td>
<td>x 14</td>
<td>1.4</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>$500,000</td>
<td>50</td>
<td>x 7</td>
<td>3.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$1,000,000</td>
<td></td>
<td></td>
<td>6.6</td>
</tr>
</tbody>
</table>
Farm Credit
Trends and Projections
K. H. Thomas and J. V. Bambenek

Between 1950 and 1965 total U.S. farm debt increased from $12.4 billion to $37.5 billion, a threefold increase. Projections by Brake\(^1\) indicate the likelihood of a similar rate of increase to about $100 billion by 1980. This article reviews recent trends and future projections for real estate and non-real estate credit use and cites the possible implications for farmers and those who provide their inputs.

Real Estate Credit

Total U.S. farm mortgage debt increased from $5.6 billion in 1950 to $13.9 billion in 1965, about a threefold increase. During the same period, Minnesota's real estate debt increased from $245 million to $851 million, a slightly faster rate. Brake projects a U.S. real estate debt of $59 billion by 1980, another threefold increase. If Minnesota's mortgage debt continues to increase at a slightly faster rate than that for the United States, a debt of $3 billion appears likely by 1980.

These increases in real estate debt are expected to occur as a result of relatively debt-free farms being purchased by credit-financed farmers. And the fact that land values are higher results in a higher debt level for the purchasers. Rising land values also create the need for and permit the use of liberal lending policies. Technological changes involving long term financing also are likely to increase the demand for this type of credit.

It now appears that during most periods, sufficient funds will be available to meet this increased demand for real estate credit. But these increased credit needs do have important implications for individual borrowers and lenders.

Rising debt loads and interest rates coupled with narrower profit margins and rising living costs make it increasingly important that detailed planning be done before major real estate investments are made. It is in the borrower's interest to work with the lender who can competently meet his needs. The lender also will be needed.

Non-Real Estate Credit

U.S. non-real estate debt (excluding dealer credit) increased from $4.5 billion in 1950 to $11.5 billion in 1965, an increase of about 255 percent. During this same period, non-real estate debt of Minnesota farmers increased from about $195 million to about $495 million, a 250 percent increase.

In 1965, dealer credit amounted to $7.1 billion, or 36 percent of the total U.S. non-real estate debt. If we assume that Minnesota farmers used the same proportion of dealer credit as for the United States (38 percent of the total), the state total in 1965 would be about $767 million of non-real estate debt. If we further assume that the total use of non-real estate credit in Minnesota would increase at the same rate as that for the United States (220 percent increase as estimated by Brake), the total for the state by 1980 would be about $1.5 billion.

Increased use of capital equipment items and other purchased inputs, rising input prices, and narrower profit margins are significant forces underlying this projection. Increases in the length of term of non-real estate credit also are a factor.

Again, this amount of non-real estate credit probably will be available to farmers, though it may at times come at a high cost. However, an important question is who will provide the credit.

Some conventional lenders may not be able to meet large credit requests because of their capital structure. The proportion provided by dealers, merchants, etc. increased from 34 percent in 1950 to 36 percent in 1965. As the size of individual accounts increases it becomes imperative that dealers become increasingly careful in their credit policies, particularly with regard to those clients who can no longer secure credit through conventional lenders.

With a probable large increase in the size of individual non-real estate loans and declining equity ratios, greater emphasis will have to be placed on the borrower's management ability and repayment capacity. Therefore, detailed information on past performance, current information on present operations, and sound projections regarding future plans will be needed. Development of close working relationships and mutual confidence between borrower and lender also will be needed.

In summary, the total amount of credit required by farmers probably will increase substantially in the years ahead. With the mobility of capital, the farm sector should have an adequate supply of funds if it can realize comparable returns to the rest of the economy. In this setting, operators with proven management and repayment ability will compete most effectively for these funds. Below average managers probably will have to rely more heavily on nonfarm income sources for their livelihoods. Consequently, the major challenges appear to lie with the lender determining the ability of the borrower and the borrower seeking out the lender who can competently meet his needs.

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