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Cost of Capital for Agricultural Cooperatives

Abstract

The cost of capital is important in the financial management of agricultural cooperatives. A measure of the cost of capital is required when evaluating various aspects of strategic business plans, e.g., selecting a financial leverage position, calculating the profitability of alternative investment opportunities, measuring economic value-added, and comparing various merger and acquisition plans. The task of determining the appropriate cost of capital to use requires a careful analysis of the effect of alternative financing choices which are open to a cooperative.

This report considers the close relationship between the cost of capital and capital structure. Ways are examined to determine the cost of capital by a cooperative. The report sequentially identifies: principles of capital structure and cost of capital, guidelines for capital structure choice, and applications of these guidelines through cooperative case examples. These applications are a starting point for cooperatives to develop capital positions and consider alternative assumptions about financing sources and their potential impacts on the overall cost of capital.

To determine the overall cost of capital for a selected capital structure, a cooperative must first determine its cost of equity capital. The cost of equity capital cannot be derived directly from the market, as in the case of a publicly traded firm. Thus, there is no ideal method for determining the cost of capital for a cooperative. So an innovative approach is needed. The opportunity cost of funds approach relates the cost of capital to the rates of return from alternative uses of capital (i.e., the assets side of the balance sheet). The focus is on the expected (or required) rates of return from alternative investments which reflects the degree of risk involved. The discounted cash flow approach relates the cost of capital to the alternative sources of capital (i.e., the liabilities and equity capital side of the balance sheet). The component costs of equity and debt capital are combined into an overall cost of capital for the cooperative. Both approaches require making some assumptions to determine the cost of equity capital for a cooperative.

Key Words: cooperatives, cost of capital, capital structure, equity capital, discounted cash flow, economic value added, financial leverage.

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Contents

Highlights

Membership capital in a cooperative has a cost, but what is that cost? Cooperatives face the problem of how to determine that cost. Solving the problem presents a challenge because the cost of equity capital in a cooperative cannot be derived directly from the capital market like a publicly traded company. The situation is further complicated by the ownership characteristics of a cooperative because the cost of capital should reflect the alternative investment choices of members, as well as the firm. In this report, logical and innovative approaches to making these important determinations of cost of capital are presented along with pros and cons on their applicability to agricultural cooperatives.

The report also studies the changing capital structure (long-term debt and equity) of agricultural cooperatives in the Upper Midwest during the period 1984-l 994. Results indicate a general, but gradual decline in the proportion of equity capital among all cooperatives, regardless of type. Significant variability exists, however, between cooperative types. An inverse relationship generally is found to exist between the proportion of equity and cooperative size. This study of capital structure provides a useful backdrop for considering cost-of-capital issues.

Note: The material on cooperative taxation presented in this report is only to provide information to persons interested in the tax treatment of cooperatives and does not represent official policy of the U. S. Department of Agriculture, the Internal Revenue Service, the U.S. Department of the Treasury, or any other Government agency.

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I-Cost-of-Capital and Capital Structure Issues

In the course of managing a cooperative, boards of directors and managers frequently encounter situations which raise questions about the appropriate capital structure and cost of capital to use. This section identifies and discusses some of the management issues, the cost of capital concept, and the problem faced by cooperatives.

Management Issues

Cooperative Capital Constraints. Access to capital is a complex and strategic issue. Selection of either internally generated capital (e.g., retained earnings) or externally-acquired capital (e.g., stock or debt) as a source of funds implies an explicit (interest or dividend) cost of each source and/or an opportunity cost of capital (due to alternative uses of those funds). Hence, the cost of capital to a cooperative is never zero, regardless of the source. When capital is constrained, the cost of each additional unit increases sharply and may become extremely high.[1] Thus, cooperatives which find that their capital is significantly constrained, may find that they must forego investment projects which would be profitable under less restrictive financial circumstances.

Use *of Financial Leverage.* The increased variability of interest costs and farm income in the early 1980s communicated a significant amount of uncertainty about earnings to agricultural cooperatives. When earnings are uncertain, decisions on the use of financial leverage and the appropriate amount of financial (cash and noncash) reserves to maintain, and evaluating the cost of maintaining those reserves, can be difficult. It appears that the largest cooperatives have been gradually reducing their use of debt capital since the mid-1980s in order to strengthen their equity capital positions. Yet, smaller farmer cooperatives have continued to increase use of nonequity capital forms in recent years. So what motivates these changes in capital structure and what are the implications for cooperatives of different sizes and types?

Evaluating Investment Opportunities. As plant and equipment investments age, and technological improvements make existing production assets relatively less efficient, cooperatives are periodically faced with the decision of how to finance efficiency-generating (e.g., cost-reducing or capacity-expanding) capital improvements by internal or external means. In recent years, cooperatives have also been asking how to raise the funds needed to invest in value-added (revenue-enhancing) ventures. For example, new cooperative capital structures such as "closed-membership cooperatives" are being formed. To finance these ventures, new equity instruments are being used, e.g., equity participation units which provide the owners with net patronage-sourced income in the form of patronage refunds from the operations. While these "stock-like" instruments may help overcome the traditional constraint on internally generated equity capital, a cooperative may not fully perceive the cost of this source of capital.

Measuring Economic Value Added. As cooperatives seek to identify and evaluate alternative business ventures and their contribution to member capital, they have increasingly measured the pay-off in terms of the economic value added (EVA). The EVA is the residual income which remains after adjusting net returns on

[1] The additional increment to capital comes at an extremely high cost once the cooperative encounters a constraint on borrowing or the ability to issue equity capital.

investment for the cost of capital. The EVA reflects the cooperative's true economic profit and, as such, it incorporates information about capital structure and the opportunity cost of capital. The EVA shows the extent to which the cooperative has contributed to shareholder-member value.

Cooperative Mergers and Consolidations. As cooperatives merge and become part of larger operating entities, their capital positions also change. Reorganization is frequently pursued with an eye on economies of size, scale and scope. The financial transactions are often quite large, so they involve significant issues of capital restructuring and the need to determine the cost of capital for the acquiring firm or the new entity. The resulting cost of capital is more difficult to determine because alternative capital structures may be considered.

The Cost-of-Capital Concept

The cost of capital is an important economic and financial concept because of the multiple roles it plays in management: identifying profitable and financially feasible investments and uses of cash (e.g., investments in new or replacement production assets, selecting a trade financing policy, payment of dividends and stock repurchases, etc.), comparing the profitability and liquidity effects of alternative financing strategies (e.g., leveraging and leasing), and assessing the value of the firm, to name a few.

Patterson (1995) suggests that the "cost of capital" may be misleading as a financial concept because it focuses attention on the right side of the balance sheet and the assumed (debt and equity capital) financing mix. Rather, the focus should be placed on the "opportunity cost" of a decision to invest in a given asset. Thus, the cost of capital would be related to the alternative uses of capital, and not to its sources. The opportunity cost approach to determining the cost of capital is important because it emphasizes the characteristics of the asset and the uncertainty of the net returns of the investment over the life of the asset.

However, evaluating the profitability of a capital investment or the advantages of alternative financing strategies requires the company to determine the cost of capital based on the alternative funding strategies and the component cost of each method of financing. Defenders of the cost-of-capital concept find it necessary to have such a measure to discount the cash flows of a project and to perform the required profitability or feasibility analysis.

The Cost-of-Capital Problem

The cost-of-capital problem has a couple of dimensions.[2] First, there is no general consensus on how to determine the cost of equity capital. Alternative assumptions can be made about future earnings, and the growth of earnings is a key factor in most "growth models." One of the central questions that relates to cooperatives is the cost of capital for a firm whose equity capital is not traded and whose growth is also uncertain.

The finance literature outlines approaches used by corporations whose equity securities (stocks) are actively and frequently traded in highly efficient capital markets. Thus, in the case of a corporation, dividends or cash flow per share and the market price of the stock may be used to derive the cost of equity capital. Cooperative stock is not traded, so an objective, market-based measure of the value of a share is not available (or even explicitly known). Therefore, the true cost of capital is difficult (but not impossible) to determine. Alternative means must be used to develop a reasonable estimate.

Secondly, the cost of equity capital is in actuality the opportunity cost of funds to cooperative members. This adds complexity to the derivation of a cost of equity capital because the range of financial alternatives members may consider is potentially quite diverse. This report recognizes that added complexity, but doesn't deal with it explicitly.

Objectives

The general objective of this report is to apply the concepts of modern financial theory to identify the appropriate cost of capital for agricultural cooperatives. The specific objectives are:

- to identify the relationships between the cost of capital and capital structure, and
- to examine ways of determining the cost of capital.

Scope and Organization

The report has four remaining sections: a review of recent changes in capital structure of agricultural cooperatives, an identification of the factors that are thought to influence cooperative capital structure, a review of alternative approaches and methods used in

[2] Estenson (1995) suggests that the financial leverage question facing cooperatives involves considering four perspectives: the cost of capital, the influence of the business cycle, owner philosophy and commitment, and competitive advantage within the industry.

measuring the cost of capital, and applications of the opportunity cost approach and the discounted cash flow approach to selected agricultural cooperatives.

II-Changing Capital Structure of Agricultural Cooperatives

This section evaluates recent trends in farmer cooperative financing strategies and changes in financial and capital structure.[3] Trends are identified and evaluated in terms of differences in cooperative types and sizes. These trends reflect changes in the underlying components of capital structure and the cost of capital.

Changes in Capital Structure

Changes in cooperative capital structure during 1989-1994 were studied, using financial data for Midwest farmer cooperatives in Minnesota, Wisconsin, Michigan and North Dakota. Additional comparisons are made using summary data from 1984-95 for the largest 100 cooperatives in the U.S. The farmer cooperatives data are used to derive annual percentages of debt and equity capital. The cooperatives are sorted and ranked according to cooperative type and size. Where cooperatives are ranked by size, the means of the ratios are reported according to quartiles.[4] In addition, subcategories of debt and equity capital are reported according to cooperative type (or function) in order to investigate differences in debt-equity composition.

To obtain consistent estimates of changes in capital structure, the cooperatives are first assembled into cohort groups.5 The cooperatives are classified according to type (or major function&grain, petroleum farm supply, other farm supply, and other marketing. These subgroups allow looking at changes over time and differences in financial structure across cooperative types.

Comparison of Cooperatives by Type. Assets, liabilities and equity capital are reported as percentages of total assets in Table 1. These indicators are used to identify changes in asset and capital structure. When all cooperatives in the sample were considered regardless of size, the percentage of equity capital declined only slightly during 1989-94. The mean debt ratio (debt as a percent of total assets expressed as a ratio) across the sample of Midwest cooperatives is generally higher than those reported by Eversull and Chesnick (1995) for local farm supply and marketing cooperatives during 1983-90.[6] By comparison, the mean debt ratios reported by Chesnick and Kraenzle (1997) for local farm supply and marketing cooperatives during 1994-95 are only slightly lower than our result for Midwest farm supply and marketing cooperatives. They report ratios of 0.45 - 0.50 in 1994-95 compared to our estimate of 0.59 for the combined set of marketing and local farm supply cooperatives in 1994. Among marketing cooperatives the debt ratios are closer at 0.53 - 0.62 in 1995, reported by Chesnick and Kraenzle, compared with this report's estimate of 0.65 in 1994.[7]

The trend of capital structure does change significantly over time when viewed according to the different cooperative types. For example, the equity positions of grain marketing and general farm supply cooperatives declined, while the percentage of equity capital increased for marketing cooperatives after 1993. There are also significant differences in equity capital positions between cooperative types. For example, petroleum cooperatives have the lowest leverage (highest relative equity capital) position, while agricultural marketing cooperatives have relatively higher financial leverage (lower equity capital) positions. The lower equity capital observed among marketing cooperatives is partially explained by the nature of their operations. They carry significant levels of payables to

Financial structure refers to all sources of financing, including short-term and long-term liabilities and equity capital. Capital structure refers just to long-term liabilities and equity capital as sources of funds, excluding short-term debt used to finance working capital.

The distributions of financial ratios are generally recognized to be quite skewed by extremely high values, so measures such as quartiles are used to statistically summarize the data. These "nonparametric statistics" are generated by ranking the cooperatives by size (e.g., total assets) and then grouping them into quartiles (quartile 1 is the 0-25% size group, quartile 2 is the 26-50% group, etc.). The intra-quartile mean of each ratio is calculated and reported

These cohort groups contain the same cooperatives for each year, thereby eliminating the variability associated with changes in which cooperatives are being evaluated.

[6] For example, Chesnick and Eversull report mean debt-to-asset ratios of 0.20 - 0.28 for their local farm supply and marketing cooperatives. This compares with about 0.30 - 0.50 among the Midwest farm supply and marketing cooperatives in our data set for 1989.

[7] Observed differences in debt ratios are due to many factors, such as location and size of the cooperatives analyzed. For example, the Midwest local farm supply cooperatives in this study's sample were significantly larger (in total assets). Marketing cooperatives were somewhat smaller than those analyzed by Chesnick and Kraenzle.

Table 1—**Mean assets, liabilities and equity capital by cooperative type, 1989 and 1994.**

Year	Total assets	Current assets	Other assets	Fixed assets[a]	Current liabilities	Long-term liabilities"	Equity capital
	($000)			*(Percent-)*			
				Grain (N = 126)			
1989	24,141	58.9	11.7	29.4	45.6	8.1	46.3
1994	51,157	62.5	13.4	24.0	51.0	7.4	41.6
				Other Marketing (N = 52)			
1989	2,044	53.1	18.0	28.9	37.1	29.3	33.6
1994	2,854	54.4	16.3	29.4	41.4	21.4	37.2
				Farm Supply-Petroleum (N = 58)			
1989	15,584	49.2	27.3	23.5	23.9	6.4	69.7
1994	12,858	45.1	29.8	25.2	26.3	7.2	66.6
				Farm Supply-Other (N = 188)			
1989	32,122	49.3	22.0	28.7	33.8	17.2	49.0
1994	35,495	52.3	19.9	27.9	38.4	27.0	34.6
				All (N = 424)			
1989	23,799	52.4	18.7	28.9	36.8	23.5	39.8
1994	33,049	53.8	17.9	28.3	40.4	23.1	36.5

[a] Fixed assets includes real estate, plant and equipment. Long-term liabilities includes long-term loans, and notes payable, leases and industrial revenue bonds, and other long-term sources. Equity capital includes common stock, allocated equity and unallocated equity.

farmers for the raw farm products that are purchased for processing. These liabilities are a substantial part of their overall funds.

Comparison of Cooperatives by Size. Capital structure differences among cooperatives relate to size differences. The ratios of various types of assets, liabilities and equity capital (to total assets) are reported by total asset size group in Table 2. It shows the total assets of the cooperatives used to rank the cooperatives by size and group them into quartiles. The cooperatives in quartile 1 had average total assets of $912,000 in 1989, and $1,194,000 in 1994. The reported ratios are the means of the ratios for the cooperatives in each quartile. Because the same cooperatives are included in both years, direct comparisons can be made within quartiles and across quartiles.

Financial leverage (the debt-to-total assets ratio) tends to increase with cooperative size. This is illustrated by the significant decrease in the ratio of equity capital from quartile 1 (small cooperatives) to quartile 4 (large cooperatives). Other differences in asset and debt capital structure are also significant between cooperative-size groups. For example, the proportion of long-term liabilities among small cooperatives is just 3.8 percent in 1994, but that proportion increases to 6.7 percent, 7.8 percent, and 24.3 percent as cooperative size increases. Thus, it appears that size and type of cooperative are factors associated with changes in cooperative capital structure during 1989-94.

Petroleum cooperatives appear to have a significantly lower leverage position than agricultural marketing cooperatives. Dividing total assets by the number of cooperatives indicates the average size of marketing cooperatives is much larger. This implies that cooperative size is a critical underlying factor that influences capital structure. It may be more important than cooperative type in explaining the observed differences in capital structure. Statistical tests for differ-

Table **n-Mean assets and liabilities by cooperative size, 1989 and 1994.**[a]

Year	Total assets	Current assets	Fixed assets	Other assets	Current liabilities	Long-term liabilities	Equity capital
	($000)	*(percent)*					
				Quartile 1			
1989	912	51.1	23.5	25.4	22.8	2.4	74.8
1994	1,194	52.6	23.4	24.0	26.9	3.8	69.4
				Quartile 2			
1989	2,041	52.0	21.1	26.9	31.6	4.0	64.4
1994	2,899	49.8	25.7	24.6	32.4	6.7	61 .O
				Quartile 3			
1989	3,516	54.0	19.9	26.1	34.4	4.4	61.2
1994	5,386	55.2	20.3	24.5	39.0	7.8	53.2
				Quartile 4			
1989	88,727	52.4	18.6	29.0	37.1	24.9	38.0
1994	122,719	53.8	17.6	28.6	40.8	24.3	34.9

[a] Cooperative size is measured by total assets.

ences in the mean leverage positions of the cooperatives by asset size quartile and by type were highly significant in each of the years analyzed. This indicates that the means reported for each size and type subgrouping in Table 1 (and subsequent Tables 2-6) is significantly different from those reported in each of the other subgroups.

A regression analysis was also conducted to determine if a statistically significant relationship exists between variations in capital structure and cooperative size during 1988-1995. Two alternative measures of cooperative capital structure were used: the term debt/total assets ratio and the term debt/total equity ratio. Two alternative indicators of cooperative size also were used: average total sales and average total assets. A significant, positive relationship was found.8 This was also true for the average term debt/average total assets ratio of each cooperative in relation to the level of average total assets. The relationship between cooperative type and debt used was also studied. Cooperative type was not found to be a significant predictor of capital structure when the cooperative size variable was included in the model. Thus, it is concluded generally that the proportion of term debt used by farmer cooperatives is positively related to increases in cooperative size.

In Table 2 trends are reported for mean percentages of assets and liabilities by cooperative size category. The mean percentages clearly indicate that there is a significant difference between the lower levels of long-term liabilities in the small cooperatives (in quartile 1) compared with the higher levels in the large cooperatives (quartile 4). Moreover, that relationship was maintained throughout the 6-year period. A similar pattern is illustrated by the mean proportions of equity capital. Small cooperatives have significantly higher mean proportions of equity capital than larger cooperatives. The pattern shows that as cooperative total assets increase (from quartile 1 to quartile 4), the proportion of equity capital decreases.

Liability Structure and Cooperative Function. In Table 3, various sources of cooperative long-term liabilities are expressed as percentages of total long-term debts. Grain marketing and farm supply petroleum cooperatives used more loans from the Bank for Cooperatives. Other farm supply cooperatives (excluding petroleum supply) and other agricultural marketing cooperatives tended to use notes payable. For

[8] Even though the model predicted a relatively low proportion of the overall variation in the debt ratio across cooperatives, the results were significant.

Table 3—**Mean percentages of long-term liabilities by cooperative type, 1989 and 1994.**

Year	Total long-term liabilities	Bank for cooperatives	Notes payable[a]	Leases and gov't funded debt	Other liabilities[b]
	($000)	*(in percent)*			
		Grain (N = 126)			
1989	1,945	51.4	4.6	33.5	10.5
1994	3,790	64.5	17.1	6.9	11.5
		Other Marketing (N = 52)			
1989	598	10.9	47.0	15.8	26.3
1994	610	34.8	39.7	7.4	18.1
		Farm Supply-Petroleum (N = 58)			
1989	1,002	43.0	7.4	7.5	42.2
1994	925	84.9	5.1	3.9	6.2
		Farm Supply-Other (N = 188)			
1989	5,509	14.2	49.6	5.1	31.2
1994	9,587	8.7	41.4	3.2	46.7
		All (N = 424)			
1989	5,583	13.2	46.1	13.7	27.1
1994	7,624	21.6	40.0	5.1	33.3

[a] Notes payable includes: general notes payable, customer notes and accounts, and regional cooperative accounts.
[b] Other liabilities includes: deferred taxes, deferred employee compensation, and deferred compensation to marketing customers.

cooperatives as a whole, notes payable is the dominant form of long-term debt. While notes include borrowing from the Bank for Cooperatives, the proportions borrowed from other sources and other long-term borrowings from the Bank for Cooperatives were increasing also. The decline of Bank for Cooperatives financing of other farm supply cooperatives during 1993-94 is the exception to this trend. The use of leases and industrial development bond financing has also declined significantly.

Comparisons of Liability Structure by Cooperative Size. Table 4 shows the structure of long-term liabilities according to size of cooperative. The size grouping is based on the outstanding amount of total long-term liabilities. The greatest differences occur between the cooperatives in quartile 4 and the three other quartiles. Notes payable are used more frequently by cooperatives which hold relatively large amounts of long-term debt (i.e., quartile 4), while the other size classes of cooperatives more often use Bank for Cooperatives' loans. The trend away from using leases and government-funded debt (e.g., industrial revenue bonds) is most obvious among cooperatives in quartile 4. These cooperatives also significantly decreased their average volume of long-term debt in recent years.

Comparisons of Equity Capital by Cooperative Function and Size. Equity capital is reported as allocated equity (common stock and other allocated equity) and unallocated equity by cooperative type in Table 5, and by equity size in Table 6. Grain cooperatives had the least common stock, while other (general) farm supply cooperatives had more common stock. The proportions of other allocated equity were somewhat higher among grain and other marketing cooperatives than among the farm supply petroleum and other farm supply groups. When divided into quartiles by size (Table 6), the proportion of common stock is significantly higher and the other allocated equity is somewhat lower among the largest cooperatives.

In summary, although the time series of financial data on smaller farmer cooperatives reported in Tables 1-6 is relatively short, the data suggest that there are

Table 4—**Mean percentages of long-term liabilities by cooperative size, 1989 and 1994**[a]

Year	Total long-term liabilities	Bank for cooperatives	Notes payable	Leases and gov't funded debt	Other liabilities
	($000)	*(in percent)*			
			Quartile 1		
1989	35	64.4	19.5	5.0	11.2
1994	60	71.9	14.3	3.0	10.8
			Quartile 2		
1989	**115**	**54.7**	**21.7**	**7.4**	**16.2**
1994	**239**	**77.1**	**12.7**	**2.0**	**8.2**
			Quartile 3		
1989	212	54.0	21.3	11.4	13.3
1994	504	67.6	15.3	5.1	12.0
			Quartile 4		
1989	26,358	12.6	46.5	13.7	27.2
1994	24,154	20.4	40.7	5.2	33.8

[a] Cooperatives are sorted into size classes using total assets, not total liabilities. See descriptions of liability categories in the previous table.

Table 5—**Mean percentages of allocated and unallocated equity by cooperative type, 1989 and 1994.**

Year	Total equity capital	Common stock	Other allocated equity capital	Unallocated equity capital
	($000)	*(in percent)*		
		Grain (N = 126)		
1989	11,177	1.0	81.1	17.8
1994	21,281	1.6	73.8	24.6
		Other Marketing (N = 52)		
1989	**687**	**5.3**	**67.1**	**27.6**
1994	**1,061**	**4.7**	**75.5**	**19.8**
		Farm Supply-Petroleum (N = 58)		
1989	**10,862**	**9.1**	**65.1**	**25.7**
1994	**8,563**	**7.7**	**61.8**	**30.5**
		Farm Supply-Other (N = 188)		
1989	**15,740**	**23.2**	**55.0**	**21.9**
1994	**12,281**	**19.4**	**54.3**	**26.2**
		All (N = 424)		
1989	9,472	**11.6**	**64.0**	**24.4**
1994	**12,063**	**11.0**	**65.9**	**23.1**

significant differences in capital structure between cooperatives generally by size and selectively by type. The percentage of debt capital increases with cooperative size. This corresponds with the results from previous studies among corporations operating outside of agriculture. Secondly, the highest equity capital positions are maintained by farm supply petroleum cooperatives, followed (in descending order) by grain, other farm supply, and other (nongrain) marketing cooperatives. Among agricultural cooperatives, notes payable is the dominant source of long-term debt financing. Moreover, the proportion of notes payable used by the largest cooperatives is significantly above that used by medium- and small-sized cooperatives. The capital structure of cooperatives appears to have changed somewhat in recent years. For example, the proportion of equity capital has declined gradually during 1989-94. Although no major trend has emerged in the use of long-term debt, the share of leases and government-funded debt diminished in the early 1990s.

The Largest 100 Agricultural Cooperatives

In contrast with the observed capital structure trends among smaller Midwest cooperatives, the capital structure of the largest 100 cooperatives in the U.S. has shifted gradually toward increased use of equity capital and away from long-term debt during 1984-95 (Table 7). The proportion of equity capital increased gradually from 33.8 percent in 1984 to 37.3 percent in

Table 6—**Mean percentages of allocated and unallocated equity by cooperative size, 1989 and 1994.**

Year	Total equity capital	Common stock	Other allocated equity capital	Unallocated equity capital
	($000)		(in percent)	
		Quartile 1		
1989	682	6.1	72.7	20.7
1994	828	5.5	70.9	23.6
		Quartile 2		
1989	1,315	6.6	71.7	21.7
1994	1,768	4.7	70.0	25.3
		Quartile 3		
1989	2,152	4.6	70.5	24.9
1994	2,864	3.0	71.6	25.5
		Quartile 4		
1989	33,726	12.3	63.1	24.6
1994	42,806	11.9	65.2	22.9

Table 7—**Proportions of assets, liabilities and equity capital in the Top 100 Cooperatives, 1984-95.**

Year	Total assets (millions)	Current assets	Other assets	Fixed assets	Current liabilities	Long-term liabilities	Equity capital
1984	$16,567	0.552	0.123	0.325	0.411	0.251	0.338
1986	$15,506	0.537	0.126	0.337	0.393	0.247	0.361
1988	$17,139	0.568	0.127	0.305	0.427	0.217	0.356
1990	$18,116	0.553	0.145	0.302	0.407	0.220	0.373
1992	$18,903	0.543	0.139	0.318	0.410	0.220	0.371
1994	$20,463	0.560	0.151	0.289	0.422	0.205	0.373
1995	$23,220	0.569	0.149	0.282	0.428	0.199	0.373

Source: Compiled from US. Dept. of Agric., Farmer *Cooperatives,* various issues.

Table 8—**Equity capital of the Top 100 Cooperatives, 1984-l 995.**

Year	Equity (in 000)	Common stock (%)	Preferred stock (%)	Other allocated equity (%)	Unallocated equity (%)
1984	$5,629	16.4	21.3	45.6	16.6
1986	$5,590	13.6	21.1	50.5	14.8
1988	$6,095	12.3	19.2	53.3	15.3
1990	$6,750	11.8	17.2	54.4	16.6
1992	$7,005	8.8	8.8	66.9	15.3
1994	$7,731	7.2	18.1	57.5	17.1
1995	$8,216	6.9	19.8	54.1	19.2

[a] Other allocated equity includes: allocated retained earnings and per-unit retains.

1995. The corresponding decrease in long-term liabilities was from 25.1 percent in 1984 to 19.9 percent in 1995. Due to the higher proportion of equity capital, the overall financial structure also shows a reduction in debt in the total financing of the cooperatives. Total liabilities decreased from 66.2 percent in 1984 to 62.7 percent in 1995. As the proportion of long-term liabilities has declined, the proportion of short-term liabilities has slightly increased.

One could argue that a comparison of the 100 largest cooperatives with Midwest cooperatives is biased, because the latter group is dominated by smaller cooperatives. However, the largest Midwest cooperatives (those in quartile 4) also reflect a gradual shift toward proportionately less equity capital. A common characteristic of the largest 100 cooperatives and Midwest cooperatives is the shift toward short-term liabilities in place of long-term liabilities. This may be motivated by the decline in interest rates which has been observed in the latter 1980s and in the 1990s, as expectations about inflation declined and remained low.

The changing equity capital position of the top 100 cooperatives during 1984-1995 indicates a shift away from common stock toward other allocated equity capital as a source of equity financing (see Table 8). Although cooperatives have continued to expand their volume of business with nonmembers, the proportion of unallocated equity capital among the top 100 cooperatives has remained relatively stable.

III-Identifying the Determinants of Cooperative Capital Structure

This section investigates the choice of a cooperative capital structure within the context of the general finance literature. Some of the key controversies and findings of previous studies are summarized.

A Checklist of Factors

The general finance literature has focused on the concept of an optimal capital structure.[9] Yet, a precise determination of an optimal capital structure is difficult and, in practice, the choice of a capital structure may be dependent on several interrelated factors, some of which may be specific to a company. Brigham and Houston (1998) suggest a checklist of factors which firms generally consider when making capital structure decisions (Table 9). They suggest that the ultimate goal of a firm is to maintain financial flexibility (i.e., adequate reserve borrowing capacity). The factors they identify align closely with those in the general finance literature.

Although it is possible to determine a firm's optimal capital structure, as a practical matter it cannot be estimated with precision. Financial officers tend to treat the optimal capital structure as a range of values (say 35-45 percent debt), rather than as a single value (40 percent debt), and the target capital structure lies within a range.

[9] The study of capital structure was sparked by Modigliani and Miller (1958) who proposed that choosing a capital structure is irrelevant to the maximizing objectives of the firm. They suggested that the value of a company could be derived by capitalizing a fixed, expected return using an expected rate of return. Because the expected return and its rate are assumed not to vary with the method of financing used (i.e., equity versus debt), the implication is that the choice of a capital structure is irrelevant to the value of the firm. Most analysts argue that capital structure does matter and the growing literature on capital structure choice since 1958 has focused on analyzing the other factors which should be considered: economic and financial trade-offs (Miller, 1977; Myers, 1984 and 1993; Barclay, Smith and Watts, 1995), asymmetric information (Ross, 1977) , agency costs (Jensen and Meckling,1976), and market interaction (Jensen and Meckling, 1976).

Table 9—**Checklist of factors which may influence capital structure choice**

Factor	Description
Sales stability	A firm with more stable sales can safely add debt and incur higher fixed charges.
Asset structure	Firms with assets which are suitable as collateral tend to use debt more heavily.
Operating leverage	A firm with less operating leverage is better able to use more financial leverage.
Growth rate	Faster-growing firms must rely more heavily on external capital.
Profitability	Firms with higher rates of return tend to be able to finance more of their investments with internally-generated funds.
Taxes	A firm with a higher tax rate has greater deductibility of interest expense and a greater incentive to use debt.
Control	If management is insecure, it may use debt to maintain control of the firm.
Management attitudes	More aggressive managements use more debt in the quest for higher profits.
Lender attitudes	Managements will use lender advice in determining the appropriate degree of financial leverage to use.
Market conditions	When financial market conditions are causing interest rates on debt instruments to be high, there is an incentive to issue equity.
Internal conditions	'A firm may prefer to finance with debt until expected earnings materialize.
Financial flexibility	A firm will determine if its reserve of future borrowing capacity will be impaired by the use of debt financing today.

Source: Brigham and Houston (1998), p. 521-522

In addition, the choice of a capital structure may be linked to funding decisions underlying the actual implementation of investment projects. Thus, it is often necessary to incorporate practical experience and knowledge of firm and industry conditions into a more realistic determination of capital structure. This approach explores the methods which potentially can be used by cooperatives to determine the cost of capital given any of several alternative capital structures, not only optimal ones.

Agricultural Cooperatives

In comparison with corporate capital structure, the literature on agricultural cooperative capital structure is relatively underdeveloped, and yet no less controversial. In general, the existing cooperative finance literature has stressed the unique characteristics of agricultural cooperatives. These characteristics tend to obstruct the straightforward application of several approaches which have been taken in the general corporate finance literature. We review each of the four primary approaches, plus the potential role of cooperative objectives, as determinants of cooperative capital structure choice.

Economic Trade-offs. One of the central ideas of the trade-off approach is that the firm balances the benefits of tax savings (from deducting interest expense) with the cost of financial distress due to bankruptcy when too much debt is used. The trade-off approach suggests that firm size may be a factor in cooperative financial leverage, even though its exact role is indeterminate. It appears that a significant positive relationship exists between financial leverage and cooperative size. However, there does not appear to be a consensus on what role cooperative size plays as a determinant of financial leverage position. Thus, the trade-off approach is mostly useful as a conceptualization of the issues involved in capital structure choice.

Asymmetric Information. The asymmetric information approach shows managers can manipulate the firm's value via the signaling of information about the firm and the influence of their actions on stock prices (Meyers and Majluf, 1984). Two factors make it difficult for agricultural cooperative managers to signal information to investors. First, managers don't often own the equity of the cooperatives they operate.[10] Second, even if they were owners, the equity is not a

[10] Cooperatives increasingly are providing stock ownership incentives to their management personnel.

traded asset." It is more likely that cooperatives follow a "pecking order" strategy, because they would potentially improve the performance of the cooperative by selecting the lowest cost financing alternatives first.

Tangible assets may also play a role in cooperative capital structure choice under the asymmetric information approach. Pederson and Manda (1994) find that cooperatives with higher fixed assets generally also carry higher levels of debt. The reasoning for this result appears to be that tangible assets provide good collateral for lenders, which may reduce the costs of asymmetric information by lowering the costs of financial distress for the lender and the borrower. However, if the assets are firm-specific, the cooperative would likely have a comparatively lower debt level because of the implied reduction in asset liquidation value, if bankruptcy were to occur. Thus, the proportions of tangible and firm-specific assets in a cooperative may contribute to opposing effects on capital structure.

Agency Costs. The agency costs of equity capital are less applicable because agricultural cooperatives are substantially still owned by their members. It is less likely that cooperative managers will attempt to appropriate perquisites, or that they will change their attitudes and become less oriented toward searching for profitable projects, even though they are not substantial owners. However, the agency costs of debt might apply to cooperatives.12 The scenario is the same as in the corporate financing situation, although cooperatives may not be as sensitive as corporations to these costs.[13] The type of agency cost of debt which remains for both cooperatives and corporations is the cost of bankruptcy.

Cooperatives confront another potential agency cost of financing. Cobia (1989) and Fischer (1983) suggest that cooperatives may be trapped in a "free cash flow problem." That is, cooperative management may decide to extend or maintain a longer revolving fund period or increase the percentage of retained patronage refunds to finance the cooperative's growth, even though this might not significantly benefit current members. This is an "agency cost of patronage refunds," which would theoretically be reflected in the cooperative's capital structure and cost of capital.

Market Interaction. The influence of product characteristics is less likely to be a significant factor in agricultural cooperatives where the customers are also the owners. Moreover, agricultural cooperatives do not generally produce (or supply) durables to their customers. When durable goods are involved, a cooperative usually plays the role of an agent, who bargains for its members with the firm producing the durable good. Although product characteristics are not likely to influence cooperative capital structure decisions, input characteristics may be important (e.g., due to lumpiness in input acquisition)

Cooperative Objectives

Potential differences exist between cooperative capital structure decisions and those of corporations for various reasons. Van Sickle and Ladd (1983) state that the disparities include: a cooperative's customers are its owners, the price of a cooperative's common stock is fixed, deferred patronage refunds are a source of capital financing, cooperatives may operate with a single tax, and a cooperative's objective is to benefit its member-customers.

The fact that cooperative customers are also its owners raises the prospect for a more complicated objective. If owners and customers are separated, the objective could be either to maximize owner profits or to minimize customer costs. *Farmer-customers* of an agricultural cooperative want to sell products at high prices and buy inputs (and services) at low prices. *As owners, farmers* would prefer the reverse situation. Thus, to specify the objective of the cooperative requires careful consideration of these characteristics. The optimal prices paid to cooperative users should be determined by the patronage refund policy. A lower proportion of cash refunds and a longer deferred patronage refunds revolvement period should induce farmers to act more like customers of the cooperative and less like owners.

Ladd (1974) assumes that the cooperative's objective is to maximize members' supply price or the quantity of raw material to outside processors. Fischer (1983) assumes that the objective function is composed of the sum of total members' net revenue from produc-

[11] These factors imply that cooperative value may be less sensitive to information. In economic terms, the gain to a cooperative manager is less than the associated cost of signaling false information, because one possible consequence is bankruptcy. However, this does not mean that managers of cooperatives will not signal false information. Given an incentive to do so, managers might do so to reduce the cost of debt. Therefore, the asymmetric information result can happen even in agricultural cooperatives, but only if managers are motivated by an achievement incentive.

[12] Jensen (1986) provides an interesting theoretical discussion of the role of debt in monitoring managers and their organizations to increase efficiency.

[13] Use of debt only weakly induces cooperative members (stockholders) to prefer risky projects, since cooperative stocks are not readily marketable. The weak incentive to take on risky projects lowers monitoring costs as well.

tion and the cooperative's net revenue. To make that specification compatible with real problems, Fischer assumes that the cooperative restricts itself to do business with members and that they are not concerned with the patronage refund policy of the cooperative (i.e., separability applies). Although both approaches consider members' double role, they ignore the patronage refund policy. A better way to state this objective function has been shown by Van Sickle and Ladd (1983). Their objective includes the sum of members' total net revenue, the present value of patronage refunds paid to members, and the net dividends paid to members. This specification captures the interests of cooperative members, the patronage refund policy, and the cost of capital.

While cooperative stock is not marketable, the value of the underlying equity capital is not fixed either. Thus, the value of equity depends on the cooperative's dividend, equity redemption policies, and operational risk. While there is no ideal way to value cooperative equity capital, the value of equity can be expressed by the sum of discounted dividend stream and redemption value of the stock adjusted for the cooperative's operational risk (i.e., the risk-adjusted cost of capital). Therefore, if operational risk varies, we cannot argue that a fixed dividend and known length of equity retirement will lead to a fixed price for a cooperative's stock, even though the book value per share may be fixed. Accordingly, the cost of capital of the cooperative is also not fixed. These and related issues are considered later in this report when it is illustrated how a cooperative might estimate its annual cost of capital using a discounted cash flow approach.

In corporate operations the level of retained earnings is an important financing source. In cooperatives it is largely reflected by retained patronage refunds. Corporate financing is "investor-oriented," but is "user-oriented" in cooperatives. The implication is that the value and cost of retained patronage refunds are more important when valuing a cooperative. Instead of just two parties to the capital structure (stockholders and debtholders), a cooperative contains a potential third party, the owners of the patronage refunds. Thus, where a corporation's primary value is in the value of its stock, the corresponding value of a cooperative is the sum of member patronage accounts and its stock.

Cooperative Taxation. While corporate earnings are taxed at the corporate level and at the personal level when distributed as dividends, this double-taxation can be eliminated by qualifying as a cooperative for tax purposes. The Internal Revenue Code requirements are in Subchapter T and Section 521. Subchapter T requires that refunds be allocated in proportion to patronage, based on the net income of the cooperative from business done with its patrons. A cooperative which meets the requirements of Subchapter T can deduct its patronage refunds from taxable earnings. If cooperatives meet the requirements of Section 521 of the Internal Revenue Code, they can also deduct the earnings from nonpatronage sources which are allocated to patrons in proportion to patronage and the dividends paid on capital stock. This implies that the tax advantage of debt might not apply to the capital structure decision of a cooperative. Thus, the tax advantage of debt financing, when compared to other financing sources, would appear to be relatively lower than in the case of a corporation.

IV-Developing Approaches to the Cost of Capital

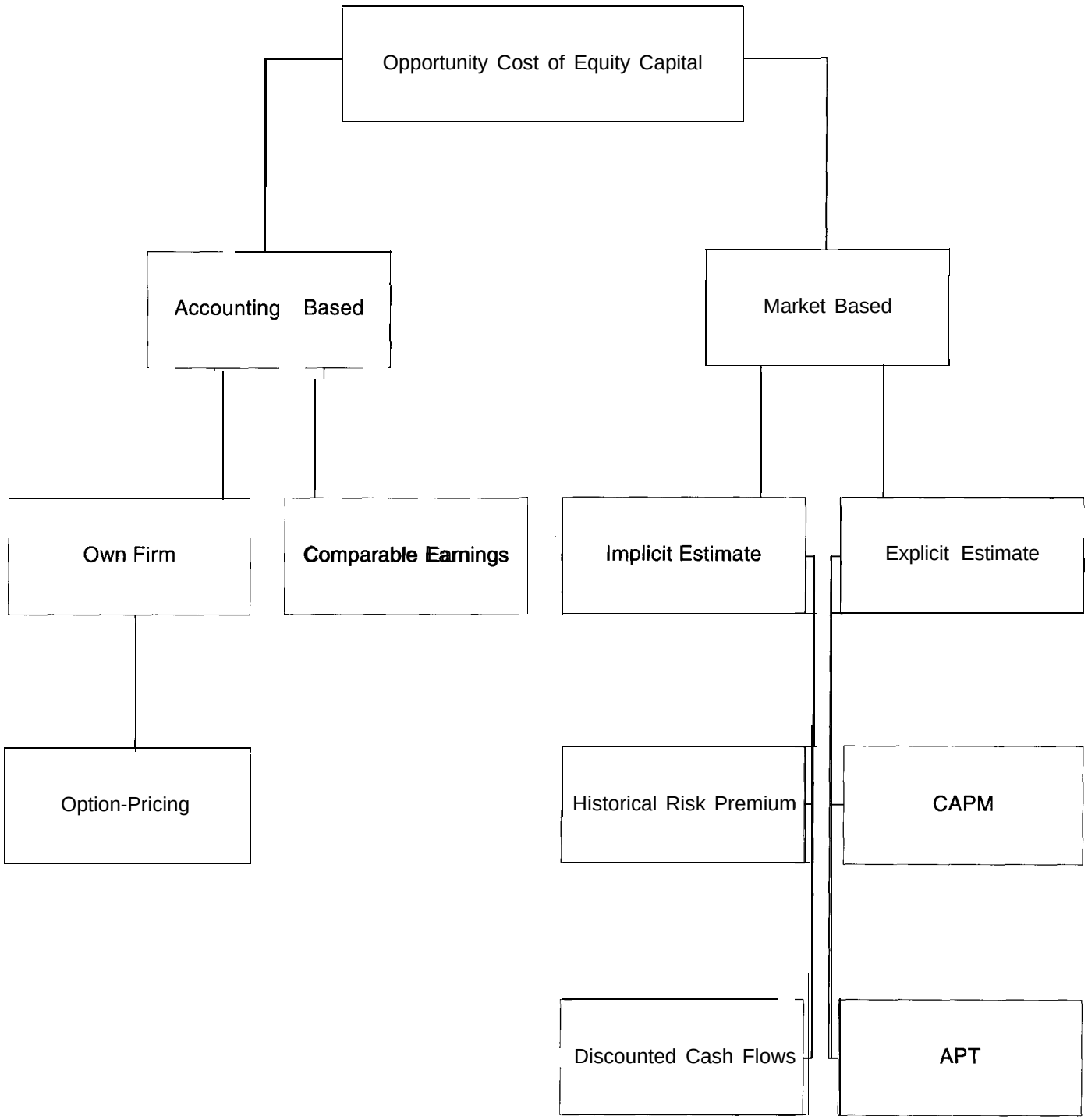
Different methods have been developed in the finance literature to estimate the equity investor's required rate of return, or opportunity cost of common equity capital. Patterson suggests a classification of those methods which differentiates between accounting-based and market-based approaches (Figure 1).

Accounting-based methods rely on information which is routinely assembled through a firm's accounting system. They generally require the same kind of data as reflected in the financial statements of a company. Indicators such as the rate of return on equity of the company (or those of companies in the same industry or risk classification) may be used.[14] The comparable earnings approach has been used primarily in the field of public utility regulation, where the rates of return earned on alternative investments is a key factor in determining the rate of return a utility can achieve through adjusting the prices it charges. This approach reflects the opportunity cost of capital.

Market-based approaches may be either implicit or explicit in their derivation of the cost of equity capital. Explicit models attempt to derive the cost of equity capital directly from capital market data through the use of a theory of market equilibrium prices. The Capital Asset Pricing Model (CAPM) is the most frequently used, although the Arbitrage Pricing Theory (APT) approach is more general in terms of the market

[14] The option-pricing model (OPM) is a subcategory of the "own firm" model. The OPM uses data from the balance sheets and income statements of the company and some key assumptions on interest rates and the volatility of the historical rates of return of the company.

Figure **I-Classification of Cost of Capital Models (Adapted from Patterson)**



factors which it incorporates. In contrast, implicit models derive the investors' required rates of return without consideration of the factors which are causing those returns to change. For example, the discounted cash flow (DCF) approach uses observed current dividend and market price data and estimates of what investors expect as the future rate of dividend growth to approximate the total expected rate of return. The historical risk premium model looks at average market returns over long periods of time and compares them with the average of rates of return on risk-free securities to determine the risk premium.[15] The estimated risk premium is added to the current risk-free rate to determine the required rate of return on equity capital.

When considering the application of accounting-based and market-based models at the firm level, the alternatives are more limited than the classification scheme suggests. This is because of the lack of available data and the resulting set of necessary assumptions. The OPM is the only one which uses both information on firm capital structure and market information to derive a cost of capital estimate.[16] The DCF model makes different assumptions about the expected growth of earnings and dividends, and can be modified to account for different growth indicators and varying growth in the future. In this way, variations of the model may yield a wide range of cost-of-capital estimates. Thus, there appears to be no ideal model which can be readily applied to determining the cost of capital at the firm level. With these limitations in mind, we use the DCF approach and a hurdle rate approach (a variation of the implicit model) to illustrate how to estimate the cost of capital.

Discounted Cash Flow

In the DCF method, the cost of equity capital is defined as the sum of the dividend yield and the growth rate of share price.[17] The approach provides a simple method for calculating the cost of capital of a traded company, yet it requires relatively strong assumptions about dividends per share and their rate of growth. In this way, the cost of equity capital calculation incorporates the opportunity cost of funds concept.

Constant Growth Model. The formula for the cost of equity (k_E) is,

$$k_E = (\text{Div}_1 / P_0) + g_D$$

where Div, is the dividend one year later, P_0 is the price per share today, and g_D is the expected annual rate of growth of dividends.'* Another way to look at the calculation of k is based on the idea that the return to equity holders comes as dividends and capital gains (or losses). The expected rate of return is,

$$k_E = (\text{Div}_1 / P_0) + g_P$$

where g_P is the expected rate of stock price appreciation (or decline). However, this may not give a reliable estimate of the cost of equity unless it is possible to tie the change in stock price to the company's performance. The constant-growth DCF model attempts to solve this problem by assuming that the expected rate of return from capital gains equals the expected growth rate of dividends (i.e., the expected long-run, sustainable growth rate).

Sustainable Growth Rate. The long-run growth rate for earnings and dividends can be derived from the forecasted profitability and growth of assets. One such estimate of the sustainable growth rate (g_S) is the rate of return on equity (ROE) multiplied by the retention rate, i.e., the fraction of annual earnings retained by the company,

$$g_S = \text{ROE} \times \text{retention rate}.$$

Thus, the constant-growth DCF method can be used with an observed stock price and an approximate forecast of dividends per share to derive an estimate of the cost of equity capital,

$$k_E = (\text{Div}_1 / P_0) + g_S = (\text{Div}_1 / P_0) + (\text{ROE} \times \text{retention rate}).$$

For example, assume that a company is expected to pay out \$0.40/share 1 year from today and the book value is currently \$5/share. If the company expects a 15 percent rate of return on book value equity and follows a constant policy of 40 percent payout, the estimated cost of equity capital becomes 17 percent.[19]

[15] The closest thing to a true "risk-free" security is the short-term U.S. Treasury bill, because of the implied low probability of default.

[16] A drawback of the OPM is the relatively strong assumptions made about the distribution of rates of return. Consequently, the OPM estimates of the cost of equity capital may be quite sensitive to these assumptions.

[17] Myers and Borucki (1994) use the discounted cash flow approach to determine the cost of equity capital for utility firms.

[18] Myers and Borucki say that this derivation can be dangerous if the assumption of a constant dividend growth rate cannot be satisfied.

[19] This example uses the book value of equity, but the equity value can also be based on the market value measure of equity.

That is,

$$k_E = (\$.40 / \$5) + (.15 * .60) = .17.$$

Alternatively, if the company expects to earn a higher ROE (20 percent) and retain a higher percentage of earnings (70 percent), the cost of equity capital rises significantly to 22 percent. Thus, the cost of equity capital rises as an indication that the opportunity cost of capital has risen, even though the dividend payout (and yield) has not increased. Thus, this cost of capital reflects the cost of retained equity capital, which may be different than the rate of return required by new equity investors in the company. A key to this method is the selection of an appropriate growth rate. The selection of a growth rate to use is likely to have more problems when a company bases its forecast on relatively short-term estimates (e.g., under 5 years of financial data).

Overall Cost of Capital. The average cost of capital (WACC) is the weighted-average of the after-tax costs of debt and equity capital, where the weights are the percentages of the debt and equity capital components in the capital structure of the company. That is, WACC $= k_D (D/V) + k_E (E/V)$ where k_D is the after-tax cost of debt, D/V is the debt capital/total capitalization ratio, k_E is the cost of equity capital, and E/V is the equity capital/total capitalization ratio. For illustration, assume that debt capital comprises 30 percent of total capitalization and the after-tax cost of debt is 8 percent. If the cost of equity capital is 17 percent (as calculated above), the WACC is 14.3 percent (.08*.30 + .17*.70 =0.143).

V-Applying Cost of Capital Concepts to Agricultural Cooperatives

Preceding sections suggested that a cooperative has two basic approaches from which to choose when determining its cost of capital-the discounted cash flow (DCF) approach and the opportunity cost of funds (OCF) approach.

Opportunity Cost of Funds Approach

Patterson (1995) suggests that the DCF approach focuses on the right side of the balance sheet and the assumption of a financing mix (of debt and equity capital) may be misleading in solving the cost-of-capital problem. He says the focus should be placed on the investment alternatives of the investor (as implied by the asset side of the balance sheet). Thus, the cost of capital would be related to the alternative uses of capital, not to its alternative sources.

Because of the problems which have been cited with determining the cost of equity capital, agricultural cooperatives appear to have followed the OCF approach in various ways. One such method is to determine an acceptable rate of return on cooperative investments. That is, cooperative management identifies what is believed to be an acceptable rate of return for the risk class of investment project(s) under consideration (i.e., an opportunity cost of capital). The procedure for implementing this approach is quite straightforward once the acceptable rate of return (the hurdle rate) has been established. This rate is compared with the calculated internal rates of return of the investments and the acceptable projects are identified. The advantage of this approach is that it is relatively easy to implement and it allows for other criteria to enter the final decision concerning which projects are preferred. The hurdle rate need not bear any relationship to the cost of funds to the cooperative.

Application of the OCF Approach

The United Farmers Cooperative (UFC) is a pooling cooperative located in the Midwest which processes and markets a specialty agricultural crop. UFC operates several processing plants in the region. It acquires the raw commodity from farmers in the fall at various collection points, processes the raw product, and sells the final products in a national market under its own label.

The UFC has also been gradually upgrading its facilities under a capital improvement plan. As a result, UFC must periodically evaluate new capital investment projects. The company uses several criteria for funding and selecting capital projects: base capital plan projects (for routine asset replacement projects), strategic investment plan projects (typically, projects which exceed a minimum threshold size and have quite long lives), and all other projects (which are of smaller size). Base capital investments are made to cover 50-75 percent of the annual depreciation of assets. Strategic investments are approved by the board of directors of the cooperative. All projects are evaluated on their estimated economic returns (the internal rate of return after-tax) and total project costs. The estimated internal rate of return of each project is compared with the hurdle rate of the company to determine its acceptability. In recent years that hurdle rate has been set at 15 percent (after-tax). Strategic projects with rates of return under the 15 percent benchmark may also be accepted based on other nonfinancial criteria and objectives of the cooperative.

Determining the Hurdle Rate. This rate at UFC has remained at 15 percent for the past couple of years. Several factors have been used to determine the rate—the level of long-term desired economic returns, alternative rates of return on noncooperative investments, interest rates, and the average cost of debt and equity capital. The desired level of economic returns is determined informally by the directors through a review of past cooperative projects. Information about the rates of return on past projects is typically derived from post-completion audit reports.

The UFC has determined that the noncooperative rates of return should include: the anticipated rate of return on a stock market index (e.g., the S&P 500), the average return on sales of the *Fortune* 500 companies in its industry group, and the rates of return that farmers can expect on investments in their own cropping operations. These are clearly quite diverse rates of return concepts, and UFC uses them to bracket the long-run rate of return that is acceptable to farmers as investors. For example, the total rate of return to the S&P 500 Index during the past several years has varied around 15 percent. The S&P 500 Total Return Index and the corresponding compound annual rate of return on the Index are reported in Table 10.

Table 10—**S&P 500 Total Return Index and compound annual rate of return.**

Mid-year	S&P Total Return Index	Percentage annual compound rate of return (through mid-1997)
1977	132.75	15.9% (20 yr.)
1987	647.35	14.7% (10 yr.)
1992	1,030.88	19.8% (5 yr.)
1997	2,571.47	—

Similarly, the median rate of return on sales of the Fortune 500 group of "food" companies was 16.5 percent in 1996. Comparable measures of the median total returns of the food group of 500 companies are also useful indicators.[20] The l-year median total return for 1996 was about 18.1 percent and the lo-year median total return (1987 through 1997) was about 15.4 percent. Thus, the UFC hurdle rate falls quite close to the long-term industry benchmarks.

The rates of return on farmer investments in their operations vary considerably by farm, by crop and by year. Thus, the expected rate of return on farm cropping operations has been a difficult number to approximate. The average rate of return on assets of crop farmers in the region was about 7 percent during 1990-1995. For comparison, the average rate of return on assets among the top 20 percent of farmers in the region varied from 10 percent to 14.4 percent (depending on how farm assets were valued). Alternatively, selected specialty crops grown in the region produced average, before-tax net rates of return (net returns/ total variable and overhead expenses including rent) per acre which were slightly higher than 15 percent during 1990-95. This suggests that the average before-tax rate of return experienced by farmers on their overall cropping operations has been below the hurdle rate of 15 percent, but the average net rate of return per acre on their specialty crops has been above that level. Thus, the 15 percent hurdle rate of UFC compares reasonably well to the opportunity cost which farmer members face in their on-farm investment alternatives.

The interest rate paid by UFC varies by lender and maturity of the debt. UFC pays about 1 to 1.5 percent above the Treasury rate on funds borrowed through the Bank for Cooperatives. In 1996, the long-term Treasury rate (e.g., 5-10 year) was about 6.2 percent to 6.5 percent. Thus, a term loan to UFC through the Bank for Cooperatives would have been priced at about 7.2 percent to 8 percent, depending on the maturity of the loan. Variable-rate term loans available to UFC through commercial banks in the region have carried interest rates of 9.0 - 9.5 percent in recent years. Because the average commercial bank rate has been higher than that available through the Bank for Cooperatives, the UFC has primarily used the Bank for Cooperatives for its term borrowing requirements.

To reflect the opportunity cost of funds to the cooperative members, the UFC also considers the rate of interest paid on loans by its farmer-members. The rates paid by members vary considerably depending on the source, maturity, security offered, pricing option, and other features of the loan. During 1995-1996, the average rate paid on long-term farm loans to commercial banks was about 9.7 percent. The corresponding average long-term rate paid to the Farm Credit System was about 8.5 percent. Related to the opportunity cost of funds to its members, UFC evaluates how the cost of capital is affected by changes in the per unit retains of its members.

In the final analysis, the hurdle rate is determined based on a consensus. To formulate a consensus

[20] The Fortune 500 total return to investors series includes capital gains and losses plus reinvested dividends.

the UFC goes through a sequential review process. Initially, the finance committee prepares a comparative chart which lists the above alternative opportunity costs of capital. The committee formulates a consensus of what rate is an appropriate cost of capital from that data and forwards that recommendation, along with the other comparative cost of capital information, to the senior management group at UFC. The senior management group formulates a consensus on the appropriate hurdle rate and forwards that and the other cost of capital information to the board of directors. The final step in building a consensus at UFC is for the board to review the hurdle rate recommendation of the senior management group (and the related information on the opportunity cost of funds) and develop a consensus hurdle rate. Through this process additional information from post-completion audits of prior investment projects and other nonfinancial considerations are brought into the decision. This makes the hurdle rate at UFC a cost of capital which reflects the overall financial and strategic objectives of the cooperative.

Assessing Risk. To evaluate an investment project, other factors related to project- specific risks are considered. The UFC includes risk factors such as: market, construction, acquisition, operation, project duration, and technology. These factors could be used to adjust the hurdle rate requirement to reflect the level of uncertainty about investment projects with higher levels of risk. UFC does not explicitly adjust the hurdle rate for risk. Rather, the risk factors are evaluated and their joint influence is considered implicitly when selecting projects.

Each of these risk factors varies in importance according to the specific project under consideration. A description of the process is provided from a recent UFC strategic plant expansion project (see Box 1).

The process of assessing the risks of a project of this size is often time-consuming. The cooperative has developed a strategic plan, and to execute that strategic plan capital needs and availability are generally projected for 5 to 10 years. Major projects (such as the one described) may be considered as a part of the cooperative's long-term capital plan for several years before actual construction begins. During this time, the priority of a project may change as the evaluation of risk factors changes.

Discounted Cash Flow Approach

The DCF approach provides a practical alternative to determining the cost of equity capital, because it relies on information that can be obtained from the cooperative's financial accounting system. The DCF approach for an agricultural cooperative deviates from the standard discounting of dividends formula found in the finance literature. This application derives a proxy for the discount rate from the relationship between the level of dividend payout and the book value of equity. Thus, the approach does not use a market-value-of-equity measure of the dividend yield when deriving the cost of capital.

Application of the DCF Approach

Midwest Cooperative primarily merchandises grain, the major crops grown in the Midwest. It also sells feed and other farm supplies, and offers other services. The cooperative is also involved in the processing and refining of grain. During 1990-96, the average sales revenues were composed of grain merchandising (83 percent), processed grain (13 percent) and feed sales and farm supply services (4 percent).

According to the constant growth equation, the cost of equity capital for Midwest Cooperative is the sum of the expected dividend rate of return (or yield) and the sustainable growth rate,

$$k_E = (Div_1 / P_0) + g_S$$

where g_S (the sustainable growth rate) is the product of the rate of return on equity and the retention rate. Thus, the constant-growth DCF method requires an observed price and an approximate forecast of dividends per share in order to derive the cost of equity capital.

Since Midwest Cooperative pays no dividends per se, it must estimate the dividend yield. Therefore, a modification is made to the constant growth model. The annual dividend yield is calculated during 1990-95 as: the sum of the annual amount of cash patronage paid plus the annual redemptions of capital equity certificates (both paid in the following year), all divided by the average annual equity capital of the cooperative. The required accounting data for Midwest Cooperative's cash patronage, redemptions of equity certificates, and equity capital balances were taken from the annual consolidated statements of capital.

The book value of equity capital used in calculating the dividend yield may be either the total or allocated equity capital of the cooperative. However, as applied to investment decisions, the total equity capital of the cooperative is a more appropriate measure. The cash patronage part of the dividend (Div_1) is paid based on the level of patron business, so there is no explicit connection between the level of cash paid out

Box 1. Determining the Hurdle Rate

A processing plant is to be expanded to increase daily production capacity by 30 percent at that plant, and by 6 percent overall, at a cost of $60 million. The expansion will require upgrading equipment in most areas of the plant. In addition, members must increase their production of the cooperative's raw product by 6 percent. This will result in a corresponding 6-percent increase in the production of all UFC products.

The project involves a variety of risks, but they are generally related to matters with which the cooperative has a great deal of experience. Therefore, the risk factor is considered low. The investment does not involve new products, new technology or the purchase of another business. However, the project does include risk elements in the market, construction and operation, and raw product production.

The expansion is projected to increase production of the cooperative's primary product by 6 percent, while consumption of the cooperative's primary products is only growing at a rate of 2 percent. The sales department is requested to thoroughly review market conditions, consumption by current customers, projected pricing levels, logistical arrangements and expected reaction from competitors. The market evaluation also includes analysis of the market conditions for the byproducts produced. This review is quite extensive and the final report is presented to the board of directors. The report indicates that there would be no direct adverse consequences and the indirect consequences are manageable. Thus, market risk is not considered to be a factor which would warrant a higher than normal hurdle rate.

Construction and operation risk arise due to the project's significant size and the duration of the construction period. The operations department has completed preliminary engineering on the major components of the plant expansion and has had preliminary discussions with equipment vendors and construction companies on the timing and cost. Operations risk is considered to be relatively low. The final report is presented to the board of directors. Based on the company's experience with expanding other plants and the findings in the final report, construction risk is not considered to be a factor that would warrant a higher than normal hurdle rate.

Production risk derives from the ability and desire of the members to supply the raw product to the cooperative at levels which exceed current levels. There is no risk of a shortage of raw products to supply the expanded plant capacity.

After the board of directors considered the consistency of the project with the cooperative's long-term strategy and the various risk factors, the financial projections were presented and considered. There was no risk premium adjustment to the hurdle rate in this case, so the projected internal rate of return of the project was compared with the general hurdle rate of 15 percent.

and the level of equity investment of a particular investor in the cooperative. However, at the cooperative level there is no requirement to associate cash paid out with the amount of individual investor equity, so total book value of equity capital can be used to estimate the dividend yield.[21]

The resulting annual estimates of the cost of equity capital are reported in Table 11. To illustrate the use of the cost-of-equity-capital equation, the cost of equity capital (k_E) was calculated for 1996. The dividend yield in 1996 is 6.31 percent. This is calculated as: the sum of the cash patronage ($13,194,000) and redemptions ($6,900,000) in 1996 all divided by average total equity capital for 1996 (about $318,370,000). The second component of the cost of equity capital is the sustainable rate of growth for 1996, or 11.87 percent. The sustainable growth rate is calculated in two steps. First, the retention rate on equity in 1996 (.2587) is calculated as: 1 .O minus the ratio of cash patronage divided by net earnings ($13,194,000 / $51,000,000). Then,

[21] In the case of Midwest Cooperative, about 72 percent of all equity capital is held as patronage certificates.

Table 11—Cost of equity capital estimates for Midwest Cooperative, 1990-1996.

Item	1996	1995	1994	1993	1992	1991	1990
Dividend Yield	0.0631	0.0615	0.0606	0.0525	0.0528	0.0474	0.0538
Retention Rate	0.7413	0.7555	0.7170	0.7890	0.8012	0.7612	0.7845
Rate of Return on Equity	0.1602	10.577	0.1358	0.1381	0.1469	0.1038	0.1389
Sustainable Growth Rate	0.1187	0.1191	0.0974	0.1090	0.1177	0.0790	0.1089
Estimated Cost of Equity	0.1819	0.1807	0.1579	0.1615	0.1705	0.1264	0.1628

the retention rate is multiplied times the ROE for 1996. The ROE in 1996 (16.02 percent) is calculated as: net earnings (about $51,000,000) divided by average total equity ($318,370,000) for 1996. Thus, the cost of equity capital in 1996 is,

$$k_E = (Div_1 / P_0) + g_S$$

= [(cash patronage + redemptions) / average equity capital] + [1.0 - (cash patronage / net earnings)] x (net earnings / average equity capital)

$$k\ (1996) = .0631 + (1.0 - .2587) \times .1602$$

$$= .1819$$

The cost-of-equity estimates in Table 11 vary between 12.64 percent in 1991 and 18.19 percent in 1996, when using total equity capital to calculate the dividend yield. The corresponding average of these rates for 1990-1996 indicates that the average cost of equity capital for Midwest Cooperative is about 16.3 percent.

The average cost of capital (WACC) for Midwest Cooperative is the weighted-average of the after-tax component costs of debt and equity capital, where the weights are the proportions of term debt and equity capital in the capital structure from the annual end-of-year (May 31) balance sheets. Algebraically, the average cost of capital is

$$WACC = k_D (D/V) + k_E (E/V),$$

where D/V is the term debt/total capitalization ratio and E/V is the equity/total capitalization ratio.** For example, in 1996 Midwest Cooperative had a 7.6 percent before-tax cost of term debt and an estimated 18.19 percent cost of equity capital (Table 12). Based on the 1996 proportions of term debt and equity capital in the total capitalization of the cooperative, the average cost of capital is calculated to be 15.2 percent. Because of the increase in the cost of equity capital component, the average cost of capital in 1995 and 1996 are higher than any of the previous years. Based on the annual cost of capital estimates in Table 12, the 7-year average Midwest Cooperative cost of capital for 1990-1996 is estimated to be about 14.6 percent.

Determining Divisional Costs of Capital. The DCF approach can be adapted for use at the divisional level of a company. This method illustrates how to determine the cost of equity capital and the average cost of capital for each division in the Midwest Cooperative. As with DCF, the divisional cost of capital calculation is based on historical financial accounting data. The methodology is relatively similar to the cooperative-level cost-of-equity-capital calculation, yet there are some additional assumptions which are made to implement it.

One key assumption is that the divisional cost of equity capital and the cooperative cost of equity capital differ in their implied sustainable growth rates (which in turn is due to differences in the rates of return on equity capital). The reasoning is that, while the sustainable growth rate of the cooperative is derived from its divisions, the growth rate of a division may be higher or lower than the overall growth rate of the cooperative due to differences in profitability and the corresponding rates of return of the various divisions. So this differential in profitability should be reflected in the cost-of-equity estimates of the various divisions of the cooperative.

Alternative assumptions could be made about the divisional cost of debt capital. One assumption could be that it is equal to the average cost of debt of the cooperative. This appears to be a reasonable assump-

[22] Total capitalization is the sum of long-term debt capital and total equity capital of the cooperative.

Table +-Weighted-average cost of capital estimates for Midwest Cooperative, 1990-l 996.

Item	1996	1995	1994	1993	1992	1991	1990
Proportion of term debt capital	0.26	0.21	0.11	0.13	0.16	0.20	0.21
Cost of term debt	0.076	0.076	0.073	0.077	0.073	0.095	0.0975
Proportion of equity capital	0.74	0.79	0.89	0.87	0.84	0.8	0.79
Estimated cost of equity capital	0.1819	0.1807	0.1579	0.1615	0.1705	0.1264	0.1628
Effective tax rate*	0.119	0.102	0.135	0.103	0.139	0.0545	0.163
Average cost of capital	0.1520	0.1570	0.1475	0.1495	0.1533	0.1191	0.1457

* The effective tax rate is equal to the income taxes paid divided by the net earnings before tax. The rate is equal to the combined federal and state marginal tax rate of the cooperative after adjusting the amount of tax liability downward to account for the distribution of patronage earnings. The marginal federal income tax rates were 35% (1994-96) and 34% (1990-93).

tion because a cooperative is expected to borrow as a single entity. Thus, if the cooperative were requesting a loan or issuing debt to finance an investment in any one of its divisions, it would be quoted a single rate of interest on that funding request, regardless of which division uses it. The alternative is to allocate the total interest charges to the divisions and allow the cost of debt to vary by division. The latter approach is used here.

The procedure begins by determining the implied amount of equity financing in each division of the cooperative. This is done by calculating the annual average assets, the annual amount of debt financing, and the residual amount of annual equity capital financing in each division. The sustainable growth rate in each division is calculated based on the annual rate of return on equity capital and the dividend rate and retention rate of the cooperative. Finally, the average cost of capital is calculated based on the derived proportions of equity and term debt financing in each division, and the effective tax rate of the cooperative. This procedure is schematically illustrated in Figure 2.

This approach is applied to data from the 1996 annual report of Midwest Cooperative. Midwest has two divisions: grain merchandising and grain manufacturing/milling and feeds.[23] In Table 13, the two divisions and the consolidated cost-of-capital calculations are summarized for 1996. The average assets of the grain marketing division and the manufacturing/milling and feeds divisions account for about 60 percent and 40 percent, respectively, of total cooperative assets.

Annual interest expenses are allocated to the divisions based on accounting data. The average borrowing rates of the divisions are calculated based on the weighted averages of the outstanding seasonal and term debt obligations of the divisions. The grain merchandising division has a lower average borrowing rate (6.31 percent) than the manufacturing and feeds division (7.06 percent) because the grain marketing activities of the cooperative rely relatively more on seasonal credit lines which carry somewhat lower interest rates than term loans. Based on the estimated average interest rates and interest expenses of the divisions, the total interest-bearing debt of each division can be determined. The total interest-bearing debt of the grain marketing division is about $304 million, and about $181 million for the manufacturing and feeds division. Midwest Cooperative estimates that more of its total long-term debt is used by the manufacturing and feeds division. So, that information is used to break total debt down into the term and seasonal debt components.

Equity capital of each division is calculated as a residual and defined as: total assets minus the calculated interest-bearing debt and the noninterest-bearing debt allocated to each division.[24] The resulting estimates of equity financing of the divisions are: $191 million for grain marketing and $127 million for manufacturing and feeds. The net earnings of each division is determined from accounting records and the rates of return on equity (ROE) of the divisions are calculated using the standard net income/average total equity

[23] For purposes of illustration, the feed and farm supply activities of Midwest Cooperative are incorporated into the grain manufacturing/milling division estimates.

[24] Noninterest-bearing debt of the cooperative includes: patron credit balances, advances received on grain sales, drafts outstanding, accounts payable, accrued expenses. and patronage dividends payable.

Figure **e-Schematic of the Divisional Cost of Capital**

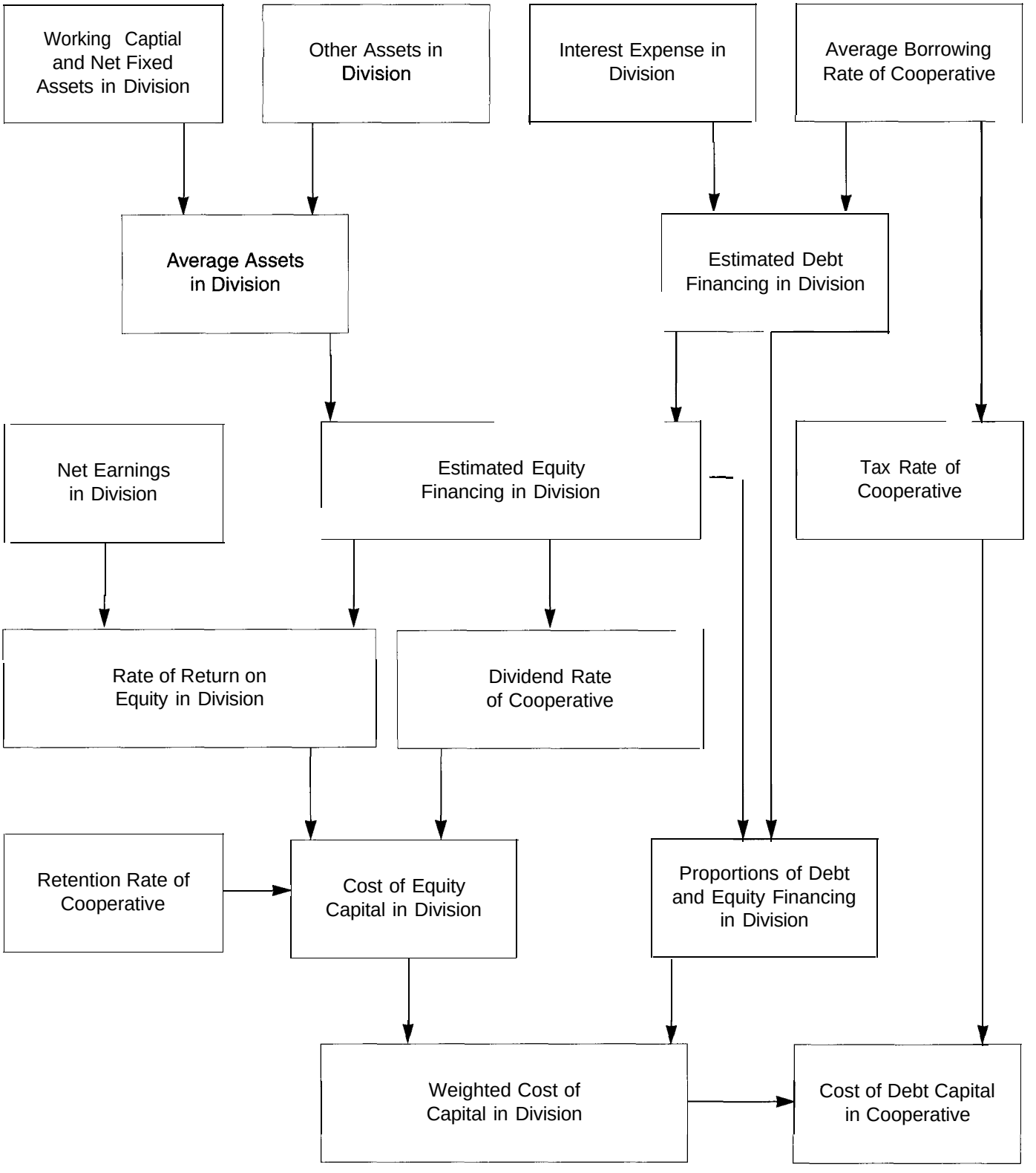


Table 13—**Divisional cost of capital calculations for Midwest Cooperative, 1996.***

Item	Grain Merchandising Division	Manufacturing and Feeds Division	Midwest Cooperative
Total assets	$646,000	$431,000	$1,076,000
Interest expense	$19,153	$12,769	$31,922
Ave. borrowing rate	0.0631	0.0706	0.0667
Interest-bearing liab.	$304,000	$181,000	$485,000
Term debt financing	$20,000	$78,400	$98,400
Equity financing	$191,000	$127,000	$318,000
Net earnings	$30,000	$21,009	$51,009
Rate of return on equity	0.157	0.165	0.160
Sustain. growth rate	0.116	0.122	0.119
Cost of equity capital	0.179	0.185	0.182
Cost of debt capital**	0.076	0.076	0.076
% Equity financing	90.5	61.9	74.0
% Debt financing	9.5	38.1	26.0
Average cost of capital	0.169	0.140	0.152

* Dollar amounts are rounded to the nearest $000.
** The before-tax, average cost of long-term debt.

ratio. The ROE of the grain marketing division is about 15.7 percent and 16.5 percent for the manufacturing and feeds division. Because ROE estimates of the two divisions are quite similar, the sustainable rates of growth and the costs of equity capital of the two divisions are also similar. The cost of equity of the grain marketing division is about 17.9 percent, while that of the manufacturing and feeds division is about 18.5 percent. The overall rate for Midwest Cooperative is 18.2 percent.

The average costs of capital of the two divisions reported in Table 13 differ more significantly due to the variation in proportions of debt and equity financing used, and differences between the component costs of equity and debt. The average cost of capital for the grain marketing division is about 16.9 percent due to the higher proportion of equity financing used. The average cost of capital in the manufacturing and feeds division is about 14 percent, compared with 15.2 percent for the cooperative.

Adjusting the Cost of Capital for Risk. Although the Midwest Cooperative has no specific approach to adjusting the cost of capital for risk, two relatively straightforward methods could be suggested. Based on a comparison of the company to other companies in the same line of business, where the degree of systematic risk is known, the cooperative could adjust its cost-of-capital estimate to approximate the risk-adjusted rate.[25] An alternative is to subjectively adjust the cost of capital for individual projects based on the board of directors' consensus view of the risk involved in each investment project. The result is a project risk classification scheme. Because the overall cost of capital of the cooperative implies an average risk premium for the cooperative, the subjective adjustment could be either an upward or downward adjustment of the cost of capital depending on project risk characteristics.

Economic Value Added

The economic value added (EVA) is a measure of the true profitability of the firm. More specifically, EVA is equal to the value added by the company above the minimum return acceptable to investors in a similar investment alternative.

The EVA may be computed in either of two ways: use total (debt and equity) capital (called EVA1 here) or use equity capital only (called EVA2 here). For consistency, the after-tax earnings must be adjusted to reflect the deduction of interest expense when just

[25] This is referred to as the "pure play method" in the finance literature (Brigham and Houston, 1998). The primary problem with this approach is in finding good comparatives.

equity capital is used. The calculation of the EVA is based on accounting data and calculations of the percentage cost of capital.

EVA1 = after-tax operating profit - after-tax cost of capital

= earnings before interest but after-tax - (total capital x % average cost of capital)

The alternative calculation of the EVA is based on the return to equity. That is,

EVA2 = Net profit (after-tax) - (Equity capital x % cost of equity capital)

The cost of capital plays a key role in determining the EVA of a cooperative in both methods of calculation. An increase in the cost of capital will result in a decrease in the EVA. For example, cost of equity capital is equal to the Midwest Cooperative estimated cost of equity capital in 1996 (.1819). The assumption is that this cost of equity capital reflects the appropriate risk premium for the business, based on the Midwest Cooperative's 1996 average equity capital (about $318 million) and earnings after-tax (about $51 million),

EVA2 = $51,000,000 - ($318,000,000 x .1819) = - $6,844,200.

That is, the cooperative lost value relative to its cost of equity capital. However, if Midwest Cooperative had arbitrarily set its overall cost of capital at the average borrowing rate (6.67 percent) plus 4 percent, the EVA estimate would have been positive,

EVA2 = $51,000,000 - ($318,000,000 x .1067) = $17,069,400.[26]

This example can also be expressed in terms of percentages (EVA%). For example,

EVA% = EVA / average equity capital Investment

= (net profit / average equity capital) - % cost of equity capital

= ($51,000,000 / $318,000,000) - .1819
= - .022 or -2.2%

when the estimated cost of equity capital is used. When the arbitrary .1067 rate is used for the cost of equity capital, the EVA% is equal to about 5.3 percent . These numerical results illustrate that the cost of capital plays an important role in evaluating the economic contribution of the cooperative to its members. The EVA is sensitive to the cost-of-capital calculation, but more importantly it communicates an important message to the management and the members of the cooperative about the financial performance of the cooperative.

Cooperative management may use any of four strategies to increase the EVA percentage-increase earnings while using the same amount of total assets, maintain earnings at the same level while using less assets, increase earnings through an expansion project which utilizes assets more efficiently, and / or redeem equity capital if its current rate of return is less than the current EVA percentage.

The EVA concept can also be used to evaluate strategies for achieving specific performance objectives. For example, if Midwest Cooperative were to earn $51 million again next year, the next year's earnings must increase by $5,820,800 to be equal to the current EVA percentage (see Box 2).

Box 2. Calculation of the Required EVA

Net earnings	$51,000,000
(less) Cash Patronage	$12,000,000
(less) Equity Redemptions	$ 7,000,000
= increase in Equity Capital	$32,000,000
(times) cost of equity capital	.1819
= Required EVA	$ 5,820,800

[26] The adding of a rate premium to the average cost of debt is referred to as the "bond yield plus risk premium approach" in the finance literature (Brigham and Houston, 1998).

VI-Conclusions

Cooperative capital structure and cost of capital are co-determined. Once a capital structure has been selected, the cost is also determined. The interdependence is due to the fact that each component of the capital structure has a cost. Therefore, the cost of capital to the cooperative must reflect the combined costs of the various sources of funds, including the capital investment of the cooperative's members. It is this close relationship between capital structure and the cost of capital which creates a "cost of capital problem" for a cooperative. A cooperative's equity capital comes from its members and is not a security that is publicly traded in the financial market. Moreover, the major source of long-term capital in a cooperative may be retained earnings and allocated patronage dividends. This makes the value of cooperative equity capital more difficult to determine.

Historically, equity capital may have been treated as a relatively fixed component of the overall capital structure, and the selection of an appropriate capital structure viewed as the concern of the cooperative financial officer. Yet, the selection of an equity capital position and capital structure influences the overall financial strategy and the performance of the cooperative. Therefore, capital structure must be the concern of all decision makers in a cooperative. In addition, a wider range of financing choices (including equity capital substitutes) is available today and should be considered along with the importance of financial flexibility and manueverability in selecting a capital structure.

The cost-of-capital problem may have been avoided by cooperatives through a couple of different ways. First, a cooperative may have relied on the experience and intuition of a manager in situations where the cost of capital is a factor in the decision. Second, some cooperatives may have (incorrectly) just put a zero financial cost on revolving fund capital, thinking that it carries no explicit cost to the cooperative. Third, the cooperative board of directors may have set an arbitrary "hurdle rate" for all of its investment projects based on external factors, and used that rate to evaluate the profitability and acceptability of investment projects. Yet, these methods could easily lead to an under-estimation of the cost of capital and a corresponding over-investment in facilities.

To determine the overall cost of capital for a selected capital structure, a cooperative must determine its cost of equity capital. Yet, a cooperative's cost of equity capital cannot be derived directly from the market, as in the case of a publicly traded firm. Thus, there is no ideal method for determining the cost of equity capital for a cooperative, so it becomes necessary to use an innovative approach. The opportunity cost of funds approach relates the cost of capital to the rates of return from alternative uses of capital (i.e., the assets side of the balance sheet). That is, the focus is on the expected (or required) rates of return from alternative investments which reflects the degree of risk involved. The discounted cash flow approach relates the cost of capital to the alternative sources of capital (i.e., the liabilities and equity capital side of the balance sheet). The component costs of equity and debt capital financing are combined into an overall cost of capital for the cooperative. Both approaches require making some assumptions to determine the cost of equity capital.

Our analysis of data suggests that the capital structure of cooperatives varies by size and type, and that it has changed in recent years. Larger cooperatives have typically carried higher proportions of term debt and lower proportions of equity capital than smaller cooperatives. Larger cooperatives have reduced their dependence on debt capital. Several factors may be contributing to this trend in financial leverage, among them changes in the strategic objectives of cooperative management.

Case applications illustrate how agricultural cooperatives can use the opportunity cost-of- capital approach and the discounted-cash-flow approach to determine the cost of equity capital. These cases serve as a starting point for cooperatives to model their capital positions and consider alternative assumptions about financing sources, and their potential impacts on the overall cost of capital.

The discounted-cash-flow approach requires some key assumptions about profitability of the cooperative, sustainable rates of growth of earnings, and payout rates. Yet, it provides additional flexibility to consider both the overall average cost of capital and the divisional costs of capital for a cooperative. The resulting cost of capital is useful in estimating the economic value added of the cooperative. In contrast, the opportunity cost of funds approach requires some key assumptions about the range of available investments and the expected rates of return the cooperative and its members would realize. Both approaches require a risk adjustment. Although the opportunity cost of funds approach may be more frequently used by cooperatives, the discounted-cash-flow approach is also valid and can be derived from cooperative accounting information.

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