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# **FINANCIAL STRUCTURE OF NEW YORK AGRICULTURAL COOPERATIVES**

**Bruce L. Anderson**

**Bernard F. Stanton**

**Department of Agricultural Economics  
Cornell University Agricultural Experiment Station  
New York State College of Agriculture and Life Sciences  
A Statutory College of the State University  
Cornell University, Ithaca, New York 14853**

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## FINANCIAL STRUCTURE OF NEW YORK AGRICULTURAL COOPERATIVES

### Introduction

Financial management is an important function of all business organizations. However, agricultural cooperatives face special financial problems. This is due to their unique structure, purpose and tax status.

Agricultural cooperatives allow farmers to perform collectively activities that are uneconomical to perform individually. Since cooperatives are owned by their farmer-members, farmers provide a significant portion of the capital resources needed to carry out these activities. Equity is commonly provided in proportion to each member's volume of business with their association, and cooperative law stipulates invested capital should not receive an annual return greater than eight percent.

Control over basic policy rests in the hands of farmer-members. Cooperative philosophy suggests that the principle of one-man one-vote should govern the decision process. As a result, the basis for member voting and financial contribution often exhibit different patterns. Differences of opinion among those with large and small businesses may eventually lead to the withdrawal of some members that make significant financial and business contributions to the cooperative.

The general purpose of a cooperative is to provide members a set of services at cost. This objective has a significant effect on the association's method of operation. Typically cooperative surplus or net income is allocated to members in proportion to their patronage with the association. A portion of allocated surplus is usually returned immediately. The remainder is retained by the cooperative as a source of equity capital. Methods used to retain allocated surplus vary from organization to organization, but, retained allocated funds often carry a specific maturity date. A cooperative operating in this manner may be limited in its ability to generate a sound equity base.

Cooperative tax laws encourage this method of handling cooperative surplus. To avoid double taxation all net income in excess of limited reserves must be allocated to patrons. In addition, the law stipulates patrons must receive cash payment of at least twenty percent of annual net income at the end of each fiscal year.

These characteristics of structure, purpose and tax status suggest agricultural cooperatives are unique organizations and thus face unique circumstances in raising capital for operations. Other factors also contribute to possible difficulties in capital markets.

The number of farms continues to decline, and those that remain are becoming more specialized. Both factors contribute to a decline in potential cooperative membership. If membership decreases, remaining members must bear an increased portion of financial responsibility. Compounding this development marketing, supply and service cooperatives are becoming more capital

intensive. Consequently, the overall financial needs of cooperatives per member are increasing. At the same time this is occurring the financial needs of farmers are increasing, due to greater capital intensity in their own agricultural businesses. Finally, financial requirements grow as cooperatives grow and extend their activities into more segments of food system.

All of these factors suggest that in the future agricultural cooperatives must rely on fewer farmers to provide larger amounts of capital.

### Objectives

The general purpose of this publication is to provide insight into the financial structure of New York State cooperatives. Specific objectives include:

- 1) to examine and discuss the financial structure of New York State cooperatives using balance sheet information,
- 2) to provide members and management a format to compare the financial structure of their cooperative with others in New York State,
- 3) to compare the financial structure of New York State cooperatives with U. S. and Springfield Farm Credit District cooperatives,
- 4) to present a framework for determining the cost of capital used by agricultural cooperatives, and
- 5) to suggest ways to improve the financial position of New York agricultural cooperatives.

### The Data

All agricultural cooperatives registered as New York State cooperative corporations were contacted by letter and asked to provide a copy of their 1976-77 balance sheets. A follow-up letter was sent to all associations that did not respond to the first letter. Complete information was obtained from 76 of the 159 cooperatives contacted. Of the remaining 83, some were no longer in operation, others preferred not to divulge their financial statements and no reply was received from the rest.

Participating cooperatives were assigned to three categories (small, medium and large) and seven groups (1 to 7) according to asset size. Due to its size and capital structure, Agway Inc. was assigned to a separate group. Group averages were computed for each item on the balance sheet.

### The Results

#### Average Liabilities, Equity and Total Assets

Table 1 indicates the number of cooperatives in each asset group as well as average liabilities, equity and total assets. The majority of responding cooperatives were small. Over fifty percent (41 out of 76) had less than \$100,000 in assets. Total assets of the eighteen smallest cooperatives (Group 1) averaged only \$2,340, while the remaining 23 small cooperatives (Group 2) averaged \$25,900.

Table 1. AVERAGE LIABILITIES, EQUITY AND ASSETS  
76 New York Cooperatives, 1976-77

Size in Assets Category and Group	Number	Liabilities	Equity	Total Assets
Small				
1- Less than \$10,000	18	\$ 690	\$ 1,650	\$ 2,340
2- \$10,000 - 99,999	23	10,400	15,500	25,900
Medium				
3- \$100,000 - 499,999	12	88,000	118,500	206,500
4- \$500,000 - 999,999	8	343,000	422,000	765,000
Large				
5- \$1,000,000 - 4,999,999	9	1,493,000	986,000	2,479,000
6- \$5,000,000 and over	5	37,771,000	18,727,000	56,498,000
7- Agway	1	353,040,000	179,142,000	532,182,000

Cooperatives with total assets between \$100,000 and \$999,999 were classified as medium-sized organizations. There were twenty such associations. Twelve of these (Group 3) had average assets of \$206,500, while eight (Group 4) averaged \$765,000.

Fifteen of the 76 participating cooperatives had more than \$1 million in assets. Of these, nine (Group 5) had total assets less than \$5 million and they averaged \$2,479,000, while five (Group 6) had average assets of \$56,498,000. Agway, Inc. had over \$500 million in total assets.

The majority of New York agricultural cooperatives are small organizations. Only a handful had assets of any significant size. This pattern is quite common to the rest of the United States as well.

#### Distribution of Liabilities and Equity

The distribution of liabilities and equity, as a percent of total assets, is presented in Table 2. In small cooperatives, liabilities were only a small portion of total assets, averaging 30-40 percent. Member equity made up the major portion of the capital structure, 60-70 percent. The importance of liabilities increased somewhat for medium-sized cooperatives. For these organizations, liabilities represented 43-45 percent of total assets, while equity accounted for 55-57 percent. There was a significant increase in liabilities in large cooperatives. Liabilities financed 60-67 percent of total assets with the remainder coming from equity.

Table 2. DISTRIBUTION OF LIABILITIES AND EQUITY  
76 New York Cooepratives, 1976-77

Size in Assets Category and Group	Liabilities	Equity	Total Assets
	(percent of total assets)		
Small			
1- Less than \$10,000	30	70	100
2- \$10,000 - 99,999	40	60	100
Medium			
3- \$100,000 - 499,999	43	57	100
4- \$500,000 - 999,999	45	55	100
Large			
5- \$1,000,000 - 4,999,999	60	40	100
6- \$5,000,000 and over	67	33	100
7- Agway	66	34	100

New York State cooperatives exhibited a definite pattern with respect to the distribution of liabilities and equity. As size increased the proportion of total assets represented by liabilities increased and that of equity decreased. In most cases this is a logical development. Due to its subordinated claims on assets, equity capital has greater risk and should be more expensive than debt. As total assets and cooperative services increase, capital requirements increase as well. Presumably greater attention must be paid to the cost of capital. But this is only one possible hypothesis for the substitution of debt for equity. An alternative explanation is that cooperatives have a difficult task generating and maintaining member equity in pace with the need for capital in the business.

#### Balance Sheet Composition

The average composition of the balance sheet for small New York State cooperatives is presented in Table 3. For organizations with assets of less than \$10,000 (Group 1), all assets were current. In addition, all liabilities were current and all equity unallocated. Most of these units were operated from the home of a member or officer. No plant or equipment was involved.

Table 3.

AVERAGE COMPOSITION OF BALANCE SHEETS  
Small New York State Cooperatives, 1976-1977

Balance Sheet Item	Assets of:	
	Group 1 Less than \$10,000	Group 2 \$10,000-\$99,999
ASSETS:	(percent of total assets)	
Current assets	100	70
Investments	-	19
Plant and equipment	-	8
Other	-	3
Total assets	<u>100</u>	<u>100</u>
LIABILITIES AND EQUITY:		
Current liabilities	30	36
Long term debt	-	-
Debentures	-	-
Other	-	4
Total liabilities	<u>30</u>	<u>40</u>
Allocated equity	-	16
Unallocated equity	<u>70</u>	<u>44</u>
Total equity	<u>70</u>	<u>60</u>

The composition of the balance sheets of cooperatives with \$10,000 to \$99,999 in total assets (Group 2) was somewhat more diversified. Current assets represented 70 percent of their total. Investments, usually in federated cooperatives, accounted for 19 percent. Only eight percent of assets were plant and equipment. Current liabilities were the major type for this group. Unallocated equity made up 44 percent of the capital structure, with allocated equity representing 16 percent.

The data on medium sized cooperatives are presented in Table 4. Balance sheet composition for the two groups was very similar, especially on the asset side. Two-thirds of total assets were current. Investments in other cooperatives were only a small component (3-5 percent), while plant and equipment represented a significant portion (20-29 percent) of total assets.

Table 4. AVERAGE COMPOSITION OF BALANCE SHEETS  
Medium Sized New York State Cooperatives, 1976-77

Balance Sheet Item	Assets of:	
	Group 4 \$100,000-499,999	Group 5 \$500,000-999,999
	(percent of total assets)	
ASSETS:		
Current assets	66	66
Investments	5	3
Plant and equipment	29	20
Other	-	11
Total assets	<u>100</u>	<u>100</u>
LIABILITIES AND EQUITY:		
Current liabilities	30	39
Long term debt	3	3
Debentures	8	1
Other	<u>2</u>	<u>2</u>
Total liabilities	43	45
Allocated equity	17	22
Unallocated equity	<u>40</u>	<u>35</u>
Total equity	57	55

For medium sized cooperatives, current liabilities accounted for the majority of liabilities. Long term debt made up only three percent of the financial structure. The role of debentures varied among the two groups. Cooperatives with assets between \$100,000 and \$499,999 (Group 3), made much more extensive use of debentures than those with assets of \$500,000 - \$999,999 (Group 4). Debentures represented eight percent of the financial structure in the former and only one percent in the latter. A major portion of equity in both groups was unallocated equity.

Balance sheet composition was significantly different for large cooperatives, especially with respect to liabilities and equity (Table 5). Distribution of assets varied between the three groups, but current assets continued to dominate total assets. Investments in other cooperatives or businesses played only a minor role, except in the case of Agway where investments accounted for seven percent of total assets. All large cooperatives had a substantial investment in plant and equipment (23-36 percent of assets).



Table 5. AVERAGE COMPOSITION OF BALANCE SHEETS  
Large New York State Cooperatives, 1976-77

Balance Sheet Item	Assets of:		
	Group 5 \$1,000,000-4,999,999	Group 6 \$5,000,000 and over	Group 7 Agway
	(percent of total assets)		
<b>ASSETS:</b>			
Current assets	71	53	68
Investments	2	2	7
Plant and equipment	23	36	25
Other	4	9	-
Total assets	<u>100</u>	<u>100</u>	<u>100</u>
<b>LIABILITIES AND EQUITY:</b>			
Current liabilities	50	47	34
Long term debt	8	16	8
Debentures	2	2	19
Other	-	2	5
Total liabilities	<u>60</u>	<u>67</u>	<u>66</u>
Allocated equity	24	33	7
Unallocated equity	16	-	27
Total equity	<u>40</u>	<u>33</u>	<u>34</u>

About one-half of the financial structure of large cooperatives consisted of current liabilities. Accounting for between 8 and 16 percent, long term debt also played a significant role. Debentures made up 19 percent of the financial structure of Agway and only two percent in the other two groups.

With the exception of Agway, the vast majority of equity used by large cooperatives was allocated to members. In fact, organizations with assets greater than \$5 million had no unallocated equity. Twenty-seven percent of Agway's equity was unallocated reserves.

Current Assets and Liabilities

The distribution of current assets and current liabilities among individual balance sheet items is presented in Table 6. The data are for medium and large cooperatives.

Table 6. CURRENT ASSETS AND LIABILITIES  
Medium and Large New York State Cooperatives, 1976-77

Balance Sheet Item	Assets of:				
	Group 3 \$100,000- 499,999	Group 4 \$500,000- 999,999	Group 5 \$1,000,000- 4,999,999	Group 6 \$5,000,000 and over	Group 7 Agway
	(percent of total assets)				
<b>CURRENT ASSETS:</b>					
Cash	15	16	6	2	6
Notes receivable	4	8	1	4	1
Accounts receivable	25	25	43	26	17
Other receivables	-	-	-	1	5
Inventories	20	15	19	19	36
Prepaid expenses	2	2	2	1	3
Total current assets	66	66	71	53	68
<b>CURRENT LIABILITIES:</b>					
Accounts payable	17	25	25	29	23
Notes payable	6	9	17	12	2
Refunds and dividends	2	1	4	1	1
Accrued expenses	1	3	3	1	7
Other	4	1	1	4	1
Total current liabilities	30	39	50	47	34
Current Ratio	2.17	1.69	1.42	1.15	2.02
Range in current ratio	1.07-52.43	0.94-5.01	1.05-3.52	0.88-1.88	

Accounts receivable were the most important items representing approximately one-fourth of the total. Inventories accounted for about 20 percent except in the case of Agway where they amounted to 36 percent of assets. Cash ranked third in importance, but as a percentage of total assets varied (between 2 and 16 percent) with firm size. Notes receivable and prepaid expenses were only a minor portion of current assets.

Accounts payable dominated current liabilities. They represented 17 to 29 percent of total assets. The only other current liability of any importance was notes payable. Notes payable varied between 2 and 17 percent.

Table 6 also shows the average current ratio of each group and the range of current ratios within each group. The average current ratio for cooperatives with \$100,000 - \$499,999 in assets was 2.17. As size increased current ratios decreased. The ratio for organizations over \$5 million in assets was 1.16. Agway had a current ratio of 2.02.

Although the variation decreased as size increased, current ratios varied considerably among cooperatives. The lowest was 0.88 and the highest

52.43. As current ratios begin to approach 1.1 or 1.2, most analysts show concern and ask questions about the balance between current assets and liabilities.

Equity Structure

The equity structures of medium and large cooperatives are presented in Table 7.

Table 7. STRUCTURE OF EQUITY  
Medium and Large New York State Cooperatives, 1976-77

Balance Sheet Item	Assets of:				
	Group 3 \$100,000- 499,999	Group 4 \$500,000- 999,999	Group 5 \$1,000,000- 4,999,999	Group 6 \$5,000,000 and over	Group 7 Agway
	(percent of total equity)				
ALLOCATED EQUITY:					
Preferred stock	10	5	7	4	19
Common Stock	11	17	4	3	2
Certificates, interest	-	-	-	37	-
Certificates, no interest	8	18	50	70	-
Total allocated	29	40	61	114	21
UNALLOCATED EQUITY:					
Unallocated reserves	75	60	40	0	79
Charges against equity	(4)	-	(1)	(14)	-
Total unallocated	71	60	39	(14)	79
TOTAL EQUITY	100	100	100	100	100

In general, as cooperative size increased, the percentage of allocated equity increased and the portion of unallocated equity decreased. Cooperatives with \$100,000 to \$499,999 of assets had 29 percent allocated equity and 71 percent unallocated equity. By comparison, those with more than \$5 million of assets had allocated equity of 114 percent and unallocated equity of negative 14 percent. The minus figure was due to charges against equity (operating losses).

For medium sized cooperatives and Agway, preferred and common stock were the primary sources of allocated equity. Interest bearing certificates were not a major means of raising equity, except for associations with assets over \$5 million. Even then they were primarily used by only one cooperative. Certificates bearing no interest were the common source of equity for large cooperatives.

The role of unallocated reserves decreased as size increased. Cooperatives with more than \$5 million in assets had no unallocated reserves. Agway was an exception with 79 percent of its total equity in unallocated reserves. For some groups charges against equity reduced unallocated reserves and even allocated equity. Charges against equity were largest for cooperatives with over \$5 million of assets.

### Summary

Balance sheets of New York State cooperatives exhibit a great deal of variation. However, a few generalizations are possible. Current assets dominated the left hand side of the balance sheet. Accounts receivables were the most important current asset. On the right hand side of the balance sheet, current liabilities were the predominant form of liabilities, and accounts payable were the single most important current liability. These facts suggest management of working capital should be a top priority issue for New York State cooperatives.

In general the cooperatives studied used two methods to generate equity capital, and the method used depended on the size of the organization. Small associations and Agway relied on unallocated equity, while large cooperatives used non-interest bearing certificates as their primary means of acquiring member capital.

### The Average Balance Sheet

Table 8 represents the average balance sheet of New York State cooperatives. The data was obtained by averaging the percentage composition of the balance sheets of the seven asset groups. Each group was weighted equally.

The information is presented to allow cooperative members and management to compare the composition of their cooperative's balance sheet with that of the average for New York State. The average balance sheet cannot be used to describe the correct distribution of assets and liabilities. That depends on the nature of the cooperative business and its operations.

Table 8.

AVERAGE BALANCE SHEET  
New York State Cooperatives, 1976-77

Balance Sheet Item	Average for NYS Cooperatives	Your Cooperative
	(percent of total assets)	
<b>ASSETS:</b>		
Current assets	71	_____
Cash	25	_____
Notes receivable	3	_____
Accounts receivable	23	_____
Other receivables	1	_____
Inventories	17	_____
Prepaid expenses	2	_____
Investments	5	_____
Plant and equipment	20	_____
Other	4	_____
Total Assets	100	100
<b>LIABILITIES AND EQUITY:</b>		
Current liabilities	38	_____
Accounts receivable	22	_____
Notes payable	10	_____
Refunds and dividends payable	1	_____
Accrued expenses	2	_____
Other	3	_____
Long term debt	5	_____
Debentures	5	_____
Other	2	_____
Total Liabilities	50	_____
Allocated equity	18	_____
Preferred stock	3	_____
Common stock	4	_____
Certificates, interest	2	_____
Certificates, no interest	9	_____
Unallocated equity	32	_____
Unallocated reserves	38	_____
Charges against equity	(6)	_____
Total Equity	50	_____
Total Liabilities and Equity	100	100

Comparison with U.S. and Springfield District Cooperatives

Three major studies have been conducted on the financial structure of U.S. cooperatives.<sup>1/</sup> Two provided information on cooperatives in the thirteen Farm Credit Districts. Using these studies it was possible to compare the financial structure of New York State associations with cooperatives in the United States and the Springfield Farm Credit District.

To make such a comparison, the data on New York State cooperatives were aggregated and balance sheet items regrouped. All forms of short term debt were subtracted from current liabilities and added to long term debt. In addition, all interest bearing equity certificates were classified as long term debt. In the studies referred to, all interest bearing certificates and certificates with a specific date of maturity were considered long term debt. However, from the balance sheet information available, it was not possible to determine which certificates had maturity dates. Consequently, all certificates not paying interest were treated as equity.

Aggregate Financial Structure

The aggregate financial structure of all U.S. cooperatives in 1954, 1962 and 1970 is shown in Table 9. Current liabilities excluding short term debt accounted for about one-fifth of total assets. Although current liabilities have increased slightly, their proportion has remained relatively constant over time. By contrast, there has been a significant increase in the percentage of short and long term debt. In 1970 debt made up almost one-third of the financial structure of U.S. cooperatives.

Table 9. FINANCIAL STRUCTURE OF U.S. COOPERATIVES  
1954, 1962 and 1970

	1954	1962	1970
	(percent of total assets)		
Current Liabilities			
Excluding Short Term Debt	18.4	20.2	20.8
Short and Long Term Debt	24.5	22.4	32.6
Equity	57.1	57.4	46.6
Total	100.0	100.0	100.0

1/ Griffin, Nelda. A Financial Profile of Farmer Cooperatives in the United States. FCS Research Report No.#23, (Washington, D.C.: U.S. Department of Agriculture, Farmer Cooperative Service, October 1972). Griffin, Nelda and Roger A. Wissman. Financial Structure of Farmer Cooperatives, FCS Research Report No.#10, (Washington, D.C.: U.S. Department of Agriculture, Farmer Cooperative Service, March 1970). Hulbert, Helim H., Nelda Griffin and Kelsey B. Gardner. Methods of Financing Farmer Cooperatives. General Report 32. (Washington, D.C.: U.S. Department of Agriculture, Farmer Cooperative Service, June 1957).

Debt has been replacing equity as the major source of capital funds. Between 1954 and 1970, the proportion of equity decreased from 57.1 to 46.6 percent.

Table 10 provides a comparison of the aggregate financial structures of U.S. and Springfield District cooperatives in 1970 with New York cooperatives in 1976-77. Since Agway Inc. had almost twice the total assets of all other New York State cooperatives studied, New York data are presented including and excluding Agway Inc.

Table 10. FINANCIAL STRUCTURE  
A Comparison of U.S., Springfield District  
and New York State Cooperatives

	U.S. 1970	Springfield District 1970	New York State 1976-77	
			Incl. Agway	Excl. Agway
(percent of total)				
Current Liabilities				
Excluding Short Term Debt	20.8	22.3	30.9	30.1
Short and Long Term Debt	32.6	43.7	39.3	46.8
Equity	<u>46.6</u>	<u>34.0</u>	<u>29.8</u>	<u>23.1</u>
Total	100.0	100.0	100.0	100.0

The proportion of current liabilities, excluding short term debt, was larger in Springfield District cooperatives than in all U.S. cooperatives. For New York State cooperatives the percentage was even larger. Short and long term debt was the major source of capital for Springfield District and New York cooperatives. In this respect they differ from U.S. cooperatives, where equity was a much more important source of funds. Only one-fourth of the capital used by New York cooperatives was equity capital, while equity accounted for almost one-half of the funds used by U.S. cooperatives.

#### Aggregate Equity Structure

The aggregate equity structure of U.S. cooperatives is shown in Table 11. The data are for 1962 and 1970. In both years, preferred and common stock contributed about two-fifths of equity. However, there is an indication the role of stock as a source of equity is decreasing. Certificates and credits were the major source of equity funds for U.S. cooperatives, and their proportion has increased. Unallocated reserves provide only a small portion of the equity used by U.S. cooperatives.

Table 11. EQUITY STRUCTURE OF U.S. COOPERATIVES  
1962 and 1970

	1962	1970
	(percent of total)	
Common and Preferred Stock	40.5	37.2
Equity Certificates and Credits	47.4	49.9
Unallocated Reserves	<u>12.1</u>	<u>12.9</u>
Total	100.0	100.0

In contrast to U.S. cooperatives, the aggregate equity structures of Springfield District and New York State cooperatives were radically different. This is illustrated in Table 12. Springfield District cooperatives depended much less on stock and equity certificates than did most U.S. cooperatives. Almost one-half of their equity structure consisted of unallocated reserves. A similar trend was found in the New York data when Agway was included. However, the figures are significantly influenced by Agway's inclusion. When Agway is excluded, there was a dramatic change in the equity structure of New York State cooperatives. Without Agway, common and preferred stock accounted for 9.5 percent of equity funds, while certificates and unallocated reserves contributed 82.0 and 8.5 percent respectively. In other words, one cooperative, Agway Inc., accounted for a large portion of stocks and reserves in the aggregate equity structure of New York (and Springfield District) cooperatives.

Table 12. EQUITY STRUCTURE  
U.S., Springfield District and New York State Cooperatives

	U.S. 1970	Springfield District 1970	New York State 1976-77	
			Incl. Agway	Excl. Agway
	(percent of total)			
Common and Preferred Stock	37.2	28.9	17.1	9.5
Equity Certificates and Credits	49.9	24.1	26.6	82.0
Unallocated Reserves	<u>12.9</u>	<u>47.0</u>	<u>56.3</u>	<u>8.5</u>
Total	100.0	100.0	100.0	100.0



### Optimal Capital Structure

To this point the discussion has focused on the balance sheets of New York State cooperatives. One of the most important decisions any cooperative must make is with respect to capital structure. This section presents a general discussion of how a cooperative can determine its optimal capital structure. Although this topic has been covered by Tubbs and West, a brief review is appropriate.<sup>2/</sup>

It is assumed the goal of a cooperative is to maximize returns to its members' equity without jeopardizing the survival of the association with excessive risk. Since return on equity increases as the cost of capital decreases, a cooperative should use that mix of capital funds that minimizes its cost of capital. Although most cooperatives have access to several types of funds only the two general sources of capital - debt and equity - will be discussed. The framework is easily expanded to include several types of capital.

The first step in determining optimal structure is to determine the cost of each type of capital. It is a relatively simple task to estimate the cost of borrowed funds. The rate is specified on the loan contract. But other factors that have an impact on costs must also be considered. Included in this category is the tax savings of interest expenses.

It is more difficult to determine the cost of equity. The cost attached to equity should be the return farmer-members could receive from their next best investment alternative of comparable risk. In other words, it should be the opportunity cost of equity funds. When a reasonable opportunity cost is not available many managers use the cost of debt as a starting point and add a premium for risk. Since equity is the recipient of residual income and has last claims on assets, it bears more risk than debt capital. Consequently, the cost of equity should always be expected to be higher than the cost of debt. Since the premium for risk will vary between industries and firms, it is impossible to identify a specific relationship between the cost of equity and the cost of debt.

Once the costs of various types of capital have been determined, the next step is to compute the weighted average cost of capital and study how it varies with financial leverage.

The weighted average cost of capital is the sum of the cost of each type of capital times the contribution of each source of funds to the total capital structure. For example, if the after tax cost of borrowed funds is 8 percent and debt makes up 25 percent of a cooperative's capital structure while the cost of equity is estimated to be 16 percent and makes up 75 percent of the capital structure, the cooperative's weighted average cost of capital is 11 percent. Financial leverage refers to the debt-equity composition of a firm's capital structure. As debt is substituted for equity, financial leverage increases.

<sup>2/</sup> Tubbs, Alan R. and Richard R. West. The Use of Debt in the Cooperative Structure. A. E. Res. 336. (Ithaca: Cornell University Agricultural Experiment Station, Department of Agricultural Economics, October 1971).

Since debt is in principle less costly than equity, initial additions of debt will reduce the firm's weighted average cost of capital. This is illustrated in Figure 1. At low debt-equity ratios - low levels of financial leverage - costly equity is being replaced by less expensive debt and the weighted average cost of capital decreases.

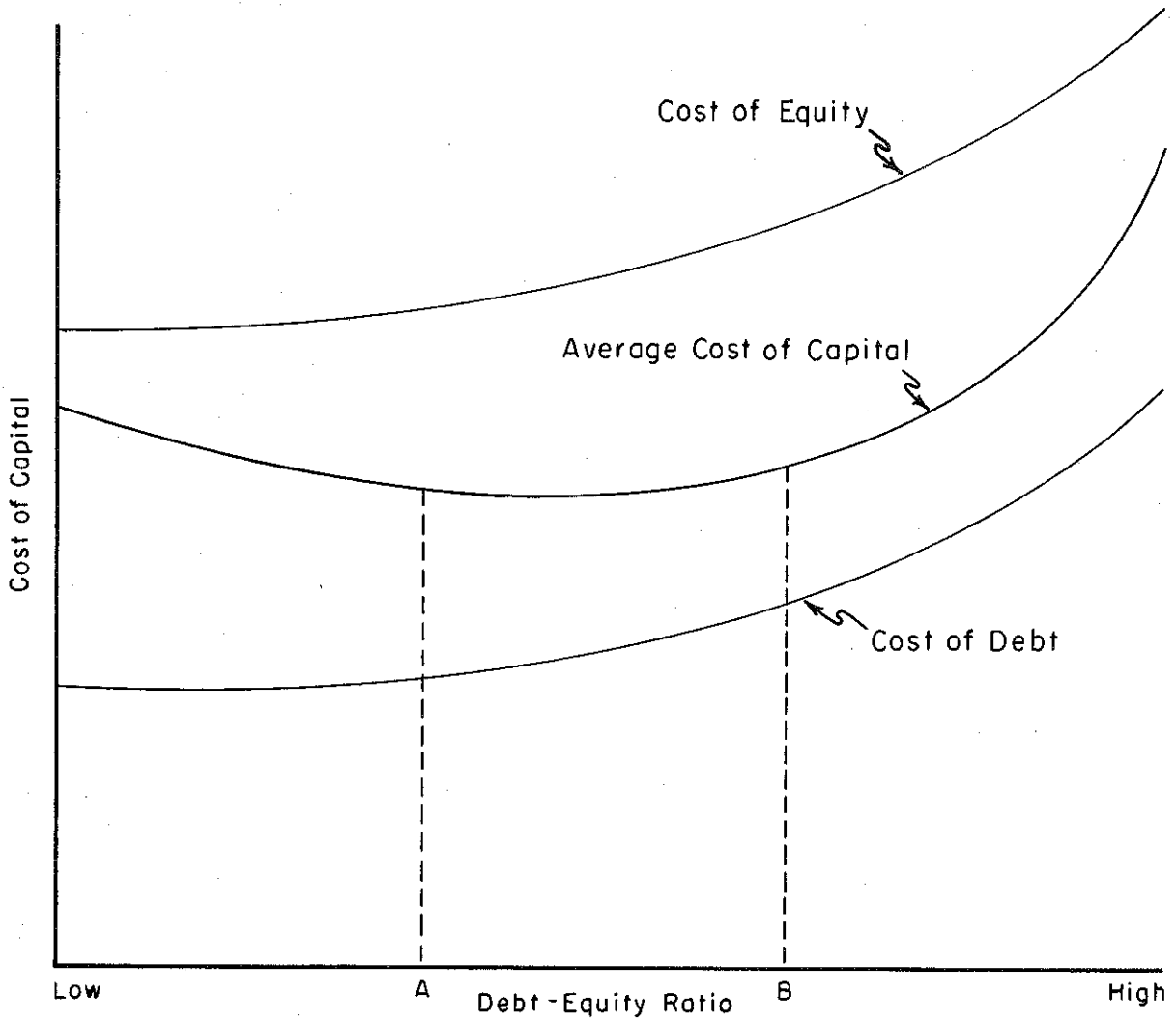


FIGURE 1. EFFECT OF THE DEBT-EQUITY RATIO ON THE COST OF CAPITAL

Associated with debt is a fixed financial obligation. As the proportion of debt used increases, a larger portion of net income is committed to paying principal and interest. Consequently, less net income is available to be converted into equity or returned to members.

Although the absolute amount of equity contributed by members decreases as financial leverage increases, the risk associated with the remaining equity increases. If the absolute variation in net income remains the same, variation as a percent of equity will increase as the percentage of equity decreases. Consequently, a cooperative's financial vulnerability - the probability of it not meeting its financial obligations - increases as its debt - equity ratio increases. For assuming the risk associated with higher levels of financial leverage, members should require a higher return on the equity invested in their cooperative. As leverage increases, at some point, lenders will also require a higher rate of interest on loaned funds. As more debt is used the increased costs of equity in principle and debt will cause the weighted average cost of capital to eventually level off and then begin to increase. This is illustrated in Figure 1.

The optimal capital structure is where the weighted average cost of capital is at a minimum. In Figure 1, minimum costs and the optimal capital structure occur at debt-equity ratios falling between points A & B. Optimal capital structure usually occurs over a range of debt-equity ratios. In addition, it will vary from firm to firm. But most important, a good working knowledge of the cooperative's actual and potential sources and costs of capital is required to determine optimal capital structure.

The board of directors and managers of some cooperatives consider equity an inexpensive or even costless form of capital. They do not attach an opportunity cost that accurately reflects the amount of risk member capital bears. Consequently, equity is used as a supplement to debt, rather than vice versa. When this happens financial problems are likely to arise. To maintain a sound financial structure, it is essential that the board, management and members view debt and equity in the proper perspectives. It must be realized that equity bears substantially more risk and should receive a higher rate of return than debt.

#### Summary

The purpose of this publication has been to examine the balance sheets of New York State cooperatives, to compare their aggregate financial structure with that of U.S. and Springfield District cooperatives, and to outline factors that should be considered to improve a cooperative's capital structure.

In studying 1962 data on the financial structure of cooperatives in the Springfield Farm Credit District, Tubbs and West found cooperatives rely heavily on equity financing. They went on to suggest "in many cases, a cooperative could increase benefits and reduce investment if larger portions

of debt were used.<sup>3/</sup> However, they added the following qualification: "Before a cooperative finds debt acquisition possible, a modification in the traditional revolving fund method of finance may be required to provide the association with more permanent and identifiable classes of equity. Such modification might include revolving traditional certificates into preferred stock or removing the maturity date in revolving investments and making the initial investments of a member more permanent while making only yearly adjustments in total investment to reflect changes in the relative use made of the association."<sup>4/</sup>

This study indicates some New York cooperatives, particularly the smaller cooperatives, still rely heavily on equity financing. However, many cooperatives, especially large New York cooperatives, have substantial amounts of debt. In fact, today some associations may rely too heavily on debt capital. From the data obtained it was difficult to determine the portion of the equity that represented more permanent forms of financing. But capital structures are changing. A few large cooperatives headquartered in New York recently completed a recapitalization program that created a substantial base of more permanent equity capital, and other State cooperatives are exploring a similar move.

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<sup>3/</sup> Ibid. p. 15.

<sup>4/</sup> Ibid. p. 15.