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CAPITAL STRUCTURE DETERMINATION FOR COOPERATIVE

WAREHOUSES IN THE NATURAL FOODS INDUSTRY

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CAPITAL STRUCTURE DETERMINATION FOR COOPERATIVE

WAREHOUSES IN THE NATURAL FOODS INDUSTRY

By

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ABSTRACT

CAPITAL STRUCTURE DETERMINATION FOR COOPERATIVE
WAREHOUSES IN THE NATURAL FOODS INDUSTRY

By

John H. Pettingill

Financial analysis techniques (capital structure determination and capital budgeting) were developed to analyze the strength of cooperative wholesalers in the natural foods industry.

Modern portfolio theory provided a cost of member equity calculation through the substitution of comparable firms' Betas (market portfolio correlation coefficients) into the Capital Asset Pricing Model formula. Surrogate cost of equity calculations were adjusted for nonwealth returns and for financial leverage (utilizing Miller-Modigliani theory).

Linear programming techniques were developed to calculate mixes of debt and equity (which maximize the value of the cooperative). Qualitative methods incorporated other financial management concerns such as liquidity and flexibility.

Ratio analysis incorporated the attributes of the cooperative structure to measure the financial strength of the three types: federated, consumer retail subsidiary, and worker. Their strength is limited due to a failure to effectively use patronage dividends and to develop adequate accounting systems.

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ACKNOWLEDGEMENTS

My sincere thank you is extended to the National Cooperative Bank for the grant which financed this study, Dr. Ronald Cotterill, my thesis advisor, and to the survey respondents who made this study possible.

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CHAPTER I

INTRODUCTION

The first objective of this study is the development of theoretical and practical approaches to determine the optimal capital structure (and concomitantly the optimal investment divisions) for cooperatives. The focus is on the relationship between combinations of different capital sources and risk, member required return, and actual returns generated.

The second objective is an analysis of the financial strength of the cooperatives in the wholesale natural foods industry utilizing the results of Part I. The risks associated with financial structure, liquidity, interest coverage, and long term growth prospects are identified for the different types of wholesale cooperative and compared to the industry.

The firms under study are the worker-owned and consumer-owned cooperative wholesalers (warehouses). These thirty-four firms distribute natural foods primarily to consumer-owned retail food cooperatives. Almost all of these wholesalers were formed after 1970. These firms played a significant role in introducing natural foods to the general public. In the middle seventies, these cooperatives controlled the lion's share of the wholesale market. Since the late seventies, these firms have not performed as well as many of their competitors and several have failed. The need for appropriate financial decision making techniques is becoming apparent to these firms as they witness a steady decline in growth, market share, and performance.

Pressure is being applied by high interest rates, increased competition from the investor-owned wholesalers, and the slow growth of the food industry. A significant additional source of problems has been these firms' failure to address the limitations and opportunities presented by the cooperative structure. This seems to be a common problem for cooperatives. Even the farm cooperatives have not adequately addressed their financial issues: " . . . it is obvious that cooperatives are not winning in the war of financial survival."[1]

Plan of the Study

The plan of the study is composed of two parts, following the two objectives of the study. The first part, contained in Chapters II through V, consists of the development of a framework to make capital structure decisions. Chapter II contains a survey of the literature of the concepts used in corporate finance. The first half will cover modern portfolio theory and how it can be used to measure risk and determine the required rate of return for equity holders (otherwise known as the cost of equity capital). The second half of Chapter II

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[1]Rolf E. Haugen (Group Vice President and Chief Financial Officer of Land O'Lakes), "Financing Growth While Coping With Inflation--A Financial Perspective," Cooperative Accountant (Winter 1981):71.

will cover net present valuation techniques. Net present valuation is a method for valuing equity, new asset purchases, or the value of the firm itself.

Chapter III adapts the concepts of corporate finance to cooperative finance. The first half of the chapter concerns the cost of cooperative equity. The nature of risk in cooperatives and the nature of the members' utility are integrated using the concepts introduced in the preceding chapter. The result of this integration are methods to calculate (or approximate) the required rates of return for cooperative members. The second half of Chapter III adjusts the methods of net present valuation to suit the characteristics of a cooperative firm.

Chapter IV examines the effect of financial leverage (debt use) upon the discount factors used in net present valuation. Methods for calculating discount facotrs which have been adjusted for the effect of nonwealth return are shown. Finally, the techniques for combining all adjusted capital source costs into one discount factor are developed.

Chapter V examines the characteristics of the different capital sources with regard to tax liability, cost, return to the members, and cash generation. General guidelines for using these capital sources are developed following the discussion of each section. There is concentrated coverage of patronage dividend management. The second part of this chapter expands upon the work of Dahl and Dobson (among others) to develop computational methods for determining the optimal mix of capital sources.

The second part of the study, Chapters VI through VIII, provides an analysis of the financial strength of the group under study. Chapter VI uses the concepts and techniques developed in Part I to develop sets of financial ratios to analyze financial strength. Chapter VII presents the calculation of the member required returns and those financial ratios which data permitted. Chapter VIII concludes the study with an interpretation of the ratio calculations of the sample and recommendations for possible future action within that industry.

PART I

DEVELOPMENT OF A FRAMEWORK TO MAKE CAPITAL STRUCTURE DECISIONS

CHAPTER II

CORPORATE FINANCIAL ANALYSIS

Two useful tools in corporate finance are modern portfolio theory and the discounted cash flow model (commonly referred to as net present valuation). The ability of modern portfolio theory to integrate risk measurement and utility theory to deduce an investor's required rate of return is of particular interest. Once a financial analyst knows the investors' required rate of return it is possible to calculate the opportunity cost of equity capital. This is needed in combination with the costs of other forms of capital to calculate the discount factor needed in net present valuation. The ability to generate a single net present value for different investments facilitates choice between them. Net present valuation techniques also are used in determining the optimal mix of capital sources. This chapter is divided into two parts: (a) a discussion of the required rate of return of investors and (b) a discussion of net present valuation.

The Required Rate of Return of Investors

This section examines how modern portfolio theory can be used to measure risk and a required rate of return of equity holders. This discussion is divided into four parts: (a) a review of the types of su

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risk, (b) the measurement of risk, (c) the utility function of investors, and (d) the capital asset pricing model.

The Nature of Risk in Corporate Finance

"Expected return" is the expectation or the mean of a frequency distribution of all possible returns. It is calculated by summing the product of possible outcomes and their respective probabilities.

Risk is the probability that the returns of an asset may have a different value than what was expected. The variance or dispersion of the observed values from what was expected is one measure of risk.

Variance is calculated by determining the difference between each observed value and the mean. This difference is squared, then multiplied by the probability or relative frequency of its occurrence. The sum of these values is divided by the number of observations. The resulting value is the variance, a measure of total risk. Total risk is composed of financial risk, business risk, and price level risk.

Financial risk. Financial risk can be broken down into financial leverage and maturity risk. Financial leverage is the extent to which the assets of a firm are financed by debt. Financial leverage is measured by the debt to equity ratio or the debt to value of assets ratio. As financial leverage increases so does the fixed interest expense. This increase in interest expense creates additional variability in net income.

The maturity structure of debt is also an important determinant of financial risk. In general, the greater a firm's reliance on short term debt, the greater the risk of financial distress. Short term debt must be "rolled-over" frequently. This continuous refinancing can lead to considerable variation in borrowing costs.[1] Consequently, financing long term assets with short term debt increases the variance of the cash flows available to equity holders.

Firms with little debt and stable operating cash flows need not be overly concerned with borrowing short or long. But those firms which have high debt ratios or unstable operating cash flows must be careful in relying on short term financing.

The coefficient of variation is the second index that is useful for analyzing the relationship between financial leverage and risk. It is the standard deviation of a return (the square root of the variance or total risk of a return) divided by the expected return.

$$\text{Coefficient of Variation (C.V.)} = \frac{\text{standard deviation}}{\text{expected return}} = \frac{\sigma(X)}{E(X)} \qquad (2.1)$$

The Coefficient of Variation provides a measurement of the risk per unit of return to the owners. If the firm is financially leveraged, then a fixed interest payment, Y, is distributed to the debt-holders.

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[1] Seha M. Tinic and Richard R. West, Investing in Securities: An Efficient Markets Approach (Reading, Massachusetts: Addison-Wesley Publishing Company, 1979), pp. 137-9.

The return distributed to the owners is E(X) - Y. The coefficient of variation is now $\frac{\sigma(X)}{E(X)} < \frac{\sigma(X)}{E(X) - Y}$. The risk per unit return for a firm with debt is greater than the all equity firm.[1]

Business risk. Business risk is the uncertainty generated by possible changes in the firm's product prices, product demand, factor costs, and technological and managerial efficiency. These four forces are influenced by changes in the general economic level, government policy, technological changes, etc. Operating leverage will increase the effects of business risk for the firm.

Operating leverage refers to the extent to which a firm's operating costs are fixed. The greater the level of fixed costs, the greater the operating leverage. Operating leverage results in a large change in net operating income for a relatively small change in sales. The effect of leverage cuts both ways. In a good sales year, the firm that is highly levered will experience greater income. In a bad sales year, the firm will experience greater losses. Operating leverage can be measured with the elasticity of income with respect to the sales.

$$\text{Degree of operating leverage} = \frac{\text{the percentage change in income}}{\text{the percentage change in units sold}} \tag{2.2}$$

[1]Peter Vitaliano, "A Comparative Analysis of the Cost of Long Term Debt Financing for Regional Marketing Cooperatives and Investor-Owned Firms in the U.S. Agricultural and Food Industries" (Ph.D. dissertation, University of Wisconsin-Madison, 1980), pp. 23-4.

One possible means of reducing the variability of a firm's business risk is diversification. For example, a firm can reduce variance in its income stream by developing new divisions or product lines that exhibit negative or low positive correlation with the existing business. When one line of business is having a bad year, profits from others offset its losses. Statistically, this concept arises from what is called the portfolio effect.

The variance of a portfolio is equal to the proportion of the first asset squared times the variance of the first asset, added to the proportion of the second asset squared times the variance of the second asset, added to the quantity two times the proportions of the two assets times the covariance of the assets.

$$\sigma_p^2 = W_a^2 \cdot \sigma_a^2 + W_b^2 \cdot \sigma_b^2 + 2W_a^2 \cdot W_b^2 \cdot COV_{ab} \tag{2.3}$$

where: W_a = Weight or proportion of asset a.

σ_a^2 = Variance of the income generated by asset a.

W_b = Weight or propertion of asset b.

σ_b^2 = Variance of the income generated by asset b.

COV_{ab} = Covariance of the income generated by assets a and b.

Since COV_{ab} = the correlation between the returns of the two assets times the standard deviations of the two assets or $\Gamma_{ab} \cdot \sigma_a \cdot \sigma_b$. The variance of a portfolio appears as follows:

$$\sigma_p^2 = W_a^2 \, \sigma_a + W_b^2 \, \sigma_b^2 + 2W_a \, W_b \, \Gamma_{ab} \, \sigma_a \, \sigma_b \tag{2.4}$$

If the correlation is low or negative, the variance of the portfolio can be less than a simple average of the two variances. Since variance is synonymous with risk, diversification can lower business risk.

Individuals can also reduce the business risk of their investments through diversification. An individual could hold a portfolio of two different securities and achieve the same reduction in risk as if the two firms had merged. Indeed, many argue that unless a firm's decision to diversify creates technological or managerial economies, it should not be undertaken.[1] A certain amount of diversification to reduce business risk, however, may produce managerial economies. Firms that must weather the ups and downs in a particular line of business by dismissing and rehiring personnel probably should be less efficient than more diversified firms which can retain staff.

<u>Price level risk</u>. Price level risk is the risk generated by inflation (or deflation). The expected inflation (or deflation) rate is incorporated into the required return sought by investors. In addition, investors face the risk that the actual price level change is different from their expectations. Therefore, an additional premium for this risk would be added to the required return.

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[1]Tinic and West, <u>Investing in Securities</u>, p. 162; Joel Stem, "Takeover Bids," <u>Wall Street Journal</u>, March 27, 1978, p. 17.

Risk Measurement

The risk of one investment cannot be viewed in isolation. Instead, it must be viewed in a portfolio context. The return of an investment combined with the returns of the assets already held determines an investor's overall level of risk and rate return. The appropriate measure of risk for a single asset is its marginal contribution to a portfolio's variance. Marginal contribution can be measured by Beta which is computed as follows:

$$\text{Beta} = \frac{\text{COV}(R_i,R_p)}{\sigma^2(R_p)} = \frac{\Gamma_{ip}\ \sigma(R_i)\ \sigma(R_p)}{\sigma^2(R_p)} = \frac{\Gamma_{ip}\ \sigma(R_i)}{\sigma^2(R_p)} \tag{2.5}$$

where: R_i = The return on the investment under consideration.

R_p = The return on the existing or currently held investments.

Γ_{ip} = The correlation between the two returns.

The covariance measures the extent to which the return of the investment tends to vary with the return of the currently held investments. It is divided by the variance of the currently held investments in order to standardize this value.

Consideration of a number of different investments can involve a large number of calculations to account for all the different investment portfolios. Analysts, however, have found a method for simplifying risk comparisons. Rather than analyzing all possible portfolio and investment combinations, the market portfolio (a portfolio containing all possible investments) is used as a "standard" portfolio. The use of this "standard" portfolio has three advantages. First, comparisons of the riskiness of different investments is simplified. Second, this standard portfolio can serve as a proxy for well diversified portfolios. This can be done because the returns on any well diversified portfolio are highly correlated with returns on the market portfolio. Finally, the use of this standard portfolio partitions the riskiness of the asset in an analytically useful way. The resulting Beta tells us the degree to which the return of an investment varies with the market. It thus provides a measure of the market (or systematic) risk associated with an investment under consideration. The remaining risk associated with the asset is called the firm-specific (or unsystematic) risk.

In general, investors should only concern themselves with a security's market risk because, the remaining risk can be eliminated through diversification. This can be shown as follows. Market Beta is the covariance of the return of the investment with the market divided by the variance of the market.

$$\text{Beta} = \frac{COV(R_i, R_M)}{\sigma^2(R_M)} = \frac{\Gamma_{iM}\ \sigma(R_i)\ \sigma(R_M)}{\sigma^2(R_M)} = \frac{\Gamma_{iM}\ \sigma(R_i)}{\sigma(R_M)} \tag{2.6}$$

where: R_i = Return on investment i.

R_M = Return on the market portfolio (the portfolio of all assets).

Beta = Measure of the market risk; marginal contribution to the risk of a portfolio of all assets. A capitalized Beta refers to market portfolio.

The size of Beta is a function of the investment's variability of returns and the investment's correlation with the market return.

$$R_{it} = \alpha_i + \text{Beta}_{iM} R_{Mt} + e_{it} \tag{2.7}$$

where: R_{it} = Return on the investment in period t.

α_i = Estimated return on security i when the market is stationary.

R_{Mt} = Return on the market portfolio (the portfolio of all assets.

e_{it} = Random error term embodying all of the factors that together make up unsystematic (firm-specific) risk.

Beta = Beta of the investment; in the equation it is the coefficient of the dependent variable.

This equation states that the return of the investment is related to the return on the market index in a linear fashion. The variance of the return using the above model would be $\sigma^2(R_i) = \text{Beta}^2\, \sigma^2(R_M) + \sigma^2(e_i)$. Since $\sigma^2(R_M)$ is the market variance, Beta squared (or simply Beta) measures the effect of change of the market portfolio risk (or simply market risk) upon the risk of the investment.

The variance (risk) generated by the firm, $\sigma^2(e_i)$ can be ignored by the holders of diversified portfolios. The unsystematic (or firm-specific) risk, $\sigma^2(e_i)$, can be eliminated from a portfolio of investments by holding as few as eight to sixteen randomly selected securities.

As the number of stocks in the portfolio is increased, the contribution of each $\sigma^2(e_i)$ to the return variance of the portfolio declines, finally approaching zero.[1] Consequently, holders of diversified portfolios are only concerned with systematic (or market) risk.

The Beta of an investment has the following implication for risk:

> With Beta equal to one, the risk of the return of an investment is the same as the risk of the market portfolio. With a Beta greater than one the risk of the investment is greater than the market portfolio. With a Beta less than one, the risk of the investment is less than the market portfolio.

The Utility Function of Investors

The utility of an investor increases as wealth increases and decreases with increased variance of the level of wealth. Thus, the investor will normally seek to maximize the expected return for a given level of risk (variance in wealth) or to minimize risk (variance) for a given level of expected return.[2] It is because of this desire to minimize risk that investors are assumed to hold diversified portfolios.[3]

In capital market theory it is assumed that individuals are "risk averse." The wealth utility function rises at a declining rate. Thus individuals experience diminishing increases in marginal utility with constant marginal increases in wealth. In other words, the risk

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[1]Tinic and West, Investing in Securities, p. 177.

[2]Ibid., p. 204. [3]Ibid., p. 210.

averse individual loses more utility from a dollar lost than from a dollar gained. Recall that variance measured the likelihood that a return will turn out to be above or below the expected return. Therefore, an individual with diminishing margial utility would want a higher expected return from investments of greater risk.

The additional return demanded by an investor for an incremental increase in risk is referred to as the risk premium. This risk premium is necessary to induce investors to take additional risk.

The Capital Asset Pricing Model

The Capital Asset Pricing Model (CAPM) integrates the previous discussions on risk measurement and investor utility. It determines the return a given asset should be expected to yield, i.e., it prices the asset. According to CAPM, in equilibrium, the expected return on an investment is a linear function of its systematic risk, Beta.[1] Specifically, the required expected return is equal to the risk free rate of return plus the product of Beta and the difference between the expected return on the market portfolio and the risk free rate.

$$K_e = R_F + (R_M - R_F)\ \text{Beta}_{iM} \tag{2.8}$$

where: K_e = Expected or required rate or return of an investment.

R_F = Risk free rate of return.

R_M = Expected return of the market portfolio.

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[1]For further discussion, see Tinic and West, Investing in Securities, pp. 278-83.

In other words, the required rate of expected return is the risk free rate plus a risk premium. The base risk premium is the market portfolio return minus the risk free return. The investor expects to be compensated in proportion (Beta) to the riskiness of the market. An investment with a Beta of one would have a required return of R_M:

$$K_e = R_F + (R_M - R_F)\ \text{Beta}_{iM} = R_F + (R_M - R_F)\ 1 = R_F + R_M - R_F = R_M \quad (2.9)$$

Investors would require a rate of return higher than R_M for investments with Betas greater than one; and a rate of return less then R_M for Betas less than one. Investors would require the risk free rate of return, if Beta was zero because there is no market risk for that investment.

Figure 1, Security Market Line, is a graphical representation of the risk-required return relationship. All investments should appear on this line to a holder of a diversified portfolio. The rate of return is represented on the vertical axis and the measure of the market risk. Beta is represented on the horizontal axis. It can be seen that an investment with a Beta of 1.5 has a required rate of return that is greater than the expected return of the market. An investment with a Beta of .5 has a required rate of return that is less than the market return.

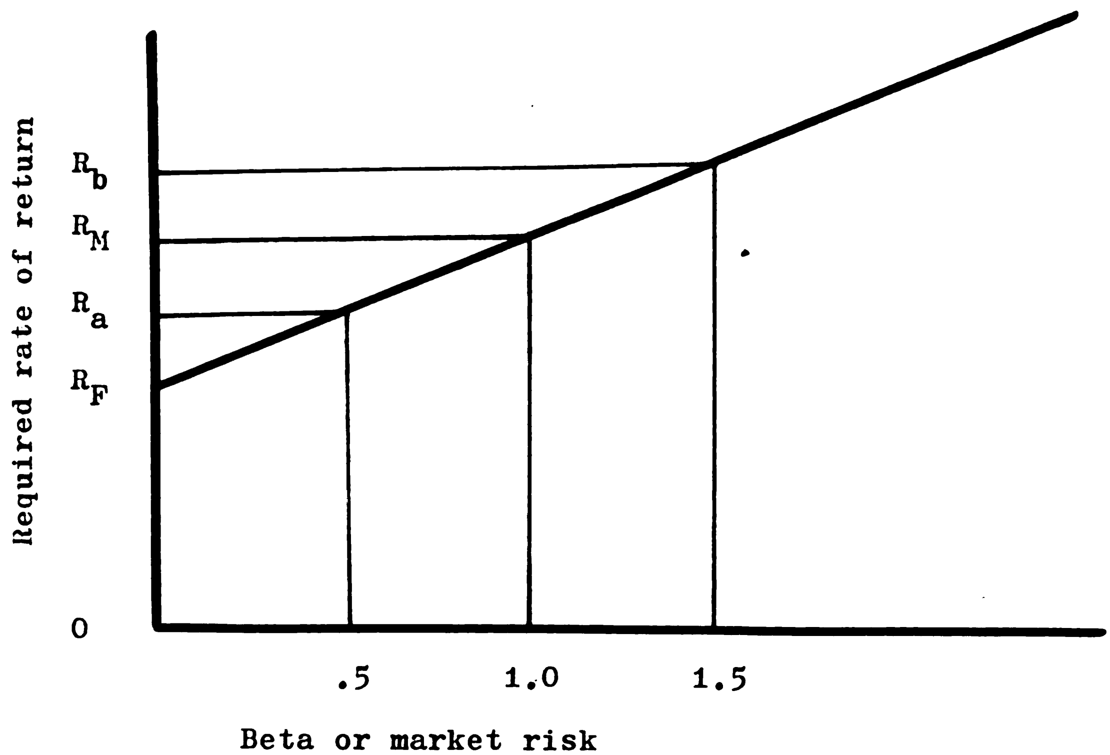

Fig. 1. Security Market Line or Capital Asset Pricing Model.

Portfolios, as well as individual investments, can be analyzed with CAPM.[1] Consequently, the holders of a diversified portfolio can determine the rate of return that should be expected for any investment and for their individual portfolios.

Net Present Valuation

Net Present Value (NPV) of an investment is the value of the sum of the discounted expected cash flows. The expected cash flow generated in each period is discounted by a transfer rate. The resulting values for the periods are summed to produce the net present value. For a one period model in a world without uncertainty net present value can be represented by the following:

$$V_o = \frac{E(C_1)}{(1+i)} \tag{2.10}$$

where: V_o = Net present value

$E(c_1)$ = Expected value of the income generated by the asset or investment in the next period.

i = Tranfer rate; cost of capital, interest rate, etc.

The discussion of NPV will be divided into four parts: (a) the theoretical basis for the NPV (the time value of money), (b) the use of the time-value concept in the valuation of cash flows, (c) the relationship of the time-value concept to the objective function of the firm, and (d) valuation under uncertainty.

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[1]For further discussion, see Tinic and West, Investing in Securities, pp. 278-83.

The Concepts Underlying Net Present Valuation

Assets or investments are purchased with the expectation of receiving an income stream over time. Prospective purchasers need to compare the income generating characteristics of different assets. Net Present Valuation calculates the amount of wealth in the current period that is equivalent to the stream that is generated over many periods. In this way assets which produce streams of different magnitude and length may be compared. The following example illustrates the major concepts involved.

Suppose you are going to receive a set income this year and the next year. Let's say $1,000 per year, for a total of $2,000. If you spent the money received in each period on consumption, you would be at Point B in Figure 2.

Normally, income can be transferred between periods by borrowing and lending. Thus the amount consumed in a given period can also be transferred. The line AC in Figure 2 represents the conversion of consumption ability (income) in one period to another period. Therefore, the slope of this line is one plus the interest rate. One could increase future consumption (moving from B to A) by lending, or one could increase present consumption (moving from B to C) by borrowing. For now, it will be assumed that there is no uncertainty. Consequently, the borrowing and lending rates will be the same, a risk free rate (i).

Notice that all the income streams that lie on the line AC are equivalent. Any income stream on the line AC can be transformed into

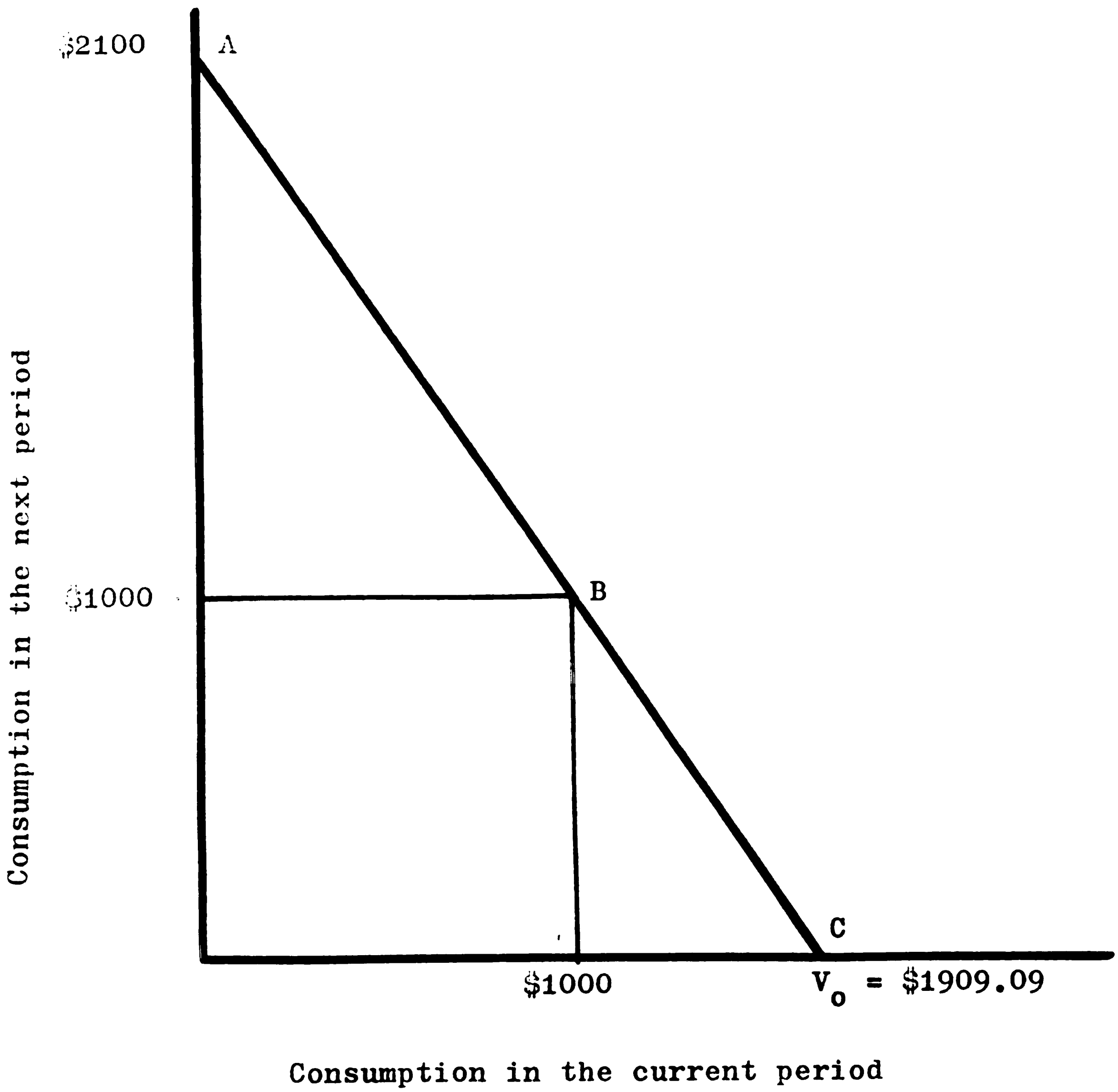

Fig. 2. Intertemporal Consumption.

SOURCE: Jack Hirshleifer, Price Theory and Applications (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1976), p. 414.

any other stream by borrowing or lending. Not all consumption patterns represented by the line AC are equivalent for an individual. Some consumption patterns will be preferred to others. In this example, however, a person would be indifferent to the alternative income streams represented by points on the line ABC.

Suppose the rate of interest is ten percent per year. The individual can transfer current income to the next year and receive \$1.10 for each dollar lent in the current period. If income is \$1,000 per year, the maximum consumption in the next period is (1.10)(1000) + 1000 = \$2100. The individual can transfer anticipated income from the next year to the current year. The maximum consumption in the current year is 1000 + (1000/1.10) = \$1909.00. This \$1,909.00 represents the net present value of the income stream of \$1,000 per year for two years. A person would be indifferent between \$1,000 per period, \$2,100 in the next period, or \$1,909.00 in the current period because the desired consumption pattern would not be affected. By calculating the maximum consumption in the current period that an asset affords, it is possible to compare it with other assets.

Point C would be referred to as the present value of that particular income source. For calculating purposes, the present value of income is represented as V_o. An individual will choose a situation yielding the highest present value possible because it is normally assumed that a person prefers more consumption over less.

Normally, an individual is concerned with income and consumption over many periods. The formula for the present value of an income stream received over "n" periods is represented as follows:

$$V_o = X_o + \frac{E(X_1)}{(1+i)} + \frac{E(X_2)}{(1+i)^2} + \frac{E(X_3)}{(1+i)^3} + \ldots + \frac{E(X_n)}{(1+i)^n} \qquad (2.11)$$

where: X_o = Value of income generated during the present time period.

$E(X_1)$ = Expected or probable value of income to be generated in the next time period (e.g., next year), period one.

$E(X_2)$ = Expected or probable value of income to be generated during the second time period (e.g., year two).

$E(X_n)$ = Expected or probable value of income to be generated in the "n^{th}" time period, period n.

i = Transfer or exchange rate.

Net Present Valuation Under Uncertainty

When one relaxes the certainty assumption, future uncertain returns should include compensation for the risk taken. In other words, the transfer rate must contain a risk premium. Since prospective investors are assumed to be risk-averse, individuals must receive greater and greater increments of wealth for each additional unit of risk taken.

Adjusting a transfer premium for risk is accomplished by adjusting the discount factor (risk-adjusted discount rate method) or by adjusting the cash flows (certainty equivalent method). The two methods are equivalent; however, the certainty equivalent method is easier to use for illustrative purposes, while the risk-adjusted discount rate method is easier to use in problem solving.

The risk-adjusted discount rate method proceeds as follows, assuming that the earnings from the current period have been distributed, the of shares (as claims to future income) in a one period model would be:

$$V_o = \frac{X_1}{(1+i)} \tag{2.12}$$

Substituting K_e, the risk-adjusted discount factor which is also the required rate of return of equity holders, for i gives:

$$V_o = \frac{X_1}{(1+K_e)} \tag{2.13}$$

For multiperiod valuation:

$$V_o = \frac{X_1}{(1+K_e)} + \frac{X_2}{(1+K_e)^2} + \frac{X_3}{(1+K_e)^3} + \ldots \frac{X_n}{(1+K_e)^n} \tag{2.14}$$

In the explanation of CAPM, it was shown that K_e contains the risk free rate (represented by R_F in that discussion) plus a risk premium $K_e = R_F + (R_M - R_F)$ Beta or $K_e = i + (R_M - i)$ Beta. Consequently, for the one period model,

$$V_o = \frac{X_1}{(1+K_e)} = \frac{X_1}{(1+[i+(R_M-i)\text{Beta}])} \tag{2.15}$$

The above formula thus provides a value for the total income generated over different time periods adjusted for the risk of the investment.

The second approach to risk adjustment is the certainty equivalent method which adjusts the cash flow stream rather than the discount factor. For a one period model, the value of shares (claims to future income) in a one period model would be:

$$V_o = \frac{Q}{1+i} \tag{2.16}$$

where: V_o = Value of shares.

i = Riskless rate of return or transfer rate.

Q = Riskless cash flow equivalent or certainty equivalent.

The certainty equivalent or riskless cash flow is obtained by subtracting a risk discount from the expected cash.

$$Q = E(X) - \Omega \tag{2.17}$$

where: Ω = Risk discount

For investors with diversified portfolios, this risk discount, Ω, should only reflect market risk. Therefore, the risk discount is the investment's contribution to the risk of a market portfolio. This contribution can be measured as the covariance of the investment's return with the market return. It is divided by the variance of the market portfolio to standardize it. Multiplying this measure of the investment's relationship to market risk with the market portfolios, $(R_M - i)$, yields the risk discount.

$$\Omega = \frac{(R_M - i) \cdot COV(X_1, R_M)}{\sigma(R_M)} \qquad (2.18)$$

For illustration purposes, it is useful to set the risk discount as follows since $(R_M - i)$ and $\sigma^2(R_M)$ are fixed:

$$\Omega = a \cdot COV(X_1, R_M) \qquad (2.19)$$

where: $a = \dfrac{(R_M - i)}{\sigma^2(R_M)}$

Net Present Value and the Objective Function of the Firm

Individuals invest in firms in order to receive a return. Accordingly, they invest in firms where they perceive the greatest positive difference between the present value of the income generated by the firm and the purchase price of the firm (or shares of stock in the firm). If individuals are already owners, they will want management to choose assets that generate a cash stream that maximizes the present value of their shares by maximizing the present value of the income stream that the owners will receive. This can be seen in the following formula.

Let "X" equal earnings before interest, "I" equal the capital or investment budget, and K_e equal the required return for shareholders. For any given period, the cash generated by the firm is the earnings before interest and taxes minus any new investments (X-I). Consequently, the present value of a one period firm would be $(X_o - I_o)$, the cash generated during the current year, plus $(X_1 - I_1)/(1+K_e)$, the cash generated in the next year. X_1 would be a function of I_o.

Assuming that the investment is used up in one period and that the firm has no debt, then the value of the firm is as follows:

$$V_o = (X_o - I_o) + \frac{(X_1 - I_1)}{(1+K_e)} + \frac{I_1}{(1+K_e)} = (X_o - I_o) + \frac{X_1}{(1+K_e)} \qquad (2.20)$$

I_1 disappears because the firm is liquidated at the end of the period.

Since the cash stream (CS) going to the owners in any period is CS = X-I, the maximization of the present value of the firm will maximize the present value of the investors' equity. In the absence of other considerations, the investors would be indifferent about dividends as long as they are able to capture capital gains (the increased I's upon their exit as owners). Assuming shares are tradable on a securities' market which is efficient, then capital gains should be capturable by shareholders.

When owners give up income in the current period for increased investment, they are increasing the consumption potential in future periods. The market will then bid up the price of the stock because of the anticipated higher dividends (X-I) in the future. The owner's wealth increases by the change in dividends received in the future or by the change in the value of the shares. If an owner has a preference for dividends and none are distributed, dividends can be created by selling off some of his/her shares.

The formal equivalence between the value of the firm and the value of income flows has implications for management. Investors will direct management to choose assets which generate a cash stream whose value is greater than the purchase cost. The general formula for asset or project selection is represented as follows:

$$NPV = \sum_{t=o}^{n} \frac{C_t}{(1+K_e)^t} \text{ ; if NPV > 0, accept.} \qquad (2.21)$$

where: n = The expected life of the firm.

c_t = The expected cash generated each period.

NPV = Net present value of the generated cash flows.

In equation 2.20, the purchase price is considered a cash flow (albeit a negative one) at time zero and is incorporated into the NPV calculation. Note that in this basic model, cash generated and net operating income are equivalent. In later chapters, the model is expanded to include taxes and other reductions in cash flow.

Summary

This chapter has examined two widely used tools of financial analysis: (a) the capital asset pricing model which is based upon modern portfolio theory and (b) net present value analysis. The capital asset pricing model integrates risk measurement with investors' preferences for risk and rate of return to derive the required rate of return for an asset. Net present value analysis utilizes this required rate of return as a discount factor to determine the capitalized value on a cash generating asset or set of assets. The asset under analysis can be an expansion of a firm's physical capital stock (plant, equipment, or product lines) or the investors' ownership in the firm.

CHAPTER III

COOPERATIVE FINANCIAL ANALYSIS

In the previous chapter, modern portfolio theory was shown to measure risk and the required rate of return of equity holders in publicly traded firms. Many of the underlying assumptions (e.g., efficient markets, uniform utility functions) break down if applied to cooperatively structured firms. This chapter modifies methods of calculating required rates of return and net present valuation to reflect the difference in risk and return for cooperative equity.

Cooperative Equity and Investor-Owned Equity

Cooperative equity is different from investory equity due to its temporary nature. When an investor-owned firm sells equity it does not usually plan to redeem these shares. This capital is considered permanent. Investors are free to sell their shares to others, but this is of no direct concern to the business itself. Cooperative members, in contrast, expect their co-op to return the value of the shares to them when they leave the cooperative. Consequently, a cooperative's capital "represents essentially a loan or temporary contribution by its patrons to finance certain economic services for them."[1] This has forced cooperatives to develop

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[1] Charles Nieman, "Revolving Capital in Stock Cooperative Corporations," Law and Contemporary Problems, Summer 1948, p. 393.

mechanisms which can accumulate and redeem equity capital without generating difficulties for the members of the cooperative.

Cooperative equity is also different from corporate equity due to its more limited supply. In theory, a publicly traded corporation has unlimited access to equity capital. A cooperative's equity capital sources, however, are limited to the amount of purchased equity (capital shares) it can sell to the members, and the earnings generated through its operations. Cooperative capital shares are limited in their dividend yield, and usually cooperative members plan to receive most of their return by patronizing the cooperative. Consequently, members have no reason to supply any more capital than is absolutely necessary for the efficient operation of the firm. In fact, individuals have incentives to supply less than their share of the equired capital if they can convince others to contribute more.

Revolving food capital, adjustable revolving food capital and capital retains are unique to cooperatives. These three types are generated by overcharges on the price of goods and services handled. These overcharges are allocated to members on the basis of patronage in the form of retain certificates. When sufficient capital has been obtained, old retain certificates are redeemed as new retain certificates are issued. The implications of these characteristics on risk will be discussed in the following section.

Characteristics Increasing the Risk of a Cooperative

The following characteristics will be examined for their role in increasing risk to members: (a) the nature of cooperative return,

(b) the limited salability of shares, and (c) the nature of cooperative organization.

Nature of Cooperative Return

The nature of the return affects risk in four ways: (a) difficulty of measurement, (b) partial distribution of earnings, (c) lack of capital gains, and (d) the fact that return is based on patronage.

Difficulty of measurement. Corporate investors are primarily concerned with receiving a wealth return. Cooperative members normally desire nonwealth return in addition to a wealth return. Nonwealth returns include secure sources of supply or social needs. Unfortuantely nonwealth returns are difficult to quantify. Consequently, it is difficult for members to know if they are receiving a fair return, and difficult for cooperative management to know how to maximize the members' utility. Voting in general membership meetings and other forms of political preference articulation take on more importance than in proprietary firm concerned only with wealth returns.

Partial distribution of earnings. A cooperative member's return is exposed to a greater degree of price level risk than a corporate investor's return. The members often receive a portion of their return as a certificate of allocation of earnings. This certificate may not be redeemable for cash for several years and a price-level change may adversely affect its value.

Absence of capital gains. The purchased equity (member share) which was necessary to join the cooperative is generally returned at its face value. Inflation can significantly diminish its value at redemption. Shares may or may not pay dividends, and dividends are limited by law to pay less than an eight percent return on member investment.

Since cooperative shares are not valued daily in a securities market there is a risk that all of the benefits from earnings will not be received. Members only benefit indirectly from allocated refunds and retained earnings. As these are invested, the cooperative expands services and may be able to provide lower cost service. Some of the added benefits may go to new members and, more importantly, if members leave the cooperative, they only receive benefits to the extent that the cooperative keeps the prices of other firms lower than they would if there was no cooperative in the market.

Return tied to patronage. A common cooperative practice is proportional contribution of capital whereby an individual member's capital must be proportional to his/her anticipated patronage. If the member is experiencing economic difficulty, the member faces the risk of not being able to patronize the cooperative as much as had been anticipated. If underpatronization occurs for this member, he/she may not receive the required rate of return.

Limited Salability of Shares

Nonwealth returns also increase risk in a second fashion independent of the measurement problem. This can be shown with the following example. Suppose there are two identifical firms. The only difference is that Business 2 generates a noncash return to its owners which affects costs. This notation is used:

$$\frac{\sigma(X_2)}{E(X_2)} > \frac{\sigma(X_1)}{E(X_1)} \tag{3.1}$$

where: $E(X_1)$ = The expected cash return generated by Business 1.

$E(X_2)$ = The expected cash return generated by Business 2.

(X_1) = The standard deviation of the cash generated by Business 1.

(X_2) = The standard deviation of the cash generated by Business 2.

Under these assumptions, the standard deviations of both firms would be identical. The expected cash return on Business 1, however, would be greater for Business 2 because of the cash outflows (expenses) caused by the noncash returns for Business 2. Therefore, the coefficient of variation for Business 2 would be greater than for Business 1.

The risk of the business which generates noncash returns may be greater than a strictly cash generating business because it would be more likely to suffer from liquidity or cash flow problems. This suggests that many cooperatives would be more risky than a comparable investor-owned business.

For members, the limited salability of shares leads to a liquidity risk. It is usually difficult for members to turn their investment into cash on short notice. Often the cooperative cannot or will not

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will not redeem the members' shares or retain certificates for many years.

The limited salability of shares makes monitoring of the cooperative difficult. Assuming efficient market conditions, the stock market adjusts the stock price for changes in the investor-owned firm's ability to generate cash flows or in the riskiness of its cash flow. This adjustment in price provides a means of monitoring the financial performance of these firms. Cooperative shares are not normally sold in the public exchanges, thus monitoring performance is made more difficult. This may increase the risk of financial distress.

Effect of the Organizational Characteristics

Cooperatives also often differ from investor-owned firms in their board of directors, management, and membership characteristics. This section will explore why these differences may increase the firm-specific risk of the cooperative enterprise.

Board of directors. We have seen that the value of an individual share is restricted by the constraints on profit, capital gains, and transferability. Therefore, an individual member may have little to gain from an increase in economic efficiency. In an investor-owned business, the board of directors is often composed of the largest stockholders, who have a desire for a wealth return and therefore an incentive to encourage economic efficiency.

Often cooperative members who are qualified and motivated do not have the means of devoting large amounts of time to the task of being a board member. In contrast, board members on investor-owned businesses are compensated to be full-time board members or have other sources of income.

Cooperative board members are often chosen out of political or popular considerations rather than on the basis of what skills they bring to the board. Cooperative board members are conscious that they have to live in the community, long after their term in office is over. Consequently, board members are often reluctant to make policy decisions that may be controversial, even when the decision is clearly in the best interests of the membership. Indeed, more board members have been known to sanction policies that lead to inefficiencies in the long run, but bring them popularity during their term. Board members for investor-owned businesses are less likely to base decisions on nonmonetary considerations because they have a large financial investment in the business.

Cooperative board members, even when highly motivated, may not have the business and cooperative skills to properly function. Investor board members normally bring extensive business training or experience to their positions.

Cooperative board members often bring to the board conflicting ideologies and differing goals for the cooperative. Consequently, the board may spend much of its time fighting amongst themselves over the right goal mix rather than providing the direction, monitoring, and control that the cooperative needs to attain its goals. This can be due to the conflicting goals of the membership itself, in which case, the problem can be particularly difficult to contain.

Board members in investor-owned firms have conflicts; however, most do not become debilitating for the corporation. The board members usually have the same basic goal, maximizing wealth, thus the monitoring of performance is more clearcut.

Traditional-hierarchical management. In the case of a cooperative with a traditional-hierarchical management structure, the phenomena of empire building, satisficing, skill building, burnout, or rapid turnover may emerge. The career opportunities for a person working in the cooperative food system are currently limited. Therefore, qualified people are difficult to attract. Once in place, management may try to alter the institution by encouraging growth. As the cooperative expands so do advancement opportunities. If frustrated in this goal, management may become satisficers, rather than maximizers. As satisficers, management strives to make its position as comfortable as possible, usually at the expense of efficiency. Management laxness is a difficult problem to monitor, because of the lack of objective standards and a security market make performance monitoring even more difficult.

Often cooperatives place people of limited skills in managerial roles because of social or political concerns or because people with limited skills are often willing to work cheaply. However, this "on-the-job training" can lead to inefficiencies until (and if) the untrained person masters the position. Having mastered the position, many people leave when the investor-owned system offers to reward them for their newly acquired skills.

Too often, cooperative managers have business skills with limited cooperative skills, or cooperative skills with limited business skills (or neither). An individual who is confronted with an untrained staff, an unsupportive board, financial crises, demanding members, and an inadequate physical plant is unlikely to enjoy a long tenure. In other industry comparisons, cooperative turnover of management is much higher than for investor-owned firms.[1]

Collective management. Collective management is management by the workers. Decisions are reached as a group. Sometimes consensus by all workers is a requirement before a decision can be made. A problem that can emerge with collective management is "worker's paradise." Worker's paradise is characterized by low efficiency, inflated wages and benefits, and worker redundancy. This problem emerges from the organizational nature of collective management. The problem can become particularly acute when there is a separation of ownership and control, such as consumer cooperative owned business run by a collective of the workers.

A goal of many collectives is job demystification or skill leveling. This is normally accomplished through job rotation and/or the minimization of pay differentials. Job demystification can enhance the strength of the organization and help stabilize operating income. The process of job rotation involves cross-training which

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[1] Carl J. Bellas, Industrial Democracy and the Worker-Owned Firm: A Study of Twenty-One Plywood Companies in the Pacific Nortwest (New York: Praeger Publishers, 1972).

allows greater flexibility in assigning tasks, meeting emergencies, etc. The equalization of pay can reduce jealously and facilitate group cohesiveness.[1]

Job demystification, however, can lead to skill bottlenecks, high payroll costs, high training costs, and high administration requirements. Skill bottlenecks are a function of the labor specialization needs of an industry. If job positions take months or years to master, then a constant rotation of job positions can greatly reduce efficiency. Even in situations where the job positions are quickly mastered, individuals often differ in their performance and motivations.

In the case of permanent or semi-permanent job positions, wage leveling eliminates one important way to motivate people to take unpleasant or demanding jobs. This encourages the hiring of nonmember workers or keeping redundant workers to ensure adequate skills or to make unpleasant job positions more desirable.

Many times when wages are leveled, they are leveled upward. This is often done in a worker-owned cooperative to minize the tax liability of the cooperative. Paying the "price adjustments" before the close of the accounting period increases the risk of insolvency. Higher wages lower operating income and thus lower the coverage ratio. Labor efficiency in a worker-owned cooperative may also decline because the risk to each member of not receiving one's return is

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[1]Daniel Zwerdling, Workplace Democracy (New York: Harper Colaphon Books, 1980).

lowered in the short run. Thus, some workers may feel less motivated to perform since their return will not be immediately affected by decreasing work effort.

When the wholesale business is owned by a federation of retail consumer cooperative, but managed by a workers' collective, additional problems may arise. The collective's goal is to maximize the return to labor, while the federation's goal is to minimize costs. Conflict between owners and workers may worsen due to a lack of mediating and business skills in both groups. The organization has a basic accountability problem. Most positions in a collective organization have little authority and responsibility. When something fails to get done, it is difficult to determine blame and to correct the problem.

Membership in a federated cooperative. Tendencies that can create problems for a federated cooperative are member preference for short term benefits over long term stability, member unwillingness to supply capital, and decline in cooperative support.

Economic behavior of members in the short run is illustrated in Figure 3. Pichette states that the output Q_3 is observed by members to be the optimal for them in the short run. The short run is the period in which the member receives all price adjustments in the form of patronage refunds. The members see that Q_3 will yield them the lowest price, P_3. However, the long run interests of the members would be better served by operating at Q_2. At this point, cooperative surplus is greatest. By retaining this surplus for reinvestment in assets which result in greater efficiencies, moving to a lower

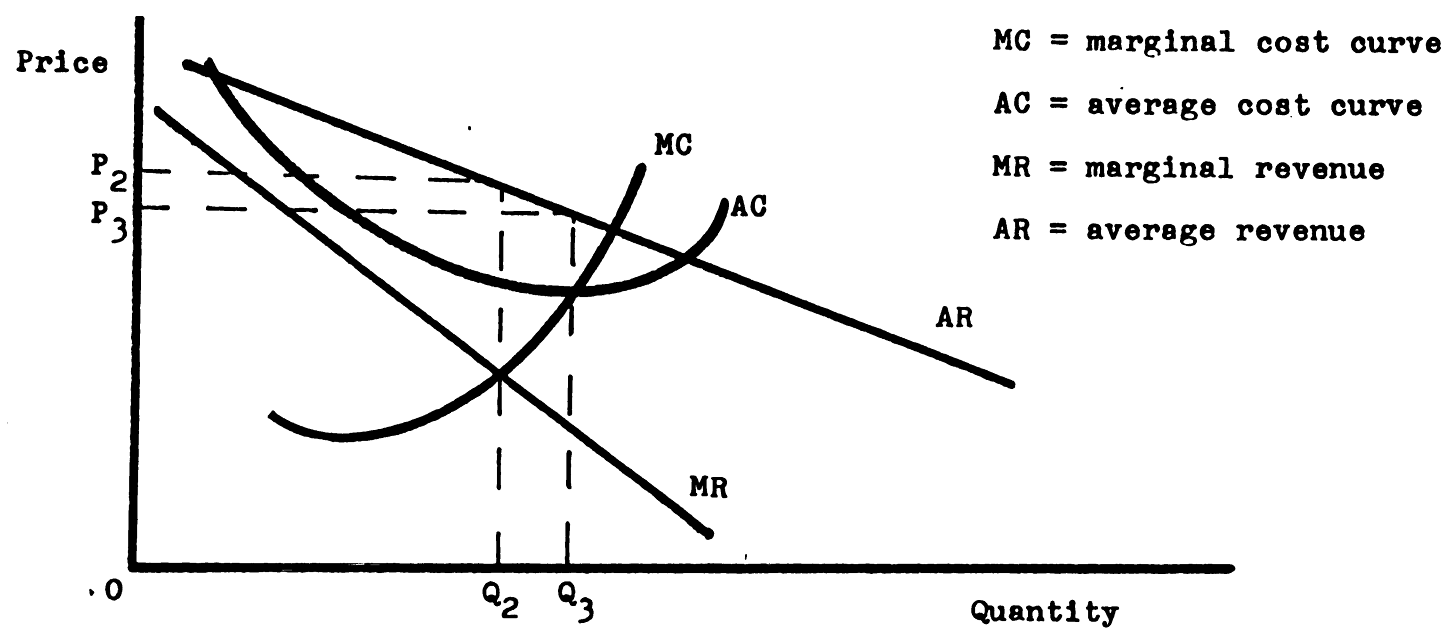

Fig. 3. Economic Behavior of Members in a Cooperative.

short-run average cost curve, a member can receive a net price lower than P_3. In this manner, the long-run benefits to members would be maximized. By holding on to a short-run beneficial position, and not investing in new facilities in a timely manner, the cooperative may find its competition moving more rapidly to a lower average cost curve.[1]

As pointed out by Erdman and Larson, members are often unwilling to supply the necessary capital for their cooperative. Members often argue that investment capital for their own use has a higher return. A shortage of equity capital may force a cooperative to seek external sources of capital and thus lose some of its control.[2] Also, as more debt is acquired, a business becomes riskier.[3] If sufficient capital is not obtained, the physical plant becomes antiquated and productivity drops. This can increase costs and reduce the benefits of cooperative membership.

Over time members may lose interest in their cooperative because of local concerns. The loss of cooperative support often results in a transfer of control to management (by default), an unwillingness to supply capital, and a decline in patronage.

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[1]Cited in Peter Vitaliano, "The Theory of Cooperative Enterprise: Its Development and Present Status," Agricultural Cooperatives and the Public Interest, No. 117, Monograph 4 (September 1978):28-33.

[2]Henry E. Erdman and Grace H. Larsen, Resolving Finance in Agricultural Cooperatives (Madison, Wisconsin: Mimer Publishers, Inc., 1965), p. 76.

[3]J. Fred Weston and Eugene F. Brigham, Managerial Finance (Hinsdale, Illinois: Drydan Press, 1981), Chapter 15.

Worker cooperative membership. Worker cooperatives have some special organizational risks. These include labor rigidity, disinvestment and consumption of capital, underinvestment, and featherbedding.

The number of employed workers in a producer cooperative is not as flexible in the short run as it is in a proprietary firm. A worker cooperative is an association of workers, and as such it is less inclined to make cost savings cuts in its labor force. As a result, during business recessions, many cooperatives do not layoff or reduce production. A worker cooperative is therefore, more likely to experience a profit squeeze or a cash flow problem.[1]

A different dynamic occurs in the long run. Otherwise successful worker cooperatives often experience a decline in members. As explained earlier, the need for specialization combined with a policy of pay differentials, can lead to a policy of hiring nonmembers. Members are encouraged to limit their own numbers attrition in order to increase the net income that is returned to each member. The increase in nonmembers often leads to decreased participation and increased conflict. The dwindling number of members tend to exhibit what is called "collective selfishness" and tend to be more willing to disinvest the firm for their own benefit.[2]

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[1] Hans G. Nutzinger, "Investment and Financing in a Labor-Managed Firm and Its Social Implications," Economic Analysis and Worker Management IX (1975):186.

[2] Paul Bernstein, "Run Your Own Business," Working Papers, Summer 1974, pp. 17-19.

Many worker cooperatives have experienced disinvestment and consumption of capital. As the founding members age and retire, they wish to take their equity in the firm with them. If their equity has grown substantially, the cooperative is faced with a significant capital loss or it is forced to sell-out to a corporate buyer.

Some cooperatives do not require a significant capital contribution from members and instead have relied on unallocated retained earnings for an equity base. When members are not required to put up a capital contribution, cooperative losses do not substantially affect member wealth. In some cooperatives, a group of workers will seize control with the intent of "coasting" on these retained earnings. This can occur following a period of dramatic growth when many new members have been added and they have not been properly oriented or education to cooperation.

Members often take a short-sighted view toward investment, preferring instead to increase their take-home pay. Consequently, the physical plant tends to become antiquated and productivity drops. The plywood cooperatives in the northwestern United States have built no new facilities since the 1950s and productivity has declined.[1]

Many worker cooperatives do not force retirement. Consequently, the cooperatives can be dominated by older, less

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[1] Andrew McGregor, "Rent Extraction and the Survival of the Agricultural Production Cooperative," American Journal of Agricultural Economics 59, No. 3 (August 1977).

productive members. Although there are many social benefits from such a policy, it can negatively affect the economic performance of the firm.[1]

Zwerdling reports that over time the positive norms of cohesiveness, solidarity, and integration tend to break down. Members tend to participate less, produce less, and surrender control to a power elite or to the manager.[2]

Cooperative Characteristics Acting to Decrease Risk

Member loyalty. Some observers reason that members will tend to patronize their cooperative even when the cooperative is not acting competitively. Members will continue to contribute capital to the cooperative, even when the cooperative is experiencing financial distress.[3] Studies which have tested this hypothesis, however, have rejected it.[4]

Patronage refunds as a source of capital. Allocating patronage refunds to member accounts rather than paying out cash is the most distinctive method of cooperative finance. This vehicle for

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[1] Bernstein, "Run Your Own Business," pp. 17-19.

[2] Zwerdling, Workplace Democracy.

[3] Leo V. Plante and Thomas W. Berry, "Strategic Financing Issues for Cooperatives," The Cooperative Accountant, Spring 1978, p. 80.

[4] Emory J. Brown and Robert G. Beale, "Value Orientation and Behavioral Correlates of Members in Purchasing Cooperatives," Rural Sociology 22, No. 1 (March 1957):50-58.

capital accumulation helps to offset the problems in selling share capital. It may also lessen risk due to the flexibility in managing the patronage dividends (see Chapter V) and the greater amount of cash that can be generated through patronage dividends. Members supply capital as long as they patronize the cooperative. Moreover, cooperatives that experience financial difficulty can extend the revolving cycle.

Nature of the return. The economic security return and the social return may exhibit little variation with the financial performance of the cooperative or with the general economy. If these nonwealth returns satisfy a large percentage of the required rate of return (K_e), then the risk of not receiving the required wealth return is less.

Some cooperatives may have greater cash generating power than comparable investor-owned firms for two reasons. First, cooperatives usually face lower tax liabilities. Second, if nonwealth returns to members are large, the required wealth return is less. Thus these cooperatives can pay out less cash and retain more earnings as allocated patronage refunds or unallocated retained earnings.

Conclusion Regarding the Risk of a Cooperative Investment

How to actually measure the level of risk in a cooperative is controversial. There appear to be both risk-enhancing and risk-diminishing characteristics. One must modify the measures used in proprietary firms in order to account for these differences.

Before developing risk measures for cooperatives, it is useful to discuss the risk-return preferences of cooperative memberships.

Member Utility Function

In corporate finance, the risk-return preferences of investors are expressed by price movements in the secondary securities market. As investors bid on the prices of securities their price quote on a given security is based on the known risk of a security's income stream. If investors' risk-return preferences should change or the risk of a firm should change, it would be reflected in the price of the share. It is this relationship between investor risk-return preferences and security prices that enables analysts to make inferences regarding the utility function of investors. For cooperatives, however, the lack of a cooperative securities market, the heterogeneity of the membership, and the difficulty in measuring the return to a member make it necessary to modify the method to determine a cooperative member's risk-return preferences. As a first step, it is necessary to develop some understanding of a cooperative member's utility function.

Member Utility Function Set

A corporate investor is assumed to be only interested in how the corporation can increase his/her personal wealth. A cooperative member in contrast normally has a set of preferences which must be satisfied; i.e., social, economic security, and wealth. In the social preference domain, a member values one or more of the following: (a) commualism--a feeling of community or solidarity with the other members, (b) public goods--such as cooperative and nutritional education, community economic development, (c) quality of work life--the betterment of working conditions through fair wages and worker participation, (d) millenarianism--the feeling of belonging to a larger movement, and (e) control--the feeling of having more control over the institutions one is dependent on.

In the economic security preference domain, a member values one or more of the following: (a) secure supply source for a critical input or a secure market outlet, (b) fair and predictable prices for the members' product or labor, (c) reduction of price variability, and (d) preserving or enhancing competition commonly called the competitive yardstick. In the wealth preference domain, a member values a market level monetary return on his/her investment in the cooperative.

Since a cooperative cannot satisfy all of these preferences, it must evaluate how important each preference is to the members. Then it must maximize or at least maintain a minimum level of member utility within the constraints under which it operates.

Moreover, in most cases a cooperative which is trying to satisfy the economic security and social components will see its cost function increase. A social return in the form of public goods and quality of worklife will mean higher administrative and labor costs, respectively. A security return in the form of a secure market can lead to higher holding costs. In the case of worker cooperative, secure markets takes the form of no layoffs in unfavorable business conditions, since it is the members' labor that is marketed.

Operating costs are thus higher. Reduction of price variability requires the cooperative to absorb the fluctuations. This may require large working capital funds with accompanying higher interest costs. The nonwealth returns thus reduce the wealth return.

Measuring Member Preferences

Cooperative members can rank their preferences by voting in a referendum or for their elected representatives. But such preference articulation has several problems. Arrow has shown that democratic voting does not produce a consistent ranking of alternatives.[1] Also, members may not understand their risk-return preferences. Even if they can, they may not be able to articulate these preferences. It is also difficult to anticipate how these risk-return preferences may change with changes in market structure and in business conditions. Many of these same problems also inhibit cooperatives from aggregating preferences by surveying their members. Even if preference aggregation was a well defined process, one must ask--what effect does the process have on a cooperative? Does it do violence to the organization by accentuating factions? Investors in proprietary firms can express their preferences at stockholder meetings; but most use the marketplace to find more quickly investments which satisfy their preferences. Due to this exit possibility, investors in a given company also tend to be relatively homogeneous. By comparison, cooperative members do not have this kind of freedom. Their

[1]Kenneth Arrow, Social Choice and Individual Values (New York: Wiley, 1951).

cooperative is probably the only vehicle for supplying these three different returns; and a cooperative member cannot usually withdraw invested funds quickly. Consequently, members are more likely to voice their concerns rather than exit in order to increase their utility.[1]

Measurement of Risk for the Determination of Member Required Return

A measurement of risk is needed in order to calculate the required rate of return of equity holders. This section explains when direct measurement is possible and it also examines how surrogates can replace direct measurement.

Direct Measurement of Risk

Although cooperative risk is more complex than risk in other types of business organizations, it may still be possible to measure its systematic risk. If the amount of social and security returns have been stable over time (so that they do not influence the variance of the total return) and if monetary return is measurable, then a Beta for a cooperative can be calculated. The required rate of return of members (the cost of equity) can be obtained from this Beta. The following example demonstrates this point. Assume that the

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[1]Albert Hirshman, Exit, Voice, and Loyalty (Boston, Massachusetts: Harvard, 1970) provides an insightful analysis of this general problem in business and political organization.

cooperative is composed of members who only desire a return in the form of wealth; and assume that the following distribution is expected.[1]

State of the Economy	P_s	R_a	P_sR_a	$R_a-\bar{R}_a$	$(R_a-\bar{R}_a)^2$	$P_s(R_a-\bar{R}_a)^2$
Recession	.20	-.20	-.04	.40	.16	.032
Static	.50	+.18	+.09	-.02	.0004	.002
Boom	.30	+.50	+.15	.30	.1225	.03675
			$\bar{X}$ = .20			variance = .07075

where: P_s = probability of this state of the economy occurring during the time period under examination

R_a = monetary return on member investment in cooperative

$\bar{R}_a$ = mean R_a

Looking at the market return (R_M):

State of the Economy	P_s	R_M	P_sR_M	$(R_M-\bar{R}_M)$	$(R_M-\bar{R}_M)^2$	$P_s(R_M-\bar{R}_M)^2$
Recession	.20	-.10	-.02	-.19	.0361	.00722
Static	.50	.10	.05	.01	.0001	.00005
Boom	.30	.20	.06	.11	.0121	.00363
			R_M = .09			variance ^2_m = .01090

[1]This example is adapted from J. Fred Weston and Eugene F. Brigham, Managerial Finance (Hinsdale, Illinois: Dryden Press, 1981), pp. 99-106.

Looking at covariances:

P_s	$(R_M-\bar{R}_M)$	$(R_a-\bar{R}_a)$	$P_s(R_M-\bar{R}_M)$	$\cdot\ (R_a-\bar{R}_a)$
.20	(-.19)	(-.40)	.2(-.19)	(-.40)
.50	(.01)	(-.02)	.5(.01)	(-.02)
.30	(.11)	(+.30)	.3(.11)	(+.30)

$\text{cov}(R_a, R_M) = .025$

$$\text{Beta} = \frac{\text{cov}(R_a R_M)}{\sigma^2(R_M)} = \frac{.025}{.01909} = 2.293578$$

Utilizing the Security Market Line:

$$K_e = R_F + (R_M - R_F)\ \text{Beta} = .051 + (.09 - .051)\ 2.293578 = .1404495$$

If the cooperative during the past had yielded a social return that caused the return to decline by .10, but had no other impact upon the distribution of returns, the distribution would be as follows:

State of the Economy	P_s	R_a	$P_s R_a$	$(R_a-\bar{R}_a)$	$(R_a-\bar{R}_a)^2$	$P_s(R_a-\bar{R}_a)^2$
Recession	.2	-.30	-.06	-.40	.16	.032
Static	.5	.08	.04	-.02	.0004	.002
Boom	.3	.40	.12	+.30	.1225	.03675
		$\bar{X} =$	.10		variance of R_a =	.07075

We see that the variance is still the same. Also, the probabilities and deviations from the mean are the same. Thus, the covariance with the market and consequently the Beta is changed.

Suppose, that the cooperative's commitment to another social return causes the wealth return to fall by another .10 for a total decline of .20.

State of the Economy	P_s	R_a	P_sR_a	$(R_a-\bar{R}_a)$	$(R_a-\bar{R}_a)^2$	$P_s(R_a-\bar{R}_a)^2$
Recession	.2	-.40	-.08	-.40	.16	.032
Static	.5	-.02	-.01	-.02	.0004	.002
Boom	.3	.30	.09	+.30	.1225	.0367
			$\bar{X} = 0$		variance of R_a	= .07075

The variance remains unchanged. Also the probabilities and deviations from the mean are the same. Thus, both the covariance with the market and Beta are unchanged.

Measurement of a cooperative's Beta will remain a rough approximation, however, for the following reasons:

1. One must be sure that the monetary returns are not varying. Measurement, however, is difficult. Social and economic return are often only indirectly measurable through their effect on the cost function.

2. The social and economic security returns are likely to vary when market structure and business conditions change.

3. The composition of the membership and the members' preferences may change. For example, the utility that members derived from the childcare service for shoppers of a retail consumer cooperative may change as more members with families join or alternatively if existing members' children mature.

4. Few cooperatives have a stable mix of returns. The amount allocated to social and economic security would likely fluctuate with business conditions. For example, in good economic times more funds may be allocated to a social return. In bad times, more funds may be allocated to economic security.

5. Even the wealth return can be difficult to measure because some cooperatives return "instant price adjustments"; i.e., they attempt to price at cost rather than at market price levels. Even if they do price at market levels, to the extent that they promote competition, prices may drop to cost. Thus, measurement of the true wealth return is still a problem.

Due to the above problems with direct measurement, it is recommended that a surrogate for risk be used.

Surrogates for Risk and Required Return

There are two approaches to selecting a surrogate. The risk premium approach approximates the marginal contribution of an investment in a cooperative to the risk of a member's portfolio. The capital asset pricing model is able to translate this marginal contribution to risk into a required return. The second approach is the opportunity cost method. The return from a member's next best investment opportunity is used as the required rate of return.

Before selecting one of these approaches, it is necessary to examine the diversification of the membership under analysis. The appropriateness of the risk surrogate used depends on the diversification of the portfolios that members hold.

Diversification of members. Probably most middle-class members of consumer cooperatives do hold diversified portfolios in the form of insurance policies, pension funds, real estate (their home), etc. In addition, the relative size of their investment in their cooperative or indirectly in their federation is quite small compared to their other investments. Consequently, one can assume that these cooperative members are only concerned with the market risk associated with (actually assumed to be associated with) the cooperative.

A question arises with the required return for producer cooperatives and low-income consumer cooperatives. Brealey and Myers have argued that the industrial producer cooperative needs to consider firm-specific risk in addition to systematic risk because a large portion of their personal assets is invested in the cooperative.[1] The diversification effect decreases as the number of investments a member possesses declines and the size of any given investment significantly overshadows the others. In the case of worker cooperatives, a member's return from his or her labor is less variable due to "labor rigidity." The member's return on capital (member investment in the cooperative) is now more variable because the member is less diversified having placed a major portion of the member's funds into one investment. In the case of low income consumer cooperatives, the members often do not hold diversified portfolios and their investment in the cooperative may be a fairly large percentage of their total assets. Consequently,

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[1] Richard Brealey and Stewart Myers, Principles of Corporate Finance (New York: McGraw-Hill Book Company, 1981), p. 150.

it must be assumed that most low income consumers and most producers should be concerned with the total risk of their interest in the cooperative.

Risk premium approach. There are two methods of using the Security Market Line from the Capital Asset Pricing Model to arrive at a required rate of return for equity holders, K_e. We can use the comparable-firm Beta or the industry Beta. With the comparable-firm Beta, the cooperative can try to locate a for-profit firm which is similar to the cooperative in debt structure, market size, asset size, etc. Value-Line and Wells Fargo Bank have calculated Betas for many firms. The Betas of many over-the-counter stocks are not calculated. The mechanics of Beta calculation are straightforward and can be calculated on many programmable calculators. William Maus recommends the use of a composite of six similar firms. A cooperative probably should maintain a file of twenty to thirty similar firms. The composite should be reviewed on a regular basis, perhaps annually to see if changes in the cooperative or in the firms in the cooperative warrant changing the composite.[1]

The comparable firm method suffers from two problems. It is often difficult to find publicly traded firms that are similar to the cooperative. The second problem is the estimation process itself. According to Brealey and Myers:

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[1]William J. Maus, "How to Calculate the Cost of Capital in a Privately Held Company," Management Accounting, June 1980.

> You are exposed to potentially large estimate errors when you estimate Betas of individual stocks from a limited sample of data. Fortunately, these errors tend to cancel out when you estimate Betas of portfolios. Suppose that you were to compute the average of the Betas of 100 common stocks. The standard error would be about one-tenth of the standard error of the Betas of 100 common stocks. That is why it is often easier to estimate the industry Betas than the Betas for individual firms.[1]

Therefore, cooperatives using the comparable-firm method should use a Beta estimate for their industry or subindustry.

The accuracy of CAPM estimates of required return suffer when firm specific risk must be considered. This occurs when cooperative members do not hold diversified portfolios and especially when poor cooperative performance could so reduce a member's income or net worth as to threaten bankruptcy.[2] The latter is not likely for members in a retail cooperative; however, it may be a valid concern for retail cooperatives who are members of a secondary cooperative that has high capital requirements. Unfortunately, there is no established criteria in adjusting a CAPM-generated required rate of return to include firm specific risk. Closely held investor owned firms face the same problem. In using CAPM, they often choose to make a subjective adjustment.

Opportunity cost approach. Cooperative members are free to exit their cooperative, liquidate their investment in their

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[1] Brealey and Myers, Principles of Corporate Finance, p. 166.

[2] James C. Van Horne, "An Application of the Capital Asset Pricing Model to Divisional Required Returns," Financial Management, Spring 1980.

cooperative, and invest in some other endeavor. The rates of return of these other investments represent a member's opportunity cost of funds. Although one alternative rate may be most appropriate, there are several to choose from including short term debt cost and return on member savings.

Dahl and Dobson, among others, used short term debt cost as a surrogate. They reason that members can use the withdrawn cooperative equity to retire a portion of their personal debt.[1]

However, as Vitaliano points out, "the interest rate on short term debt may not necessarily accurately reflect the weighted average opportunity cost for the entire membership of a cooperative."[2] Most of the previous studies which have used this surrogate have neglected to note that the interest charges are tax deductible and therefore, must be adjusted downward. These studies have also overlooked the penalties involved in retiring debt early. Lenders often calculate interest on an accelerated basis or include penalty clauses. Thus this surrogate would have to be adjusted downward still further.

Cooperative management often uses the return on member savings such as a passbook account, money market fund, or an all saver certificate as an opportunity cost. These surrogates, however, are relatively riskless and therefore are not good surrogates the members' opportunity cost. Also, these investments are short term.

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[1]Wilmer Dahl and W. A. Dobson, "An Analysis of Alternative Financing Strategies and Early Retirement Plans for Farm Supply Cooperative," American Journal of Agricultural Economics, May 1976.

[2]Vitaliano, "Comparative Analysis," p. 47.

In conclusion, the best procedure appears to be the use of CAPM and a sample of similar firms whose stock is publicly traded to produce a Beta. A market risk adjusted rate of return can then be obtained from the security market line. If one feels that firm specific risk should also be considered, one can make subjective adjustment. The next section explains techniques for adjusting K_e for use in cooperatives.

<u>Adjusting the Surrogate Required Rate of Return for Nonwealth Benefits</u>

Fenwick, among others, states that the required rate of return should reflect the willingness of members to pay for the less tangible social and economic security returns as well as wealth returns. "Cooperative members are willing to forgo a five percent return on their investment in their cooperative to maintain the cooperative as a competitive factor in the farm supply market."[1]

Vitaliano criticizes Fenwick for his choice of five percent because Fenwick offers no support for this choice. However, Vitaliano agrees with Fenwick that "the willingness of cooperative members to pay for the more intangible benefits of cooperative membership" may well reduce the cost of cooperative equity capital.[2] Vitaliano argues that the member of a farm cooperative has to "adjust the return available from the alternative investment to account for

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[1]Richard S. Fenwick, Jr., "Capital Acquisition Strategy for Missouri Farm Supply Cooperatives" (Ph.D. dissertation, University of Missouri-Columbia, 1972), p. 69.

[2]Vitaliano, "Comparative Analysis," p. 52.

the impact on the total farm enterprise, of the withdrawal of the cooperatively invested funds, of the resulting reduction or termination of intangible benefits."[1] Vitaliano goes on to say that "the resulting adjustment will reduce the estimate of the return available from the alterntive on-farm investment and in addition, increase the estimate of the variability of this return."[2]

Vitaliano is concerned with farm cooperatives, but the argument can be transferred to the worker cooperatives and federated cooperatives in the cooperative food system. For a member of a worker cooperative, the variability of a return for labor activity may increase after leaving the cooperative. An ex-member faces greater likelihood of layoffs or unemployment when working for another firm. Similarly, a consumer cooperative member of a federation may see the variability of its return increase upon exiting because of greater difficulties in securing the necessary inputs.

Restating Fenwick's and Vitaliano's reasoning algebraically, the required rate of return for a member in the absence of the cooperative would be K_e. K_e is the required rate of return in an investment of comparable risk to the cooperative. K_{Se} is the economic security return from the cooperative that Fenwick and Vitaliano describe. K_S is the social return. K_w is the wealth return, consisting of dividends and price adjustments. Fenwick and Vitaliano are arguing that the adjusted cost of capital or discount factor

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[1]Vitaliano, "Comparative Analysis," p. 52.

[2]Ibid.

should be $K_e - K_{Se} - K_S$. Rearranging we see that $K_e = K_{Se} + K_S + K_w$. The adjusted cost of capital (AK_e) is the required wealth return, K_w.

K_{Se} will depend upon the market structure within which the member operates. Members of a consumer cooperative in a monopolistic market would probably have a high economic security requirement, K_{Se}. Members of such a cooperative in a perfectly competitive market would probably have a low K_{Se}. Members of a workers cooperative in a monopsonistic labor market (for their labor) would probably have a high K_{Se}, while in a perfectly competitive market they would probably have a low K_{Se}. Since K_{Se} is a function of market structure this suggests another risk for the cooperative. At the time when the cooperative is experiencing the pressure of competition, possibly seeing its margins or sales shrink, the members are demanding a larger cash return. In addition many of the assets were chosen on the basis of a lower discount factor because K_w was lower. Consequently, these assets may be incapable of generating the cash return necessary to retain the membership. Assuming K_S fixed, then as K_{Se} declines K_w must increase to maintain the required rate of return.

While the concept of an adjusted K_e is conceptually correct, it should be used with caution. Fenwick and Vitaliano are implicitly assuming that all projects make the same contribution to wealth, social, and security returns. The composition of returns may differ among projects. If it does, using a constant adjusted cost of equity (AK_e) can lead to serious errors. A particular project may have a greater overall return, but if the wealth return is less than K_w, the project would be incorrectly rejected.

Summary

In the first half of the chapter, the nature of cooperative risk and member utility were discussed. Unfortunately, there is no "Cooperative Asset Pricing Model" which combines cooperative risk and member preferences to compute a required rate of return. Although such a model may in theory exist, the problems involved in measuring risk and member utility functions would preclude a straightforward application. Consequently, empirical work in the cooperative finance area has not proceeded very far.

> Too little has been estalished on the basis of reliable empirical evidence (regarding the members required rate of return and thus the cost of equity capital) . . . to conduct capital budgeting analysis and to specify least cost capital structures for cooperatives with any substantial degree of confidence.[1]

Cooperatives and loan analysts that make capital budgeting and least cost capital structure decisions have obviously not waited for cooperative finance theory to develop to a "substantial degree of confidence." Some cooperatives have pursued the conservative option of using unadjusted industry discount factors. This implicitly assumes that the market risk of a cooperative venture is similar to that of investor-owned ventures; and that the utility function of cooperative members is similar to the utility function of investors in the security market. Objections can be raised regarding these

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[1] Vitaliano, "Comparative Analysis," p. 53.

assumptions, and these criticisms combined with those explained earlier about CAPM are not without foundation. Nonetheless, this approach does offer objectivity, ease of calculation, and a basis (however rough) for making capital budgeting and capital structure decisions. It is necessary, however, to adjust the required return for the economic security and social returns that are expected.

A Computational Approach to Valuation in a Cooperative

Chapter II described how valuation techniques are used in stock valuation, project selection, and the objective function of the firm. The preceding discussion of this chapter indicates that the nature of cooperative returns and the equity structure of cooperatives require adjustment in these valuation techniques.

Valuation of Member Equity

A cooperative member's share can be valued in two ways. The cash equivalent of all returns are estimated and discounted by the investor required rate of return as shown in the following equation:

$$\sum_{t=1}^{LM} \frac{\text{cash flows to the individual member}}{(1+K_e)^t} + \sum_{t=1}^{LM} \frac{\text{returns due to economic security}}{(1+K_e)^t} + \sum_{t=1}^{LM} \frac{\text{social returns}}{(1+K_e)} \qquad (3.2)$$

where: LM = anticipated length of membership.

The second method of share valuation does not consider the cash flow equivalents for the nonwealth returns. Instead, the investor required rate of return is adjusted downward for the presence of nonwealth returns as shown in the following equation:

$$\sum_{t=1}^{LM} \frac{\text{cash flows to the individual member}}{((1+K_w \text{ or } AK_e))^t} \tag{3.3}$$

A valuation model is presented which considers the different sources of wealth returns. For illustrative purposes, the following assumptions are used:

1. Straight line depreciation.
2. Retained earnings are not distributed.
3. Goods are traded at market prices; gross margins and operating margins are the same as investor-owned firms serving the same market area as the cooperative.

The following symbols and abbreviations will be used:

<u>Tax Rates</u>

t_c = marginal income tax rate for the cooperative

t_p = marginal patronage dividend rate (equals zero for consumer cooperative members)

t_{DIV} = marginal tax rate on dividends

t_M = marginal income tax rate for members

Required Rate of Return

K_d = required rate of return for debt holders; cost of debt

K_e = required rate of return for equity holders, cost of equity

K_w = required wealth return; the adjusted cost of equity

K_{cc} = composite cost of capital; return a project must generate to meet both K_d and K_e

Generated Returns

r_m = rate of return on assets going to members

R_m = amount of wealth return to members

R_c = cash return to cooperative

Debt

D = debt

B^P = repayment of principal

Y^M = interest paid on member notes

Y^R = interest paid on patronage dividends (revolving fund)

Y^B = interest paid on debt obtained from nonmember sources

D_t^M = new debt from members

D_t^E = new debt from nonmember sources

Equity

S^{pf} = sale of preferred stock

Q = redemption of shares

RE = amount of retained earnings

rf = (as subscript or superscript) length of revolving fund cycle

Miscellaneous

I = investment

L_a = life of investment

I/L = depreciation per period

J = proportion of patronage dividends returned as cash

$i-J$ = proportion of patronage dividends returned as certificates

G = proportion of after-tax taxable income returned as dividends

$1-G$ = proportion of after-tax taxable income retained as unallocated retained earnings

ϕ = proportion of income subject to taxation

LM = anticipated tenure or length of membership

CS = cash stream

DS = debt shield

S^a = sale of assets

CI = cash flow

CO = cash outflow

X = operating income

t = (as subscript and superscript) time period

a = (as subscript and superscript) asset or investment

The cash flow equation in any given period must balance so that cash inflow equals cash outflow. The cash inflow side of the equation appears as follows:

$$CI = S^a + S^{pf} + X_t + D_t^M + D_t^E \tag{3.4}$$

where: CI = cash inflow

S^a = sale of assets

S^{pf} = sales of preferred stock

X_t = operating income

D_t^M = new debt to members

D_t^E = new external debt

The cash outflow side of the cash flow equation appears as follows:

$$CO = I_t + Y_t^M + Y_t^R + Y_t^B + B_t^P + Q + \phi_t t_c(X_t - Y_t^M - Y_t^R - Y_t^B - I_a/L_a) + (1-J_{(t-rf)})\,(1-\phi_{(t-rf)})\,X_{(t-rf)} + J_t(1-\phi_t)X_t \tag{3.5}$$

where:

CO = cash outflow

I_t = new investment

Y_t^M = interest on member debt

Y_t^R = interest paid on retain certificates (those issued as notes)

B_t^P = repayment of principle

Q = redemption of shares

$\phi_t t_c(X_t - Y_t^M - Y_t^R - Y_t^B - I_a/L_a)$ = taxes paid

$J_t(1-\phi_t)X_t$ = cash portion of patronage refund

$(1-J_{(t-rf)})(1-\phi_{(t-rf)})$ = redemption of previously issued retain certificates

The return to the cooperative is the after-tax income plus the interest and depreciation tax shields:

$$R_c = (1-\phi)(X_t-Y^B-Y^M-Y^R-I_a/L_a) + \phi(1-t_c)(X_t-Y^B-Y^M-Y^R-I_z/L_a) + \phi t_c(Y^B+Y^M+Y^R) + \phi t_c\ I_a/L_a \tag{3.6}$$

In an investor-owned firm this would be also the approximate return to the stockholder in an efficient market. What was not returned as a dividend should be reflected in the increased market value of the equity. A cooperative member, however, does not receive the face value of undistributed patronage refunds due to the discounting effect of the time value of money. The member also does not receive the face value of unallocated retained earnings and the tax shields. The members only receive the discounted value of the returns generated by unallocated retained earnings and shields for their anticipated tenure as members.

The amount of retained earnings generated in a given period is:

$$RE_t = \phi\, t_c(1 - G_t)\ (1 - t_c)\ (X_t - Y^B - Y^M - Y^R - I_a/L_a) \tag{3.7}$$

The value of this return to members is:

$$V_{REt} = \sum_{t=1}^{LM} \frac{r_m \cdot RE_t}{(1+K_w)^t} \tag{3.8}$$

The amount of cash generated by a debt shield in a given period is:

$$DS_t = \phi\ t_c\ K_d\ D = \phi t_c\ Y; \tag{3.9}$$

The value of this period's return to member is:

$$V_{DS_T} = \sum_{t=1}^{LM} \frac{(r_m \cdot DS_t)}{(1+K_w)^t} \tag{3.10}$$

The wealth return to members in any one period are as follows:

- the member return from retained earnings
- dividends (capital rents) on purchased equity
- interest payment (capital rents)
- patronage refunds (retain certificates in revolving fund)
- present value of interest shields
- present value of depreciation shield
- present value of member return from cooperative investment of depreciation.

Represented algebraically, the wealth return to the members in any one period is:

$$R_m = \sum_{t=1}^{LM} \frac{(r_m(\phi_t(1-G_t)(1-t_c)(X_t-Y^B-Y^M-Y^R-I_a/L_a))}{(1+K_w)^t} \quad \text{(retained earnings)} \tag{3.11}$$

$$+ (1-t_{DIV})\phi_t\ G_t\ (1-t_c)(X_t-Y^B-Y^M-Y^R-I_a/L_a) \quad \text{(dividends)}$$

$$+ (1-t_{M)}(Y_t^R) + (1-t_M(Y_t^M) \quad \text{(interest accruing to members)}$$

$$+ (1-t_p)(1-\phi_t)(X_t-Y^B-Y^M-Y^R-I_a/L_a) \quad \text{(cash patronage dividends)}$$

$$+ \frac{(1-t_p)(1-J_t)(1-\phi_t)(X_t-Y^B-Y^M-Y^R-I_a/L_a}{(1+K_w)^{r.f.}} \quad \text{(retain certificates)}$$

$$+ \sum_{t=1}^{LM} \frac{(r_m \cdot \phi t_c (Y^B + Y^R + Y^M))}{(1+K_w)^t} \qquad \text{(interest shield)}$$

$$+ \sum_{t=1}^{LM} \frac{(r_m \; \phi t_c \; I_a/L_a)}{(1+K_w)^t} \qquad \text{(depreciation shield)}$$

$$+ \sum_{t=1}^{LM} \frac{(r_m \quad I_a/L_a}{(1+K_w)^t} \qquad \text{(return on depreciation)}$$

The measurable value of a member's equity is the summation of the discounted wealth returns over the anticipated length of tenure:

$$\text{Value of member equity} = \sum_{t=1}^{LM} \frac{R_{mt}}{(1+K_w)^t} \qquad (3.12)$$

This model of the return to cooperative members illustrates several important interactions. It can be seen that as depreciation, debt, or interest rates rise, the amount of patronage refund will decrease and the interest tax shield will increase. As the retained earnings or capital dividends increase, the patronage refund will decrease. This implies that a cooperative with no taxable income should question using accelerated depreciation. It also suggests that if the membership tenure is short, the members may realize a lower return if the cooperative follows a policy of retaining earnings or using debt.

Use of Valuation in Cooperative Capital Budgeting

Valuation concepts are useful in the selection of projects (or new assets) for the cooperative. The Discounted Cash Flow model can be used when the members hold diversified portfolios. When members are concerned with total risk, however, alternative methods are more appropriate.

Valuation of projects is different for an all equity cooperative and a levered cooperative. For an all equity cooperative the selection criteria would be to choose projects which have the greatest net present value:

$$\text{NPV} = \text{Purchase Price} - \sum_{t=1}^{LM} \frac{\text{Cash Flows}}{(1+K_{cc})} \tag{3.13}$$

K_{cc} represents the composite cost of capital. It includes the effect of debt on the members' required rate of return, and the need to pay interest costs to the debt source.

Capital Budgeting Decisions When Total Risk Must Be Considered

Worker cooperative members and low-income consumer cooperative members are usually not holders of diversified portfolios. Therefore, these cooperatives must look at the total risk of the projects under consideration. Even if one can measure firm-specific risk, it is difficult to measure individual member risk preferences. Moreover, a group's risk preferences which arise from a group utility function can only be derived under very restricted conditions.[1]

If one can assume that group indifference curves are approximately linear, the evaluation process can consist of a comparison of return to risk ratios with and without the investment proposal(s) under consideration. A proposal would be accepted if the value to risk ratio of the firm with the project was greater than the value to risk ratio of the firm without the project:

$$\frac{\overline{NPV}_{FP} \text{ of firm plus project}}{\text{Standard deviation of return of firm plus project}} > \frac{\overline{NPV}_{F} \text{ of firm plus project}}{\text{Standard deviation of return of firm}} \qquad (3.14)$$

where: $\overline{NPV}_{FP}$ = expected value of the probability distribution of possible net present values for the assets of the firm plus the project under consideration.

$\overline{NPV}_{F}$ = expected value of the probability distribution of possible net present value for the assets of the firm presently held.

The ratios provide a measure of the return per unit of total risk.[2]

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[1]Robert Wilson, "The Theory of Syndicates," Econometrica 36 (January 1968).

[2]James C. Van Horne, Financial Management and Policy (Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1980), pp. 205-209.

Dual Approach to Capital Budgeting

It has been suggested by several writers that a dual approach to capital budgeting be taken. One should consider the effect of market and total risk. In situations where one technique suggests accept while the other suggests reject, an analyst or cooperative should follow the approach that most nearly approximates the risk concern of the membership.[1]

Summary

Net present valuation techniques have been modified for use in valuing cooperative equity and for valuing projects under consideration. An analyst should include nonwealth returns in valuing member equity. One method converts nonwealth returns into a cash stream which is discounted by the surrogate required rate of return. The second method only adjusts the required rate of return for the effect of nonwealth returns. It assumes that the nonwealth returns are present and therefore reduce the required rate of wealth return.

Capital budgeting (or project selection) for cooperatives utilizes the same net present valuation as corporate finance. As with member equity, however, either the cash stream or the discount factor (the required rate of return) should be adjusted for nonwealth returns. Another method in capital budgeting is the comparison between return to risk ratios. The return to risk ratio with the

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[1] Ibid.

project under consideration, if greater than the return to risk ratio without the project indicates that the project should be selected.

The valuation techniques described in the chapter are instrumental in the computational methods for calculating the optimal mix of debt and equity as shown in the next chapter.

CHAPTER IV

CALCULATION OF THE DISCOUNT FACTORS IN VALUATION

Chapters II and III analyzed the calculation of the required rate of return for equity holders. In an all-equity business, the required rate of return for equity is used as the discount factor in both equity valuation and project valuation. This chapter analyzes the effect of debt on the required rate of return of equity holders. Although the amount of debt a firm carries affects the required return for equity holders, it affects the discount factors for equity valuation and project valuation differently. Due to these different effects, the discussion of discount factors will be divided into two parts: (a) the discount factor for equity valuation and (b) the discount factor for project valuation. The first half of this chapter explains the calculation of discount factors in corporate finance; the second half explains modifications necessary for using discount factors.

The Calculation of Discount Factors in Corporate Finance

This section of the chapter will be divided into two parts: (a) the discount factor for equity valuation and (b) the discount factor for project valuation.

The Discount Factor for Equity Valuation

When calculating the discount factor for equity valuation for a firm that has debt, the following factors must be considered: the effect of leverage, the indirect effects of debt, and the interaction of leverage and distress costs.

The effect of leverage on the required rate of return for equity holders. There are two primary schools of thought regarding the effect on financial leverage upon risk and thereupon the required rate of return or cost of capital: (a) Modigliani-Miller (MM) and (b) Traditional.

1. The proponents of the Modigliani-Miller school hold that K_e, the required rate of return, rises *linearly* with increases in debt. This can be shown in the following illustriation. In the absence of other costs or subsidies, the cash stream generated by an investment is expected to be fixed. This fixed return is distributed to debt-holders and equity-holders on the basis of their contribution to the capital needed to purchase the asset:

$$\underset{\text{(total return)}}{R_a} = \underset{\text{(interest)}}{\left(\frac{D}{D+E} \times K_d\right)} + \underset{\text{(return to equity holders)}}{\left(\frac{E}{D+E} + K_e\right)} \qquad (4.1)$$

Rearranging, the required rate of return is obtained:

$$K_e = R_a + \frac{D}{E}(R_a - K_d) \qquad (4.2)$$

where: R_a = return on the asset or investment

D = debt

E = equity

K_d = required rate of return of the lender; interest rate

K_e = required rate of return of the equity holders

As the debt-equity ratio (financial leverage) increases, the required rate of return for equity holders increases linearly.[1] (Figure 4)

This linear relationship between K_e and leverage had led to the following adjustment of Beta for the effect of leverage.

$$\text{Beta Levered} = \text{Beta}_L = \text{Beta (unlevered)} \left(1 + \frac{D}{E}(1-t_c)\right) \qquad (4.3)$$

where: $\frac{D}{E}$ = debt to equity ratio; financial leverage

t_c = corporate tax rate

An analyst computes the levered Beta from the unlevered Beta and then locates it on the Security Market Line to find the required rate of return:

$$K_e = R_R + (R_M - R_R)\ \text{Beta}_L = R_F + (R_M - R_F)\ \text{Beta}\ \left(1 + \frac{D}{E}(1-t_c)\right) \qquad (4.4)$$

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[1]F. Modigliani and M. H. Miller, "The Cost of Capital, Corporation Finance, and the Theory of Investment," American Economic Review 48 (June 1958):261-297.

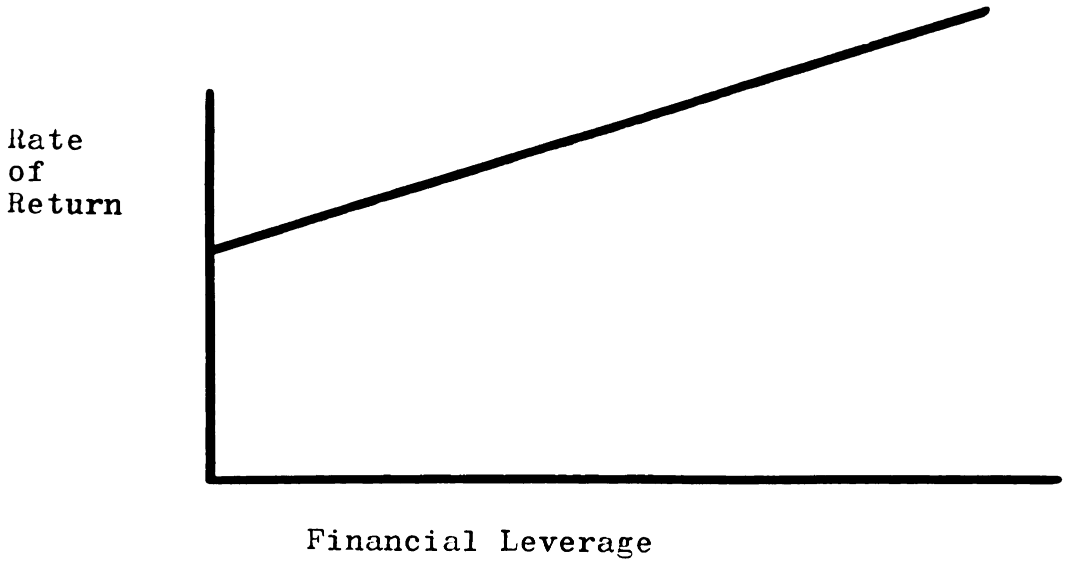

Fig. 4. Relationship Between Leverage and Required Return.

The result is an approximation of the required rate of return that an investor would be expected to demand for a given degree of financial leverage.[1]

2. The traditional position holds that K_e does *not* rise in a linear fashion with increased use of debt. At "moderate" debt use, investors do not perceive or are not concerned with the risk associated with the use of leverage. However, when debt is observed to be "excessive" investors react strongly and demand an increasing return with each additional unit of debt.[2] Figure 5 illustrates the effect of leverage on the required rate of return. The traditionalist's assumption of investor apathy or naivete is generally assumed to be incorrect. This argument "may reflect a confusion between financial risk and the risk of default."

Even if investors happen to be naive, the risk created by leverage is real. This raises the issue: Should equity holders be compensated for the risk they perceive or the risk they incur? If one believes that the function of managers is to protect the equity holders' interest, then management should be providing the information

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[1]Robert S. Hamada, "Portfolio Analysis, Market Equilibrium and Corporation Finance," Journal of Finance 24 (March 1969):19-30.

[2]A common rule of thumb is to consider debt use below a debt/(debt + equity) ratio of .3 or less as moderate debt use. A ratio of .5 or greater is excessive. These rules will vary by industry and by different economic conditions. See Weston and Brigham, Managerial Finance, p. 605.

[3]Brealey and Myers, Principles of Corporate Finance, p. 365.

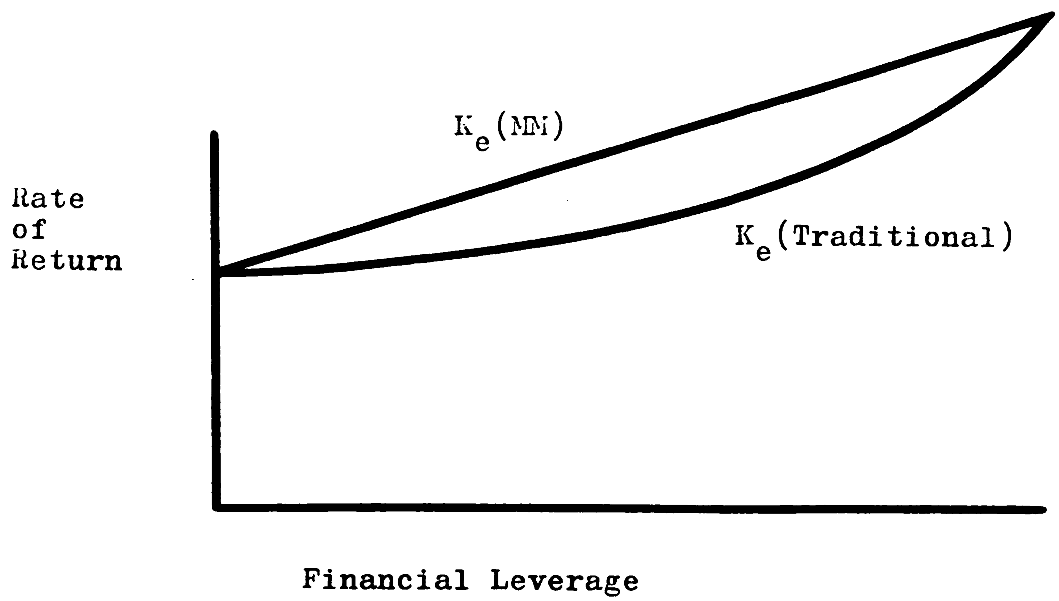

Fig. 5. Effect of Leverage: Traditional and Modigliani-Miller.

necessary so that equity holders can determine the risk of the firm or management should be ensuing that equity holders receive their fair rewards.[1]

Effect of indirect costs: Financial distress. Financial distress costs are the most important indirect cost of debt. Financial distress costs are the costs incurred in a business disruption created by a firm's financial practices. In the extreme form, financial distress costs involve the court costs and losses incurred as a result of bankruptcy.

Financial leverage leads to increased variability in operating income due to the fixed nature of debt obligations. Consequently, the increased variance increases the probability of disruptions in the payments to creditors or suppliers. If suppliers become alarmed at real or potential late payments, they may impose credit restrictions that increase costs. In extreme situations, the suppliers may terminate service to the cooperative. The cooperative may be forced to seek out a supplier offering less favorable terms. As operating income becomes more variable, members may demand (or are entitled to) a larger total return or larger wealth return. Creditors may impose restrictions upon the cooperative's behavior regarding the sale of assets, expansion, new debt acquisition, minimum inventory size,

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[1]Some argue that managers do not maximize the equity holders' interest, but only provide what is required. See Michael C. Meckling and William H. Jensen, "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure," Journal of Financial Economics 3 (1976):305-360.

minimum balances, etc. Opportunities may be foregone because of these restrictions.

Financial distress may lead to dysfunctional behavior on the part of board and membership. The board may elect to follow a cautious strategy by milking the capital out of the business through deferring maintenance and reinvestment. Production costs may increase as the quality of the asset base declines. Members may become dissatisfied both with the increased variability and decline in service and leave the cooperative, causing a reduction in revenues. Administrative costs may increase due to the need to tightly monitor cash flows. This may develop into a reinforcing style whereby financial distress leads to increased costs which lead to further financial distress.

The effect of financial distress costs and leverage upon the cost of equity. Equity holders will require a risk premium for financial distress. If financial distress costs are significant, the relationship between leverage and required rates of return becomes curvilinear upward.[1] Figures 6 and 7 illustrate the effect of leverage on the required rate of return for Modigliani-Miller and traditional assumptions, respectively.

Unfortunately, the effects of financial distress are difficult to quantify until after the fact. Consequently, inclusion of the premium for financial distress in the cost of capital is not usually

[1]Weston and Brigham, Managerial Finance, p. 608.

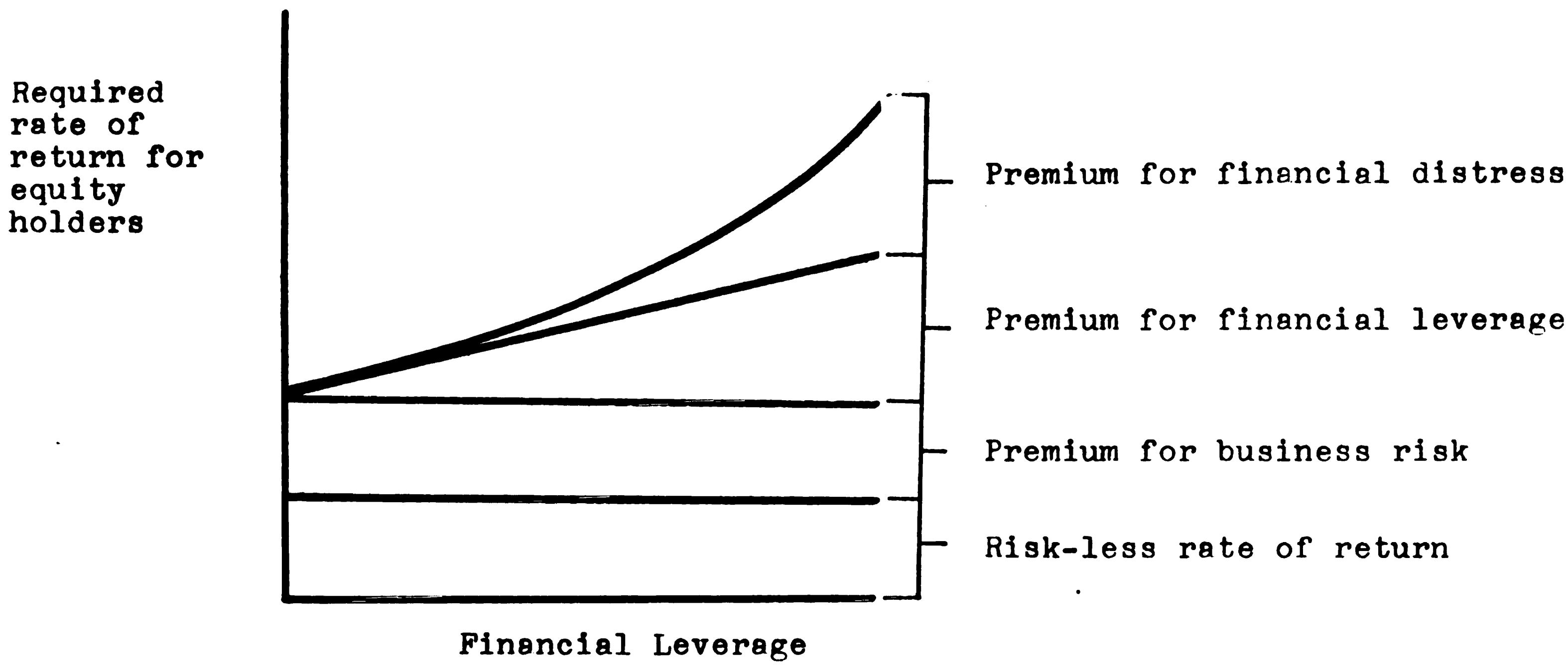

Fig. 6. Effect of Leverage--Modigliani-Miller Assumptions.

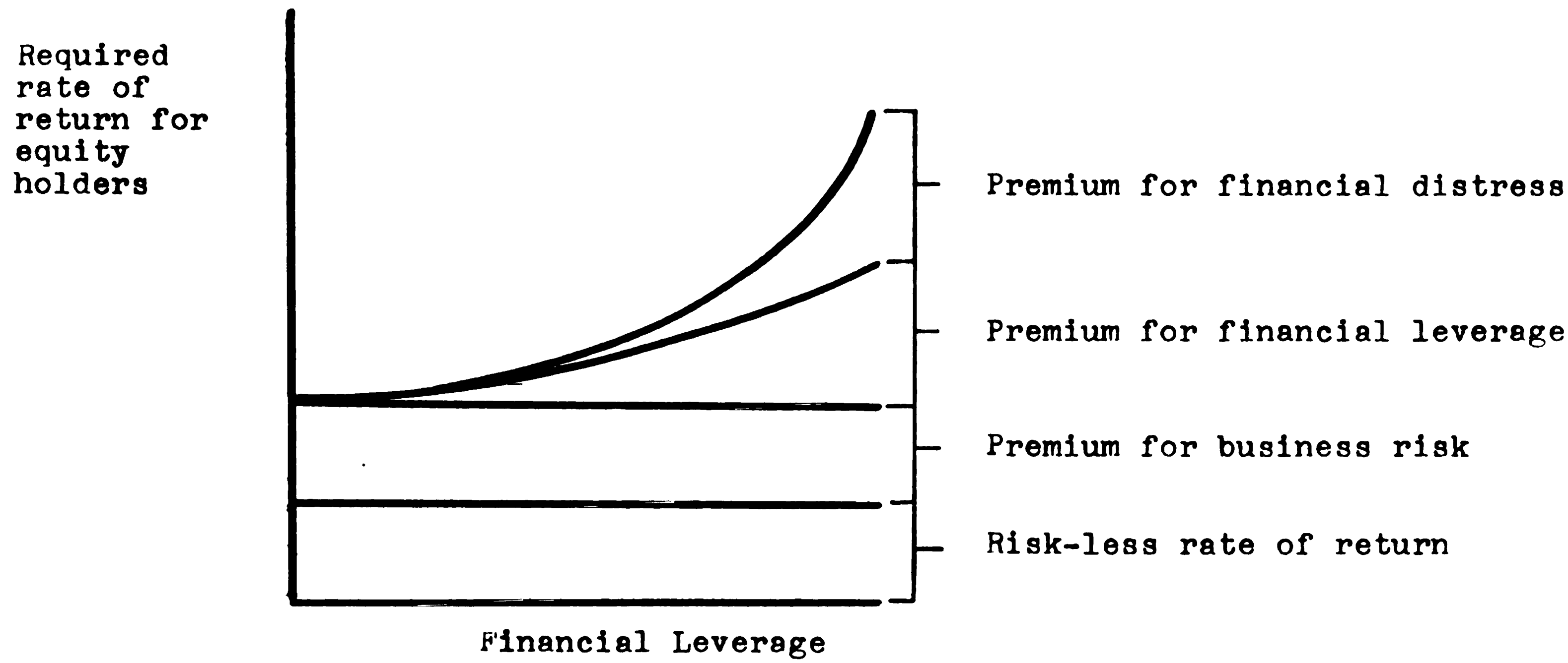

Fig. 7. Effect of Leverage--Traditional Assumptions.

feasible. Management, however, must be conscious when distress costs are likely to occur and incorporate them as best as possible in its decisions.

The Discount Factor for Project Valuation (Capital Budgeting)

For an all-equity business, the required rate of return for the equity holder is used as the discount factor in both equity and project valuation.

If the business is using debt, the required return for equity holders is still used as the discount factor in equity valuation (albeit adjusted for the effect of leverage). The discount factor in project valuation, however, must allow for the required return for both equity and debt holders. Thus the discount factor must represent the composite cost of capital.

To compute the composite cost of capital, one must measure the cost of debt as well as the cost of equity.

Cost of debt. Interest rates tend to rise with leverage. The greater the cash flow to lenders, the greater the probability that earnings will not be sufficient to meet this interest obligation. Creditors and potential debt holders will demand a greater return (interest charge) to compensate for this increased risk.[1]

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[1]Weston and Brigham, Managerial Finance, p. 609; see Vitaliano, "Comparative Analysis," for the formulas for calculating the direct costs of different forms of debt.

A second influence on the direct cost of debt is the number of debt sources the firm must utilize to obtain the funding it needs. A firm normally obtains its debt from the cheapest or most convenient source. When the firm has exhausted the amount of debt it can obtain from its favored sources, it must go elsewhere. These additional lenders will often charge higher interest costs because of higher costs or because of the lack of a credit relationship with that firm.

Lenders are also sensitive to the risks and costs associated with financial distress. As with equity holders, the lenders normally will require increasingly greater amounts of compensation as leverage increases.

The shape of the cost of debt curve is gently sloping at first owing to the relative lack of risk for the lender at low levels of borrowing. However, as leverage increases, the influences described above become operative and cause the required return to increase at an increasing rate. This is illustrated in Figure 8.

Taxes are the final factor that influence the cost of debt. The interest that a company pays is a deductible expense, whereas dividends and retained earnings are not tax deductible. For this reason, debt offers a firm a tax shield. A tax shield is the tax liability avoided by using debt financing. The following example illustrates how a tax shield works. Suppose an investor-owned firm has $10,000 of equity capital and no debt. The assets generate a return of ten percent or $1,000. Alternatively, suppose this firm converts $1,000 of its equity into debt costing eight percent.

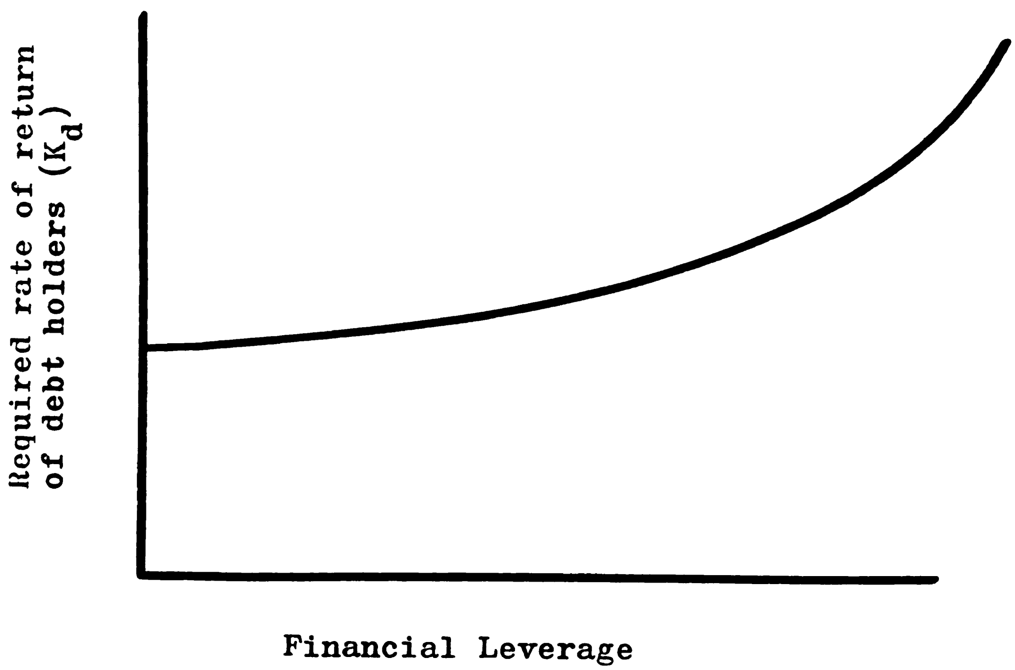

Fig. 8. The Effect of Financial Leverage on the Cost of Debt.

	Investor firm with all equity	Investor firm with debt and equity
Earnings before interest and taxes	$1,000.00	$1,000.00
Interest paid	-0-	80.00
Pretax income	1,000.00	920.00
Tax rate (forty-six percent)	460.00	423.20
Net income to owners	540.00	496.80
Net income to both owners and bond holders	540.00	476.80
Interest tax shield (marginal tax rate times interest payment)	-0-	36.80 = (576.80 - 540.00)
Return on owner's investment	$\frac{540.00}{1,000.00} = 5.40\%$	$\frac{496.80}{900.00} = 5.52\%$

The interest tax shield is the marginal tax rate times the cost of debt times the amount of debt assumed or in the notation introduced earlier, $t_c \cdot K_d \cdot D$. If the debt was permanent, that is permanently rolled over, the tax shield of $26.80 becomes a permanent stream. The risk associated with the tax shield flows are less risky than the risk associated with the assets because tax shields depend only on the marginal corporate tax rate and the ability of the business to earn enough to cover interest payments. The risk of the tax shields is assumed to be close to the risk of the interest payments generating them, therefore the tax shields are discounted by the cost of debt, K_d. The present value of a permanent tax shield can be represented as follows:

$$\frac{t_c \cdot K_d \cdot D}{K_d} \quad \text{or} \quad t_c D. \tag{4.5}$$

In the preceding example, the present value of the debt shield is $\frac{\$36.80}{.08} = \$460.00$.

The interest rate can be adjusted for the tax shield effect by subtracting out the tax liability avoided by the interest charge: Therefore, the actual cost of the debt is represented as

$$K_d - K_d \cdot t_c \quad \text{or} \quad K_d\ (1-t_c). \tag{4.6}$$

Calculation of the composite cost of capital. There are two common rules of thumb for calculating the discount factor: (a) the WACC method and (b) the MM method.

WACC stands for Weighted Average Cost of Capital. As its name implied, it is the weighted average of all the sources of capital. The general formula for one debt source and one equity source is as follows:

$$K_{cc} = K_d\ (1-t_c)\ \frac{D}{V} + K_e\ \frac{E}{V} \tag{4.7}$$

where: K_{cc} = composite cost of capital

K_d = required rate of return for debt holders; cost of debt

K_e = required rate of return for equity holders; cost of equity

t_c = marginal tax rate

E = value of equity

D = value of debt use

V = cost or value of the investment (V = D + E)

This formula can be expanded to include several forms of capital. WACC has intuitive appeal and is easy to use. The assumptions necessary, however, severely restrict its use.

1. The project under consideration must yield a constant perpetual stream of cash flows.

2. The project must make a permanent contribution to debt capacity.

3. The project must have the same risk as the firm.

4. The firm is already at its target debt ratio. Adoption of the project will not cause the firm to change this ratio.

5. The firm's currently held assets generate a constant after tax cash flow indefinitely.

6. Weights must reflect market value of debt and equity not bookvalue.[1]

The Modigliani-Miller (MM) model for the cost of equity predicts that the composite cost of capital, in the absence of taxes and distress costs is unaffected by debt use. The composite cost of

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[1] Stewart C. Myers, "Interactions of Corporate Financing and Investment Decisions--Implications for Capital Budgeting," Journal of Finance 29, No. 1 (March 1975):1-25.

capital is the same as the unlevered cost of equity. Both the cost of debt and the cost of equity rise with leverage such that the composite cost remains constant as leverage is increased. When taxes are introduced, the composite cost of capital decreases as leverage increases because of the tax shield effect of debt. The MM composite cost of capital then appears as follows:[1]

$$K_{cc} = K_e \left(1 - t_c \frac{D}{V}\right) \tag{4.8}$$

where: K_e = the cost of equity in the absence of debt = required rate of return for an all equity firm

t_c = marginal corporate tax rate

$\frac{D}{V}$ = target debt ratio; debt to value of assets or $\frac{D}{D+E}$

To use the MM approach to cost of calculation the following conditions are necessary.

1. The project must have the same risk as the firm.

2. The project must make a permanent contribution to debt capacity.

3. The firm is already at its target debt ratio. Adoption of the project will not cause the firm to change this ratio.

4. The project under consideration must yield a constant perpetual stream of cash flows.[2]

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[1]Brealey and Myers, Principles of Corporate Finance, p. 359. Also see Modigliani and Miller, "The Cost of Capital," pp. 261-297.

[2]Myers, "Interactions of Corporate Financing," pp. 1-25.

Brealey and Myers have shown that violations of the fourth condition do not lead to serious errors.[1] The MM approach can be further generalized to include projects whose risk varies from the firm's risk. This general formula can be represented as follows:

$$K_{cc} = K_j \,(1 - t_c \cdot L_j) \qquad (4.9)$$

where: K_{cc} = composite cost of capital

K_j = required rate of return for a project of that particular risk

L_j = marginal contribution to debt capacity as a proportion of the project's present value. Value of L_j may be higher or lower than the firm's overall debt ratio.[2]

One major reservation with the use of the MM formulas is the lack of consideration of the indirect costs such as bankruptcy costs, agency costs, and flotation. Another reservation is MM's assumption of perfect markets in developing these formulas. In spite of these reservations, Brealey and Myers, among others, have concluded that the MM formulas are probably the best rules of thumb for considering projects by investor-owned firms with moderate debt use.

Calculation of Discount Factors in Cooperative Finance

The second half of this chapter explains the calculation of discount factors for cooperatives by building upon the corporate finance models explained in the first half of the chapter. There

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[1] Brealey and Myers, Principles of Corporate Finance, pp. 408-11.

[2] Ibid.

are three major subjects: (a) measuring the cost of levered cooperative equity, (b) adjusting the cost of leveraged equity for nonwealth returns, and (c) computing the composite cost of capital.

Measuring the Cost of Levered Cooperative Equity

The invariant school holds that the required rate of return for cooperative equity holders and hence the cost of levered equity does not change with financial leverage. Members do not approach an investment in their cooperative with the same expectations that they approach an investment in securities, and consequently do not recognize the increased risk associated wtih leverage.

The traditional position is less extreme. Proponents argue that the nature of the returns, loyalty, perception lag, naivete, and other social or personal factors may lead members not to require the return that an investor would require. For a fully rational investor in a cooperative, the required rate of return should vary with financial leverage. Specifically, the cost of cooperative equity should rise slowly and gradually increase its rate of climb as debt increases. Tubbs and West have observed this behavior in the members of farmer cooperatives.

> Because of the obligatory nature of farmers' investment in cooperative equity, the argument that farmers are not attentive to increased risk may be true to a limited extent. However, as increasing portions of debt are added to the cooperative capital structure and the risk becomes increasingly great, a point will be reached where the producer must ask himself, "Why bear this risk

> and recognize fewer returns to my equity than I would be able to realize if I were to assume the same degree of risk in my farming operation?"[1]

Due to the initial slow rise in the required return to equity holders (cost of equity capital) curve, the traditionalist's curve should lie below the MM predicted curve. This is illustrated in Figure 9.

An important criticism of the traditionalist position is their underlying assumption that members should only be compensated for the risk they perceive or the return that they demand. The decision makers of a cooperative are in a fiduciary position with respect to the members' investment. They have a responsibility to maximize the members' welfare. Consequently, members should be compensated for the risk they are exposed to, not what they perceive.

In adjusting the cost of equity for distress costs, cooperatives and proprietary firms share the same problem of measurement. Firms must usually rely upon the subjective judgment of management. Cooperatives face an additional measurement problem in that the distress at the cooperative's level can have profound effects at the member level. Even if these costs could be approximated with some degree of confidence, the question arises--should members be compensated for this extra cost? Compensation would probably be appropriate if debt were being used to maximize the wealth return or the growth in assets. However, misfortunes may cause disruptions

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[1]Alan R. Tubbs and Richard R. West, The Use of Debt in Cooperative Capital Structure (Cornell University: A.E. Res. 336, October 1971), pp. 10-11.

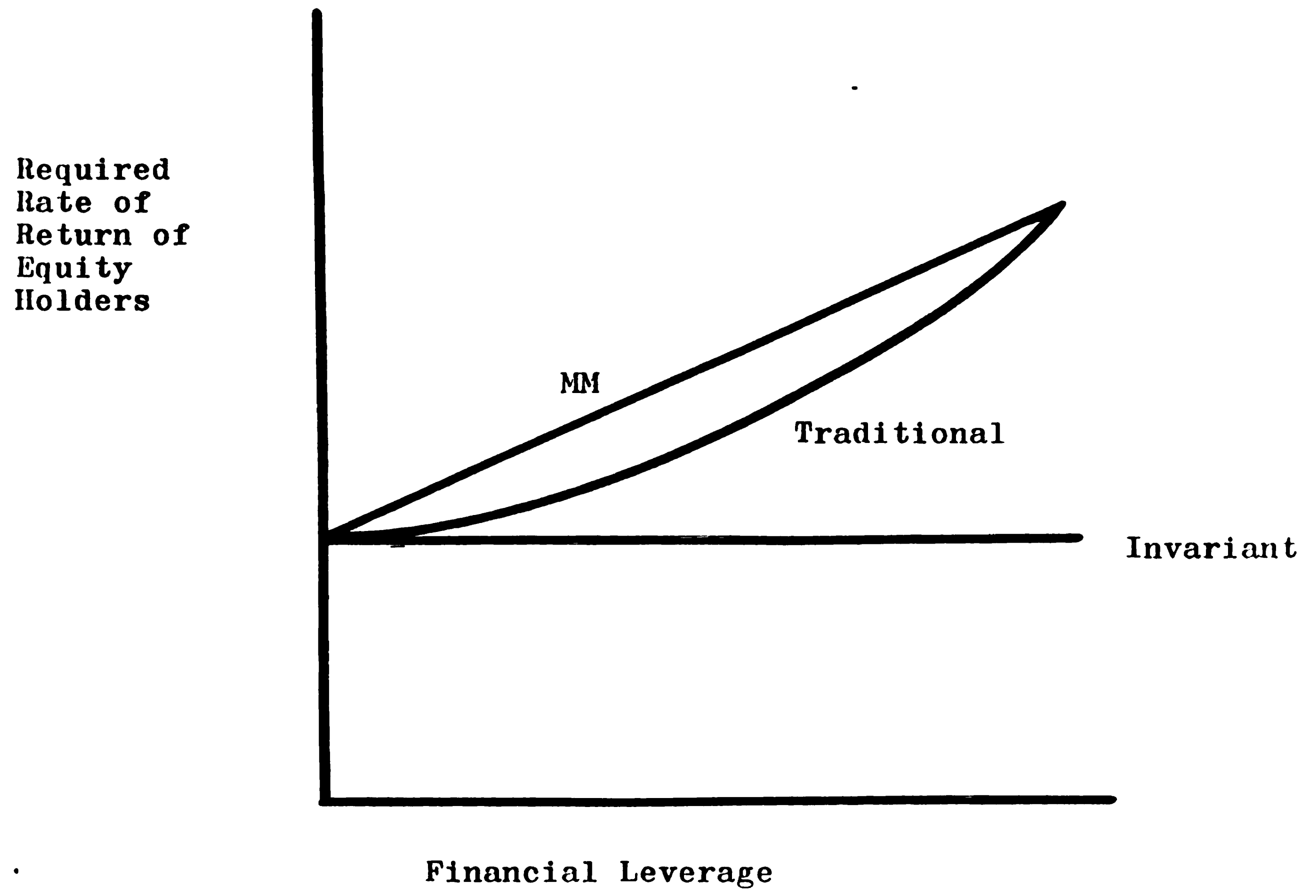


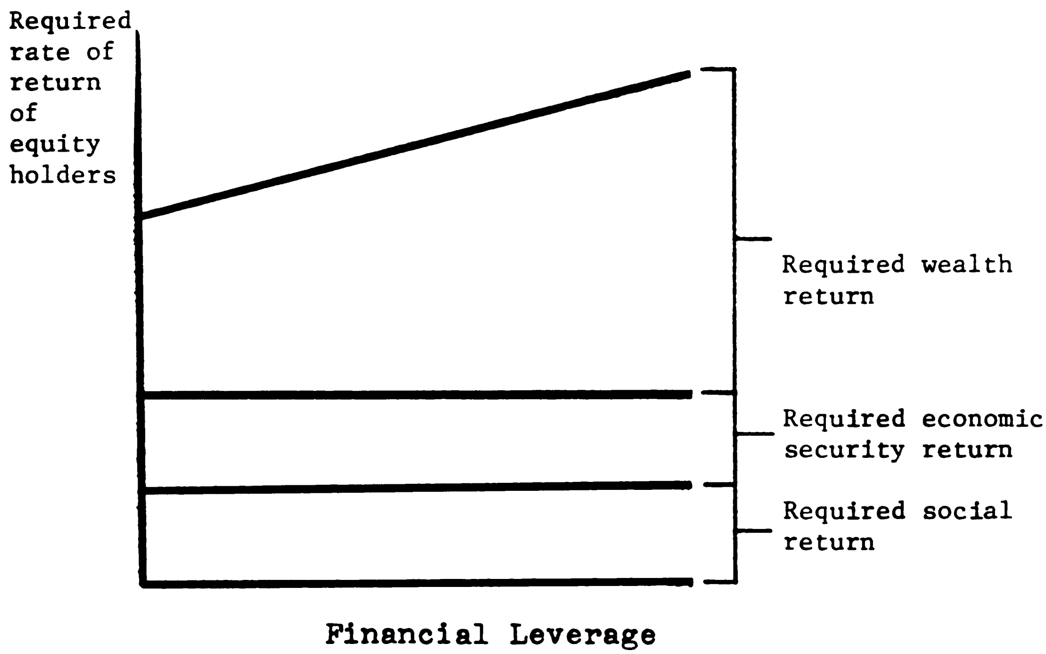
Fig. 9. Effect of Leverage on the Required Return of Cooperative Members.

which force the cooperative to refinance to a more leveraged position. Increasing the cash flow to members may further deteriorate the financial position of the cooperative. The wisdom of compensation should also be questioned if the leverage that has increased the risk of distress is the result of social policies such as low entry costs or low capital contribution requirements.

Adjusting of the Cost of Leveraged Equity for Nonwealth Returns

Chapter III explained the adjustment of the cost of unlevered equity for nonwealth returns. When equity is leveraged, the problems of adjustment are compounded. There is no theoretical or empirical body of work to draw upon in trying to determine how the required economic security and social return in cooperatives vary with financial leverage. To date, investigators have usually ignored this issue, implicitly assuming that the required returns for economic security and social return do not vary with leverage. This assumption is appropriate when the nonwealth returns are not appropriable by members; i.e., they spill over to affect all users of the market. This assumption holds if a cooperative is limited in its ability to generate or increase nonwealth returns or if members are limited in their ability to absorb these returns.

For such cooperatives, the cost of equity capital curves would be shifted downward with no change in slope. Assuming that the MM position regarding the linear relationship of debt and required returns of equity holders is correct, the cost curves would appear as shown in Figure 10.



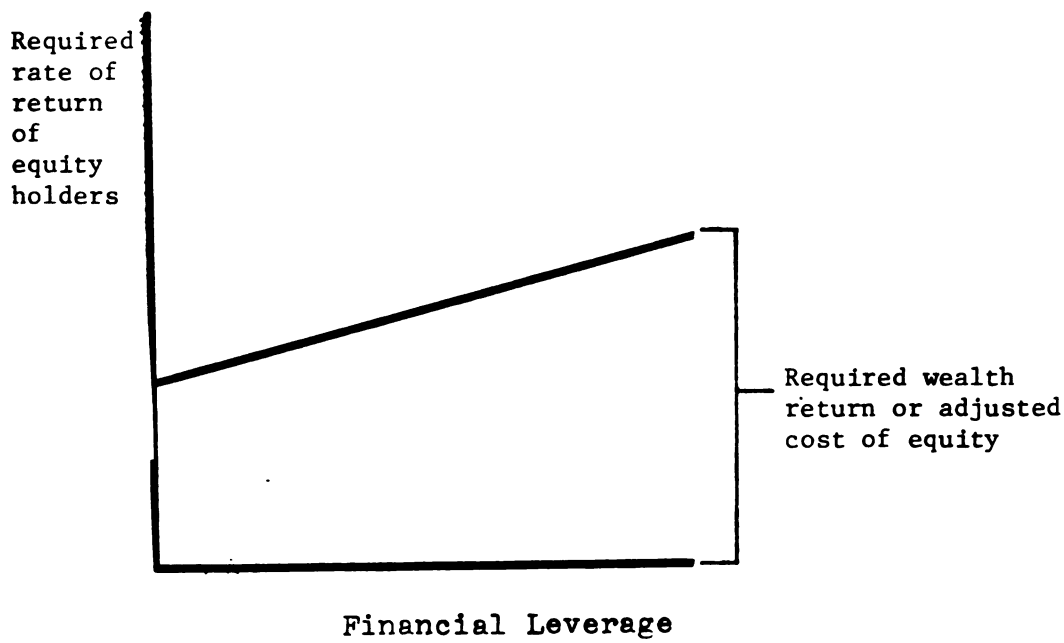


Fig. 10. Adjustment of the Cost of Equity for Nonwealth Returns.

This required rate of wealth return (the adjusted cost of equity return) should rise more sharply if there are nonwealth returns which raise costs or lower prices. The associated reduction in cash flow increases the variability per unit of cash generated. The required wealth return (adjusted cost of equity curve) would therefore tend to rise faster with increased leverage, than the total required rate of return. See Figure 11.

A crude method of adjustment that accounts for the increased risk due to nonwealth returns and provides an appropriate measure of the required rate of return is presented as follows. Recall that analysts of publicly traded investor owned firms can use the CAPM to approximate the effect of leverage on the required rate of return for equity holders. The equation for the Security Market Line can be decomposed as follows:

$$K_e = R_F + (R_M - R_F)\ Beta_L \tag{4.10}$$

$$Beta_L = Beta_U\ (1 + \frac{D}{E}\ (1 - t_c) \tag{4.11}$$

$$Beta_L = Beta_U\ (1 + \frac{D}{E} - \frac{D}{E}\ t_c) \tag{4.12}$$

$$Beta_L = Beta_U + Beta_U\ (\frac{D}{E}) + Beta_U\ (\frac{D}{E}\ t_c) \tag{4.13}$$

where: K_e = required rate of return for equity holders

R_F = risk free rate of return

R_M = market rate of return

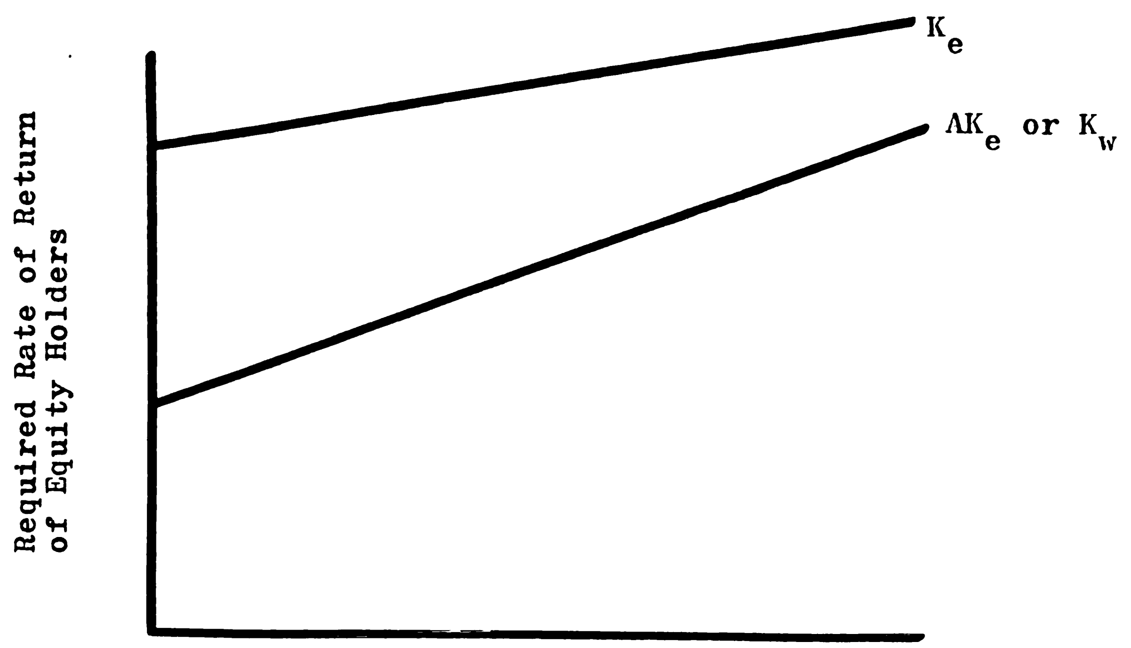


Fig. 11. Effect of Leverage on the Cost of Equity in the Presence of Nonwealth Returns.

$\frac{D}{E}$ = debt to equity ratio; financial leverage

t_c = corporate marginal tax rate

$Beta_L$ = measure of market risk when the firm uses debt

$Beta_U$ = measure of market risk for an all equity firm

$Beta_U(\frac{D}{E})$ = adjustment of $Beta_U$ for financial risk

$Beta_U(\frac{D}{E}\ t_c)$ = adjustment of the effect of financial risk for the tax shield effect of debt

Since cooperatives are subject to different tax liability than investor-owned firms, the tax shield effect of debt is represented as $(\frac{D}{E}\ \phi\ t_c)$, where ϕ represents the proportion of cooperative earnings subject to taxation. The levered Beta would then appear as:

$$Beta_L = Beta_U + Beta_U\ (\frac{D}{E}) + Beta_U\ (\frac{D}{E}\ \phi\ t_c) \tag{4.14}$$

Our adjustment procedure, however, is not complete because substitution of a cooperative's leverage ratio into the levered Beta formula leads to an underestimate of financial risk. Nonwealth returns which affect cost, lower the coverage ratio and therefore increase risk. An adjustment can be performed by changing the leverage ratio. To perform this adjustment, it is first necessary to define the coverage ratio.

$$CR = \frac{EBIT}{K_d D} \tag{4.15}$$

where: CR = coverage ratio

K_d = required rate of return for debt holders; interest rate

D = debt

$K_d D$ = the interest payment

EBIT = earnings before interest and taxes

Rearranging gives:

$$D = \frac{EBIT}{K_d \cdot CR} \tag{4.16}$$

Dividing both sides by total assets gives an alternative expression for the leverage ratio which includes the coverage ratio.

$$\frac{D}{TA} = \frac{EBIT/TA}{K_d \cdot CR} \tag{4.17}$$

Using the Security Market Line, the required rate of return can be estimated. Dividing this estimated K_e by $(1-t_c)$ yields the required pretax rate of return, EBIT/TA. Since this is an all equity firm (unlevered Beta), dividing by $(1-t_c)$ also yields a crude estimate of the pretax and preinterest earnings as a return on assets (EBIT/TA) expected of a firm with that market risk.

This estimate of the industry's expected EBIT/TA and the market interest rate are substituted into equation 4.17 along with an estimation of a cooperative's coverage ratio. This should yield the financial risk (equivalent debt ratio for investor-owned firms) that a cooperative faces. This ratio should be larger than the actual debt ratio of a cooperative with nonwealth returns.

The necessary steps for calculating an adjusted surrogate required rate of return for the members of a particular cooperative are summarized as follows:

1. Find the unlevered Beta of the cooperative's industry or a cluster of comparable firm's.

2. Substitute this Beta into the equation for the Security Market Line ($K_e = R_F + (R_M - R_F)\text{Beta}$) to obtain the required rate of return for the all equity surrogate.

3. Take the K_e obtained from Step 2 and divide by $(1-t_c)$, the tax rate for the industry or cluster. This will yield a rough approximation of the operating return on assets. This is the return on assets independent of financial structure or tax liability (EBIT/TA).

4. Calculate the leverage ratio for the cooperative.

5. Calculate the interest rate for the cooperative's debt.

6. Calculate the wealth return before interest and taxes that a cooperative is expected to generate based on past history or an economic engineering study.

7. Calculate a cooperative's coverage ratio based on Step 5 and Step 6.

8. Calculate the cooperative's financial risk equivalence.

   a. Substitute the cooperative's coverage ratio and the market interest rate into the denominator of the financial risk equivalence formula.

   b. Substitute the operating return on assets obtained from Step 3 into the numerator.

   c. Solve for the financial risk equivalent.

$$\frac{D}{TA} = \frac{EBIT/TA}{K_d \cdot CR}$$

   d. Convert D/TA to D/E:

$$\frac{D}{E} = \frac{D/TA}{(1-D/TA)} = \frac{D/(D+E)}{(1-D/(D+E))}$$

9. Substitute the cooperative's financial risk equivalent into the leverage Beta formula:

$$Beta_L = Beta_U + Beta_U\ (\frac{D}{E}\ \text{equivalent}) + Beta_U\ (\text{actual}\ \frac{D}{E})\phi t_c$$

10. Substitute the leveraged Beta from Step 9 into the equation for the Security Market Line: $K_e = R_F + (R_M - R_F)Beta$. The resulting K_e is a surrogate for the required rate of return for the members of a particular cooperative. This required rate of return can be met by a combination of wealth, security, and social returns.

11. The final step to obtain the required wealth return (adjusted cost of equity) is:

   a. Take the K_e obtained from Step 10.

   b. Subtract out the estimated nonwealth required returns that the cooperative is expected to satisfy:

$$AK_e = K_w = K_e - K_s - K_{se}$$

Calculation of the Composite Cost of Capital

In the preceding section the calculation of the cost of equity in cooperatives was discussed. This section will first cover the calculation of the cost of debt. Then the integration of the cost of equity and the cost of debt into the composite cost of capital will be explained.

Calculation of the cost of debt. The use of debt in cooperatives differs from the use of debt in investor-owned firms for two major institutional reasons. First, cooperatives have their own cooperative banking system. This banking system offers services and an interest rate structure different from most commercial banks. Second, cooperatives are subject to different federal tax statutes. These statutes and the nature of cooperative organization and return have implications for the desirability of debt.

The effect of leverage on the cost of debt. In the discussion of the cost of debt in corporate finance, it was shown that the cost of debt rises with increases in financial leverage. Although little empirical work has been done, the cost of debt from conventional sources would be expected to behave the same for cooperatives as for investor-owned firms of similar risk.[1] Consumer and worker cooperatives, however, can obtain debt capital from the NCCB. At this

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[1]Vitaliano, "Comparative Analysis," has shown that in farm cooperatives, the cost of debt from commercial sources increases with financial leverage.

writing, the NCCB is pursuing a similar policy to the Farm Cooperative Bank System, whereby the interest cost does not vary with the financial risk of the cooperative. However, the bank will refuse to supply any more debt to a cooperative when it feels that additional debt will harm the cooperative, or when it fears default. At the point where the cooperative bank refuses to supply more debt, the cost of debt curves rises as the cooperative is forced to obtain debt from conventional sources which adjusts interest rates for risk. Even at this cut-off point, the cost of debt curve is affected by the previously obtained cooperative debt. A cooperative's coverage ratio is greater at the point of cut-off than it would have been if financing only with commercial lenders. Therefore, commercial lenders may provide larger loans or debt at a lower cost to a cooperative using cooperative bank debt after the cut-off point. This is illustrated in Figures 12 and 13. If a cooperative finances with a mix of cooperative bank and commercial sources at each incremented increase in debt, the lower curve may become flatter. The cooperative may feel it is worthwhile to finance from a mix of debt sources in order to develop a good credit history, because of services from the other financial sources, or to maximize borrowing flexibility.

Adjustment for the tax shield effect. Cooperatives can only use tax shields when they have taxable income. Most cooperatives that generate net margins from member sales will return these margins to the members in the form of cash patronage refunds and qualified retain certificates. If done according to I.R.S. rules, no taxable income is

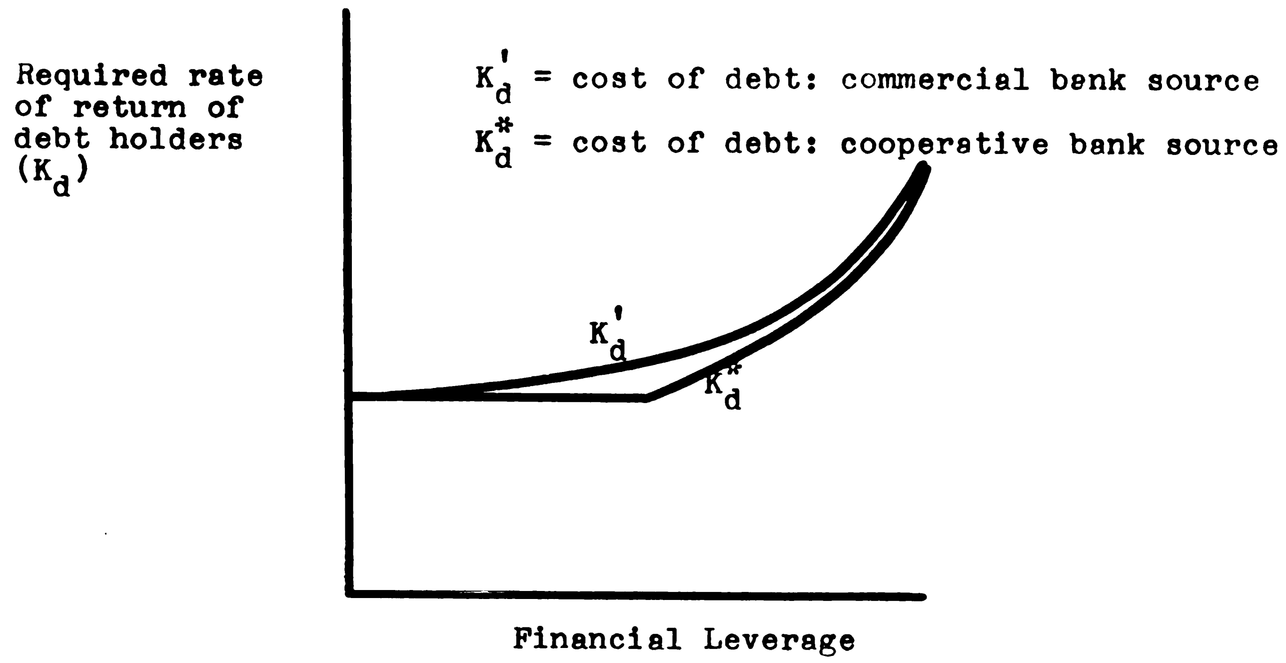

Fig. 12. The Effect of a Cooperative Source of Debt on the Relationship between Leverage and the Cost of Debt.

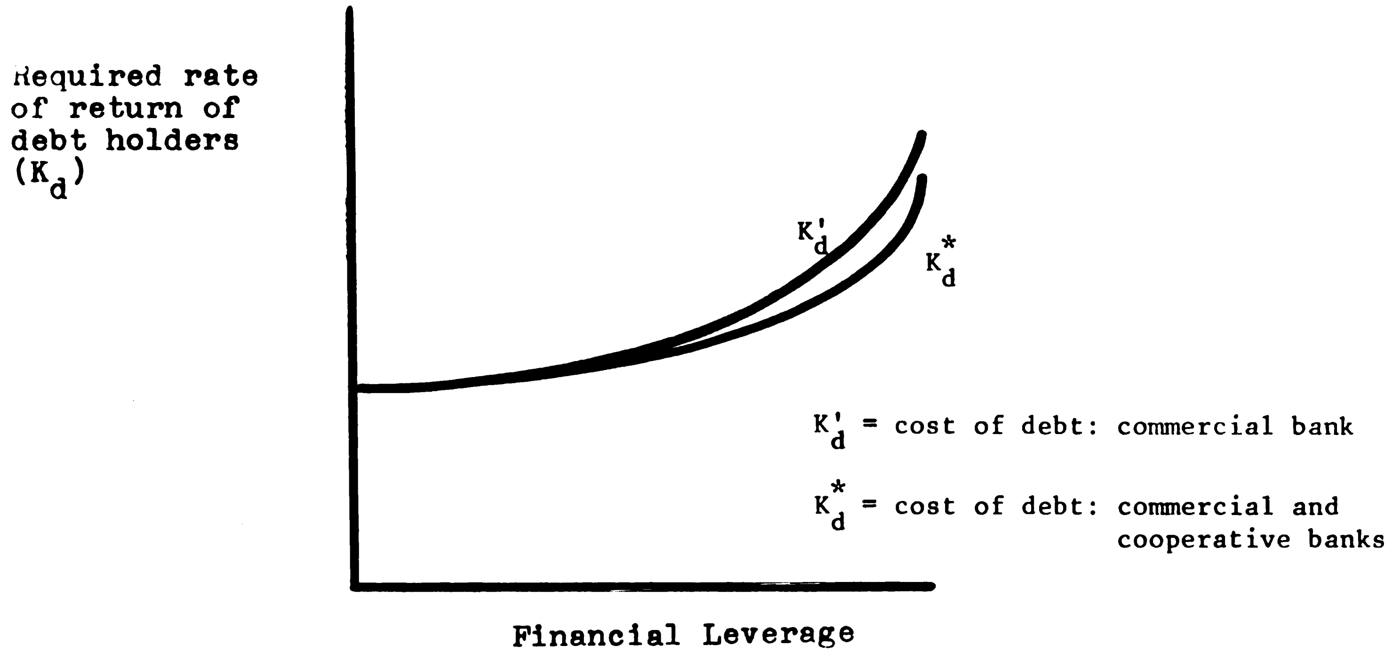

Fig. 13. Utilizing a Mix of Cooperative and Commercial Sources at All Levels of Debt Use.

generated when surplus is returned as patronage refunds. If a cooperative has nonpatronage income, or retains net margins as unallocated retained earnings, it will have income subject to tax liability.[1]

Cooperative tax law limits the usefulness of the interest tax shield associated with the corporate income tax. If a cooperative has no taxable income, then it has no tax shields. Moreover, interest expense can only be applied against taxable income to the extent that interest expense was used in generating that income. For example, suppose an asset was used only in the generation of member net margins which were returned to the members. This interest expense could not be applied against the nonmember net margins which were not refunded and hence are taxable income. For a cooperative whose assets are used thirty percent of the time to serve nonmembers, only thirty percent of the interest expense could be applied against income from nonmember business. This holds true even if income from nonmember sales is more or less than thirty percent of the total income generated. Suppose the assets were only used for nonmember sales. In this case, the entire interest expense could be applied to any taxable income generated by nonmember business.

The tax shield is equal to the proportion of net margins subject to a tax liability (ϕ) times the marginal tax rate (t_c) times

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[1]See Ronald Cotterill, "Basic Legal and Economic Aspects of Cooperative Finance," in Ronald Cotterill, ed. Consumer Food Cooperatives (Danville, Illinois: Interstate, 1982).

the cost of debt (K_d) times the assumed debt (D) or $\phi t_c K_d D$. The present value of the cooperative tax shield would be $\phi t_c D$.

The derivation of this formula can be useful in illuminating several aspects of cooperative tax shields. A two period model has been used for the derivation.[1] It assumes that the assets of the cooperative will be liquidated at the end of the second period.

Let ϕ = proportion of net margins subject to taxation

Y_B = interest payments to the debt sources = $K_d D$

X = net operating income

D = debt

t_c = marginal tax rate

R_c = cash received by the members

$a = \dfrac{(R_M - R_E)}{(R_M)}$; standardized risk premium

I = investment or productive asset

subscripts = the time period, period one, period two, etc.

At period one, the present, the cash flow equation is

$$\underbrace{X_1 + D_1}_{\text{(inflow)}} = \underbrace{R_{c1} + I_1 + t_c X_1}_{\text{(outflow)}} \tag{4.18}$$

The operating income plus whatever debt has been obtained must balance with the cash stream distributed to members plus any new

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[1]The framework for this model was taken from the following source: Charles W. Haley and L. D. Schall, The Theory of Financial Decisions (New York: McGraw-Hill Book Company, 1979).

The operating income plus whatever debt has been obtained must balance with the cash stream distributed to members plus any new investment plus any taxes paid. If the cooperative elects to return all excess cash earnings to the members, the cash stream is as follows:

$$R_{c1} = X_1 + D_1 - I_1 - \phi t_c X_1 \qquad (4.19)$$

As required by law the return to members must also not exceed after tax income:

$$R_{c1} = X_1 - \phi t_c X_1 \qquad (4.20)$$

In period two, the next period, the cash flow equation is:

$$\underset{\text{(inflow)}}{X_2} = R_{c1} + Y^B + \underset{\text{(outflow)}}{\phi t_c (X_2 - I_1 - Y^B)} + D_1 \qquad (4.21)$$

where: $\phi t_c(X_2-I_1-Y^B)$ = the tax paid

I_1 = depreciation, complete write-off in one period is assumed

D_1 = repayment of the debt incurred in period one

The cash stream to the members in period two becomes:

$$R_{c2} = X_2 - Y^B - \phi t_c X_2 + \phi t_c I_1 + \phi t_c Y^B - D_1 \qquad (4.22)$$

The cash stream is equal to operating income *minus* interest payments *minus* taxes paid *plus* the depreciation shield *plus* the interest shield *minus* the repayment of debt. The value of the members' equity cash stream plus the discounted value of the next period's cash stream.[1]

$$W_1 = \frac{R_{c1} + R_{c2} - a \cdot \text{cov}(R_{c2}, R_M)}{(1+i)} \tag{4.23}$$

Substituting the equation for R_{c1} in the discounted value equation:

$$W_1 = X_1 + D_1 - I_1 - \phi t_c X_1 + \frac{(X_2 - Y^B - \phi t_c X_2 + \phi t_c Y^B - D_1) - a \cdot \text{cov}(X_2 - Y^B - \phi t_c X_2 + \phi t_c Y^B - D_1, R_M)}{(1+i)} \tag{4.24}$$

Separating the terms:

$$W_1 = X_1 + D_1 - I_1 - \phi t_c X_1 + \frac{X_2 - a \cdot \text{cov}(X_2, R_M)}{(1+i)} + \frac{ot_c(Y^B - a \cdot \text{cov}(Y^B, R_M)}{(1+i)} - \frac{D_1}{(1+i)} - \frac{Y_B - a \cdot \text{cov}(Y^B, R_M)}{(1+i)} \tag{4.25}$$

[1]Normally in present value notation, the present is represented by the subscript zero (0). However, since this model is an adaptation of Haley and Schall's derivation of the corporate tax shield, their practice of representing the present by subscript one (1) was followed.

Since $D_1 = \frac{D_1}{1+i} + \frac{Y^B - a \cdot cov(Y_1,R_M)}{(1+i)}$, under conditions of efficient markets, then wealth is equal to:

$$W_1 = X_1 - I_1 - \phi t_c X_1 + \frac{X_2 - a \cdot cov(X_2,R_M)}{(1+i)} + \frac{\phi t_c (Y^B - a \cdot cov(Y^B,R_M)}{(1+i)} +$$

$$\frac{\phi t_c I_1}{(1+i)} - \frac{\phi t_c X_2}{(1+i)} \tag{4.26}$$

where:

X_1 = operating income period one

$\phi t_c X_1$ = tax paid period one

I_1 = new assets

$\frac{X_2 - a \cdot cov(X_2,R_M)}{1+i}$ = operating income period two

$\frac{\phi t_c (Y^B - a \cdot cov(Y^B,R_M)}{(1+i)}$ = interest tax shield

$\frac{\phi t_c I_1}{(1+i)}$ = depreciation shield

$\frac{\phi t_c X_2}{1+i}$ = tax paid period two, if no shields

The wealth of the membership of a similar cooperative without debt can be computed by letting D and Y equal zero in equation 4.26.

$$W_1 = X_1 - I_1 + \phi t_c X_1 + \frac{X_2 + a \cdot cov(X_2,R_M)}{(1+i)} + \frac{\phi t_c I_1}{(1+i)} -$$

$$\frac{\phi t_c (X_2 - a \cdot cov(X_2,R_M))}{(1+i)} \tag{4.27}$$

The difference between the wealth of the memberships of the levered cooperative and the unlevered cooperative is equation 4.26 minus equation 4.27. Thus, the use of debt increases member wealth by the interest tax shield:

$$\frac{\phi t_c \; (Y^B - a \cdot \mathrm{cov}(Y^B, R_M)}{(1+i)} \tag{4.28}$$

Converting equation 4.28 from its certainty equivalent form to the risk adjusted discount rate form gives the following tax shield formula:

$$\frac{\phi t_c Y^B}{K_d} \tag{4.29}$$

where: ϕ = percentage of income subject to taxaction

t_c = tax rate

Y^B = interest expense

K_d = cost of debt; interest rate

Since the interest expense is equal to the interest rate times the amount of debt ($Y^B = K_d \cdot D_1$) , then the tax shield can be represented as follows:

$$\frac{\phi t_c Y^B}{K_d} = \frac{\phi t_c K_d D_1}{K_d} = \phi t_c D_1 \tag{4.30}$$

This is the same value for an interest tax shield in corporate finance, only reduced by ϕ, the percentage of taxable income.

One final point must be mentioned. The equation for a cooperative tax shield, while less than a proprietary firm's tax shield, nonetheless overstates its contribution to member wealth. Since the returns from tax shields are not usually distributed, they have approximately the same value as retained earnings.

Calculation of the composite cost of capital for cooperatives. At present the WACC and MM composite cost of capital approaches explained in the first half of this chapter are the only available ways to proceed. Both, however, have limitations.

In addition to the problems raised earlier about WACC, there is the question of choosing the proper weights. Recall that one of the requirements was that the weights reflect market value. Myers shows that the use of book weights instead of market weights can lead to serious errors.[1] But what is the market value of the equity and debt? While the market value of debt can be found quite easily the market value of cooperative equity is open to debate. Consequently, cooperatives using WACC will normally have to use the book weights with the accompanying errors.

In using the MM approach to the composite cost of capital, the cooperative tax shields must be included. In the case of the MM general formula, the tax shield effect is changed from $t_c L$ to $\phi t_c L$. Thus, the MM general formula for the composite cost of capital for cooperative use is:

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[1]Myers, "Interactions of Corporate Financing," p. 18.

$$K_{cc} = K_e(1-\phi t_c L) \tag{4.31}$$

where: K_{cc} = composite cost of capital

K_e = required rate of return of equity holders; cost of equity

ϕ = proportion of income subject to taxation

t_c = tax rate

L = marginal contribution to debt capacity as a proportion of the project's present value

If a cooperative wished to adjust this composite cost of capital for nonwealth returns, it would appear as follows:

$$K_{cc} = AK_e - K_e \phi t_c L \tag{4.32}$$

where: AK_e = adjusted cost of equity; equivalent to required wealth return

K_e = cost of equity

ϕ = proportion of income subject to taxation

t_c = tax rate

L = marginal contribution to debt capacity as a proportion of the project's present value

Accurate calculation of a composite cost of capital for cooperatives remains a problem. Perhaps the best rule of thumb is to calculate WACC and MM for projects of equivalent risk to the cooperate and take the higher of the two. Under this technique opportunities may be foregone, but the members at minimum should receive their opportunity cost in other investments. So the members are at least no worse off than receiving their best alternative.

The effect of a cooperative bank on the composite cost of capital. With the NCCB as a financing option, the K_d curve develops a kink at the point where the NCCB stops providing debt. The effect of the debt curve on the composite cost of capital curve, K_{cc}, will be to flatten out over the range where the NCCB is providing financing. At the point on the leverage axis where the debt curve is kinked, the K_{cc} curve would be expected to rise dramatically.

The set of curves in Figure 14 illustrates two effects. The K_{cc} curve becomes flatter and reduces somewhat the error in choosing the discount factor. Also, the NCCB can effectively determine the firm's optimal capital structure. Tubbs and West, in observing farm cooperatives and the Bank of Cooperatives, have noted that:

> . . . the optimum capital under these conditions includes as much debt as the firm can possibly obtain. This, in effect, leaves the determination of the debt and equity mix up to the loan board of the Bank of Cooperatives. Therefore, at some point the downward sloping line stops and under the conditions of the foregoing argument, the combination of debt and equity at that point is the optimum capital structure.[1]

Summary

Chapter IV described methods for calculating discount factors to be used in equity valuation and project (asset) selection. In both cases, it is necessary to determine the cost of equity. Methods for determining the effect of debt and nonwealth returns on cooperative

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[1]Tubbs and West, Use of Debt, p. 11.

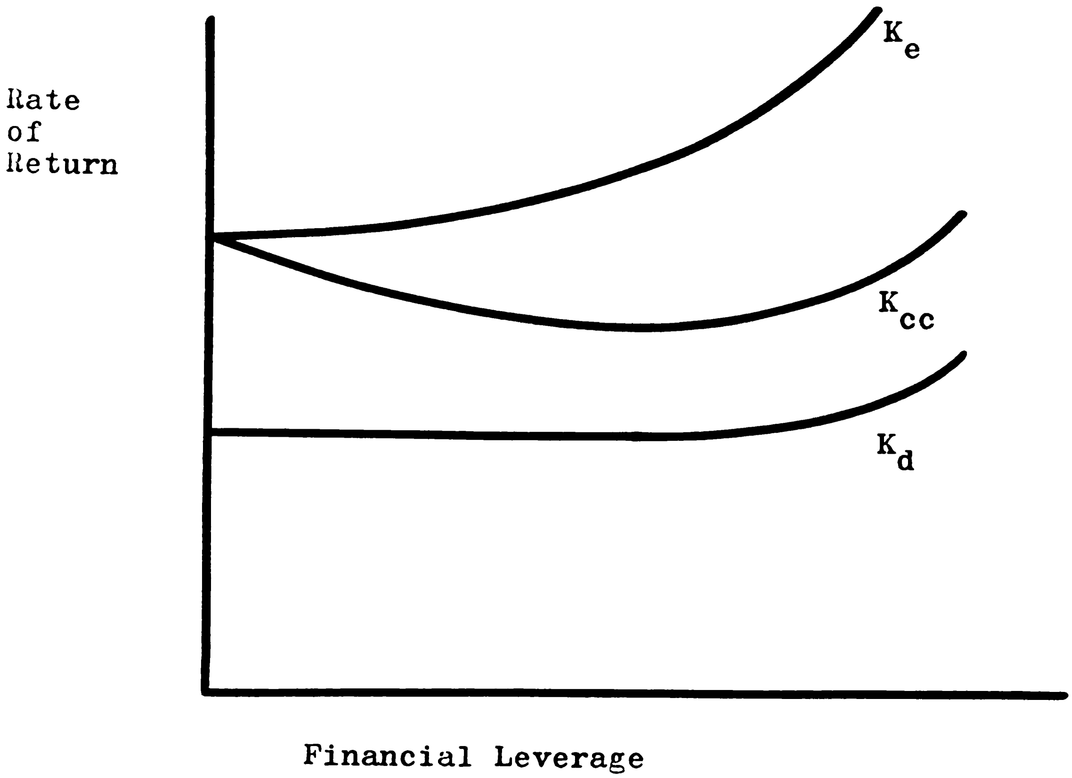

Fig. 14. Composite Cost of Capital for a Cooperative Using Cooperative Bank-Provided Debt Capital.

equity were explained. The MM school argues that there is a linear relationship between leverage and cost of equity while the traditional school sees a less dramatic rise in cost. Nonwealth returns cause the cost of equity to be adjusted downward. Nonwealth returns, however, increase financial leverage risks, and therefore, cause the cost of equity to rise faster as leverage is increased.

In calculating the composite cost of capital it was first necessary to examine the cost of debt. While leverage acts to increase the cost of debt, the tax shield effect tends to lower the cost. For cooperatives, however, the tax shield effect tends to be much less than for investor-owned firms.

Finally, two approaches for computing the composite cost of capital were shown: (a) the weighted average cost of capital (WACC) and (b) the MM approach. The MM approach is somewhat superior to the WACC method because it can be used for projects whose risks differ from the firm; and the MM approach has less restrictive conditions.

CHAPTER V

CAPITAL STRUCTURE: CHOOSING THE TYPES AND PROPORTIONS OF DIFFERENT EQUITY AND DEBT SOURCES

An analyst of an investor-owned firm is concerned with the effect of capital structure upon the firm's cash flow and upon the cost of capital (both debt and equity). The investor-owned firm does not have to consider the form of return, because an investor (ignoring tax differences and capital rationing) is relatively indifferent between retained earnings and dividends. Retained earnings are immediately capitalized by the secondary market so that shareholders receive their return through stock price appreciation.

The cooperative financial analyst's task is considerably more difficult because a cooperative member has more reason to be concerned with the form and timing of member returns. Cooperative equities are not traded in a secondary market. Therefore, deferred patronage dividends, and after-tax unallocated retained earnings only increase member wealth when these returns are paid out in cash (or alternatively when these returns are productively invested in a manner which leads to lower cost services). Consequently, an analyst must be more concerned with the effect of capital structure on the composition and timing of payout as well as the cost of capital.

An analyst's task is further complicated by the nature of cooperative capital. Cooperative equity is usually temporary, of limited supply, and takes many forms. Each particular form can affect the return that members perceive. Cooperatives also have their own unique lending institutions which can affect the desirability of borrowing. Given these issues, this chapter will be divided into three parts: (a) equity sources, (b) debt sources, and (c) determination of the optimal mix of capital sources.

Cooperative Equity

Internally generated equity is the principal source of equity capital for most cooperatives. Although shares are sold to members, often as an entrance requirement, sales to nonmembers is difficult. Internally generated equity falls into four classes: (a) unallocated retained earnings, (b) patronage equity revolving fund, (c) adjustable revolving fund (permanent fund), and (d) capital retain revolving fund. Before explaining these classes of internal equity, the role of margin policy in the formation of internal equity will be discussed.

The Role of Margins

The ability of the cooperative to raise capital through any type of internal equity program depends upon the margin policy of the cooperative. Many cooperatives have followed a policy of "instant refunds," whereby goods and services are sold as close to cost as feasible. At-cost margins can provide a return greater than an equivalent patronage refund paid at the end of the period due to the time value of money. Cooperatives sometimes prefer to follow this policy with the intent of attracting members and avoiding taxes, and some cooperatives argue that low margins force them to be self-disciplined. Such a policy, nonetheless, is shortsighted. It often leads to higher costs and less return to the members in the long run. A policy of below market margins has the following implications:

1. It hampers the internal generation of capital.

2. If a cooperative utilizes debt, the cost of debt may be higher for the limited margin cooperative due to a lower coverage ratio. The probability of not utilizing the available tax shields also increases.

3. A cooperative which does a substantial business with nonmembers will be giving away one of the benefits of cooperative membership, that of a price adjustment with no capital requirement.

4. The classic problem with an "instant refund" policy is price war. The competition acts to better the cooperative's lower prices, even to the point of selling below cost. If the competition has greater resources than the cooperative, the cooperative may fail.

5. Cooperatives are not permitted by law to sustain a loss for tax purposes on member business. Therefore, there is no loss carryforward or backward on member business. If the cooperative sells at cost, there is little in retained earnings which can be assessed. Thus, the members may have to be assessed directly if there is a loss. This could lead to mass exit from the cooperatives.

The only cooperatives which should consider a limited margin policy are those with a high proportion of equity financing and a high proportion of member sales. Otherwise, a cooperative would be better advised to price as close to prevailing market prices as possible.

Unallocated Retained Earnings

Unallocated retained earnings, or simply retained earnings, refer to the unallocated reserve of permanent capital. They occur when a cooperative, for whatever reason, has taxable income, pays any tax liability, and returns after tax income for uses that further the lawful purposes of the cooperative. Regardless of their source, unallocated retained earnings, by definition are not allocated to individuals. The membership has no direct claims upon these after tax earnings even though they may benefit from them.

The use of unallocated retained earnings by cooperatives is restricted. Many states require the distribution of funds not actually used for reserves. The federal government also has the right to intervene when a business is building up too large an amount of retained earnings and the business has no clear purpose for it. The federal government also does not view this equity as a portion of the members' capital base. Thus, a member cannot earn a capital rent (dividend or interest payment) on this portion of the equity.

A cooperative must address the following decision variables in using retained earnings: how much to retain, when to retain, when to return retained earnings to members, and in what form. The decision will depend upon the tax management policies and the growth needs of the cooperative. It is commonly held that a business should only grow as fast as it is able to generate internal equity. For publicly traded investor-owned corporations the earnings retained after dividend payments have been made is relatively permanent capital. The retain certificates used by cooperatives in contrast are a temporary form of equity capital. As the retain certificates are revolved out and new ones issued, however, a quasi-permanent equity fund is formed. As the business transacted with members grows, the quasi-permanent equity fund grows.

Planning for asset replacement influences retained earnings strategies. Inflation raises all costs on an income statement, except for the depreciation expense which must remain fixed under current law. In theory, this cashless expense enables a firm to replace its productive assets after they are worn out. Inflation, however, raises the replacement cost of assets, and thus depreciation expense cannot generate enough funds for replacement. To insure adequate replacement of assets, a portion of the retained earnings or the quasi-permanent revolving fund should be targeted for this purpose.

When using a weighted average cost of capital, it is necessary to determine a cost for the retained earnings. In cooperative finance as in corporate finance, the cost of retained earnings is the same as the cost of equity. If the retained earnings are invested at a rate less than the cost of equity, the market price of an investor owned firm's stock will decline. In a cooperative, a rational and informed membership would realize that an investment which returns less than their opportunity costs would leave them worse off. They would prefer to receive the retained earnings plus any taxes paid by the cooperative as cash patronage refunds. Even if earnings are only retained from business with nonmembers, these retained margins must still generate at least the cost of equity. Otherwise, additional capital from the members must be obtained.

Perhaps the most important question regarding retained earnings is how to compute its value as a return to members. Although some have argued that retained earnings are a lost return, members receive an indirect return from them. Retained earnings are used for investments which generate a stream of cash or services to members. The value of retained earnings to an individual is the net present value of the cash stream generated during the time an individual plans to remain with the cooperative. This may be greater than or less than the cost of the investment. The value of retained earnings is represented as follows:

$$RE_t = NER_t \ (1-t_c) + ITC, \text{ given } (5.2) \tag{5.1}$$

where: RE_t = retained earnings in period t

NER_t = net earnings retained (before tax) in period t

t_c = tax rate

ITC = investment tax credit

$$ITC \leq t_c \cdot NER \tag{5.2}$$

The investment tax credit used cannot be greater than the tax paid. The value of retained earnings as a return to a member at a given point in time, t = 0 is:

$$V_{RE_o} = \sum_{t=0}^{LM} \frac{r_m \, RE_t}{(1+K_w)^t} \tag{5.3}$$

where: r_m = rate of return on assets going to members

LM = anticipated length of membership

K_w = required wealth return; the adjusted cost of equity

Obviously, members about to exit the cooperative, would place a very low value on returns in the form of retained earnings. Due to the wide variation of membership terms and member cost of capital, there will be wide variation as to the valuation of retained earnings. For most federated cooperatives, the member retail cooperatives are assumed to belong indefinitely with few exits. Wide variation of valuation would still exist, however, because of the flow through effect to the members of the retail cooperative, who naturally are not indefinite members. Members receive from retained earnings, the lowest return of all the forms of internal equity. Consequently, a cooperative should consider the impact that a policy of retained earnings will have on member satisfaction. The pros and cons of retained earnings are summarized below.

Advantages in using unallocated retained earnings.

1. If used in coordination with investment credits, retained earnings can be an inexpensive way of raising funds because of the low administration and flotation costs. The Investment Credit Amendments of 1978 and 1979 have now enabled cooperatives to take advantage of

tax credits for new capital purchases. Thus, cooperatives may reduce or escape the tax liability, generally associated with retaining earnings.

2. Retaining nonmember net margins rather than distributing the after-tax proceeds to members means that the nonmembers share in the services generated by the investment or the lower costs.

3. Retained earnings are regarded by lenders as permanent capital. Consequently, the terms and the availability of debt may be improved by retaining earnings rather than distributing them.

4. Retained earnings have been used as a means of structuring in a capital gain with the return to members. When members exit, their shares are redeemed at book equity, rather than par or face value. Thus the member is able to capture both the members' and the nonmembers' contribution to retained earnings.[1]

5. Retained earnings do not require a large one lump sum payment as with the revolving fund. The cooperative has more flexibility. It does not have to worry about future repayment.

6. The cooperative is not precluded from allocating out the retained earnings. Such allocation must be on the basis of patronage. Usually an average of several years is used.

7. The tax courts have ruled that losses from nonmember business can be used to reduce the taxable income of member business.

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[1]Kenneth W. Gideon, "Report of the Subcommittee on New Development Regarding Capital and Financial Structure of Cooperatives," <u>Cooperative Accountant</u>, Summer 1981, p. 67.

Thus, it is possible to retain income from member business without tax liability.[1]

Possible disadvantages in using unallocated retained earnings.

1. Tax liability in the absence of significant tax credits or shields.

2. If the cooperative has a policy of new members purchasing the book equity of exiting members, barriers to entry could become a problem.

3. The liquidity risk of the members' interest in the cooperative increases as the percentage of equity in retained earnings increases.

4. The benefits of retained earnings do not necessarily pass to members in proportion to their contribution to capitalization or to their use of the cooperative. If the retained earnings are used to increase the value of ownership of interest, then the benefits of retained earnings are received on a per capita basis assuming equality of ownership.[2]

5. In the event of liquidation or dissolution, some states require that this surplus be apportioned on a per capita rather than a

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[1]Rev. Rul. 277, 174-2 Cum. Bull. 274. There is controversy surrounding this point. John J. Blair ("Issuance and Redemption of Nonqualified Written Notices of Allocation," Cooperative Accountant, Summer 1980, pp. 23-4) states that the IRS will probably not follow the entity concept while Neil E. Harl (Agricultural Law, Vol. 14 [New York: Matthew Bender, 1981], Section 135.02(7)) believes that it will.

[2]Gideon, "Report of the Subcommittee," p. 67.

patronage basis. Some states require that any surplus be transferred to other cooperatives or given to the state.[1]

6. When earnings from member patronage are held as unallocated retained earnings, there may be a tax liability at the cooperative level which could have been avoided.

7. Differences between members regarding the perception of the value of retained earnings could lead to internal conflict.

8. If retained earnings are eventually allocated out, there can be a great loss in the precision that should exist in matching the distribution of retained earnings to those who patronized the cooperative at the time the earnings were made.

Strategies for using retained earnings.

1. Suppose a cooperative has a policy of distributing retained earnings as capital rents. If the cooperative revolved out the retained earnings with redeemed patronage refunds, the retained earnings will be taxed at the capital gains rate rather than as dividends.[2] This policy also insures that the limited return on capital rule is not violated. In this instance the return in the form of retained earnings is based on patronage, not capital.

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[1] Israel Packel, The Organization and Operation of Cooperatives (Philadelphia, Pennsylvania: ALI-ABA, 1970), p. 187.

[2] Erdman and Larsen, Revolving Finance, p. 108.

2. Eidam has recommended cooperatives go through a periodic reorganization.[1] The function of a reorganization would be to retire the capital interests of former members and to make whatever legal and organizational changes that are necessary to ensure adequate capitalization. Reorganization also provides the opportunity to allocate the previously unallocated retained earnings and perhaps to revalue the member interests in the cooperative to reflect the change in value of the cooperative.

3. With inflation, depreciation fails to generate sufficient funds to replace the asset at the end of its useful life. A crude rule of thumb can be used. The cooperative needs to generate enough cash over the life of the asset to pay its inflated cost. Thus, the shortfall is the replacement cost minus the purchase cost.

$$\text{Set } Z = \sum_{t=1}^{L} X_t \ (1 + roa) \tag{5.4}$$

where: Z = cash the cooperative must generate

roa = cash rate of return generated by the asset

L = useful life of the asset

X = unknown variable

$$\text{Since } RC = P\ (1 + K_i)^L \tag{5.5}$$

where: RC = replacement cost

K_i = inflation rate

P = purchase price of asset

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[1] John Eidam, "Reorganizing and Financing Agricultural Cooperatives," Law and Contemporary Problems, Summer 1948, pp. 420-9.

$$\text{Then the Shortfall} = RC - P \tag{5.6}$$

By setting $RC - P = Z$ or $P\ (1 + K_i)^L - P = \sum_{t=i}^{L} X_t\ (1 + roa)$ and solving for X, X should represent the amount of cash the cooperative needs to generate each period to ensure replacement of the asset. With inflation, X will be greater than the depreciation rate. A cooperative should consider retaining earnings or increasing the quasi-permanent revolving fund to make up the shortfall.

4. The following equations indicate what levels of retained earnings are consistent with growth targets and capital plans. The desired growth of assets is equal to the amount of new assets financed by debt *plus* retained earnings *plus* the change (positive or negative) in the revolving fund.

$$A' = \frac{D}{D+E}(A') + RE + RF' \tag{5.7}$$

where: A' = the desired change in assets

D = debt

E = equity

RE = retained earnings

RF' = net change in the revolving fund

Rearranging:

$$RE = A' - \frac{D}{D+E}(A') - RF' \tag{5.8}$$

The equation illustrates how the level of retained earnings is related to a growth target, debt policy, and management of a revolving fund.

In addition, the tax management strategies of a cooperative will effect the desired amount of retained earnings.

$$RE = (1-t_c)\phi_t X_t - DIV_t \tag{5.9}$$

$$RE = \phi X_t - \phi t_c X_t - DIV_t \tag{5.10}$$

where: ϕX_t = the amount of operating income for retained earnings and dividends

$\phi t_c X_t$ = the amount of corporate taxes

DIV_t = the amount of dividends paid out

The above relationship has to hold. Therefore, the more earnings that are retained, the more taxes that must be paid. When available tax shields and credits are exhausted the cooperative must weight carefully the benefits and cost of retaining earnings.

5. Leveraged retained earnings: Some cooperatives will have taxable income which has been generated by nonpatronage sourced income. Rather than leaving these earnings in the retained earnings account, the cooperative could use these earnings to make dividend payments to preferred stockholders and to holders of notices of allocation. In this manner, the cooperative may be better able to tap member and external sources of capital.

Retaining earnings on a permanent basis stabilizes cash flows and may lower the cost of debt. On the other hand, allocating and periodically distributing retained earnings increases the value of retained earnings as a return to members. Upon allocation, this equity is by definition, no longer retained earnings. The allocation of earnings to members on the basis of patronage will be discussed in detail in the next section.

Patronage Equity Revolving Fund

A revolving fund is a means of raising temporary capital. This discussion of the revolving fund is composed of seven parts: (a) definition, (b) decision variables, (c) cost, (d) value as a return, (e) advantages, (f) disadvantages , and (g) management strategies.

Definition of the revolving fund. Members must authorize management or the board, in a cooperative's bylaws, in order for a cooperative to defer cash redemption of the allocated patronage refunds. When a cooperative's fund has accumulated a desired amount of capital, its board can revolve out the previously retained patronage refunds as new patronage refunds are retained--hence the name revolving fund.

The revolving fund has been described as the financial intermediation arm or agency of cooperatives. This is because a cooperative that uses a revolving fund is using its short-term liabilities to finance long-term assets.

> It is just as if the cooperative consisted of a fund raising intermediary and a productive facility which utilized the funds acquired by it. The intermediary branch purchases the direct securities from the productive branch, and issues its own indirect securities to the ultimate lenders.[1]

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[1]Ryland A. Taylor, "Cooperative Finance as a Form of Financial Intermediation," Cooperative Accountant, Winter 1971, p. 31.

Revolving funds originated from the need to raise equity capital, the instability of emerging cooperatives, the temporary nature of cooperative equity, and cooperative ideology. Prior to the introduction of revolving funds, many cooperatives had difficulty raising equity capital beyond the original subscribed shares. Members, then and now, often perceive few benefits from investing in a cooperative because they receive their major benefits from patronage rather than ownership.

> This dichotomization of benefits led to the downfall of many early cooperatives. While capital could be raised on the basis of expected marketings, the changing volume of business by existing members and the turnover in membership caused this initial correspondence of capital and return to change over time. Retiring members sold their interest in the cooperatives to others, while hardpressed members sold theirs as well, often resulting in the loss of patron control and the cooperative character of the organization.[1]

The revolving fund is a relatively painless and low transaction cost way to raise equity capital. If equity redemption is provided for retiring members, then active members contribute to the fund in proportion to their patronage.

Decision variables of the revolving fund. The management of the revolving fund requires attention to the following decision variables: (a) the payment decision, (b) the redemption decision, (c) capital rents, and (d) the form of the retain certificate (paper patronage dividend). These decisions should be made simultaneously because of their interactions with one another, and their joint impact upon the required rate of return.

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[1]Taylor, "Cooperative Finance," p. 29.

1. Payout: As the cash portion of the patronage dividend increases, a cooperative must increase the length of the revolving period, or seek additional capital elsewhere. The lower the cash payout, the shorter the revolving period or the lower the outside capital requirement. In making this decision, management must examine the costs of the forms of capital, the capital supply curve of the members, and possible interactions between the financing decision of the cooperative and prospective investment decisions.

The cooperative also has to decide if the cash payout should be a fixed or a variable percentage. Although some cooperatives try to operate with a fixed percentage payout, it is not recommended unless the cooperative is in a very strong financial condition.

A change in the cash payout can also affect the holders of older retain certificates. As the cash payout is increased, holders of older retain certificates must wait longer for redemption. Consequently, when cash payout is increased, these older members (in the absence of compensating capital rents) are subsidizing the other members.

2. Another aspect of revolving fund management is deciding the legal form of the retain certificate. The cooperative must decide the tax liability that the membership will incur when receiving this certificate and the capital or ownership rights of the certificate issued.

The tax liability issue is only applicable to members that are businesses or workers. If the members are consumers or consumer cooperatives that pass through the patronage refund to consumers, the patronage dividends are not subject to taxation. Refunds to consumers do not increase the consumers' income, so they are not taxable. For workers in a worker cooperative these refunds are viewed as income and are taxable at the individual member level. For these members, the legal form of the retain certificates can have implications on their wealth return. So the question arises: Should a retain certificate be "qualified" or "nonqualified"?

When a retain certificate is qualified, the patron-members receiving it have agreed to include the value of the certificate as part of their taxable income. Issuance of the qualified retain certificate achieves for the cooperative, a tax reduction equal to the face value of the certificate. When a retain certificate is issued as nonqualified the cooperative will not be able to deduct the retained allocated net margin when the certificate is redeemed for cash by the member. The patron-member does not incur a tax liability until the certificate is redeemed.

Most cooperatives distribute retain certificates in the form of qualified certificates. For most cooperatives, particularly consumer cooperatives, this is probably the best method. There are situations, however, where the use of nonqualified retain certificates might be advantageous. Unless noted otherwise, these situations involve members whose patronage refunds are considered taxable income.

1. Members may be experiencing capital rationing. Members may prefer to have the cooperative assume the initial tax burden even though the value of the return is lowered.

2. There are often timing differences in tax and book income. Nonqualified retain certificates may enable the financial reporting of income and actual income to conform.[1]

3. There may be investment tax credits at the cooperative level which would be unutilized without the creation of taxable income. Nonqualified certificates present an opportunity for any cooperative which wished to retain earnings to do so painlessly. If the investment tax credits were sufficient, no tax would be incurred upon retaining these earnings.[2]

4. There may be a net operating loss carryforward that is about to expire and would be lost. The use of nonqualified certificates might create taxable income in order to utilize this carryforward. The neither the member or the cooperative would be saddled with the tax burden until redemption.[3]

5. The use of nonqualified retain certificates will enable a cooperative to avoid the twenty percent minimum cash payout requirement. If a cooperative is experiencing cash flow difficulties, it may wish to issue nonqualified certificates. The appropriateness of this action will depend on the size and timing of any tax burden at the cooperative level.

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[1]Blair, "Issuance and Redemption," p. 16.

[2]Myron J. Fleck, "Nonqualified Written Notices of Allocation May Salvage a Cooperative's Otherwise Lost Benefits," Journal of Taxation, June 1973, pp. 378-80.

[3]Blair, "Issuance and Redemption," p. 16.

6. Suppose a cooperative has a policy of using unallocated retained earnings. The issuance of nonqualified retain certificates will not affect the tax liability of the cooperative, but does have several advantages. The return in the form of retained earnings is not invisible. The members would have a legal instrument conveying their right to ownership to those earnings to be redeemed at some future time at the discretion of the board. Consequently, members would probably be likely to accept a policy of retaining earnings. Also, by issuing nonqualified retain certificates, the eventual distribution of the retain earnings is forced to occur and is reasonably accurate.

7. The membership may be composed of some members in very high tax brackets and others in low tax brackets. Because of their high tax brackets, the cash payout may be insufficient to cover the high-tax-bracket members' tax liability. The cooperative could accommodate the needs of everyone by giving each member the option of receiving either qualified or nonqualified allocations. Because each member has the same alternative, all members are being treated alike. The high-tax-bracket members who elected to receive nonqualified certificates would not have their patronage dividends (the paper portion) included in their taxable income. Thus, they would not be in the position of having to pay to receive paper.[1]

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[1]Blair, "Issuance and Redeption," p. 21.

8. A member's tax bracket may be higher than the cooperative's. In this case the use of nonqualified certificates would mean a lower initial tax burden for the member.

9. Some states require a minimum corporate tax. Since a tax is required, nonqualified certificates lend themselves readily to this situation.

10. If a cooperative is in its start-up phase, it probably has large amounts of investment tax credit. Start-up is usually the most vulnerable period for an emerging business, thus it needs to keep distribution of earnings to a minimum. By using nonqualified certificates, the cooperative can use its investment credits, avoid cash payment to members, yet give some form of compensation to its members.

11. The cooperative may wish to issue qualified certificates for member business and nonqualified for nonmember business. The revolving fund would only include qualified certificates. The cooperative could even have two revolving funds. A fund of short duration for qualified certificates and a fund of longer duration for nonqualified certificates (if derived from nonmember business).

The retain certificate may take the form of common stock, preferred stock, a note, or other legal instruments stating an obligation to pay the member its face value. Management must consider the following variables in determining the form of the retain certificate.

1. States securities laws: Many states do not allow the repurchase of stock by the firm. The cooperative contemplating

setting up a revolving fund must be careful that its certificates are not regarded as securities, thus requiring expensive registration fees.

2. Effect on cost of capital: If the retain certificates are issued as notes, the cooperative will be more leveraged. This could lead to a higher cost of debt from external sources. If issued as common or preferred, may lower cost of external debt as lenders see debt ratio fall.

3. Tax liability of cooperative: If the cooperative has taxable income, it may be advantageous to issue notes because interest payments are a deductible expense. The government in effect is paying for a portion of any interest charges.

4. Desired rent payment: Common stock is limited to a return of eight percent by federal statute.[1] However, there is no federal ceiling on the return for notes and preferred stock. A cooperative which desired to return more than eight percent must issue either notes and/or preferred stock.[2]

3. Capital rents: The decision regarding rents depends on the proportional contribution of capital, nature of the membership (capital supply curve), tax liability of the cooperative, and tax liability of the members. An individual member's equity is often not proportional to the member's patronage. The member's use of the

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[1] First enacted 1926.

[2] Some states do have limits on the rate of return on preferred stock and notes issued by cooperatives.

cooperative may vary from year to year. The member may even have stopped using the cooperative, but may still have retain certificates. This member is subsidizing the other members because members are expected to obtain their return from patronage. Capital rents on the retain certificates could correct this form of subsidy.

If the rent is sufficient, some members may be encouraged to hold rather than redeem their retain certificates thus leading to a greater supply of equity. The conversion of the retain certificates into rent-bearing instruments may affect member psychology, aside from any view of compensation. The members may perceive the retain certificate as an investment instead of perceiving it as something the cooperative owes them. They might therefore be less likely to agitate for redemption. Even though the total return to members may be less with capital rents on retain certificates, members may nonetheless perceive themselves as better off.

Capital rents may lower total return to members. Returns to consumers in the form of patronage dividends are not taxed as income. However, returns in the form of capital rents (interest, dividends) are taxed. In addition, if the cooperative issues the retain certificates in the form of stock and to pay rents in the form of dividends, it must normally pay the corporate tax rate on the income that is distributed as dividends. Dividends also must be prorated from all income. Consequently, the net rent may be taxed twice. Members may also experience an increase in the length of the revolving cycle of the retain certificates as cash is used to pay rents and taxes rather than retain certificates.[1]

Several sources have shown that rents may have a stabilizing influence upon patronage. Members may be more willing to patronize their cooperative if they receive compensation for their withheld patronage equity.[2] A cooperative desiring to issue rents may wish to do so as interest payments on notes. By issuing the retain certificates as interest-bearing notes, a cooperative may be able to take advantage of a tax shield effect.

4. Redemption of retain certificates involves two decisions. The first, order of redemption, involves the selection of criteria for redeeming retain certificates. FIFO or first in-first out is the most common. Retain certificates under FIFO are redeemed first. FIFO is probably the most equitable. However, many new members may have to wait several years before they experience any redemption of their retain certificates. If these new members are also new businesses these early years are critical. At the same time many established older members may be established economically and may have cash

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[1]Jeffrey S. Royer, "Mandatory Equity Programs Could Alter Traditional Cooperative Financing Methods," Farmer Cooperatives, September 1981, p. 13.

[2]Daniel L. Jensen, "The Role of Interest in Revolving Capital Plans for Cooperative Enterprise," International Journal of Accounting, Spring 1974, pp. 105-109; David W. Cobia and Luis A. Navarro, How Members Feel About Cooperatives, Agricultural Economics Report No. 86 (Fargo, North Dakota: Department of Agricultural Economics, North Dakota State University, July 1972).

surpluses. In light of this, some cooperatives have opted for the percentage method, whereby a percentage of each member's certificates are redeemed, regardless of their tenure in the cooperative. Although it can be argued that older members are subsidizing new members, the percentage method may provide for greater stability in membership.

The cooperative may wish to have special redemption plans to meet the particular needs of the members. They include redemption for estates, retirees, hardship, and "on call-discount." On-call discount redemption refers to the redemption of retain certificates at the discretion of the patron. However, redemption does not take place at face value, but is discounted by the cooperative. Discounting enables the members to obtain funds if it really desires them. The discount discourages "runs" on the retain certificates, however. The cooperative has to be careful in administering this plan. It must choose a discount rate that is fair, but does not encourage excessive redemption. Because the cooperative realizes a paper gain, it must be watchful of the tax implications of discounting and how it fits into its overall tax management program.[1]

The second redemption decision and perhaps the most controversial aspect of redemption is deciding the length of maturity of the retain certificates (the length of the revolving cycle). The decision involves deciding the time period from allocation to redemption and the constancy of this decision. In making this

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[1] See Frank L. Bradley, "Equities Redeemed at a Discount," Cooperative Accountant, Fall 1981, pp. 3-5.

decision, the cooperative must consider the cost of capital, member supply capacity, risk, and tax liability.

A common criticism of the revolving fund is that the cost of equity increases with an increase in the maturity (or revolving cycle).[1] The reasoning behind this argument is that risk increases with an increase in the revolving cycle, and therefore, the cost of equity capital must rise. This argument ignores the nature of risk adjusted discount rates, the nature of wealth returns, and the interaction of the revolving fund and leverage.

Any risk-adjusted discount rate automatically recognizes that more distant cash flows have more risk. The discount rate compensates for the risk borne per period. The longer the duration, the greater the number of periods and the larger the total risk adjustment. The riskiness of all returns (security, social, dividend, cash patronage dividend, value of redeemed retain certificate) is reflected in the discount factor.

There is a single required return for the cooperative investment, not one for each type of return. A longer revolving cycle may mean larger cash payouts, greater security return, etc. When the returns are viewed in total there may not be a change in the return with an increase in the revolving cycle.

The argument that risk increases with the revolving cycle ignores the effect of debt. As the revolving cycle increases, there

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[1] Taylor, "Cooperative Finance."

would be less need for debt. Then, the member required rate of return would decline as leverage declined.

Increasing the length of the revolving cycle can affect the member capital supply curve. A redemption program which is uncertain or highly variable can lead to hostility. Inflation and the time value of money may sharply reduce the value of this return. If the required return is not made up in other ways (cash payout, security return, etc.) the member may become reluctant to supply capital or to patronize the cooperative.

The absence of a policy on the length of the cycle may create problems. Management may not redeem the retain certificates if not disciplined with maturity dates or capital rents. Management often views the revolving fund as a "free" source of capital with no provision for repayment. Consequently, investment decisions are made which do not return the opportunity cost.

The counter argument to a set redemption plan maintains that it severely restricts the cooperative's flexibility. This problem will depend upon the availability of other forms of capital and the flexibility the cooperative has in setting the cash payment. The smaller the payout the more flexibility the cooperative would have in meeting a fixed length of cycle.

The length of the revolving fund can affect tax management strategies, particularly strategies involving nonqualified retain certificates. The Internal Revenue Service allows two different methods for calculating taxes: (a) the deduction method and (b) the tax credit method.

Under Section 1383, the cooperative computes its tax for the year of redemption by first reducing the current taxable income by the amount of the redeemed nonqualified patronage. This is the deduction method.

The tax credit method involves the recomputation of the tax for all years in which the redeemed paper was issued as though it had been qualified when issued. The cooperative's current tax is the lesser of the two methods. When computing the tax under this method, any item affected by gross income or taxable income must be adjusted. Thus, investment tax credit limitations, contribution limitations, loss carrybacks, and carryforwards must be considered. Also, the Section 1383 regulations eliminate the possibility of picking and choosing the most favorable years when adjusting the prior tax year liabilities. Rather, a cooperative must consider "all" notices redeemed during the current taxable year as qualified.[1] Thus the year in which one chooses to redeem nonqualified retain certificates is very important. In order to follow the goal of minimizing tax liability, a cooperative would want to keep the duration of nonqualified retain certificates flexible.

In recent years, some cooperatives have extended the redemption date of the retain certificates to the date of termination of the individual's membership, with periodic adjustment. This adjustment ensures that a member is not contributing more than a

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[1] John E. Thomas and Kenneth R. Nilsestuen, "Advance Planning for Redemption of Nonqualified Allocation and Retains," Cooperative Accountant, Spril 1980, pp. 34-38.

proportional or fair share. These "Adjustable Revolving Fund Plans" have enabled many cooperatives to increase the cash payout of their patronage dividends. The Adjustable Revolving Fund will be examined in greater detail under a separate section.

Cost of equity generated. As described in the previous section, the required rate of return does not necessarily increase with changes in the revolving cycle. And, a quasi-permanent amount in the fund is formed after the fund has been operating for the length of its cycle. Therefore, in most cases, the cost is the same as for the capital share--the required rate of return of members.

Value of retain certificate. The value of retain certificates as a return depends on the capital rents generated by these certificates and the length of the revolving cycle; however, one cannot look at one type of return in isolation. All returns must be examined at the same time.

Advantages of the revolving fund.

1. "Maintains equities in proportion to user when revolving or holding periods are kept reasonably short."[1]

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[1]Donald R. Davidson and David W. Cobia, "Inflation, Need for Prompt Capital Equity Program Reviews," Farmer Cooperatives, April 1981, pp. 9-11.

2. "Furnishes a ready means for separating capital into separate funds or departments when needed to increase equitability of patronage allocations."[1]

3. Low transaction cost.

4. Suitable for slow to moderate growth.

5. Flexibility: In times of financial distress or capital shortage the revolving cycle can be extended.

Disadvantages of the revolving fund.

1. Can be abused by management.

2. May not be suited for rapid growth.

3. Inequitable conditions can develop if the revolving cycle is too long or if margins vary over time.

4. Cash flow problems can develop with a fixed revolving cycle.

5. Psychological: The I.R.S. may view retain certificates in the revolving fund as equity, but members often view them as debt--something the cooperative owes them.

Strategies for using the revolving fund

1. Voluntary revolving fund: This may be useful in a situation where some members have exhibited hostility to the revolving fund. A voluntary revolving fund does not have a set length. Rather the cooperative uses rents or discounts to "control"

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[1]Davidson and Cobia, "Inflation," pp. 9-11.

the amount of redemption. A sufficiently high rent can encourage members to view the retain certificate as an investment rather than as a debt owed to the members. If the member has greater opportunities than the rent paid by the cooperative, it can redeem the certificate at its discretion or perhaps by mutual agreement to avoid risk. The cooperative may wish to allow these retain certificates to be freely traded among members. A limitation should be placed upon the amount an individual member could garner, to prevent undue influence. The advantages of a voluntary revolving fund are that members can redeem certificates to meet their needs and management can fine-tune redemption to tap individual capital supply curves. The disadvantages include the administrative cost and managerial demands.

2. Convertibles: A cooperative could put a convertibility right on its retain certificates. During the first period (say one to four years) the retain certificate pays a limited rate of return. If the cooperative has failed to redeem the retain certificate during this period, it becomes convertible into a note paying the market rate of interest. At a future time (five years, for example) a cooperative has to redeem the retain certificates upon demand. Many members would probably choose to hold their certificates as investments rather than redeeming them. Convertibles might be useful for members whose use of the cooperative is disproportionate to their contribution or who have retired from the cooperative.

There are difficulties which would have to be addressed. Management must be sophisticated in its planning and not susceptible to political pressure in managing the fund. Certificates with convertibility rights may be considered securities by government agencies. Lenders may also move to restrict the activity of such a fund because of its debt-producing ability.

3. Annuities: For retiring members, particularly members in worker cooperatives, their retain certificates and all other equity interests might be convertible into annuities. This might solve the problem of retiring members removing their equity for a retirement fund. A cooperative would not experience the pressure to disband by selling to a proprietary firm in order to meet the demands of a wave of retiring employees. Also, entry costs for prospective members could be kept down.

4. Multiple revolving funds: Multiple revolving funds may assist the cooperative in its equity redemption program. Separate equity accounts can be established for the retained patronage refunds from local operations and another for refunds from other cooperatives (federations). The separation of these accounts shows the members the origin of their patronage equities and the relative size of their investments in federated cooperatives. This facilitates the analysis of local and federated performance and may reduce discontent regarding the fund.[1] Another aspect of multiple fund operation is the manipulation of cash flows to create a steady

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[1]Roger A. Wissman, "Federated Cooperatives Play Vital Role in Equity Redemption," Farmer Cooperatives, February 1981, p. 8.

constant payout. This could increase member dependency and consequently risk. A stable flow of redemptions, however, could lead to greater confidence in the cooperative, the use of retain certificates as loan collateral, and a lower required return as liquidity risk is reduced.

Patronage dividends in the form of retain certificates would be issued in two forms. One certificate would have a fixed duration, the other certificate would have no fixed redemption date. The redemption of the nonfixed certificates would be coordinated to insure a steady cash payout each year. This system is especially conducive to a producer cooperative which issues nonqualified retain certificates to represent retained earnings. A cooperative can use the nonqualified retain certificates in the nonfixed fund.

A dual revolving fund enables a cooperative to reduce the variability of its cash flow of redemptions. This may lead to a lower return to members if cash is not distributed in anticipation of future redemption. Members may realize greater utility, however, because cash disbursal is increased and is more stable.

5. <u>Federation participation in local cooperative redemption</u>: Many farmer cooperative federations participate in the local members equity redemption programs. Participation may include redemption of estates or redemption of retirees' accounts. The federation usually redeems a proportionate amount of the local cooperative's patronage

equity in the same proportion as the individual member's investment in the local cooperative.[1]

Some federated cooperatives may operate a mutual fund to aid in the retirement of patronage equity at the local level. Member cooperatives contribute to this fund which in turn is redeemed when local members exit.[2]

Ideally, the revolving funds at the local and federation level operate on the same cycle. Cash management for local cooperatives would be simplified with this strategy.

6. Issuing retain certificates as a mix of equities and notes: By adjusting the proportion of notes, preferred stock, common stock, etc., a cooperative can manipulate tax liability, return to members, cost of debt, and cost of capital as discussed earlier. If done wisely, a cooperative can maximize the benefits to members. Management of the proper mix of securities, however, necessitates consideration of all other financing decisions.

7. Multiple payouts: When the members have different tenure, cooperatives may find it wise to have different cash payouts on patronage dividends. The cooperative might consider a higher payout for members who had a disproportionate share of equity. This may

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[1]Wissman, "Federated Cooperatives."

[2]Michael Lee Cook, "An Economic and Legal Analysis of Farmer Cooperative Equity Capital Redemption Policies" (Ph.D. dissertation, University of Wisconsin-Madison, 1976), p. 171.

provide some compensation for long tenured members if they are not receiving capital rents.

8. Rents on retain certificates: When capital contribution is not proportionate to patronage, a cooperative might consider only compensating of the over contribution. This would enable a cooperative to minimize the negative effects of rent payments. Also, by compensating only the over contribution, by using an individual's entire equity base as a basis for compensation, a cooperative might be able to pay a capital rent greater than the eight percent limit.

9. Short revolving cycle: It is probably best to keep a relatively short revolving cycle (three to five years). The cooperative should have a policy (but not a mandatory program) of a short revolving cycle. A policy implies a goal rather than a requirement. Thus a cooperative is not hamstrung by a required cash outflow, but members are assured of a reasonably quick redemption when the cooperative is able.[1]

10. Subsidization of new members: New members are often allowed to build up their equity to the required amount (to be proportional to patronage) by subscription or by having a cooperative issue them a smaller cash payout. In either case, if it takes several years for a member to achieve its share, in effect it is being subsidized by older members. A new member is receiving a higher

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[1] Donald R. Davidson, "Dairymen, Inc. Makes Short Revolving Cycle Work," Farmer Cooperatives, August 1980, pp. 9-11.

return on its investment in its cooperative than older members because its investment per unit of return is less. If this becomes an issue, a cooperative may wish to impute an interest cost (to be deducted from the patronage dividends on the unmet capital requirement).

11. Capital retains: Commonly used in marketing cooperatives, capital retains could be useful in supply cooperatives. Capital retains have the advantage of being exempt from the twenty percent cash payout requirement.[1]

Adjustable Revolving Fund (Permanent Fund)

Some cooperatives are turning to an adjustable revolving fund as a means of increasing the generation of equity and facilitate capital planning. An adjustable revolving fund is commonly called a permanent fund or base capital plan. An adjustable revolving fund operates as follows:

1. Determine the total capital requirements of the cooperative for the coming year.
2. Determine the relative patronage of each member over a set number of years.
3. Use the member's percentage of patronage to determine the capital required from each member. (Average percentage of patronage times the capital requirements of the cooperative equals required contribution of the individual.)
4. Calculate the patronage dividend due each member. If the member's capital account is not full, then part or all of the patronage dividend is applied toward meeting the member's capital contribution. Any patronage dividend remaining is paid out in

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[1]Davidson and Cobia, "Inflation Need," p. 9.

cash. The portion applied to the capital contribution is represented by the appropriate form of retain certificate.[1]

The decision variables for an adjustable revolving fund are summarized as follows:

1. In order to determine the capital requirement for each member, the number of years to use in determining the member's average patronage must be determined. Too long a period will tend to even out fluctuations or changes in patronage.[2] Too short a period may simply target an unusual event for the member.

2. The amount of capital an under invested member should provide must be decided.[3] Too large a requirement can discourage the growth of the membership. Too small a requirement can lead to subsidization of new members by old members.

3. A redemption plan and/or compensatory rent payments are needed for members who have contributed a disproportionate share of capital. Otherwise, inequitable treatment of members will result.

4. Determination of each member's capital contribution involves two decisions: (a) the amount of equity capital needed and

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[1] Nelda Griffin, How Adjustable Revolving Fund Capital Plan Works (Farmer Cooperative Service, USDA, April 1963), General Report 111.

[2] J. Warren Mather and Kenneth P. Krueger, "The Base of Adjustable Capital Plan: An Approach to Equity Redemption," Farmer Cooperative, March 1981, pp. 11-14.

[3] Ibid.

(b) the method of capital contribution. Capital contribution can be tied to assets employed, sales volume or weight.[1]

Advantages of an adjustable revolving fund.

1. "Financial responsibilities are tied directly to patronage"[2] leading to a more equitable situation for members.

2. "Members can more readily see their responsibility to invest in their cooperative because they are assured that they are investing only their share and thereafter will receive all refunds in cash when their share is paid up."[3]

3. The problems with inactive members are reduced.

4. "Allows the board and management to do a more accurate job of budgeting and funds flow forecasting because of improvement in predictability and reliability of capital sources."[4]

5. The adjustable revolving fund may lead to a greater member loyalty. The member gets most of its return from patronage. Thus, if investment is "prepaid," the member has an incentive to patronize the cooperative as much as possible during that period.

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[1] Robert C. Luizzi, "Member Investment Plan Based on Assets Employed," Farmer Cooperatives, January 1981, pp. 18-20.

[2] David W. Cobia, "Equity Redemption: Issues and Alternatives," Farmer Cooperatives, July 1980, pp. 18-20.

[3] Ibid.

[4] Mather and Krueger, "Base of Adjustable Capital Plan," pp. 11-14.

Disadvantages of an adjustable revolving fund.

1. Complexity: It is more difficult for members to understand and for the cooperative to administer.[1]

2. "Boards may hesitate to sufficiently increase estimated equity requirements for sound financial operations."[2]

3. "Patrons may find it difficult to provide their equity share."[3]

4. Guidelines for the transition from revolving fund to an adjustable revolving fund have not been adequately developed.[4]

Strategies in using the adjustable revolving fund.

1. Variable cash refund: Assuming a stable membership, the cooperative can use a variable cash refund plan to address the problem of members who are not fully paid up in their capital contribution requirement. The cash portion of the patronage refund for each member is determined by the extent to which a member is paid up. The more one is paid up, the greater the cash payout. For example, a cooperative in Oklahoma has four different levels of cash refund: (a) twenty percent--for new members, (b) forty percent--until a member's share equals its ten year average patronage, (c) sixty percent--when capital contribution equals or exceeds its ten year average patronage, (d) one hundred percent--when the member's capital

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[1]Cobia, "Equity Redemption."

[2]Ibid. [3]Ibid.

[4]Steve Cooke, p. 21.

contribution equals or exceeds its share of the projected equity base. With this plan, long tenured members receive some compensation (larger cash payout and therefore a greater value for their patronage dividend) for subsidizing the newer members.[1]

2. Exchange of equity among members: The cooperative may allow members with an over accumulation of retain certificates (whose contribution is greater than their projected share) to sell these retain certificates. These "extra" retain certificates would be sold to members whose contributed capital is not up to their required share. Over invested members can divest themselves of cooperative equity when they need cash rather than waiting for the cooperative to redeem them. This strategy has two principal advantages. Under invested members can build up their capital share in good times, and members can utilize certain tax management advantages.

When equity is purchased at a discount to its face value, the gain realized at redemption is taxed at the capital gains rate not as ordinary income. The cooperative may wish to set certain restrictions. The cooperative may wish to control and record these transactions. It may also be desirable to control the maximum amount any one party may control or may transfer at any one period.[2]

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[1]Wissman, "Federated Cooperatives," pp. 8-11.

[2]Cobia, "Equity Redemption."

Debt as Source of Capital

The effect of debt on the cost of equity and the composite cost of capital were explored in earlier chapters. There are other considerations in using debt, however, in addition to its effect on costs. Debt use can (a) transfer risk, (b) decrease barriers to entry for new members, (c) decrease the capital burden, and (d) obtain managerial and technical services.

1. Risk transference: It is commonly held that debt use automatically transfers risk from the members to the lenders. Replacing equity with debt capital does mean that there is less for the equity holders to lose. The probability of a loss to member equity is increased, however, because of the risk associated with leverage. Also commercial banks would require a risk premium to cover the increased probability of financial distress.

There are two situations where a cooperative can transfer risk to the lending situation. The first is when a cooperative already has assumed some debt. The lender has calculated its required rate of return with regard to the riskiness of a cooperative's cash flows. In the absence of restrictive covenants the cooperative which enters a riskier business enterprise will be shifting a disproportionate share of the risk to the lender. The lender is still only receiving the compensation for the previous level of risk.[1]

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[1]Meckling and Jensen, "Theory of the Firm," pp. 305-360.

Risk transfer may take place in the cooperative banking system. The cooperative banking systems (both farm and consumer) only charge one risk premium to all borrowers. Cooperatives in riskier industries or with a riskier operation would be transferring some of the risk to the cooperative banks. The cooperative banks do not charge a risk premium commensurate with this risk.

The cooperative banks do not necessarily have riskier loss portfolios than commerical banks, rather the more financially secure cooperatives are subsidizing the riskier cooperatives. The banks also can exercize considerable control over the prospective borrowers through the use of loan covenants. Thus the amount of risk that can be transferred is limited by the cooperative bank.

2. Decreasing the barriers to entry for prospective members: Some cooperatives (usually worker cooperatives) require a new member to purchase the equity interest (book value) of an exiting member. In many cases the cost of purchasing such equity is prohibitive if an exiting member has been with the cooperative some time. Replacing some of this member equity with debt (redeeming old retain certificates or distributing some of the retained earnings) may make the entry costs more affordable. This may insure continuity of the business as a cooperative.

3. Decreasing the capital burden of members: The membership may find it desirable to use debt beyond the optimal amount. Although the wealth return from the cooperative may be less, the utility received could be more. Members may be experiencing capital

rationing and difficulty in supplying capital. The use of debt could be used to redeem retain certificates or to increase debt payout. The utility generated from receiving cash in a critical period could be greater than the return foregone.

Member capital supply capacity may not be sufficient to achieve the optimal structure for the assets desired. The assets may be able to generate sufficient total return (wealth, economic security, and social return), however, even with the reduced wealth return. The wealth return would be less because of the higher debt servicing costs. The total return may be sufficient, even with a reduced wealth return, because a membership's desire for the economic security and social return generated by the assets.

4. Banking services: Another consideration in utilizing debt are the services (both intended and unintended) that a lender may provide. A lender may be large enough to afford specialists that can provide managerial and technical services. A lender having extended funds to the cooperative does not want to lose these funds. A lender will usually monitor a cooperative and alert it to potential problems.

Borrowing funds often forces a cooperative to submit to the guidance of another business institution. A lender will often place restrictions upon the cooperative through restrictive covenants in the loan agreement. Sometimes these covenants not only protect the bank's interests, but may indirectly protect the membership's investment in the cooperative.

By submitting itself to the guidance imposed by the bank, the cooperative may achieve a stability otherwise infeasible. Internal discipline for a cooperative is often difficult due to factionalism, internal politics, etc. Indeed, it has often been held that the strength of the farmer cooperative system has been due to this type of relationship between farmer cooperatives and their banking system.

Cooperative Banks as a Source of Debt Capital

An alternative to commercial sources of debt is the use of a cooperative borrowing source. Cooperatives can form an association which obtains funds from the debt markets to be used by the member cooperatives. In the United States, the consumer cooperative banking system and the farmer cooperative banking system enable the individual cooperatives to obtain more debt than would be possible through the commerical banking system alone.

Most cooperative banks do not increase their interest costs as leverage increases. Thus the coverage ratio does not decline as rapidly, as it would with commercial debt. Also, the cost of equity will not rise as rapidly with debt use for the same reason. At the same time, the lower total interest cost for a given amount of debt will increase the return that is available to compensate the member's required rate of return. Consequently, more debt can be used. Even if the cooperative bank should limit the amount of debt supplied, the increased debt capacity may be used to obtain further debt from commercial sources.

Strategies in Using Debt

Some rules of thumb or strategies for using debt are presented below. These "rules" are intended to be general guidelines. The decision to use debt should involve extensive planning and should consider the objectives and policies of the cooperative.

1. Cooperatives with no tax liability will usually receive little or no earnings advantage to using debt. If a cooperative returns all earnings as patronage dividends or has large accumulated losses, large depreciation deductions, investment tax credits, etc., it may not be in a tax paying position. The absence of tax liability means the absence of tax shields, and thus one of the primary advantages of debt. "Companies that do not pay taxes should avoid the use of debt."[1] Situations where debt can be advantageous from a growth standpoint will be examined in the last section of this chapter.

2. The use of large amounts of debt distorts the decision-making methodology available. Extra caution should therefore be used in considering large amounts of debt.

3. *Avoid debt when the risk is unknown.* When this risk of a product line or business is unknown, a cooperative would not want to worry about restrictive covenants and fixed debt obligations. "When you don't know what risks the firm may incure, you should finance mainly by equity."[2]

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[1] Brealey and Myers, Principles of Corporate Finance, p. 393.

[2] Ibid.

4. Some cooperatives have access to subsidized, below market interest rates on debt, usually because of a precarious financial condition. In making capital budgeting and capital structure decisions, these cooperatives should consider using the market rather than the subsidized rate. If a cooperative uses the subsidized rate, the discount factor will be smaller, and the amount of debt used larger. If the subsidized interest should end, the projects selected on the basis of the lower discount rate may not be able to generate enough earnings to cover the change in interest rates. If a cooperative has calculated its optimal capital structure on the basis of subsidized interest rates, a change of interest rates to market rates (upon rollover or refinancing) would mean that the cooperative would have to adjust its capital structure to one of less leverage. The adjustment to a less leveraged debt structure would be less painful, if the cooperative made investments on the basis of a discount factor which assumes market prices. The differences in expected returns of projects could be retained as internal equity.

5. Cooperatives with low coverage ratios should consider developing "surge capacity." Surge capacity is a reserve fund of highly liquid assets designated for cash flow emergencies. Surge capacity does involve an expense. The interest cost (or opportunity cost) may be greater than the earnings that are generated by this reserve fund. The difference between the earnings and the interest cost could be viewed as an insurance expense.

6. Cooperatives with low coverage ratios should also consider maintaining margins at market levels; thereby improving coverage and possibly the equity base.

7. Alternative debt financing arrangements are available as summarized below.

Income bonds. A cooperative is obligated to pay interest to holders of income bonds only when it has net earnings. Interest is cumulative and paid out when earnings permit. Income bonds reduce the risk of financial distress of the cooperative. Income bonds also enable cooperatives to fine tune their tax strategy, by paying out the interest in years of high taxable income. Sale of income bonds would be limited to members. The cooperative may find it expedient to have the retain certificates issued in the form of income bonds.

Single payment bond. A single payment bond pays the holder accumulated interest plus principal in one balloon payment at the end of the bond's life. Single payment bonds would offer straight-line amortization to the issuer over the life of the bond.[1] The coupon or annual payment of interest would be avoided. In addition, a tax savings could result because a cooperative can deduct a greater amount of amortized discount, on a year to year base than for an equivalent conventional bond.[2]

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[1] IRC Section 1232(a)(3) and Section 163.

[2] James S. Ang and Betty P. Wynn, "Single Payment Bonds--A Financing Alternative," Atlanta Economic Review, November-December 1977, p. 39.

Throughput and deficiency contracts. A throughput and deficiency contract guarantees that a taker (the member cooperatives) will purchase a certain volume of a project's output (the wholesale cooperative) in a timely fashion which will enable a wholesale cooperative to service its debt obligations. A taker also agrees to make these payments even if delivery is interrupted. A simpler variation of this method is a guarantee by the members to service the debt obligations of their federation without specific mention of the delivery of goods.

Commerical banks are sometimes reluctant to lend to cooperatives. By providing extra security the warehouse cooperative may obtain more debt or a better rate of interest. The membership would probably wish to make the risk (guarantee) proportional to patronage.

Financial leases. Financial leases are an alternative form of secured lending with somewhat different rights and restrictions. A particular cooperative may have little tax liability. This cooperative is unable to take advantage of the various tax shields. A for-profit leasing company is able to utilize these tax shields. Therefore, it can purchase the asset desired by the cooperative, capture the tax credit and pass a portion of the income on to the cooperative in the form of lower lease payments.

Leasing may enable a cooperative to obtain greater flexibility. Leasing allows a cooperative to leave the other credit sources untapped. Some leases permit a cooperative to cancel the lease. A cooperative may be able to obtain a flexible payment schedule with leasing to coincide with its earning stream.

Leasing can act as a hedge against inflation because a cooperative will be making the lease payments with inflated dollars. Although a debt-financed asset will also be repaid with inflated dollars, inflation has a negative effect upon the value of the depreciation deduction.

Leveraged leasing. In a conventional financial lease, the leasing company provides one hundred percent of the capital for the asset from its own funds. In a leveraged lease the lessor provides a smaller percentage of the necessary capital. Debt is usually obtained from commercial sources secured by a lease contract. To safeguard the lender, a trust is usually set up as an intermediary. This trust receives lease payments from the lease (user), pays the debt service (principle and interest) to the lender, and distributes the rest to the lessor.[1]

A variation of leveraged leasing is the use of documented discount notes (DDN) to provide financial leverage. A DDN is a short or intermediate term note which is guaranteed by a bank. The guarantee enables the notes to be sold to the public at a lower cost.

Another variation, used in the farm cooperative system, is an interfederation for-profit subsidiary. The subsidiary allows the cooperatives to take advantage of the tax shields and credits. Tax

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[1]See Brealey and Myers, Principles of Corporate Finance, p. 539, for a discussion on calculation of the discount factor for leveraged leases.

liability at the federation level is limited due to the eighty-five percent exclusion on company-owned shares.

Credit union administration of a member loan program: share-secured loans. A method utilized by the Leon County Food Cooperative (a retail consumer cooperative with a subsidiary warehouse) was the use of a credit union share-secured loan. It operates in the following manner.[1]

1. Members of a food cooperative become members of the credit union involved in the program.

2. Members of the food cooperative deposit money in their personal share (savings) account.

3. Members then borrow funds from the credit union, but pledge to keep an amount of shares in their account equal to the outstanding balance of the loan.

4. Participating members also sign an agreement authorizing the credit union to transfer the proceeds of the loan directly to an account of the food cooperative.

5. The food cooperative signs a loan agreement obligating the cooperative to repay the credit union directly for the principal and interest.

Benefits of this technique include the following:

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[1] Jerry Johansen, "Mutual Aid in Tallahassee," Moving Food, No. 12 (October-November 1981):31-34.

1. Participating members receive regular interest dividends on the savings account in the credit union even though it is technically collateral.

2. The credit union administers the loan program, thus freeing up the staff of the cooperative.

3. The credit union is exposed to little risk because the debt is secured by savings. Consequently, the credit union charges an interest rate less than commercial loan rates.

4. Members can withdraw funds from the share (savings) account.

Although this technique was designed for a retail food cooperative, it could be adapted for use by a federation or producer cooperative. This technique may be less effective for a federation because individual member retail food cooperatives would probably feel less loyalty to the federation. Federations may find it desirable to pass funds through the two layers of cooperatives. The retail cooperatives would enter an agreement with the local credit unions and the federation enters an agreement with the member retail cooperatives.

Determination of an Appropriate Mix of Capital Sources

Determination of an appropriate capital structure is more difficult for cooperatives than investor-owned firms. Corporate financial analysts are concerned with the capital structure's effect on the discount factor and the cash flow generated by the firm.

However, cooperative financial analysts must also be concerned with the effect on the return to the membership.

This part of the chapter will describe how different capital sources affect these three concerns: (a) discount factor, (b) cash flow, and (c) the return to the members. It is not possible to determine all of the interactions of the different sources of capital with these three concerns. The estimates of capital structure will, therefore, only provide rough guidelines to appropriate mixes of capital sources.

Mathematical programming techniques can be used to find a capital structure which maximizes the value of the return to its members. Two approaches will be presented: (a) a return maximization program and (b) a cost minimization program.

Return Maximization: LONGER

LONGER is a programming model developed by Myers and Pogue.[1] LONGER can be used in both capital structure and capital budgeting decision-making. The objective function of LONGER is to maximize the value of the firm:

$$V = V_o + t_c D \tag{5.11}$$

where: V = value of a firm

V_o = value of an all-equity firm

$t_c D$ = value of the debt shield assuming debt is permanent.

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[1] Stewart Myers and G. A. Pogue, "A Programming Approach to Coporate Financial Management," Journal of Finance 29 (May 1974): 579-599.

$$V_o = \sum_{t=1}^{n} \frac{X_t}{(1+K_e)^t} \tag{5.12}$$

where: X_t = net income generated by firm in period t

K_e = required rate of return

n = life of the firm

Ideally, one would add the indirect costs (bankruptcy, agency, etc.), in this function.

$$V = V_o + t_c D - IND \tag{5.13}$$

where: IND = indirect debt cost

The indirect costs, however, cannot usually be calculated. For practical purposes, the analyst may wish to adjust the debt use constraint where indirect costs are expected to begin.

LONGER is useful in capital budgeting because of the interactive effects that can occur between asset selection and financing. A new project may warrant a change in the firm's capital structure because of its effect on debt capacity. The objective function of this capital budgeting program is as follows:

$$V = V_o + t_c D + r_1 X_1 + t_c D_1 \tag{5.14}$$

where: V_o = value of an all-equity financed firm

$t_c D$ = value of the tax shield

r_1X_1 = return from the project X under consideration

t_cD_1 = value of the tax shield of the project under consideration

Since V_o and t_cD are fixed if it has already achieved its optimal capital structure, the objective function is $r_1X_1 + t_cD_1$, for considering one project. Since D_1 is the debt source variable, the solution will yield the optimal amount of debt to use. For multiple projects, the objective function is represented as follows:

$$V = \sum_{j=1}^{n} (r_j X_j + t_c D_j) \tag{5.15}$$

where: j = project identification number

Caution must be exercised in choosing the return coefficient for projects, due to the nature of the returns generated by a cooperative's assets. When viewing multiple projects, a cooperative must try to convert all the expected returns into a wealth return. Otherwise, projects which return low wealth returns may be rejected even though their total return may be quite high. Unfortunately, this conversion will be subjective and prone to error.

For the constaints of the program, any assumptions and limitations deemed necessary to describe the firm's situation may be added. Mutual exclusiveness, dependence, and contingent relationships between projects can be developed in the constraints. In addition, cash balance constraints, resource limitations, physical constraints, and cash outflow or rationing constraints can be developed.[1]

Of particular interest is the debt capacity constraint. Debt capacity is the ability of a project to attract debt financing. As a constraint, the debt capacity of a project is a percentage of the project's cost.

The nature of the member supply curve for a particular cooperative under consideration must be included. Members may demand a certain payout, maximum duration, or maximum equity contribution. These considerations can also be placed in the constraints.

In using LONGER with cooperatives, certain adjustments have to be made. The value of the tax shield is reduced by cooperative tax considerations and by the fact that the members usually do not capture all the benefits of the shields. Temporarily assuming that members can capture all of the return generated by the shields, the objective function is to maximize the following formula:

$$V = V_o + \phi t_c D \qquad (5.16)$$

where: V_o = the value of all equity-financed cooperatives = $\sum_{t=1}^{LM} \frac{R_{mt}}{(1+K_w)^t}$

$\phi t_c D$ = the value of the tax shield in the cooperative

ϕ = the percent of income facing a tax liability

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[1]See Brealey and Myers, <u>Principles of Corporate Finance</u>, pp. 647-52 for further discussion.

For capital budgeting, the objective function becomes "Maximize V."

$$V = V_o + \phi t_c D + r_1 X_1 + \phi_1 t_c D_1 \tag{5.17}$$

where: $r_1 X_1$ = wealth return

$\phi_1 t_c D_1$ = value of tax shield

ϕ_1 = percent of income from project facing a tax liability

D_1 = debt capacity of project

Assuming the cooperative has achieved its targeted capital structure, the objective functioning for selecting new projects is:

$$\text{Maximize } V = \sum_{j=1}^{n} (r_j X_j + \phi_j t_c D_j) \tag{5.18}$$

Relaxing the assumption that the members receive all the return from the debt shield, the objective function for a single project is:

$$\text{Maximize } V = r_1 X_1 + \sum_{t=1}^{LM} \sum_{t=1}^{L} \frac{(r_m \phi t_c K_d D_1)}{(1+K_w)^t} \tag{5.19}$$

However, there are considerable difficulties with working with this equation. Therefore, the original objective function provides a simpler, if somewhat less accurate, approximation.

Advantages of LONGER.

1. It provides a quick, objective criterion for selecting capital structure. Also, it can be used in capital budgeting.

2. The shadow price contains information regarding investment decisions. In the case of the investments constraint, the shadow price provides the adjusted present value of each project in the objective function.[1]

Disadvantages (or weaknesses) of LONGER.

1. LONGER utilizes the assumptions of Modigliani-Miller. It, therefore, suffers from the problems of the Modigliani-Miller world. LONGER will yield inaccurate results when there are capital market imperfections. The question remains, what is a more accurate method?

2. LONGER is not well suited for multiple project selection when the projects have differing mixes of return (wealth, economic security, and social). The cooperative may try to convert all the returns that are expected to be generated into a wealth return. Otherwise, projects which return low wealth returns but high total returns may be rejected. Unfortunately, this conversion will be difficult and subject to error.

3. The indirect costs of debt are not considered.

4. LONGER does not consider all of the interactions between the different equity forms and debt.

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[1]Myers and Pogue, "A Programming Approach," pp. 579-599.

5. It does not address the transition from an imperfect mix of capital to the targeted capital structure.

The Cost Minimization Model

The most common method of determining the optimal capital structure is the minimization model. With the minimization model one may take the traditional or the MM approach with regard to the effect of leverage on the costs of the capital sources. The reasoning behind this model is that by minimizing the total cost of capital, the value of a cooperative is maximized. The objective function is to maximize the cost of capital function:

$$\text{Minimize } C = \sum_{j=1}^{n} c_j X_j \qquad (5.20)$$

where: C = cost of capital

c_j = cost of the capital form source j (rate)

X_j = amount of capital from source j

Dahl and Dobson, among others, have used a different cost for each form of cooperative equity.[1] All equity that is tied to the requirement of being a member should, however, be treated as one source. The member share, patronage retain certificates, retained earnings are one source--the member equity capital. Equity not tied to the necessary capital contribution of a member (such as sales of

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[1]Dahl and Dobson, "Analysis of Alternative Financing," pp. 198-208.

preferred stock to the community) may be treated as a separate source. The other variables would be the debt sources.

Special care must be taken in choosing the cost coefficients, particularly for the member equity variable. The cost coefficient must be K_e, the total required rate of return, not the adjusted required rate of return (K_w or AK_e). The members may only expect K_w or AK_e as a wealth return, but the members expect all their returns (wealth, economic security, and social) to meet or exceed K_e. If K_w or AK_e is used, the program will tend to select more member equity than is optimal.

The tax shield effect (if applicable) can be placed in the objective function or in the constraints. In the objective function, it would be represented as another variable ($-\ \phi t_c D$). If placed in the constraints, the following relationship would be expected to hold:

$$C_1 = (1 - \phi t_c)K_d \qquad (5.21)$$

where: C_1 = adjusted cost of debt

ϕ = percentage of income subject to tax liability

t_c = tax rate

K_d = cost of debt

Another constaint that should be considered is the debt supply capacity. One can try to reproduce the nature of the debt market in the constraints. For example, if the debt market performed as if it were in a MM world, a constraint should reflect the way the debt curve rises with increasing leverage. Actually, it is more likely that the quantities of debt available are tied to the costs of the assets to be financed.

A cooperative should also place the effect of leverage on the required rate of return for equity holders. With the MM approach, the program constraint would be $C_1 = R_F + (R_M - R_F)\text{Beta}$. As long as the relationship between required rate of return and leverage can be represented linearly, it can be placed in the constraint.

Once an appropriate mix of debt and equity has been determined, it is necessary to calculate the optimal mix of equity sources. Equation 5.20 selects the mix of debt and equity which maximizes the value of return to the case of an investor-owned firm. This is not necessarily the case for cooperatives. The mix of equity sources determines the value of the return to members. The value of a member's share is therefore dependent upon the mix of equity sources.

Assuming no change in growth or patronage, the objective function could be represented:

$$\text{Maximize } V = \sum_{j=1}^{n} r_j X_j \tag{5.22}$$

where: r = percentage return from a dollar received in this form = return to member divided by the return to the cooperative

X = the form in which the return is received (retain earnings, patronage retain certificate, etc.)

n = the number of return forms.

In the case of the revolving fund a variable will be used for many different plans. For example, X_6 may represent a five-year plan redemption, forty percent payout, with eight percent payment.

Constraints must include the total equity needs (taken from Step 1) or balancing constraints so that only enough is taken for capital needs, and the nature of the member capital supply capacity.

The advantages and disadvantages of this program are summarized below.

Advantages of the cost minimization model.

1. It provides a quick objective method for selecting a capital structure.

2. It is easier to use than LONGER.

3. It can be readily adapted to use the MM or traditional assumptions.

Disadvantages of the cost minimization model.

1. It does not provide the capital budgeting information that LONGER does.

2. The indirect costs of debt are not considered.

3. There is the problem of converting the nonwealth returns to wealth returns.

Determination of the Mix of Capital Sources to Meet Growth Targets

An analyst must look beyond the costs of the capital sources in determining optimal capital structure. The previous section described how the capital structure decision is tied to such policies as entry cost, margin policy, and nonwealth returns. A critical component of the capital structure decision is growth policy. Cooperatives may pursue a policy of growth for one or more of the following reasons: (a) control over inputs (backward vertical integration), (b) control over assets (ownership rather than rental), (c) control over price (expanding market power), (d) expansion of new services to existing members (and possibly nonmembers), (e) expansion of existing services to new members (and possibly nonmembers).

Expansion of existing services to new patrons is the most common reason. One advantage of this expansion is the capture of economies of scale. Sales expansion may allow a cooperative to operate on a lower point on its long run average cost curve, thus lowering costs and increasing benefits to members. Failure to grow in the presence of competitors may result in a loss of competitive power. An aggressive competitor may capture economies of scale by increasing its volume. The reduction in costs enables the competitor to become more competitive. Thus, it can expand its share further. Then it may achieve still further economies of scale, and so on.

Economies of scale can extend beyond the productive facilities to include the cooperative organization. With increased size, the cooperative may be able to improve the functioning of the cooperative organization itself due to the following changes:

1. Replacement of volunteer labor with full time staff.
2. Improvement of the information flow to members.
3. Improvement of the quality of member services.

4. Increased sophistication in the financial management of the cooperative.

The Effect of Capital Structure on Growth Rate

A cooperative's ability to attain a certain growth rate is dependent on its ability to generate internal equity. Debt can sometimes enable a cooperative to overcome some of its weaknesses in generating and retaining equity. For example, suppose there is a market which consists of two businesses, a cooperative and an investor-owned firm which are locked in competition. The cooperative has a lower wealth return on assets because it provides a greater product line and greater benefits for its staff. Each business has the same interest costs and leverage. Utilizing the growth formula developed by Zakon, the growth rate in funds available for asset investment for both businesses can be examined.[1]

$$g = \frac{D}{E} (R_a - K_d)\, r + R_a r \qquad (5.23)$$

where: g = growth rate in funds for asset investment

$\frac{D}{E}$ = debt to equity ratio, the degree of financial leverage

R_a = wealth return on assets

K_d = required return for debt holders, the interest rate

r = retention rate of earnings

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[1]Alan J. Zakon, "Capital Structure Optimization," in The Treasurer's Handbook, ed. J. Fred Weston and Maurice B. Goudzwaard (Homewood, Illinois: Dow Jones-Irwin, 1976), p. 653.

Cooperative	Investor-owned firm
g = .0528 or 5.28%	g = .0612 or 6.12%
$\frac{D}{E}$ = .4	$\frac{D}{E}$ = .4
R_a = .16 or 16%	R_a = .20 or 20%
K_d = .12 or 12%	K_d = .12 or 12%
r = .3	r = .3

The cooperative's growth rate is less than that of the investor-owned firm. If economies of scale are present, the investor-owned firm may gradually force the cooperative out of the market. In this example, however, the cooperative could correct its disadvantage by increasing its leverage. Suppose the cooperative increases its debt/equity ratio to two ($\frac{D}{E}$ = 2). Assuming that the interest rate rises to thirteen percent, the growth rate becomes 6.6 percent. Thus, debt use, in this example, has enabled the cooperative to maintain pace with its competitor. A cooperative must be careful, however, to ensure that return is adequate to meet its members' increased required rate of return due to leverage.

Setting a Growth Target

In setting a growth target, an analyst must weigh the obtained benefits against the anticipated disadvantages. These disadvantages can be divided into two areas: (a) financial and (b) organizational. Financial problems include liquidity problems, inefficiency, loss of financial flexibility, and reduced return.

Liquidity problems can result from sudden market retrenchment, or uncontrolled growth. Uncontrolled growth can lead to liquidity problems because working capital may be converted into inventory and accounts receivable faster than new cash is generated by these assets. Otherwise successful businesses often incur business disruption or financial embarrassment because growth occurred faster than anticipated.

Illiquidity may result from market retrenchment because the anticipated revenue is not present to meet fixed costs. As the market share expands, a cooperative becomes less familiar with the market. Consequently, the behavior of the market during an economic downturn may be harder to predict.

Inefficiencies can arise from entering diseconomies of scale, and from growth indigestion. The economies of scale initially captured by growth may eventually dissolve into diseconomies. Diseconomies would cause operating costs to rise and thus lower the return.

Inefficiency may also arise from "growth indigestion." Often the production process and assets cannot be adapted quickly enough to meet the growth in sales.

A loss in financial flexibility may occur during growth. To meet growth needs, equity and debt may both be needed. For a cooperative business, the amount of debt and equity available at reasonable cost is limited. When this limitation is reached, a cooperative cannot obtain more capital until sufficient margins or new member equity is generated. Consequently, meeting growth targets entails a commitment to investing in certain assets. Funds once committed are not easily released for other opportunities. Consequently, financial flexibility is diminished.

A reduction in the return to members may occur due to the capital structure chosen and overinvestment by the current members.

Cooperative members cannot capture the capital gains that occur from a cooperative investing in assets rather than distributing returns. While the current members may gain from the greater economies and the greater competitive strength of growth in the future, their present returns are lowered. There is the risk that a cooperative is growing at a rate whereby the net return from growth (present value of cost savings from the captured economies of scale minus the foregone returns) is negative for current members.

A reduction in the "real" return to members may also result from the capital structure chosen to fuel growth. A cooperative may decide to use more debt than what is optimal from the perspective of maximizing returns. This higher leverage results in a higher required rate of return because of increased financial risk. At the same time, interest costs have increased. Even if a cooperative's return after investment is sufficient to meet the required rate of return for equity holders, it will still be less than what would have resulted at the optimal capital structure. This lost return could be regarded as an insurance cost of doing business in the market. However, if the required return of members cannot be met, there is a danger that members will become dissatisfied and leave their cooperative.

Organizational problems include diseconomies of organizational scale, dilution of participative power, and disruptive changes in management structure.

Diseconomies of organizational scale may emerge for several reasons. The organization may become too large and unwieldly for the board and management. As the number of members increases, the possibilities of factionalism would be expected to increase.

Member dissatisfaction may increase as the power of participative structures is diluted. Dilution of member participative power may also lead to a leadership becoming out of touch with the membership.

Organizational problems may emerge due to changes in the management structure. One of the potential advantages of growth was the opportunity to specialize. In some instances, growth will require a degree of specialization. This need for specialization may create problems for worker-controlled businesses. Specialization may conflict with a policy of job rotation. Specialization may lead to the hiring of nonmember specialists which may lead to the problems associated with a workforce of members and nonmembers.

Useful techniques for planning and pursuing growth are summarized as follows:

1. In order to maximize the equity generated, a cooperative may wish to pay rents on retain certificates. Capital rents may reduce the total return to members (see Chapter III), but may increase the amount of equity raised and in turn the debt capacity.

2. Theoretically, a cooperative bank will enable a cooperative to increase its debt capacity. Thus, a cooperative bank source should be examined even though a commercial source appears to offer favorable interest rates.

3. A useful planning tool is the growth sustainable formula developed by Zakon. This formula indicates the growth rate in funds available for investment in assets. It is based on the capital structure policy, return on assets, interest rate, and the capital retention rate.[1]

$$\text{Growth Sustainable} = g = \frac{D}{E}\,(R_a - K_d)\,r + R_a r \qquad (5.24)$$

where: $\frac{D}{E}$ = debt to equity ratio; financial leverage

R_a = wealth return on assets

K_d = the required rate of return for debt holders; interest rate

r = the capital retention rate

This formula was designed for investor-owned firms. A cooperative relying on a revolving fund to generate internal equity should use the net change in the revolving fund, RF´, for the retention rate.

$$RF' = \frac{\text{(new retain certificates minus redemptions)}}{\text{new savings}} \qquad (5.25)$$

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[1]Zakon, "Capital Structure Organization."

Substituting the calculated figure for the optimal debt to equity ratio ($\frac{D}{E}$) for $\frac{D}{E}$ in the growth formula will yield the maximum growth rate while attempting to maximize the members' wealth return.

Substituting the targeted growth rate for g, and solving for $\frac{D}{E}$ will yield the deviation from the optimal capital structure that is needed to achieve the targeted growth rate.

Finally, any planning for growth should include a projected monthly cash budget. This is necessary in order to identify potential cash flow shortfalls in the future.

4. A cooperative can improve its ability to generate internal equity and thus improve debt capacity by charging market prices. Theoretically, the federated cooperative has the ability to generate more debt than the investor-owned firm because of the closed nature of business transactions. If the members agreed, the cooperative could charge higher than market prices. This would increase coverage and make more debt available. The excess margin (the overcharge) would be returned to the members at the end of the accounting period.

This strategy is not recommended without careful planning. Members may misunderstand and become resentful. Also, competition may be encouraged to enter the market because of the high prices. Debt incurred under the expectation of high prices might be difficult to service with price competition.

A cooperative may overcome the problem of resentment and the danger of competition through the use of surge capacity. A higher price of margin represents an investment by members because the cooperative is using their funds that otherwise would not be advanced.

The cooperative may employ a strategy of a reserve fund to be controlled by the lender. Members will still have to contribute additional capital, but this would allow prices to stay at or below market and should increase debt capacity.

5. The growth of new members may result in a dilution of the members' equity in a federation. Although the face value of their invested equity will not change, the net return may decrease if a cooperative is entering diseconomies of scale. The more members added, the higher the costs, and the lower the net return. A cooperative may wish to consider spinning off a second facility or encouraging development of a second cooperative.

6. Cooperatives should realize that debt does not cause growth. Debt causes investment which causes growth. Proper decision-making is critical. If a cooperative should lever itself and not invest wisely, it may be worse off than before. Its debt capacity will be diminished until its present debts are reduced or until equity is increased.

Summary

The major sources of capital for a cooperative are internally generated equity and debt. This chapter examined the mechanism for generating internal equity with respect to tax strategy, capital generation, cost, and return to members.

The effects of debt had been discussed in Chapter IV. Therefore, the discussion on debt concentrated on some of the noncost effects of debt use and strategies for using debt.

Finally, two mathematical techniques for rapid calculation of the optimal mix of capital sources were examined. LONGER utilizes the equity valuation models of earlier chapters to construct a return maximization model. This model chooses the mix of capital sources so that the value of the return and hence the value of equity is maximized.

The other model is a cost minimization model. This model chooses the mix of capital sources so that the cost of acquiring capital is minimized. Consequently, the return is indirectly maximized. Of the two models, the cost minimization model is the easier to use.

A cooperative may wish to pursue growth to obtain several advantages, the most common being economies of scale. Debt use may enable a cooperative to overcome some of its weaknesses in generating equity. A decision to deviate from a cooperative's capital structure, however, must carefully examine the risk generated by growth and increased leverage.

PART II

ANALYSIS OF FINANCIAL STRENGTH OF STUDY GROUP

CHAPTER VI

FINANCIAL RATIOS

The first five chapters of this study developed methods to assist in the capital structure decision. Financial ratios provide a means of measuring capital structure decisions and the effect of these decisions. Ratios will therefore provide a measure of how well cooperative behavior corresponded to theory. Ratios allow comparisons between different types of cooperatives and between cooperatives and investor-owned firms.

Examination of a single ratio can be misleading. Ratio analysis should occur in sets or clusters in order to provide a complete measure. The following sets have been developed utilizing established practices and the concepts of Part I of this study: (a) membership utility, (b) financial structure, (c) coverage, (d) resource efficiency, and (e) growth.

Member Utility

Member utility cannot be measured directly. Instead, indirect and surrogate measures must be used. Determination of the members' opportunity costs and actual return, however, is possible. Member dissatisfaction is possible when the return to members does not meet their opportunity costs.

Capital structure and member utility interact in the following manner. Debt use affects opportunity costs because risk increases with debt. Equity structure affects the value of member return because of the discounting effect of time. Failure to maintain member utility may affect capital structure because of member reluctance to supply equity.

The member return ratio set and the member stability set provide information on the utility of a cooperative's membership.

Member Return Ratio Cluster

Member return ratios measure the rate of wealth return on the member's investment and its ability to meet the member's opportunity cost. The difficulty in quantifying nonwealth returns normally precludes their use in ratio analysis. There are five member return ratios. Four of these ratios measure the rate of return. The fifth ratio measures the ability of the return to cover opportunity costs.

Rate of return on total equity.[1] The rate of return on total equity measures the total net savings in terms of total equity. This ratio measures the efficiency of equity capital. This ratio is a poor measure of the return on member investment, however, because of the nature of member return and investment. Members seldom receive the full value of net savings or a full allocation of equity.

[1]For further discussion on this ratio, see Van Horne, "Application of the Capital Asset Pricing Model"; and Weston and Goudzwaard, Treasurer's Handbook.

$$\text{Rate of Return on Total Equity} = NET/TE \tag{6.1}$$

where: NET = net earnings

TE = total equity

<u>Rate of return on initial member investment</u>.[1] The rate of return on initial member investment measures the value of the return received by the members in terms of their initial capital investment. This ratio considers the discounting effect of time and the related noncapture of retained earnings.

$$\text{Rate of Return on Initial Member Investment} = \frac{CPO+NPV(RC)+DIV+NPV(RE)}{S} \tag{6.2}$$

where: CPO = cash portion of the patronage refund

NPV(RC) = net present value of currently issued retain certificates

DIV = capital rents; dividends

NPV(RE) = net present value of the annuitized return from the investment of retained earnings

S = initial member investment; shares, deposits

<u>Rate of return on total member investment</u>.[2] The rate of return on total investment measures the value of the return to members in terms of total member investment. It differs from the previous

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[1] This ratio was developed from the concepts of Part I. Caution should be exercised because the effectiveness of the ratio has not been tested.

[2] This ratio was developed from the concepts of Part I.

ratio in the definition of the member's investment. The issue of the definition of member investment will not be discussed here. It is the author's position, however, that member investment includes all allocated and recoverable equity. If the withholding of a particular equity form is necessary for an individual to remain an ongoing member, then it constitutes an investment by the member.

The rate of return on total investment addresses the problem of rate of return calculation for cooperatives which require no initial investment, but which allocate earnings to the members. Worker cooperatives which require no initial investment and no allocation or capture of earnings are "public enterprises." No member investment exists for these cooperatives, so the return on total member investment ratio is not applicable.

$$\text{Rate of Return on Total Member Investment} = \frac{CPO+NPV(RC)+DIV+NPV(RE)}{S+RF+REA} \qquad (6.3)$$

where: CPO = cash portion of patronage refund

NPO(RC) = net present value of retain certificates

DIV = capital rents; dividends

NPV(RE) = net present value of the annuitized return from the investment of retained earnings

S = initial member investment

RF = revolving fund

REA = recoverable retained earnings; retained earnings eventually returned to members

Return to opportunity cost ratio. The return to opportunity cost ratio measures a cooperative's success in generating a return that meets the members' opportunity costs.

$$\text{Return to Opportunity Cost Ratio} = r_m/K_w \tag{6.4}$$

where: r_m = rate of monetary return on member investment

K_w = required wealth return of members

Member stability. It is possible to meet member opportunity costs and still have member dissatisfaction. Although it is difficult to measure member dissatisfaction, it is possible to measure the negative conditions which can lead to member dissatisfaction.

Entry Cost

The entry cost ratio measures the percent of total equity consisting of initial member investment. High entry costs may produce a perception of entry barriers for prospective members and a capital burden for existing members.

A change in entry costs is likely to lead to accusations of unfairness. An increase in entry costs favors members of long tenure, while a decrease favors new members.

$$\text{Entry Cost Ratio} = S/TE \tag{6.5}$$

where: S = initial member investment

TE = total equity

Member Investment to Patronage

The member investment to patronage ratio measures the average member investment per unit of patronage. This ratio indicates if some members contribute a disproportionate share of capital.

$$\text{Member Investment to Patronage Ratio} = \frac{S + RF + RRE}{MP} \qquad (6.6)$$

where: S = initial member investment

RF = revolving fund

RRE = recoverable retained earnings

MP = member patronage

Cash Payout

The cash payout of patronage refunds has two implications for member utility. First, the value of the return to members increases with the percentage of cash paid out. Second, cash payout affects the equitable treatment of members. A cash payout percentage decreasing over time favors members of long tenure because retain certificates are likely to be redeemed sooner. A cash payout percentage increasing over time favors newer members. Longer tenured members may share a disproportionate capital contribution burden. Retain certificates are redeemed at a later time to compensate for the reduced retention of retain certificates.

$$\text{Cash Payout} = CPO/PR \qquad (6.7)$$

where: CPO = cash payment of patronage refund

PR = patronage refund

Gross Margin

The gross margin ratio measures the contribution margin as a percent of total sales or cost of goods sold. Changes in the gross margin affect equitable treatment of members. An increase in the gross margin ratio benefits members of long tenure because retain certificates can be redeemed earlier. A decrease in the gross margin ratio shifts a portion of the capital burden to longer tenured members as the revolving cycle is extended.

$$\text{Gross Margin} = CM/S \tag{6.8}$$

where: CM = contribution margin

X = cost of goods sold or sales revenue

Realized Return to Net Savings

The realized return to net savings ratio measures the percent of net savings returned to members. A low ratio indicates a high retention of net savings. High retention can lead to internal dissension, especially if members are not receiving their opportunity costs.

$$\text{Realized Return to Net Savings} = R_m/NET \tag{6.9}$$

where: R_m = present value of the return to members

NET = net savings

Retained Earnings

The retained earnings ratio measures the percent of total equity in the form of retained earnings. A large accumulation of retained earnings can lead to internal dissension over the issue of capital consumption.

$$\text{Retained Earnings Ratio} = RE/TE \qquad (6.10)$$

where: RE = retained earnings

TE = total equity

Members to Workers

The member to worker ratio measures the percent of members in a worker cooperative. A ratio that is declining over time suggests that the organization is losing its cooperative nature. This transformation may generate disagreement between members, and between members and nonmember workers.

$$\text{Member to Worker Ratio} = FT/TW \qquad (6.11)$$

where: FT = full time workers that are members

TW = total workers

Member Turnover

Member turnover measures the number of times the cooperative membership has been replaced in a given period. A high turnover ratio may indicate a transient community. If a community appears stable, howeve

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however, a high ratio suggests the presence of member dissatisfaction and subsequent desertion.

$$\text{Member Turnover} = TM/PM \tag{6.12}$$

where: TM = total members over a given period

PM = present number of members

New Members

The new member ratio measures the percentage of total members who have short tenure. A significant percentage of new members may lead to difficulties in absorbing individuals who may not be familiar with the principles and practices of cooperation.

A high percentage of new members may lead to instability for a worker cooperative with a large accumulation of unallocated retained earnings. Retained earnings create an incentive for new members to liquidate a cooperative. Liquidation can occur quickly through sale or slowly through adoption of comfortable, but inefficient work methods.

$$\text{New Member Ratio} = NM/PM \tag{6.13}$$

where: NM = new members

PM = present members

Financial Structure Ratios

Financial structure ratios measure the nature and proportion of the capital provided from different sources. In this study financial ratios have been divided into equity structure ratios and debt structure ratios, which reflect the two sections of the right hand side of the balance sheet.

Equity Structure Ratios

Equity structure ratios measure equity and "near equity." Near equity is member debt which is subordinated to all other obligations.

Member debt. The member debt ratio measures the percent of member-supplied funds in the form of member debt. A high ratio may lead to difficulty in securing loans from commercial lenders. Many commercial lenders refuse to consider member debt as a near form of equity. Commercial lenders may also hesitate to advance funds because of the cash flow obligation to members (debt retirement and servicing).

$$\text{Member Debt Ratio} = \frac{\text{NMN}}{\text{S + RF + RRE + NMD}} \tag{6.14}$$

where: NMD = noncurrent member debt

S = initial member investment

RF = revolving fund

RRE = recoverable retained earnings

Retained earnings. The retained earnings ratio measures the percent of equity in the form of retained earnings. An increase in the proportion of retained earnings may lead to a decrease in the return to members if retained earnings are not recoverable. Nonrecoverable retained earnings have the lowest value as a return because members only receive the return from the invested retained earnings. Capital consumption risk also increases with an increase in retained earnings.

$$\text{Retained Earnings Ratio} = RE/TE \qquad (6.15)$$

where: RE = retained earnings

TE = total equity

<u>Revolving fund</u>. The revolving fund ratio measures the percent of total equity in the revolving fund. A high ratio may indicate a long revolving cycle or the absence of a redemption plan. A revolving fund ratio increasing over time may be a warning that capital consumption is occurring.

$$\text{Revolving Fund Ratio} = RF/TE \qquad (6.16)$$

where: RE = revolving fund

TE = total equity

<u>Internally generated equity</u>. The internally generated equity ratio measures the percent of equity internally generated. A high ratio suggests low entry costs. Low entry costs can lead to uncontrolled growth in federated cooperatives and worker redundancy in worker cooperatives.

$$\text{Internally Generated Equity Ratio} = IE/TE \tag{6.17}$$

where: IE = internally generated equity

TE = total equity

<u>Permanent equity</u>. The permanent equity ratio measures the percent of total equity that is "permanent." Permanent equity refers to that equity which many commercial lenders consider stable: capital shares and unallocated retained earnings. A high permanent equity ratio is viewed favorably by commercial lenders.

$$\text{Permanent Equity Ratio} = \frac{RE + S}{TE} \tag{6.18}$$

where: RE = retained earnings

S = capital shares

TE = total equity

<u>Member equity investment as a proportion of total equity</u>. The inverse of the retained earnings ratio provides similar information, however, it focuses on member investment (stock and patronage dividends).

$$\text{Member Equity} = (RF + S)/TE \tag{6.19}$$

where: RF = revolving fund

S = capital shares

TE = total equity

Total member investment. Member investment includes member debt, which in some cases can be quite substantial. Therefore, the total member investment ratio provides a more accurate view of the capital provided internally.

$$\text{Total Member Investment} = (S + RF + MD)/(TE + MD) \qquad (6.20)$$

where: S = capital shares

RF = revolving fund

MD = member debt

TE = total equity

Debt Structure Ratios

Debt structure ratios provide a measure of the cooperative's dependence upon external capital and the sources of this capital.

Financial leverage. Financial leverage measures a cooperative's reliance on nonequity sources of funds. Standardization of these liabilities is accomplished by dividing total liabilities by total equity or total assets.

$$\text{Financial Leverage} = TL/TA \qquad (6.21)$$

where: TL = total liabilities

TA = total assets

External financial leverage. External leverage only considers those liabilities external to the cooperative organization. Member debt is excluded because active members have other interests in the cooperative in addition to their loans. Cooperative members, therefore, are less likely to push a cooperative into a difficult financial position in order to protect their loans.

$$\text{External Financial Leverage} = \frac{TL - MD}{TA} \qquad (6.22)$$

where: TL = total liabilities

MD = member debt

TA = total assets

<u>Funded debt leverage</u>. The debt to equity ratio measures the proportion of debt use. Debt use is measured in terms of equity or terms of equity and debt combined in order to standardize it.

$$\text{Debt to Equity Ratio} = \frac{NCD}{TE} \qquad (6.23)$$

where: NCD = noncurrent portion of funded debt

TE = total equity

<u>Adjusted external funded debt leverage</u>. Since member debt may more properly be considered quasi-equity, the funded debt leverage ratio should remove member debt if it is substantial.

$$\text{Adjusted Funded Debt Leverage} = (NCD - NMD)/(NCD + TE) \qquad (6.24)$$

where: NCD = noncurrent debt or funded debt

NMD = noncurrent member debt

TE = total equity

Liquidity Ratios

Liquidity ratios measure the ability of a cooperative to meet its current obligations. Failure to meet current obligations results in distress costs and possibly bankruptcy.

Current Ratio

The current ratio measures the ability of a cooperative to settle current claims with current assets.

$$\text{Current Ratio} = CA/CL \tag{6.25}$$

where: CA = current assets

CL = current liabilities

Quick Ratio

The quick ratio measures the ability of a cooperative to settle current claims immediately without asset liquidation. Inventory is therefore excluded from the current assets available for settling claims.

$$\text{Quick Ratio} = \frac{CA - INV}{CL} \tag{6.26}$$

where: CA = current assets

CL = current liabilities

INV = inventory

Accounts Payable Turnover Ratio

The accounts payable turnover ratio measures the average number of days that payables are outstanding. The reliance on suppliers for financing increases with the number of days that payables are outstanding. This ratio also allows comparison between the actual use of supplier financing and the terms offered.

$$\text{Accounts Payable Turnover} = \frac{AP \times N}{COGS} \qquad (6.27)$$

where: AP = accounts payable

N = numbers of days in the period examined

COGS = cost of goods sold in the period examined

Inventory Turnover Ratio

The inventory turnover ratio measures the cash generating ability of inventory. The ratio measures the cost of goods sold or sales per unit of inventory. A greater amount of goods moved per unit of inventory leads to less funds tied in inventory.

$$\text{Inventory Turnover Ratio} = X/INV \qquad (6.28)$$

where: X = cost of goods sold or sales revenue

INV = inventory

Surge Capacity Ratio

Surge capacity is the ability of reserves to meet contingencies. Surge *interest* capacity is the ability to cover interest payments. Surge *operating* capacity is the ability to cover operating expenses for a given length of time.

$$\text{Surge Interest Capcity} = RLA/Y \tag{6.29}$$

where: RLA = reserve liquid assets

Y = interest expense

$$\text{Surge Operating Capacity} = RLA/OE \tag{6.30}$$

where: RLA = reserve liquid assets

OE = operating expenses

Coverage Ratios

Coverage ratios measure the ability of a cooperative to meet the cash obligations to capital sources. Most coverage ratios are concerned with debt, however, one ratio in this set incorporates the obligations to both equity holders and to lenders.

Interest Coverage Ratio

Interest coverage is the most commonly used coverage ratio. It measures the ability of a cooperative to generate cash (pretax earnings) to cover interest expense.

$$\text{Interest Coverage} = EBIT/Y \tag{6.31}$$

where: EBIT = earnings before interest and taxes

Y = interest payments

Complete Debt Coverage Ratio

Complete debt coverage measures the ability of a cooperative to generate cash (pretax earnings) to cover all cash outflows associated with debt and lease agreements.

$$\text{Complete Debt Coverage} = \frac{\text{EBIT}}{\text{Y} + \text{P} + \text{LP}} \tag{6.32}$$

where: EBIT = earnings before interest and taxes

Y = interest payments

P = principle payments

LP = lease payments

Capital Coverage Ratio

Capital coverage measures the ability of a cooperative to generate cash (pretax earnings) to meet the opportunity costs of the capital supplied by both lenders and members.

$$\text{Capital Coverage} = \frac{\text{EBIT}}{\text{Y} + \text{W}} \tag{6.33}$$

where: EBIT = earnings before interest and tax

Y = interest payments

W = required wealth return of members

Resource Efficiency Ratios

Resource efficiency is important in capital structure consideration due to the relationship between efficiency and generation of earnings. Optimally, efficiency is measured directly at each facility. However, it is possible to use the financial statements to achieve approximations. Resource efficiency ratios examine the use of assets, operating inputs, and labor.

Assets

Generating power ratio. The generating power ratio measures the ability of a particular balance sheet asset to generate sales revenue, earnings before taxes, net savings, or cash.

$$\text{Generating Power} = X/Z \tag{6.34}$$

where: X = sales revenue, earnings before taxes, etc.

Z = a particular balance sheet asset

Capacity utilization ratio. The capacity utilization ratio measures the capacity utilization or physical efficiency of an asset (for example, sales revenue per square foot). Research in many industries, including food retailing, has shown that operating costs per unit of output are strongly and negatively correlated to capacity utilization.[1]

$$\text{Capacity Utilization Ratio} = X/Z \tag{6.35}$$

where: X = units handled in terms of sales revenue or cost of goods sold

Z = nature of physical asset, such as total square feet

[1]For additional information see Bruce Marion, et al., *The Food Retailing Industry* (New York: Praeger, 1979) and the National Commission on Food Marketing, *Food Retailing: Technial Study, No. 7* (Washington, D.C.: USGPO, 1966).

Rate of return on local assets.[1] The rate of return on local assets measures the return from local operations in terms of total local assets. Local assets are the assets used in the generation of the product or service. Local assets do not include outside investments in subsidiaries or other cooperatives.

$$\text{Rate of Return on Local Assets} = \frac{NET - NET_{oc}}{TA - S_{oc}} \tag{6.36}$$

where: NET = net savings

NET_{oc} = net savings from outside investments

TA = total assets

S_{oc} = investment in outside activities

Labor

Cost of labor. The cost of labor is standardized by dividing labor cost by sales or cost of goods sold. Standardization of costs enables comparison through time and between cooperatives. The use of "cost of goods sold" as a method of standardization is prefereable for intercooperative comparison because of differences in margin policy.

$$\text{Cost Efficiency} = X/Z \tag{6.37}$$

where: X = the cost of labor

Z = cost of goods sold or sales revenue

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[1] Stephen E. Mathis and Gary L. Devino, "Financial Planning for Growth in Local Farmer Cooperatives," Cooperative Accountant, Spring 1977, pp. 16-20.

Physical efficiency.[1] The physical efficiency ratios measure the value or physical units handled or transformed by labor. Physical efficiency is useful for intercooperative comparison because of the differences in wages and benefits.

$$\text{Physical Efficiency} = X/Z \tag{6.38}$$

where: X = units handled or transformed by labor

Z = units of labor (hours, full time workers, etc.)

Average value product of labor.[2] A ratio which measures the average value product of labor has been developed by Shashua and Goldschmidt.

$$\text{Average Value Product of Labor} = \frac{EBT - W - DEP}{L} \tag{6.39}$$

where: EBT = earnings before taxes

W = required wealth return on equity holders

DEP = depreciation

L = number of labor units

Growth Potential Ratios

Cooperatives pursue growth to expand the benefits of cooperation or to expand their control over the business. Expanding

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[1] See Grocery Distribution Center Efficiency Report (Ithaca, New York: Cornell University, Annual).

[2] L. Shashua and Y. Goldschmidt, "An Index for Evaluating Financial Performance," Journal of Finance 29, No. 3 (June 1974).

the benefits of cooperation involves new services to existing members or delivery of services to new members. Expanding control involves control over inputs (backward vertical integration), control over markets (forward vertical integration), control over price (market expansion), or control over cost (economies of scale).

Failure to grow in the face of expanding competition can increase risk: "Growing less rapidly on trend than competition will erode market position and utlimately profitability relative to competition. . . .The ultimate risk of overconservatism is increasing business risk if competition is aware."[1] Changes in market share may necessitate changes in the capital structure if a cooperative desires to recapture or increase market share.

A necessary, but insufficient condition for growth is adequate capital. One measure of capital availability is debt capacity. This is the ability of a firm to attract and service external debt. Lenders are concerned with cash flow and the equity base in determining a firm's debt capacity, consequently the growth potential ratios will focus on ratios which measure these two concerns. These ratios are divided into three types: (a) equity base, (b) leverage, and (c) cash flow.

Equity Base

In examining equity base, it is necessary to determine three things: (a) dependence on internally generated equity, (b) ability to

[1]Zakon, "Capital Structure Organization," p. 656.

generate internal equity, (c) anticipated internal equity generation. It would also be useful to examine a cooperative's member share program. Unfortunately, it is difficult to predict the growth patterns of these programs.

Dependence on internally generated equity. This ratio measures the proportion or dependence of a firm upon internally generated equity for building an equity base.

$$\text{Internal Equity Ratio} = EI/TE \text{ or } IE/TA \tag{6.40}$$

where: IE = internally generated equity

TE = total equity

TA = total assets

A disproportionate amount of internally generated equity suggests difficulty in raising member share capital and a dependence upon internal equity.

Ability to generate internal equity. Ability to generate internal equity is reflected in three measures: (a) return on assets (ROA), (b) return on equity (ROE), and (c) required rate of return for equity holders (K_e). ROA measures the ability of a firm's assets to generate a return. ROE measures the return the members receive on their equity investment. K_e measures the amount of earnings members expect to receive. It is important that ROE meet K_e (after adjustment for nonwealth returns). Otherwise members may become dissatisfied.

If ROA is lower than the industry's, it could be difficult to generate sufficient earnings so that ROE is commiserate with K_e.

Anticipated generation. To determine probable internal equity generation it is necessary to look at the *retention rate* (RR), in order to see what percent of earnings are retained after cash distribution of patronage dividends, dividends on stock and redemptions.

The *probable growth rate of internal equity* (g'_{ie}) is the retention rate times the rate of return on assets.

By substituting the industry rate of return (assuming that it is higher than the cooperative) in the probable growth rate formula yields the *maximum growth rate*. It is assumed that most cooperatives would have an ROA lower than the industry due to nonwealth returns which would affect costs and therefore income.

Leverage

The amount of funded debt and trade obligations influences a lender's willingness to provide capital since these other creditors are also laying claim to the firm's cash stream and/or assets.

Financial leverage. Financial leverage measures the reliance on total nonequity sources of funds.

$$\text{Financial Leverage} = TL/TA \qquad (6.41)$$

where: TL = total liabilities

TA = total assets

Funded debt leverage. The debt to equity ratio measures the proportion of debt use. Debt use is measured in terms of equity or in terms of equity and debt combined.

$$\text{Debt to Equity} = NCD/TE \tag{6.42}$$

where: NCD = noncurrent portion of funded debt

TE = total equity

Trade payables. Use of trade payables is usually standardized by dividing by total assets.

$$\text{Trade Payables} = AP/TA \tag{6.43}$$

where: AP = accounts payable

TA = total assets

Cash Flow

In analyzing growth, an analyst should examine present cash flow and the changes in cash flow caused by new capital structures which support the growth target.

Coverage. The debt coverage ratio measures the firm's ability to service debt while the capital sources coverage ratio measures the ability to service all capital sources.

$$\text{Debt Coverage Ratio} = EBIT/Y \tag{6.44}$$

$$\text{Capital Coverage Ratio} = EBIT/(Y + W) \tag{6.45}$$

where: EBIT = earnings before interest and taxes

Y = debt service requirements

W = wealth return requirements of equity holders

Return on assets. The return on assets ratio measures the firm's assets' ability to generate earnings.

$$\text{Return on Assets} = \text{NET/TA} \tag{6.46}$$

where: NET = net earnings

TA = total assets

A similar ratio is the cash generation ratio which measures the ability of the asset base to generate cash.

$$\text{Cash Generation Ratio} = \text{CBT/TA} \tag{6.47}$$

where: CBT = cash generated before taxes

TA = total assets

Summary

Six financial ratio clusters were developed to measure capital structure decisions and the effects on these decisions.

1. Member utility ratios cannot measure member utility directly. Instead; one subset, member return ratios, measures the rate of wealth return on the members' investment and its ability to meet the members' opportunity cost. The second subset, member

stability, measures the negative conditions which can lead to member dissatisfaction.

2. Financial structure ratios measure the nature and proportion of capital provided from different sources. Financial ratios have been divided into two subsets: (a) equity structure ratios and (b) debt structure ratios which reflect the two main sources of capital.

3. Liquidity ratios measure the ability of a firm to meet its current obligations through liquidation of specific current assets.

4. Coverage ratios measure the ability to meet the cash obligations to each capital source. Most coverage ratios measure debt obligations, however, this set includes the obligations to both debt holders and equity holders.

5. Resource efficiency ratios measure the ability of a firm's assets, operating inputs, and labor to generate earnings.

6. Growth potential ratios measure a firm's debt capacity, the ability to attract debt capital for growth. These ratios examine the equity base (dependence on internal equity, ability to generate internal equity, and probable internal equity generation), leverage (external debt sources), and cash flow.

CHAPTER VII

PRESENTATION OF SAMPLE DATA

Since the early seventies, there has been dramatic growth in the number and sales volume of cooperatively structured warehouses in the natural foods industry. In order to analyze the financial position of these warehouses and their prospects for future growth, a survey instrument (see Appendix) was sent to thirty-four cooperatives (the entire universe). After two follow-up letters and one phone call to each cooperative which did not immediately respond, eighteen surveys were received. Sixteen surveys were complete enough to be analyzed.

Statistical Analysis of the Sample Group

The previous chapter developed a system of financial ratios for analyzing cooperatives. These ratios may also be used to analyze a group or subgroup of cooperatives. Analysis on a group basis can provide information on the relationship between specific financial and organizational characteristics and performance.

The original intent of this study was to use statistical techniques to make inferences on the industry. Two statistical techniques were under consideration: (a) regression analysis and (b) discriminant analysis. Regression analysis measures the relationship between variables. It is possible to determine what ratio values are associated with financial performance measures such as member return, risk, growth, etc. From these measured associations it is possible to make predictions on specific cooperatives. Mathis and Devino conducted regression studies on farm cooperatives and were able to determine what ratio values were associated with successful growth.[1]

Discriminant analysis differs from regression analysis in its assumption that the observations come from two or more universes. This division of a sample into groups enables an analyst to make predictions about an individual firm because it falls within a certain group.[2]

Unfortunately, statistical analysis could not be performed because of the limited information. The information which the cooperatives were *unable* to provide precluded the calculation of many ratios. The absence of an accepted method for quantifying nonwealth returns means that the cost of equity could not be adjusted for nonwealth returns. The inability to incorporate total risk into a discount factor precludes accurate capital structure analysis for cooperatives with nondiversified memberships.

The information that cooperatives were *unwilling* to provide precluded the use of statistical techniques. The response rate of the

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[1] Mathis and Devino, "Financial Planning."

[2] For a discussion of discriminant analysis of financial ratios, see Edward I. Altman, "Financial Ratios, Discriminant Analysis, and the Prediction of Corporate Bankruptcy," Journal of Finance 23 (September 1968):179-192.

surveys was below fifty percent. Of these responses, only sixteen were usable. For regression purposes, sixteen observations is inadequate.

The quality of the data provided makes comparison between the subgroups within the sample difficult. Many of the accounting statements and survey responses were of poor quality. In addition, the cooperatives exhibited so many differences that comparisons between the main subgroups (worker, federation, subsidiary) must be made with caution. The following outline summarizes these differences:

1. Gaps in the information provided

   - taxes paid
   - allocation and distribution of earnings
   - statement of changes in financial position
   - breakout of nonmember labor (for worker cooperatives)
   - breakout of member labor in the consultant and contract labor category
   - brokering activity
   - supplier terms
   - nonwealth activity (social returns)
   - terminalization activity
   - backhauling activity
   - inadequate breakout of activity (profit) centers
   - breakdown of types of customers and sales to these customers

2. Differences in policies

   - surcharges to members
   - margin policies
   - credit terms to buyers
   - prepayment of patronage dividends
   - payout and revolving cycle of patronage dividends

3. Differences in products and the mix of products

4. Differences in market structure and market growth

5. Differences in accounting statements

   - formats
   - terminology
   - inventory valuation
   - backhauling (income versus cost reduction)
   - failure to capitalize leases
   - treatment of patronage dividends from suppliers
   - treatment of price discounts from suppliers

Although the quantity and quality of the sample responses precludes statistical analysis, there is sufficient information and available theory to complete an analysis of this group. This analysis will be performed in the following chapter. The remainder of this chapter will concern the calculation of the member required returns (K_e) and the financial ratios of the sample. It was not possible to calculate the optimal capital structure, however, due to the absence of critical information.

Estimation of Member Required Returns

It is unlikely that the following estimates reflect the actual required return because of differing attitudes toward risk, the amount of diversification for each member's personal portfolio, and the amount of nonwealth returns. It is a useful calculation, nonetheless, because it represents the maximum wealth return that members should reasonably expect.

The estimation of the member required rate of return involves three steps: (a) estimation of Beta, (b) estimation of the risk free rate of return and the market rate of return, and (c) substitution of these estimates into the security market line.

Estimation of Beta

Estimation of the Beta surrogate for each cooperative involves the following steps:

1. Find the Beta of the industry (or subindustry), or the Betas of the firms in this industry.

2. Unlever the Beta(s) found in Step 1. Beta(s) must be adjusted for each investor-owned firm's use of debt. The formula for unlevering Beta is as follows:

$$\text{Beta}_U = \frac{\text{Beta}_L}{((1+D/E)(1-t_c))} \tag{7.1}$$

where: Beta_L = levered Beta

D/E = debt to equity ratio

t_c = marginal tax rate

3. Average the unlevered Betas of the individual firms to obtain a single unlevered Beta.

4. Since cooperatives will differ in their use of debt, it will be necessary to relever Beta for each cooperative using the following formula:

$$\text{Beta}_L = \text{Beta}_U \; [1+(\frac{D}{E})(1-\phi t_c)] \tag{7.2}$$

where: Beta_L = levered Beta of an individual cooperative

Beta_U = unlevered Beta found in Step 3

$\frac{D}{E}$ = leverage ratio of cooperative

ϕt_c = effective tax rate of cooperative

There are seven investor-owned wholesalers whose stock is publicly-traded. Although these wholesalers are among the largest in the industry, their Betas should reflect the market risk of the industry (Table 1).

Due to the paucity of information and the fact that these estimates are for illustration, it will be assumed that the cooperatives have no taxable income. Substituting the unlevered group Beta into the levered Beta formula, the Betas shown in Table 2 are obtained.

Estimation of the Risk-Free and Market Rates of Return

There are two commonly used methods for calculating the risk-free and market returns: (a) the historical spread method and (b) the historical average method. The historical spread method uses the work of Ibbotson and Sinquefield regarding the spreads between various financial instruments over time. To obtain the market rate of return, one would obtain the current long term government bond rate and then add the long term government bond's historical spread with the market.[1]

To obtain the risk-free rate, subtract the historic spread between the long term government bond rate and the Treasury-bill rate from the current long term government bond rate. The major criticism

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[1] J. Keith Butters, et al., Case Problems in Finance (Homewood, Illinois: Irwin, 1981), pp. 173-86.

TABLE 1

BETAS OF SEVEN PUBLICLY-TRADED, INVESTOR-OWNED WHOLESALERS

Firm	$Beta_L$	$\frac{D}{E}$	t_c	$Beta_U$
Super Value	1.00	.4914	.451	.7876
Fleming	.70	.6114	.425	.5179
Malone and Hyde	.75	.5312	.411	.5713
Wetterau	.80	.5163	.410	.6132
Super Food	.85	1.5021	.49	.4813
Scot Lad	.80	.9870	.257	.4615
Farm House	.80	3.264	.360	.2589

Mean = .5274

TABLE 2

BETAS OBTAINED BY SUBSTITUTING UNLEVERED GROUP BETA INTO LEVERED BETA FORMULA

Since ϕ is assumed to be zero, then $Beta_L = Beta_U\ (1 + \frac{D}{E})$

Cooperative	$Beta_L$	=	$Beta_U$	$(1 + \frac{D}{E})$		
Consumer-Owned Cooperatives						
Iota	$Beta_L$	=	.527403	(1 + .0000)	=	.527403
Mu	$Beta_L$	=	.527403	(1 + .0350)	=	.545862
Delta	$Beta_L$	=	.527403	(1 + .1825)	=	.623654
Tau	$Beta_L$	=	.527403	(1 + .5172)	=	.800176
Phi	$Beta_L$	=	.527403	(1 + .0000)	=	.527403
Beta	$Beta_L$	=	.527403	(1 + .3005)	=	.685888
Omicron	$Beta_L$	=	.527403	(1 + .9753)	=	1.041779
Kappa	$Beta_L$	=	.527403	(1 + .0314)	=	.543963
Nu	$Beta_L$	=	.527403	(1 + .0666)	=	.562528
Lambda	$Beta_L$	=	.527403	(1 + 2.2941)	=	1.737318
Worker-Owned Cooperatives						
Eta	$Beta_L$	=	.527403	(1 + 1.2759)	=	1.200316
Gamma	$Beta_L$	=	.527403	(1 + .0000)	=	.527403
Pi	$Beta_L$	=	.527403	(1 + .2696)	=	.669591
Rho	$Beta_L$	=	.527403	(1 + .0016)	=	.528247
Sigma	$Beta_L$	=	.527403	(1 + 3.3380)	=	2.287874
Chi	$Beta_L$	=	.527403	(1 + .0000)	=	.527403

of this technique is that interest rates may vary considerably over a short period leading to distortion.[1]

The historical average method uses averages of monthly data of surrogates over a several year period (usually four to five years). For the market rate of return, the Standard and Poor's 500 firm composite is often used. For the risk free rate, the Treasury bill rate of return is normally used.

For the five year period preceding the close of 1980, the Treasury bill average rate was 7.7194 percent and the Standard and Poor's 500 composite return averaged 14.49 percent.

Estimation of Member Required Rate of Return from the Security Market Line

The estimates for the risk-free rate, market rate of return, and each cooperative Beta are substituted into the formula for the security market line:

$$K_e = R_F + (R_M - R_F) \text{ Beta}_L \qquad (7.3)$$

The results for the surveyed cooperatives are shown in Table 3. These are the rates of return that the diversified members of these cooperatives would have required during the year 1980. It should be emphasized that these calculations have not been adjusted for firm-specific risk or nonwealth returns.

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[1] Butters, et al., Case Problems in Finance, pp. 173-86.

TABLE 3

ESTIMATION OF MEMBER REQUIRED RATE OF RETURN FROM THE SECURITY MARKET LINE RESULTS FOR THE SURVEYED COOPERATIVES

Cooperative	K_e = R_F + $(R_M - R_F)$	$Beta_L$	= Result
	Consumer-Owned Cooperatives		
Iota	K_e = 7.7194 + (14.49 - 7.7194)	.527403	= 11.2902
Mu	K_e = 7.7194 + (14.49 - 7.7194)	.545862	= 11.4152
Delta	K_e = 7.7194 + (14.49 - 7.7194)	.623654	= 11.9419
Tau	K_e = 7.7194 + (14.49 - 7.7194)	.800176	= 13.1371
Phi	K_e = 7.7194 + (14.49 - 7.7194)	.527403	= 11.2902
Beta	K_e = 7.7194 + (14.49 - 7.7194)	.685888	= 12.3633
Omicron	K_e = 7.7194 + (14.49 - 7.7194)	1.041779	= 14.7729
Kappa	K_e = 7.7194 + (14.49 - 7.7194)	.543963	= 11.4024
Nu	K_e = 7.7194 + (14.49 - 7.7194)	.562528	= 11.5281
Lambda	K_e = 7.7194 + (14.49 - 7.7194)	1.1737318	= 19.4821
	Worker-Owned Cooperatives		
Eta	K_e = 7.7194 + (14.49 - 7.7194)	1.200316	= 15.8463
Gamma	K_e = 7.7194 + (14.49 - 7.7194)	.527403	= 11.2902
Pi	K_e = 7.7194 + (14.49 - 7.7194)	.66952	= 12.2524
Rho	K_e = 7.7194 + (14.49 - 7.7194)	.52827	= 11.2961
Sigma	K_e = 7.7194 + (14.49 - 7.7194)	2.287884	= 23.2094
Chi	K_e = 7.7194 + (14.49 - 7.7194)	.527403	= 11.2902

Calculation of Financial Ratios

The names of the cooperatives answering the survey have been coded to ensure confidentiality. The cooperatives have been split into consumer-owned and worker-owned cooperatives. Each group is ranked by sales revenue (Tables 4 and 5).

Symbols

AP = accounts payable

AR = accounts receivable

CA = current assets

CBT = cash generated before taxes

COGS = cost of goods sold

CL = current liabilities

DEP = depreciation

EBIT = earnings before interest and taxes

EBT = earnings before taxes

g'_{ie} = growth rate of internally-generated equity at market rates of return on assets and the cooperative's present retention rate

g''_{ie} = growth rate of internally-generated equity at the cooperative's present rate of return on assets and retention rate

IE = internally-generated equity

INV = inventory

LI = lack of information

MD = member debt

NCD = noncurrent debt

NMD = noncurrent member debt

NFA = net fixed assets

RE = retained earnings

RF = revolving fund

ROA = return on assets

ROE = return on equity

S = initial member investment; shares or deposits

SR = sales revenue

TA = total assets

TE = total equity

TL = total liabilities

TR = total revenues

W = required wealth return (as an amount)

WC = working capital

Y = interest payments

TABLE 4

ALL COOPERATIVES RANKED BY SALES

Cooperative	Sales Revenue	Owners	Own/Rent Building	ROA	Assets
Iota	7,905,470	CF	Rent	.1044	657,356
Mu	5,495,493	CF	Rent	(.0400)	830,881
Eta	5,228,122	WK	Own	(.0003)	690,444
Gamma	3,462,599	WK	Rent	.2394	350,127
Delta	3,247,282	CF	Rent	.1540	265,313
Pi	3,112,256	WK	Rent	.2400	377,673
Tau	2,849,350	CF	Rent	.0669	285,674
Phi	1,762,418	CF	Rent	.0990	265,010
Beta	1,746,227	CF	Rent	(.0326)	275,506
Omicron	1,558,395	CF	Rent	.0954	144,225
Kappa	1,553,558	CF	Own	.2609	477,372
Nu	1,384,504	CR	Rent	.4051	55,096
Lambda	1,240,770	CR	Own	.0144	328,791
Rho	1,164,920	WK	Rent	.2262	71,052
Sigma	1,043,196	WK	Rent	.1481	106,681
Chi	773,654	WK	Rent	.4739	35,355

TABLE 5

ALL COOPERATIVES RANKED BY ASSETS

Cooperative	Sales Revenue	Owners	Own/Rent Building	ROA	Assets
Mu	5,495,493	CF	Rent	(.0400)	830,881
Eta	5,228,122	WK	Own	(.0003)	690,444
Iota	7,905,470	CF	Rent	.1044	657,356
Kappa	1,553,558	CF	Own	.2609	477,372
Pi	3,122,256	WK	Rent	.2400	377,673
Gamma	3,462,599	WK	Rent	.2394	350,127
Lambda	1,240,770	CR	Own	.0144	328,791
Tau	2,849,350	CF	Rent	.0669	285,674
Beta	1,746,227	CF	Rent	(.0326)	275,506
Delta	3,247,282	CF	Rent	.1540	265,313
Phi	1,762,418	CF	Rent	.0990	265,010
Omicron	1,558,395	CF	Rent	.0954	144,225
Sigma	1,043,196	WK	Rent	.1481	106,681
Rho	1,164,920	WK	Rent	.2262	71,052
Nu	1,384,504	CR	Rent	.4051	55,096
Chi	773,654	WK	Rent	.4739	35,355

Summary

This chapter presented the cost of equity and financial ratio calculations for the sample group. The financial ratios were clustered in the following categories: (a) common size income statements (Tables 6 through 13), (b) common size balance sheets (Tables 14 through 19), (c) financial structure ratios (Tables 20 through 23), (d) liquidity and coverage ratios (Tables 24 and 25), (e) Robert Morris Associates ratios[1] (Tables 26 through 31), and (f) growth analysis ratios (Tables 32 through 35).

The next chapter will utilize these calculations to provide a comparison between consumer and worker cooperatives and between cooperatives and the investor-owned firms.

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[1]Robert Morris Associates is a firm which provides composite financial statements and financial ratios for a number of different industries annually. The ratios listed are those used in their annual survey.

TABLE 6

COMMON SIZE INCOME STATEMENTS: EXPENSES AS A PERCENT OF SALES REVENUE

Cooperative	Sales Revenue	Spoilage	Rent and Utilities	Gross Payroll	Contract Labor	Total* Labor	Interest	Depre-ciation
			Consumer Cooperatives					
Federations:								
Iota	$7,905,470	LI	.0063	.0412	.0003	.0672	.0008	.0006
Mu	5,495,493	LI	.0062	LI	LI	.0868	LI	.0020
Delta	3,247,282	.0016	.0209	.0728	LI	.0835	.0028	.0021
Tau	2,849,350	.0028	.0141	.0988	.0025	.1293	.0021	.0046
Phi	1,762,418	LI	.0117	.0675	.0058	.0812	.0005	.0055
Beta	1,746,227	.0005	.0140	.0640	.0035	.0827	.0030	.0085
Omicron	1,558,395	LI	.0074	.0887	.0002	.0932	.0016	.0017
Kappa	1,553,558	LI	.0035	.0998	.0019	.1151	.0021	.0048
Subsidiaries of Retail:								
Nu	1,384,504	.0000	.0207	.0782	.0008	.0919	.0005	.0038
Lambda	1,240,770	LI	.0208	.0537	.0013	.0595	.0030	.0056

TABLE 6--Continued

Cooperative	Sales Revenue	Spoilage	Rent and Utilities	Gross Payroll	Contract Labor	Total* Labor	Interest	Depre-ciation
				Worker Cooperatives				
Eta	$5,228,122	LI	.0026	.0444	.0004	.0542	.0068	.0055
Gamma	3,462,599	LI	.0136	.0664	.0058	.0825	.0006	.0020
Pi	3,112,256	.0128	.0126	.0864	LI	.1136	.0035	.0103
Rho	1,164,920	.0073	.0147	.0461	.0246	.0803	.0007	.0024
Sigma	1,043,196	.0019	.0221	.0775	.0085	.0872	.0064	.0081
Chi	773,654	.0019	.0092	.0499	.0012	.0810	.0021	.0057

*Total Labor includes benefits.

TABLE 7

COMMON SIZE INCOME STATEMENTS: EXPENSES AS A PERCENT OF SALES REVENUE (RATIO AVERAGES AND MEDIANS)

Cooperative	Sales Revenue	Spoilage	Rent and Utilities	Gross Payroll	Contract Labor	Total* Labor	Interest	Depre-ciation
				Averages				
Subsidiary	$1,312,637	.0000	.0125	.0660	.0011	.0757	.0018	.0047
Federation	3,264,774	.0017	.0105	.0759	.0024	.0924	.0016	.0037
All Consumer Owned	2,874,347	.0013	.0126	.0738	.0020	.0890	.0016	.0039
Worker-Owned	2,464,125	.0060	.0125	.0618	.0081	.0832	.0034	.0057
All Co-ops	2,720,513	.0036	.0125	.0690	.0043	.0868	.0023	.0046
				Medians				
Subsidiary	1,312,637	.0000	.0208	.0660	.0011	.0757	.0018	.0047
Federation	2,305,884	.0016	.0096	.0658	.0011	.0852	.0019	.0034
All Consumer Owned	1,754,323	.0011	.0129	.0658	.0011	.0852	.0019	.0042

TABLE 7--Continued

Cooperative	Sales Revenue	Spoilage	Rent and Utilities	Gross Payroll	Contract Labor	Total* Labor	Interest	Depre-ciation
				Medians--Continued				
Worker-Owned	2,138,588	.0046	.0131	.0582	.0058	.0818	.0028	.0056
All Co-ops	1,754,323	.0019	.0131	.0652	.0013	.0831	.0021	.0047

*Total Labor includes benefits.

TABLE 8

COMMON SIZE INCOME STATEMENTS: EXPENSES AS A PERCENT OF SALES REVENUE

Cooperative	Sales Revenue	Education	Promotion	Maintenance	Contribution Margin	Operating Margin	Net Margin	Cash Generated
				Consumer-Owned Cooperatives				
Federations:								
Iota	$7,905,470	.0010	.0002	.0004	.0870	.0054	(.0087)	.0093
Mu	5,495,493	LI	LI	LI	.1239	(.0153)	(.0060)	(.0040)
Delta	3,247,282	LI	.0001	.0016	.1936	.0089	.0126	.0147
Tau	2,849,350	LI	.0036	.0049	.2723	.0097	.0067	.0113
Phi	1,762,418	.0012	LI	.0024	.1853	.0128	.0149	.0204
Beta	1,746,227	.0122	LI	.0003	.1421	.0058	(.0053)	.0032
Omicron	1,558,395	.0005	.0007	.0013	.1196	.0088	.0088	.0105
Kappa	1,553,558	LI	LI	.0012	.2250	.0697	.0802	.0850
Retail Subsidiaries:								
Nu	1,384,504	LI	.0008	.0011	.1755	.0161	.0161	.0199
Lambda	1,240,770	.0009	.0032	.0073	.1253	.0038	.0038	.0094

TABLE 8--Continued

Cooperative	Sales Revenue	Education	Promotion	Maintenance	Contribution Margin	Operating Margin	Net Margin	Cash Generated
				Worker-Owned Cooperatives				
Eta	$5,228,122	LI	LI	LI	.1032	(.0003)	(.0004)	.0055
Gamma	3,462,599	.0003	.0022	.0009	.1574	.0234	.0242	.0262
Pi	3,112,256	.0002	LI	.0009	.1932	.0268	.0291	.0394
Rho	1,164,920	.0001	.0001	.0014	.1301	.0132	.0139	.0163
Sigma	1,043,196	.0001	.0022	.0069	.1636	.0161	.0151	.0260
Chi	773,654	.0001	.0001	.0002	.1202	.0173	.0217	.0274

TABLE 9

COMMON SIZE INCOME STATEMENTS: EXPENSES AS A PERCENT OF SALES REVENUE
(RATIO AVERAGES AND MEDIANS)

Cooperative	Sales Revenue	Education	Promotion	Maintenance	Contribution Margin	Operating Margin	Net Margin	Cash Generated
				Averages				
Subsidiary	$1,312,637	.009	.0020	.0042	.1504	.0100	.0100	.0147
Federation	3,264,774	.0037	.0012	.0017	.1686	.0132	.0129	.0188
All Consumer-Owned Co-ops	2,874,347	.0032	.0014	.0022	.1650	.0126	.0123	.0180
Worker-Owned	2,464,125	.0002	.0012	.0021	.1446	.0161	.0173	.0235
All Co-ops	2,720,514	.0017	.0013	.0022	.1573	.0139	.0142	.0200
				Medians				
Subsidiary	1,312,637	.0009	.0020	.0042	.1504	.0010	.0100	.0147
Federation	2,305,884	.0011	.0007	.0013	.1637	.0089	.0078	.0109
All Consumer-Owned Co-ops	1,754,323	.0010	.0008	.0013	.1588	.0089	.0078	.0109

TABLE 9--Continued

Cooperative	Sales Revenue	Education	Promotion	Maintenance	Contribution Margin	Operating Margin	Net Margin	Cash Generated
				Medians--Continued				
Worker-Owned	$2,138,588	.0001	.0012	.0009	.1438	.0167	.0184	.0261
All Co-ops	1,754,323	.0004	.0007	.0012	.1498	.0113	.0133	.0155

TABLE 10

COMMON SIZE INCOME STATEMENT: EXPENSES AS A PERCENT OF THE COST OF GOODS SOLD (COGS)

Cooperative	Cost of Goods Sold	Spoilage	Rent and Utilities	Gross Payroll	Contract Labor	Total Labor	Interest	Depre-ciation
				Consumer-Owned				
Federations:								
Iota	$7,217,327	LI	.0069	.0451	.0004	.0736	.0001	.0007
Mu	4,814,717	LI	.0071	LI	LI	.1101	LI	.0023
Delta	2,618,640	.0020	.0259	.0903	LI	.1036	.0037	.0026
Tau	2,073,464	.0039	.0193	.1359	.0034	.1778	.0028	.0064
Phi	1,435,775	LI	.0143	.0828	.0071	.0996	.0006	.0067
Beta	1,498,088	.0005	.0163	.0728	.0041	.0964	.0035	.0099
Omicron	1,372,009	LI	.0085	.1008	.0002	.1059	.0018	.0019
Kappa	1,204,013	LI	.0046	.1287	.0025	.1485	.0027	.0062
Retail Subsidiaries:								
Nu	1,141,553	.0000	.0251	.0948	.0009	.1115	.0006	.0046
Lambda	1,085,301	LI	.0238	.0614	.0015	.0680	.0034	.0064

TABLE 10--Continued

Cooperative	Cost of Goods Sold	Spoilage	Rent and Utilities	Gross Payroll	Contract Labor	Total Labor	Interest	Depre-ciation
				Worker-Owned				
Eta	$4,694,761	LI	.0029	.0495	.0046	.0604	.0076	.0076
Gamma	2,917,583	LI	.0161	.0788	.0069	.0979	.0007	.0024
Pi	2,511,046	.0159	.0156	.1076	LI	.1412	.0044	.0127
Rho	1,013,341	.0084	.0169	.0530	.0283	.0923	.0008	.0028
Sigma	872,564	.0017	.0263	.0927	.0101	.1042	.0076	.0097
Chi	680,689	.0022	.0104	.0567	.0013	.0920	.0024	.0065

TABLE 11

COMMON SIZE INCOME STATEMENTS: EXPENSES AS A PERCENT OF COST OF GOODS SOLD (COGS)
(RATIO AVERAGES AND MEDIANS)

Cooperative	Cost of Goods Sold	Spoilage	Rent and Utilities	Gross Payroll	Contract Labor	Total Labor	Interest	Depre-ciation
				Averages				
Subsidiary	$1,312,637	.0000	.0245	.0781	.0012	.0898	.0020	.0055
Federation	3,264,774	.0021	.0129	.0938	.0030	.1144	.0027	.0046
All Consumer-Owned Co-ops	2,874,347	.0016	.0152	.0903	.0024	.1095	.0025	.0048
Worker-Owned	2,464,125	.0071	.0147	.0730	.0102	.0980	.0039	.0070
All Co-ops	2,720,514	.0049	.0150	.0834	.0055	.1052	.0031	.0060
				Medians				
Subsidiary	1,312,637	.0000	.0245	.0780	.0012	.0898	.0020	.0055
Federation	2,305,884	.0200	.0114	.0903	.0030	.1048	.0027	.0044
All Consumer-Owned Co-ops	1,754,323	.0013	.0153	.0903	.0020	.1048	.0027	.0054
Worker-Owned	2,138,588	.0053	.0159	.0678	.0069	.0951	.0034	.0071
All Co-ops	1,754,323	.0021	.0150	.0808	.0034	.1016	.0028	.0063

TABLE 12

COMMON SIZE INCOME STATEMENTS: EXPENSES AS A PERCENT OF THE COST OF GOODS SOLD (COGS)

Cooperative	Cost of Goods Sold	Education	Promotion	Maintenance	Contribution Margin	Operating Margin	Net Margin	Cash Generated
				Consumer-Owned				
Federations:								
Iota	$7,217,327	.0011	.0003	.0004	.0954	.0059	.0095	.0102
Mu	4,814,717	LI	LI	LI	.1424	(.0175)	(.0067)	(.0046)
Delta	2,618,640	LI	.0001	.0020	.2401	.0110	.0156	.0182
Tau	2,073,464	LI	.0050	.0067	.3742	.0133	.0092	.0156
Phi	1,435,775	.0014	LI	.0029	.2275	.0159	.0183	.0250
Beta	1,498,088	.0143	LI	.0004	.1656	(.0068)	(.0062)	.0004
Omicron	1,372,009	.0006	.0008	.0015	.1358	.0100	.0100	.0120
Kappa	1,204,013	LI	LI	.0016	.2903	.0899	.1034	.1096
Retail Subsidiaries:								
Nu	1,141,553	LI	.0010	.0013	.2129	.0195	.0195	.0241
Lambda	1,085,301	.0011	.0037	.0083	.1432	.0044	.0043	.0107

TABLE 12--Continued

Cooperative	Cost of Goods Sold	Education	Promotion	Maintenance	Contribution Margin	Operating Margin	Net Margin	Cash Generated
				Worker-Owned				
Eta	$4,694,762	LI	LI	LI	.1149	(.0003)	(.0004)	.0061
Gamma	2,917,583	.0004	.0026	.0011	.1868	.0278	.0287	.0311
Pi	2,511,046	.0002	LI	.0011	.2394	.0332	.0361	.0488
Rho	1,013,341	.0001	.0001	.0016	.1496	.0152	.0160	.0188
Sigma	872,564	.0002	.0011	.0083	.1956	.0193	.0181	.0310
Chi	680,689	.0002	.0001	.0002	.1366	.0197	.0246	.0311

TABLE 13

COMMON SIZE INCOME STATEMENT: EXPENSES AS A PERCENT OF COST OF GOODS SOLD (COGS)
(RATIO AVERAGES AND MEDIANS)

Cooperative	Cost of Goods Sold	Education	Promotion	Maintenance	Contribution Margin	Operating Margin	Net Margin	Cash Generated
				Averages				
Subsidiary	$1,312,637	.0011	.0024	.0048	.1781	.0120	.0119	.0174
Federation	3,264,774	.0044	.0016	.0022	.2089	.0152	.0191	.0233
All Consumer-Owned Co-ops	2,874,347	.0037	.0018	.0028	.2027	.0146	.0176	.0221
Worker-Owned	2,464,125	.0002	.0010	.0025	.1704	.0192	.0205	.0278
All Co-ops	2,720,514	.0020	.0015	.0027	.1906	.0163	.0187	.0243
				Medians				
Subsidiary	$1,312,637	.0011	.0024	.0048	.1781	.0120	.0119	.0174
Federation	2,305,884	.0013	.0006	.0016	.1966	.0105	.0096	.0138
All Consumer-Owned Co-ops	1,754,323	.0011	.0009	.0016	.1893	.0105	.0096	.0138

TABLE 13--Continued

Cooperative	Cost of Goods Sold	Education	Promotion	Maintenance	Contribution Margin	Operating Margin	Net Margin	Cash Generated
				Medians--Continued				
Worker-Owned	$2,138,588	.0002	.0006	.0011	.1682	.0195	.0214	.0311
All Co-ops	1,754,323	.0005	.0010	.0016	.1762	.0143	.0158	.0185

TABLE 14

BALANCE SHEET ACCOUNTS AS A PERCENT OF ASSETS: ASSETS

Cooperative	Asset Book Value	Current Assets	Inventory	Fixed Assets	Fixed* Assets	Accounts Receivable
			Consumer-Owned			
Federations:						
Iota	$657,356	.9793	.3946	.0178	.0178	.5322
Mu	830,881	.7893	.4543	.1428	.1428	.1244
Delta	265,313	.7082	.5241	.2568	.2568	.1184
Tau	285,674	.7043	.4048	.2957	.2957	.2399
Phi	265,010	.7898	.5318	.1770	.1770	.0580
Beta	275,506	.7578	.4475	.2422	.2422	.1942
Omicron	144,225	.7785	.6773	.2090	.2090	.0850
Kappa	477,372	.8235	.4403	.1765	.1276	.2383
Retail Subsidiaries:						
Nu	55,096	.7426	.6239	.2574	.2574	.1795
Lambda	328,791	.2527	.2128	.7374	.0366	.1457

TABLE 14--Continued

Cooperative	Asset Book Value	Current Assets	Inventory	Fixed Assets	Fixed* Assets	Accounts Receivable
			Worker-Owned			
Eta	$690,444	.4999	.5951	.4999	.1844	.0772
Gamma	350,127	.9083	.6556	.0812	.0812	.2338
Pi	377,673	.7512	.5428	.2382	.2382	.3411
Rho	71,052	.7488	.2412	.2512	.2512	.3112
Sigma	106,681	.7868	.4672	.2114	.2114	.2428
Chi	35,355	.5183	.5987	.4435	.4435	.0448

*Net Fixed Assets less land and building.

TABLE 15

BALANCE SHEET ACCOUNTS AS A PERCENT OF ASSETS: ASSETS (RATIO AVERAGES AND MEDIANS)

Cooperative	Asset Book Value	Current Assets	Inventory	Fixed Assets	Fixed* Assets	Accounts Receivable
			Averages			
Subsidiary	$191,944	.4977	.4184	.4974	.1470	.1626
Federation	400,167	.7913	.4843	.1900	.1836	.1988
All Consumer-Owned	358,522	.7326	.4711	.2515	.1763	.1916
Worker-Owned	271,889	.7022	.5168	.2876	.2350	.2085
All Co-ops	326,035	.7212	.4883	.2650	.1983	.1979
			Medians			
Subsidiary	191,944	.4977	.4184	.4974	.1470	.1626
Federation	280,590	.7839	.4509	.1930	.1930	.1595
All Consumer-Owned	280,590	.7682	.4509	.2266	.1930	.1626
Worker-Owned	228,404	.7500	.5690	.2447	.2248	.2383
All Co-ops	280,590	.7545	.4957	.2412	.2102	.1869

*Net Fixed Assets less land and building.

TABLE 16

BALANCE SHEET ACCOUNTS AS A PERCENT OF TOTAL ASSETS: LIABILITIES

Cooperative	Asset Book Value	Total Liabilities	Current Liabilities	Current Member Debt	Noncurrent Member Debt	Total Member Debt	Total Noncurrent Debt	Accounts Payable
				Consumer-Owned				
Federations:								
Iota	$657,356	.5587	.5587	.0000	.0000	.0000	.0000	.4659
Mu	830,881	.3543	.3318	.0000	.0000	.0000	.0226	.2471
Delta	265,313	.4583	.3318	.0000	.0000	.0000	.0988	.2677
Tau	285,674	.6332	.3730	.0000	.0000	.0000	.2602	.2855
Phi	265,010	.2532	.2532	.0000	.0000	.0000	.0000	.1607
Beta	275,506	.5126	.3661	.0329	.0000	.0239	.1265	.2942
Omicron	144,225	.7246	.4362	.0000	.0218	.0218	.2784	.3547
Kappa	477,372	.1146	.0867	.0000	.0000	.0000	.0278	.3547
Retail Subsidiaries:								
Nu (s)	55,096	.5715	.5430	.0000	.0000	.0000	.0285	.4350
Lambda (s)	328,791	.7298	.1098	.0000	.0063	.0063	.6199	.1024

TABLE 16--Continued

Cooperative	Asset Book Value	Total Liabilities	Current Liabilities	Current Member Debt	Noncurrent Member Debt	Total Member Debt	Total Noncurrent Debt	Accounts Payable
				Worker-Owned				
Eta	$690,444	.6725	.2546	.0000	.1286	.1286	.4179	.2481
Gamma	350,127	.6435	.6435	.0000	.0000	.0000	.0000	.5026
Pi	377,673	.6357	.5374	.0000	.0000	.0000	.0982	.2874
Rho	71,052	.6543	.6543	.0000	.0000	.0000	.0144	.5789
Sigma	106,681	.9090	.6051	.1587	.2296	.3882	.3039	.4031
Chi	35,355	.7391	.7391	.0000	.0000	.0000	.0000	.0216

TABLE 17

BALANCE SHEET ACCOUNTS AS A PERCENT OF ASSETS: LIABILITIES (RATIO AVERAGES AND MEDIANS)

Cooperative	Asset Book Value	Total Liabilities	Current Liabilities	Current Member Debt	Noncurrent Member Debt	Total Member Debt	Total Noncurrent Debt	Accounts Payable
				Averages				
Subsidiary	$191,944	.6507	.3264	.0000	.0032	.0032	.3242	.2687
Federation	400,167	.4499	.3422	.0041	.0027	.0057	.1043	.3038
All Consumer-Owned Co-ops	358,522	.4901	.3390	.0033	.0028	.0052	.1483	.2968
Worker-Owned	271,889	.7090	.5723	.0265	.0597	.0861	.1391	.3403
All Co-ops	326,035	.5722	.4265	.0120	.0241	.0356	.1448	.3131
				Medians				
Subsidiary	191,944	.6507	.3264	.0000	.0032	.0032	.3242	.2687
Federation	280,590	.4854	.3490	.0000	.0000	.0000	.0634	.2899
All Consumer-Owned Co-ops	280,590	.5357	.3490	.0000	.0000	.0000	.0637	.2899
Worker-Owned	228,404	.6634	.6243	.0000	.0000	.0000	.0563	.3453
All Co-ops	280,590	.6345	.4046	.0000	.0000	.0000	.0634	.2908

TABLE 18

BALANCE SHEET ACCOUNTS AS A PERCENT OF TOTAL ASSETS: EQUITIES

Cooperative	Asset Book Value	Total Equity	Retained Earnings	Revolving Fund	Internal Equity	Capital Shares (or deposits)
			Consumer-Owned			
Federations:						
Iota	$657,356	.4413	.1192	.2417	.3609	.0804
Mu	830,881	.6457	.0701	.0000	.0701	.5756
Delta	265,313	.5358	(.0150)	.2496	.2346	.3012
Ta$	285,674	.3668	.0175	.3381	.3555	.0113
Phi	265,010	.7468	.0263	.0000	.0263	.7205
Beta	275,506	.4874	.1175	.0000	.1175	.3698
Omicron	1444,225	.2854	.0000	.0888	.0888	.1966
Kappa	477,372	.8856	.0236	.4246	.4493	.4363
Retail Subsidiaries:						
Nu	55,096	.4285	.4285	.0000	.4285	.0000
Lambda	328,791	.2702	.2337	.0000	.2337	.0365

TABLE 18--Continued

Cooperative	Asset Book Value	Total Equity	Retained Earnings	Revolving Fund	Internal Equity	Capital Shares (or deposits)
			Worker-Owned			
Eta	$690,444	.3275	.3275	.0000	.3275	.0000
Gamma	350,127	.3265	.1163	.2037	.3200	.0365
Pi	377,673	.3643	.3643	.0000	.3643	.0000
Rho	71,052	.3457	(.0014)	.3457	.3303	.0155
Sigma	106,681	.0910	.0910	.0000	.0910	.0000
Chi	35,355	.2227	.0275	.1941	.2216	.0011

TABLE 19

BALANCE SHEET ACCOUNTS AS A PERCENT OF TOTAL ASSETS: EQUITIES (RATIO AVERAGES AND MEDIANS)

Cooperative	Asset Book Value	Total Equity	Retained Earnings	Revolving Fund	Internal Equity	Capital Shares (or deposits)
			Averages			
Subsidiary	$191,944	.3494	.3311	.0000	.3311	.0183
Federation	400,167	.5494	.0449	.1679	.2129	.3364
All Consumer-Owned Co-ops	358,522	.5094	.1021	.1343	.2365	.2728
Worker-Owned	271,889	.2846	.1542	.1239	.2758	.0089
All Co-ops	326,035	.4251	.1217	.1304	.2512	.1738
			Medians			
Subsidiary	191,944	.3494	.3311	.0000	.3311	.0183
Federation	280,590	.5116	.0250	.1653	.1761	.3355
All Consumer-Owned Co-ops	280,590	.4644	.0482	.0444	.2342	.2489
Worker-Owned	228,404	.3366	.1037	.0971	.3238	.0006
All Co-ops	280,590	.3656	.0806	.0444	.2773	.0365

TABLE 20

FINANCIAL STRUCTURE RATIOS

Cooperative	Asset Book Value	$\frac{MD}{TE+MD}$	$\frac{RE}{TE}$	$\frac{RF}{TE}$	$\frac{IE}{TE}$	$\frac{RE+S}{TE}$	$\frac{RF+S}{TE}$	$\frac{S+MD+RF}{TE+MD}$
				Consumer-Owned				
Federations:								
Iota	$657,356	.0000	.2702	.5476	.8178	.4524	1.0000	1.0000
Mu	830,881	.0000	.1086	.0000	.1086	.9801	.8914	.8914
Delta	265,313	.0000	(.0278)	.4608	.4439	.5283	1.0169	1.0169
Tau	285,674	.0000	.0476	.9217	.9693	.0783	.9524	.9524
Phi	265,010	.0000	.0352	.0000	.0352	1.0000	.9648	.9468
Beta	275,506	.0632	.2412	.0000	.2412	1.0000	.7588	.7741
Omicron	144,225	.0711	.0000	.3781	.3781	.6219	1.0000	.7109
Kappa	477,372	.0000	.0267	.4794	.5073	.5194	.5410	.5410
Retail Subsidiaries:								
Nu	55,096	.0000	1.0000	.0000	1.0000	1.0000	.0000	.0000
Lambda	328,791	.0227	.8648	.0000	.8648	1.0000	.1352	.1548

TABLE 20--Continued

Cooperative	Asset Book Value	MD / TE+MD	RE / TE	RF / TE	IE / TE	RE+S / TE	RF+S / TE	S+MD+RF / TE+MD
				Worker-Owned				
Eta	$690,444	.2820	1.0000	.0000	1.0000	1.0000	.0000	.2865
Gamma	350,127	.0000	.3262	.5713	.8975	.4287	.6740	.6740
Pi	377,673	.0000	1.0000	.0000	1.0000	1.0000	.0000	.0000
Rho	71,052	.0000	.0000	.9522	.9522	.0448	1.0000	1.0000
Sigma	106,681	.8100	1.0000	.0000	1.0000	1.0000	.0000	.6679
Chi	35,355	.0000	.1234	.0000	.9951	.1234	.8766	.8766

TABLE 21

FINANCIAL STRUCTURE RATIOS: AVERAGES AND MEDIANS

Cooperative	Asset Book Value	$\frac{MD}{TE+MD}$	$\frac{RE}{TE}$	$\frac{RF}{TE}$	$\frac{IE}{TE}$	$\frac{RE+S}{TE}$	$\frac{RF+S}{TE}$	$\frac{S+MD+RF}{TE+MD}$
				Averages				
Subsidiary	$191,944	.0114	.9324	.0000	.9324	1.0000	.0676	.0774
Federation	400,167	.0168	.0877	.3485	.4377	.6476	.8907	.8564
All Consumer-Owned Co-ops	358,522	.0157	.2567	.2788	.5366	.1780	.7261	.7006
Worker-Owned	271,889	.1820	.5749	.2544	.9746	.5995	.4251	.5842
All Co-ops	326,035	.0781	.3760	.2696	.7009	.6736	.6132	.6570
				Medians				
Subsidiary	191,944	.0114	.9324	.0000	.9324	1.0000	.0676	.0744
Federation	280,590	.0000	.0414	.4195	.4110	.5751	.9586	.9219
All Consumer-Owned Co-ops	280,590	.0000	.0781	.1891	.4756	.8010	.9219	.8328
Worker-Owned	228,404	.0000	.6631	.0000	.9976	.7144	.3370	.6710
All Co-ops	280,590	.0000	.1823	.0000	.8812	.8010	.8177	.7425

TABLE 22

FINANCIAL STRUCTURE RATIOS

Cooperative	Asset Book Value	$\frac{TL}{TA}$	$\frac{TL-MD}{TA}$	$\frac{NCD}{TE}$	$\frac{NCD}{NCD+TE}$	$\frac{NCD-NMD}{NCD+TE}$
			Consumer-Owned			
Federations:						
Iota	$657,356	.5587	.5587	.0000	.0000	.0000
Mu	830,881	.3318	.3318	.0350	.0338	.0338
Delta	265,313	.4583	.4583	.1825	.1543	.1543
Tau	285,674	.6332	.6332	.5172	.4150	.4150
Phi	265,010	.2532	.2532	.0000	.0000	.0000
Beta	275,506	.5126	.4797	.3005	.2311	.1792
Omicron	144,225	.7146	.6927	.9753	.4938	.4550
Kappa	477,372	.1146	.1146	.0314	.0304	.0304
Retail Subsidiaries:						
Nu	55,096	.5715	.5715	.0666	.0624	.0624
Lambda	328,791	.7298	.7298	2.2941	.6961	.6890

TABLE 22--Continued

Cooperative	Asset Book Value	TL/TA	(TL-MD)/TA	NCD/TE	NCD/(NCD+TE)	(NCD-NMD)/(NCD+TE)
			Worker-Owned			
Eta	$690,444	.6725	.6210	1.2759	.5606	.3880
Gamma	350,127	.6435	.6435	.0000	.0000	.0000
Pi	377,673	.6357	.6357	.2696	.2124	.2124
Rho	71,052	.6542	.6542	.0416	.0399	.0399
Sigma	106,681	.9090	.5207	3.3380	.7695	.1881
Chi	35,355	.7391	.7391	.0000	.0000	.0000

TABLE 23

FINANCIAL STRUCTURE RATIOS: AVERAGES AND MEDIANS

Cooperative	Asset Book Value	TL/TA	TL-MD/TA	NCD/TE	NCD/NCD+TE	NCD-NMD/NCD+TE
			Averages			
Subsidiary	$191,944	.6507	.6507	1.1804	.3793	.3757
Federation	400,167	.4471	.4403	.2552	.1698	.1585
All Consumer-Owned Co-ops	358,522	.4878	.4824	.4403	.2117	.2019
Worker-Owned	271,889	.7090	.6357	.8209	.2637	.1381
All Co-ops	326,035	.5708	.5399	.5830	.2312	.1780
			Medians			
Subsidiary	191,944	.6507	.6507	1.1804	.3793	.3757
Federation	280,590	.4855	.4690	.1088	.0941	.0941
All Consumer-Owned Co-ops	280,590	.5357	.5192	.1246	.1084	.1084
Worker-Owned	228,404	.6634	.6396	.1556	.1262	.1140
All Co-ops	280,590	.6345	.5963	.1246	.1084	.1084

TABLE 24

LIQUIDITY AND COVERAGE RATIOS

Cooperative	Asset Book Value	CA / CL	CA-INV / CL	CA-INV / CL-AP	APx360 / COGS	COGS / INV	EBIT / Y
				Consumer-Owned			
Federations:							
Iota	$657,356	1.7529	1.0468	6.3021	15.2749	27.8261	111.0030
Mu	830,881	2.3792	1.0098	3.9579	15.3523	12.7551	.0000*
Delta	265,313	1.9701	.5121	2.0055	9.7631	18.8320	5.9500
Tau	285,674	1.8883	.8030	3.4217	14.1594	17.9291	4.2601
Phi	265,010	3.1196	1.0192	2.7898	10.6773	10.1879	29.5700
Beta	275,506	2.0696	.8474	4.2803	19.4419	12.1209	.0000*
Omicron	144,225	1.7847	.2320	1.2408	13.4215	14.0451	6.6921
Kappa	477,372	9.4931	4.4177	6.6817	4.1956	5.7285	33.5401
Retail Subsidiaries:							
Nu	55,096	1.4032	.3403	1.7106	8.1694	33.2121	33.1763
Lambda	328,791	2.3266	.3892	5.7719	11.1719	15.5109	2.2752

TABLE 24--Continued

Cooperative	Asset Book Value	CA / CL	CA-INV / CL	CA-INV / CL-AP	APx360 / COGS	COGS / INV	EBIT / Y
			Worker-Owned				
Eta	$690,444	1.9633	(.3739)	(14.6343)	13.1358	11.4263	.9948
Gamma	350,127	1.4115	.3927	.5027	21.7144	12.9495	40.5930
Pi	377,673	1.3977	.3876	.8332	15.5613	12.2480	9.2500
Rho	71,052	1.1703	.7934	8.3192	14.6119	59.1386	20.2010
Sigma	106,681	1.3003	.5282	.7929	17.7421	13.5176	3.3851
Chi	35,355	.7012	(.1088)	(.1120)	.4205	30.9320	9.3939

*Coverage is less than zero because of a negative EBIT.

TABLE 25

LIQUIDITY AND COVERAGE RATIOS: AVERAGES AND MEDIANS

Cooperative	Asset Book Value	CA/CL	CA-INV/CL	CA-INV/CL-AP	APx360/COGS	COGS/INV	EBIT/Y
			Averages				
Subsidiary	$191,944	1.8649	.3648	3.7413	9.6707	24.3615	17.7258
Federation	400,167	3.0572	1.2360	3.8349	12.7858	14.9318	23.8769
All Consumer-Owned Co-ops	358,522	2.8187	1.0618	3.8162	12.1627	16.8178	22.6467
Worker-Owned	271,889	1.3241	.2699	(.7164)	13.8643	23.3766	13.9696
All Co-ops	326,035	2.2582	.76479	2.1165	12.8008	19.2773	19.3927
			Medians				
Subsidiary	191,944	1.8649	.3648	3.7413	9.6707	24.3615	17.7258
Federation	280,590	2.0198	.9286	3.6898	13.7904	13.4001	6.3211
All Consumer-Owned Co-ops	180,590	2.0198	.8252	3.6898	12.2967	14.7780	6.3211
Worker-Owned	228,404	1.3490	.3902	.6478	15.0866	13.2336	9.3219
All Co-ops	280,590	1.8365	.5202	2.3977	13.7904	13.7814	7.9711

TABLE 26

RATIOS USED IN THE ROBERT MORRIS ASSOCIATES' INDUSTRY SURVEY OF WHOLESALE GROCERY BUSINESSES

Cooperative	Asset Book Value	CA/CL	CA-INV/CL	SR/AR	COGS/INV	SR/WC	EBIT/Y	NFA/TE
				Consumer-Owned				
Federations:								
Iota	$657,356	1.7529	1.0468	22.5988	27.8261	28.5874	111.0031	.0404
Mu	830,881	2.3792	1.0098	53.1620	12.7552	15.2101	.0000*	.2211
Delta	265,313	1.9701	.5121	103.4002	18.8320	35.0981	5.9521	.4741
Tau	285,674	1.8883	.8029	41.5740	17.9290	30.1030	4.2601	.8061
Phi	265,010	3.1196	1.0192	114.7410	10.1880	12.3931	29.5711	.2369
Beta	275,506	2.0696	.8474	32.6403	12.1511	16.1834	.0000*	.4970
Omicron	144,225	1.7847	.2319	127.1330	14.0451	31.5700	6.6923	.1523
Kappa	477,372	9.4931	4.4177	13.6601	5.7285	4.4171	33.5441	.1993
Retail Subsidiaries:								
Nu	55,096	1.4032	.3403	140.0201	33.2121	161.4802	33.1763	.5557
Lambda	328,791	2.3266	.3892	3902.0010	15.5111	26.4211	2.2752	.1410

TABLE 26--Continued

Cooperative	Asset Book Value	CA/CL	CA-INV/CL	SR/AR	COGS/INV	SR/WC	EBIT/Y	NFA/TE
				Worker-Owned				
Eta	$690,444	1.9633	(.3739)	98.0521	11.4263	30.8702	.9948	1.5266
Gamma	350,127	1.4115	.3927	42.3001	12.9495	37.3492	40.5931	.2279
Pi	377,673	1.3977	.3876	24.1622	12.2481	38.5443	9.2513	.6539
Rho	71,052	1.1703	.7934	52.6902	59.1376	150.4722	20.2010	.7264
Sigma	106,681	1.3003	.5282	40.2700	13.5176	53.8211	3.3853	2.3211
Chi	35,355	.7012	(.1088)	469.4504	30.9320	115.2131	9.3939	1.9921

*Coverage is less than zero because of a negative EBIT.

TABLE 27

RATIOS USED IN THE ROBERT MORRIS ASSOCIATES' INDUSTRY SURVEY OF WHOLESALE GROCERY BUSINESSES: AVERAGES AND MEDIANS

Cooperative	Asset Book Value	$\frac{CA}{CL}$	$\frac{CA-INV}{CL}$	$\frac{SR}{AR}$	$\frac{COGS}{INV}$	$\frac{SR}{WC}$	$\frac{EBIT}{Y}$	$\frac{NFA}{TE}$
				Averages				
Subsidiary	$191,944	1.8649	.3648	2021.0106	24.3615	93.9507	17.7258	.3484
Federation	400,167	3.0572	1.2360	63.6137	14.9318	21.6953	23.8769	.3284
All Consumer-Owned Co-ops	358,522	2.8187	1.0618	455.0931	16.8178	36.1464	22.6467	.3324
Worker-Owned	271,889	1.3241	.2699	121.1542	23.3766	71.0450	13.9696	1.2417
All Co-ops	326,035	2.2582	.7648	329.8660	19.2773	49.2333	19.3927	.6732
				Medians				
Subsidiary	191,944	1.8649	.3648	2021.0106	24.3615	93.9507	17.7258	.3484
Federation	280,590	2.0198	.9286	47.3680	13.4001	22.3854	6.3211	.2290
All Consumer-Owned Co-ops	280,590	2.0198	.8252	78.2811	14.7780	27.5043	6.3211	.2290
Worker-Owned	228,404	1.3490	.3902	47.4952	13.2336	46.1827	9.3219	1.1265
All Co-ops	280,590	1.8365	.5202	52.9261	13.7814	31.2201	7.9711	.4856

TABLE 28

RATIOS USED IN THE ROBERT MORRIS ASSOCIATES' INDUSTRY SURVEY OF WHOLESALE GROCERY BUSINESSES

Cooperative	Asset Book Value	$\frac{TL}{TE}$	$\frac{EBT}{TE}$	$\frac{EBT}{TA}$	$\frac{SR}{NFA}$
		Consumer-Owned			
Federations:					
Iota	$657,356	1.2658	.2366	.1044	675.2202
Mu	830,881	.5488	(.0619)	(.0399)	46.3149
Delta	265,313	.5316	.2844	.1540	47.6610
Tau	285,674	1.2586	.1824	.0669	33.7341
Phi	265,010	.3390	.1814	.0990	37.5774
Beta	275,506	1.0518	(.0886)	(.0337)	26.1681
Omicron	144,225	2.5037	.3342	.0954	51.7101
Kappa	477,372	.1293	.3022	.2676	18.4112
Retail Subsidiaries:					
Nu	55,096	1.3337	.8745	.4051	97.6204
Lambda	328,791	2.7006	.0533	.0144	5.1180

TABLE 28--Continued

Cooperative	Asset Book Value	$\frac{TL}{TE}$	$\frac{EBT}{TE}$	$\frac{EBT}{TA}$	$\frac{SR}{NFA}$
		Worker-Owned			
Eta	$690,444	2.0534	(.0008)	(.0003)	15.1452
Gamma	350,127	1.8050	.6715	.2394	121.7470
Pi	377,673	1.7447	.6587	.2400	34.5914
Rho	71,052	1.8927	.6542	.2260	65.2812
Sigma	106,681	9.9834	1.6268	.1481	46.2704
Chi	35,355	3.3190	2.0468	.4739	47.4521

TABLE 29

RATIOS USED IN THE ROBERT MORRIS ASSOCIATES' INDUSTRY SURVEY OF WHOLESALE GROCERY BUSINESS: AVERAGES AND MEDIANS

Cooperative	Asset Book Value	$\frac{TL}{TE}$	$\frac{EBT}{TE}$	$\frac{EBT}{TA}$	$\frac{SR}{NFA}$
		Averages			
Subsidiary	$191,944	2.0172	.4639	.2098	51.3692
Federation	400,167	.9536	.1713	.0892	117.0966
All Consumer-Owned Co-ops	358,522	1.1663	.2299	.1133	103.9535
Worker-Owned	271,889	3.4663	.9429	.2212	55.0812
All Co-ops	326,035	2.0288	.4972	.1538	85.6264
		Medians			
Subsidiary	191,944	2.0172	.4639	.2098	51.3692
Federation	280,590	.8003	.2095	.0972	41.9462
All Consumer-Owned Co-ops	280,590	1.1552	.2095	.0972	41.9462
Worker-Owned	228,404	1.9729	.6651	.2327	46.8613
All Co-ops	280,590	1.5392	.2933	.1263	46.2927

TABLE 30

RATIOS USED IN THE ROBERT MORRIS ASSOCIATES' INDUSTRY SURVEY OF WHOLESALE GROCERY BUSINESSES

Cooperative	Asset Book Value	ROA	ROE	$\frac{SR}{TA}$	$\frac{DEP}{SR}$
		Consumer-Owned			
Federations:					
Iota	$657,356	.1044	.2388	12.0262	.0006
Mu	830,881	(.0400)	(.0140)	6.6141	.0020
Delta	265,313	.1540	.2844	12.2411	.0021
Tau	285,674	.0669	.1824	9.7414	.0046
Phi	265,010	.0990	.1325	6.6504	.0055
Beta	275,506	(.0326)	(.0301)	6.3383	.0085
Omicron	144,225	.0954	.3342	10.8101	.0017
Kappa	477,372	.2609	.2946	3.2544	.0048
Retail Subsidiaries:					
Nu	55,096	.4051	.8995	25.1302	.0038
Lambda	328,791	.0144	.0951	3.7743	.0056

TABLE 30--Continued

Cooperative	Asset Book Value	ROA	ROE	$\frac{SR}{TA}$	$\frac{DEP}{SR}$
		Worker-Owned			
Eta	$690,444	(.0003)	(.1567)	7.5721	.0055
Gamma	350,127	.2394	.6885	9.8894	.0020
Pi	377,673	.2400	.7386	8.2410	.0103
Rho	71,052	.2262	.6883	16.8963	.0024
Sigma	106,681	.1481	2.3163	9.7824	.0081
Chi	35,355	.4739	1.8499	21.8824	.0057

TABLE 31

RATIOS USED IN THE ROBERT MORRIS ASSOCIATES' INDUSTRY SURVEY OF WHOLESALE GROCERY BUSINESSES: AVERAGES AND MEDIANS

Cooperative	Asset Book Value	ROA	ROE	$\frac{SR}{TA}$	$\frac{DEP}{SR}$
		Averages			
Subsidiary	$191,944	.2593	.4973	14.4523	.0047
Federation	400,167	.0880	.1779	8.4595	.0037
All Consumer-Owned Co-ops	358,522	.1223	.2417	9.6581	.0039
Worker-Owned	271,889	.2212	1.0208	12.2939	.0057
All Co-ops	326,035	.1594	.5339	10.6465	.0046
		Medians			
Subsidiary	191,944	.2593	.4973	14.4523	.0047
Federation	280,590	.0972	.2106	8.1959	.0034
All Consumer-Owned Co-ops	280,590	.0972	.2106	8.1959	.0042
Worker-Owned	228,404	.2328	.7136	9.8359	.0056
All Co-ops	280,590	.1263	.2895	9.7619	.0047

TABLE 32

GROWTH ANALYSIS RATIOS

Cooperative	Asset Book Value	EBIT/Y	EBIT/Y+W	CBT/TA	IE/TA	IE/TE	NCD/TE
			Consumer-Owned				
Federations:							
Iota	$657,356	111.0030	2.0750	.1116	.3609	.8178	.0000
Mu	830,881	.0000*	.0000*	(.0266)	.0701	.1086	.0350
Delta	265,313	5.9500	2.1690	.1799	.2405	.4439	.1147
Tau	285,674	4.2601	1.2722	.1130	.3555	.9693	.5172
Phi	265,010	29.5700	1.1670	.1355	.0263	.0352	.0000
Beta	275,506	.0000*	.0000*	.0201	.1175	.2412	.3005
Omicron	144,225	6.6921	1.9034	.1133	.1079	.3781	.9753
Kappa	477,372	33.5401	2.4560	.2765	.4493	.5073	.0314
Retail Subsidiaries:							
Nu (s)	55,096	33.1763	6.3104	.4996	.4578	1.0000	.0666
Lambda (s)	328,791	2.2752	.4734	.0346	.2337	.8648	2.2941

TABLE 32--Continued

Cooperative	Asset Book Value	$\frac{EBIT}{Y}$	$\frac{EBIT}{Y+W}$	$\frac{CBT}{TA}$	$\frac{IE}{TA}$	$\frac{IE}{TE}$	$\frac{NCD}{TE}$
			Worker-Owned				
Eta	$690,444	.9948	.4987	.0414	.3274	.9999	1.2759
Gamma	350,127	40.5930	5.3014	.2592	.3199	.8974	.0000
Pi	377,673	9.2500	3.6498	.3247	.3643	1.0000	.2696
Rho	71,052	20.2010	4.6361	.2660	.3303	.9552	.0416
Sigma	106,681	3.3851	2.6301	.2272	.0910	1.0000	3.3380
Chi	35,355	9.3939	5.9712	.5986	.2304	.9951	.0000

*Coverage is less than zero because of a negative EBIT.

TABLE 33

GROWTH ANALYSIS RATIOS: AVERAGES AND MEDIANS

Cooperative	Asset Book Value	$\frac{EBIT}{Y}$	$\frac{EBIT}{Y+W}$	$\frac{CBT}{TA}$	$\frac{IE}{TA}$	$\frac{IE}{TE}$	$\frac{NCD}{TE}$
			Averages				
Subsidiary	$191,944	17.7258	3.3919	.2671	.3311	.9324	1.1804
Federation	400,167	23.8769	1.3803	.1154	.2129	.4377	.2552
All Consumer-Owned Co-ops	358,522	22.6467	1.7826	.1458	.2365	.5366	.4403
Worker-Owned	271,889	13.9696	3.7812	.2862	.2758	.9746	.8209
All Co-ops	326,035	19.3927	2.5321	.1984	.2512	.7009	.5830
			Medians				
Subsidiary	191,944	17.7258	3.3919	.2671	.3311	.9324	1.1804
Federation	280,590	6.3211	1.5878	.1132	.1761	.4110	.1088
All Consumer-Owned Co-ops	280,590	6.3211	1.5878	.1132	.2342	.4756	.1246
Worker-Owned	228,404	9.3219	4.1429	.2432	.3238	.9976	.1556
All Co-ops	280,590	7.9711	2.1220	.1577	.2773	.8812	.1246

TABLE 34

GROWTH ANALYSIS RATIOS

Cooperative	Asset Book Value	ROA	ROE	K^*_e	Retention Rate	g'_{ie}	g''_{ie}
			Consumer-Owned				
Federations:							
Iota	$657,356	.1044	.2388	.1129	.5270	.0612	.0550
Mu	830,881	(.0400)	(.0140)	.1142	.0000	.0000	.0000
Delta	265,313	.1540	.2844	.1170	.5886	.0684	.0907
Tau	285,674	.0669	.1824	.1314	.2796	.0325	.0187
Phi	265,010	.0990	.1325	.1129	.1480	.0172	.0146
Beta	275,506	(.0326)	(.0301)	.1236	.0000	.0000	.0000
Omicron	144,225	.0954	.3342	.1477	.5580	.0648	.0532
Kappa	477,372	.2609	.2946	.1140	.6129	.0712	.1599
Retail Subsidiaries:							
Nu (s)	55,096	.4051	.8995	.1153	.8718	.1013	.3532
Lambda (s)	328,791	.0144	.0951	.1591	.0000	.0000	.0000

TABLE 34--Continued

Cooperative	Asset Book Value	ROA	ROE	K^*_e	Retention Rate	g'_{ie}	g''_{ie}
			Worker-Owned				
Eta	$690,444	(.0003)	(.1567)	.1532	.0000	.0000	.0000
Gamma	350,127	.2394	.6885	.1129	.8360	.0971	.2001
Pi	377,673	.2400	.7386	.1225	.8341	.0969	.2002
Rho	71,052	.2262	.6883	.1144	.8338	.0969	.1886
Sigma	106,681	.1481	2.3163	.1964	.9152	.1063	.1356
Chi	35,355	.4739	1.8499	.1129	.9390	.1091	.4450

*Required *rate* of wealth return for a diversified membership, with no nonwealth returns expected. Presented for illustrative purposes only.

TABLE 35

GROWTH ANALYSIS RATIOS: AVERAGES AND MEDIANS

Cooperative	Asset Book Value	ROA	ROE	K^*_e	Retention Rate	g'_{ie}	g''_{ie}
			Averages				
Subsidiary	$191,944	.2593	.4973	.1372	.4359	.0506	.1766
Federation	400,267	.0880	.1779	.1217	.3393	.0394	.0490
All Consumer-Owned Co-ops	358,522	.1223	.2417	.1248	.3586	.0417	.0745
Worker-Owned	271,889	.2212	1.0208	.1354	.7264	.0844	.1949
All Co-ops	326,035	.1594	.5339	.1288	.4965	.0577	.1197
			Medians				
Subsidiary	191,944	.2593	.4973	.1372	.4359	.0506	.1766
Federation	280,590	.0972	.2106	.1156	.4033	.0630	.0360
All Consumer-Owned Co-ops	280,590	.0972	.2106	.1162	.4033	.0469	.0360
Worker-Owned	228,404	.2328	.7136	.1184	.8350	.0970	.1944
All Co-ops	280,590	.1263	.2863	.1157	.5583	.0666	.0729

*Required *rate* of wealth return for a diversified membership, with no nonwealth returns expected. Presented for illustrative purposes only.

CHAPTER VIII

INTERPRETATION OF SAMPLE DATA: FINANCIAL STRENGTH OF THE INDUSTRY

The limitations encountered in data collection preclude hypothesis testing, which in turn precludes a statistical test of the concepts introduced in Part I of this study. Nonetheless these concepts are sufficiently grounded in generally accepted economic and financial theory that their use in this analysis is valid.

In determining the financial strength of this industry, attention focuses primarily on financial risk. Risk assessment is critical due to its relationship to required return of the members and the ability of the firm to survive. Growth becomes important in the long run if a firm is to maintain its market share, profitability, and competitive viability.

The analysis of financial risk focuses on financial structure, liquidity, and coverage. The ratio sets described in Chapter VI are used in this analysis.

Financial Structure Ratios

Financial structure ratios are composed of equity structure and debt structure ratios.

Equity Structure Ratios

Equity structure ratios are composed of the following: (a) member investment, (b) internally-generated equity, and (c) permanent equity.

Member investment. Capital shares as a percent of total equity for each subgroup are outlined in the matrix shown in Table 36.

The proportion of capital shares to total equity is often lower for a subsidiary corporation because the parent organization frequently puts in minimal equity since it is the only owner. Consequently, the results of this sample should not be surprising.

Federated cooperatives have a high percentage of capital shares due to the effects of double leverage which results in greater equity capital provided by each member, and by the larger number of members in each federated cooperative.

The worker cooperatives in contrast were notably sparing in their use of capital shares. Four of the six worker cooperatives have virtually no share equity, while the remaining two cooperatives have capital share equity that is less than ten percent of total equity.

Since capital shares are minimized, the worker cooperatives have turned to debt, both member and institutional. Of those cooperatives using member debt, the worker cooperative's ratio of member debt to total member contribution is the highest (Table 37).

TABLE 36

CAPITAL SHARES AS A PERCENT OF TOTAL EQUITY

Cooperative	Median	Mean	High	Low
Subsidiary	.0676	.0676	.1352	.0000
Federation	.5890	.5623	.9648	.0207
Worker-Owned	.0024	.0254	.1025	.0000

TABLE 37

MEMBER DEBT AS A PROPORTION OF
TOTAL MEMBER CONTRIBUTION

Cooperative	Median	Mean	High	Low
Subsidiary	.0114	.0114	.0227	.0000
Federation	.0000	.0168	.0711	.0000
Worker-Owned	.0000	.1820	.8100	.0000

In analyzing member total investment, patronage dividend should also be considered. Comparing federated cooperatives to worker cooperatives, shows federated cooperatives with a much greater percentage of member investment in equities (Table 38).

However, when member investment is adjusted to include member debt, the difference narrows drastically (Table 39). The remaining difference between worker and federated cooperatives' member investment is primarily due to the worker cooperatives' greater use of unallocated retained earnings.

Internally-generated equity. The federated cooperatives have achieved almost an equal balance between shares and internally-generated equity as sources of capital. This should create a more stable financial structure in the face of member turnover or a decline in earnings. The worker cooperatives and subsidiary wholesalers are almost entirely dependent upon internally-generated equity for equity capital (Table 40).

The subsidiary wholesalers have most of their equity as retained earnings. This is not so surprising when one realizes that each subsidiary is not really an independent entity, rather they are ultimately supported by the capital structure of the retail cooperative which owns its. Retail subsidiaries are not able to issue patronage dividends due to their legal structure. Therefore all earnings are unallocated retained earnings. The federated cooperatives' use of retained earnings is restrained by the advantages of the alternative-patronage dividends.

TABLE 38

SHARES AND PATRONGE DIVIDENDS AS
PERCENT OF TOTAL EQUITY

Cooperative	Median	Mean	High	Low
Subsidiary	.0676	.0676	.1352	.0000
Federation	.9586	.8907	1.0000	.5410
Worker-Owned	.3370	.4251	1.0000	.0000

TABLE 39

MEMBER DEBT, SHARES, AND PATRONAGE DIVIDENDS TO
TOTAL EQUITY AND MEMBER DEBT

Cooperative	Median	Mean	High	Low
Subsidiary	.0774	.0774	.1548	.0000
Federation	.9217	.8564	1.0000	.5410
Worker-Owned	.6710	.5842	1.0000	.0000

TABLE 40

INTERNALLY-GENERATED EQUITY AS A
PROPORTION OF TOTAL EQUITY

Cooperative	Median	Mean	High	Low
Subsidiary	.9324	.9324	1.0000	.8648
Federation	.4110	.4337	.9693	.0352
Worker-Owned	.9976	.9746	1.0000	.8975

The worker cooperatives predominantly rely upon unallocated retained earnings as a source of internally-generated equity. These worker cooperatives may be exposing themselves to the risk (e.g., internal dissension) and dependence upon debt. Each subgroup's use of retained earnings is shown in the matrix in Table 41.

Three of the six worker cooperatives derived one hundred percent of their equity from retained earnings, while all worker cooperatives derived at least ninety percent of their equity from earnings. If members in a worker cooperative have no investment and are unable to capture retained earnings, the cooperative functions as a "public enterprise." Not having any investment, the members could not be expected to be concerned about a return on investment. Therefore, there is no strong incentive for members to be efficient in the short run, particularly for new members who have not made a "sweat equity" investment. These attitude differences between tenured and recent members can erupt into internal discord for worker cooperatives.

In spite of the tax advantages of patronage dividends, only half of the federated cooperatives and one-third of the producer cooperatives were using them (Table 42).

One reason that the worker cooperatives are not utilizing patronage dividends as much as federated cooperatives could be due to risk aversion. The members would rather take wages up front, rather than taking a chance on their cooperative performing below expectation and thus declaring a lower patronage dividend.

TABLE 41

RETAINED EARNINGS AS A PROPORTION
OF TOTAL EQUITY

Cooperative	Median	Mean	High	Low
Subsidiary	.9324	.9324	1.0000	.8648
Federation	.0414	.0877	.2702	(.0278)
Worker-Owned	.6631	.5749	1.0000	.0000

TABLE 42

PERMANENT EQUITY AS A PERCENT
OF TOTAL EQUITY

Cooperative	Median	Mean	High	Low
Subsidiary	1.0000	1.0000	1.0000	1.0000
Federation	.5751	.6476	1.0000	.0783
Worker-Owned	.7144	.5995	1.0000	.0448

A disturbing aspect of patronage dividend use by federated cooperatives is the absence of redemption planning. Approximately half of the federations using revolving funds keep the retain certificates indefinitely. This policy could lead to the following risks:

1. Legislation regarding mandatory redemption may be forthcoming. Cook has demonstrated the potential effects of such legislation upon farm cooperatives. A cooperative which has been relying on indefinite deferment of redemption could experience a dramatic cash outflow should such legislation be passed.[1]

2. Indefinite deferment may be regarded as a fraudulent practice by members. It would be more honest to use a system such as the *adjustable* revolving fund, where the "paper" patronage dividends are recognized as "permanent." Otherwise member resentment may be generated over the expectation of eventual redemption.

3. Absence of a redemption policy makes the calculation of member return and required return difficult. Consequently, capital budgeting and capital structure decisions become difficult.

Permanent equity. The combination of member shares and retained earnings represents equity capital that bankers regard as permanent equity. This is the equity that commercial lenders usually consider when calculating debt to equity ratios, and ultimately debt capacity.

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[1] Cook, "Economic and Legal Analysis."

Permanent equity was a relatively high proportion of total equity for the three classes of cooperatives, with worker cooperatives exhibiting a greater amount than consumer-owned cooperatives. The worker cooperatives' preponderance of permanent equity was probably due to their reliance on retained earnings (Table 42).

Debt Structure Ratios

Total leverage. The three types of cooperative warehouses did not deviate dramatically from the industry or from each other in terms of total leverage. The federations, however, did use the least amount of outside debt of all groups even after adjustment for member debt (Tables 43 and 44).

Funded debt. The subsidiary cooperatives are the most dependent upon funded debt. This is primarily due to the retail parent using its own equity base to obtain the debt for the subsidiary. The worker and federated cooperatives both use less debt than the industry, which was expected. Contrary to theory, the worker cooperatives used more debt than the federations (Table 45).

Brealey and Myers have indicated that worker-owned firms would be less levered than investor-owned firms since workers have less diversified personal portfolios than consumers.[1]

Worker cooperatives may have greater use of debt for three reasons. First, the public firm phenomenon may have occurred, whereby

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[1]Brealey and Myers, Principles of Corporate Finance.

TABLE 43

TOTAL DEBT AS A PROPORTION OF TOTAL ASSETS

Cooperative	Median	Mean	High	Low
Subsidiary	.6507	.6507	.7298	.5715
Federation	.4855	.4471	.6927	.1146
Worker-Owned	.6634	.7090	.7391	.5207
Robert Morris	.6210	-	-	-

TABLE 44

TOTAL DEBT (SANS MEMBER DEBT) AS A
PROPORTION OF TOTAL ASSETS

Cooperative	Median	Mean	High	Low
Subsidiary	.6507	.6507	.7298	.5715
Federation	.4690	.4403	.6927	.1146
Worker-Owned	.6396	.6396	.7391	.5207
Robert Morris	.6210	-	-	-

TABLE 45

FUNDED DEBT TO TOTAL EQUITY

Cooperative	Median	Mean	High	Low
Subsidiary	1.1804	1.1804	2.2941	.0666
Federation	.1088	.2552	.9753	.0000
Worker-Owned	.1556	.8209	3.3380	.0000
Robert Morris	.3850	-	-	-

the members view their cooperatives as a "public" firm in which they have no significant financial investment. The worker cooperatives have a longer degree of member investment than the federations, which may support this conclusion.

A second reason for greater debt use by worker cooperatives is capital rationing. The number of members in a worker cooperative is much smaller for a worker cooperative than a consumer-owned federation. Even when members do not view their cooperative as a public firm, there is a limit to the amount of capital an individual can provide. This limit is reached quickly when the members receive low salary payments which is typical for worker-owned cooperatives in this industry. A worker cooperative is therefore forced to use debt to meet any capital shortfall.

A third reason for greater debt use by worker cooperatives is the reliance by worker cooperatives on member debt. Member investment may represent a high proportion of an individual's personal portfolio even if the sum of these investments is a relatively small proportion of total equity. Members may attempt to reduce the risk of their investment in the cooperative by utilizing debt rather than equity. Indeed, an adjustment of the debt to equity ratio for member debt substantially reduces the difference in ratios between consumer and worker cooperatives (Table 46).

Accounts payable. Both worker and federated cooperatives used less funded debt than the industry, however, they compensated by being somewhat more dependent upon trade payables. It is likely that these

TABLE 46

FUNDED DEBT LESS MEMBER DEBT TO TOTAL EQUITY

Cooperative	Median	Mean	High	Low
Subsidiary	.3757	.3757	.6890	.0624
Federation	.0941	.1585	.4550	.0000
Worker-Owned	.1140	.1381	.3880	.0000
Robert Morris	.3850	-	-	-

cooperatives view trade payables as equivalent to subordinated debt and thus a quasi-equity source of capital (Table 47).

Liquidity Ratios

As measured by the current and quick ratios, the worker cooperatives and the retail subsidiary warehouses are less liquid than the industry and considerably less liquid than the federated cooperatives (Tables 48 and 49).

One reason that subsidiary warehouses can run on less cash is that the subsidiary warehouses can draw upon the parent for additional funds. Both the worker and subsidiary warehouses may find a lower degree of liquidity acceptable because they are both throwing off more cash than the federated cooperatives (Table 50).

Another reason for the acceptance of lower liquidity was the greater inventory turns for cooperatives with subsidiaries exhibiting the greatest turns (Table 51).

Coverage Ratios

All cooperatives have greater interest coverage than the industry. The retail subsidiaries exhibited considerable coverage for both interest and capital coverage. The federations as a group have greater interest coverage, but lower capital coverage than the worker cooperatives. This is probably due to the greater leverage of the worker cooperatives and the greater number of equity holders for federated cooperatives (Tables 52 and 53).

TABLE 47

ACCOUNTS PAYABLE AS A PROPORTION OF TOTAL ASSETS

Cooperative	Median	Mean	High	Low
Subsidiary	.2687	.2687	.4350	.1024
Federation	.2899	.3038	.4659	.1607
Worker-Owned	.3453	.3403	.5789	.0216
Robert Morris	.2370	-	-	-

TABLE 48

CURRENT RATIO

Cooperative	Median	Mean	High	Low
Subsidiary	1.8649	1.8649	2.3266	1.4032
Federation	2.0198	3.0572	9.4931	1.7529
Worker-Owned	1.3490	1.4351	1.9633	.7012
Robert Morris	1.6000	-	-	-

TABLE 49

QUICK RATIO

Cooperative	Median	Mean	High	Low
Subsidiary	.3648	.3648	.3892	.3403
Federation	.9286	1.2360	4.4177	.2320
Worker-Owned	.3902	.2699	.7934	(.3739)
Robert Morris	.7000	-	-	-

TABLE 50

CASH GENERATED AS A PERCENT OF TOTAL SALES

Cooperative	Median	Mean	High	Low
Subsidiary	.0147	.0147	.0199	.0094
Federation	.0109	.0188	.0850	(.0040)
Worker-Owned	.0261	.0235	.0394	.0055
Robert Morris	.0200	-	-	-

TABLE 51

INVENTORY TURNOVER

Cooperative	Median	Mean	High	Low
Subsidiary	24.3615	24.3615	33.2121	15.5109
Federation	13.4001	14.9318	27.8261	5.7285
Worker-Owned	13.2336	23.3766	59.1386	11.4263
Robert Morris	9.3000	-	-	-

TABLE 52

INTEREST COVERAGE

Cooperative	Median	Mean	High	Low
Subsidiary	17.7258	17.7258	33.1763	2.2752
Federation	23.8769	23.8769	111.0030	.0000
Worker-Owned	13.9696	13.9696	40.5930	.9948
Robert Morris	2.8000	-	-	-

TABLE 53

CAPITAL COVERAGE

Cooperative	Median	Mean	High	Low
Subsidiary	3.3919	3.3919	6.3104	.4734
Federation	1.5878	1.3803	2.4560	.0000
Worker-Owned	4.1429	3.7812	5.9712	.4987

Growth Potential Ratios

Growth potential is defined in Chapter VI as the ability to obtain revenue-producing assets. A firm may achieve some growth by operating its existing assets more efficiently. Ultimately, however, growth derives from an increase in the asset base which is needed to generate products or services which meet market demand. A firm's ability to take on debt provides a measure of its ability to increase its asset base. Neither a firm's asset base nor its debt capacity is a sufficient condition for growth. Ultimately, however, they are necessary conditions. The sample group's debt capacity can be measured through the use of leverage, equity, and cash generative ratios.

Leverage

Measures of total financial leverage for worker and retail subsidiary cooperatives were similar to the industry. Federated cooperatives were somewhat less totally leveraged. All sample groups differed from the industry in relying more heavily upon accounts payable, while using less funded debt. Worker cooperatives used somewhat greater amounts of funded debt (Tables 54, 55, and 56).

Cash Generated

Only worker cooperatives displayed superior earnings and cash generation performance relative to the industry (Tables 57, 58).

The reasons for the worker cooperative's superior cash generation can only be generalized. Worker cooperatives have a lower asset base which results in lower fixed costs (Table 59).

TABLE 54

TOTAL LIABILITIES TO TOTAL ASSETS

Cooperative	Median	Mean	High	Low
Subsidiary	.6507	.6507	.7298	.5715
Federation	.4855	.4471	.7146	.1146
Worker-Owned	.6634	.7090	.9090	.6357
Robert Morris	.7250	-	-	-

TABLE 55

ACCOUNTS PAYABLE TO TOTAL ASSETS

Cooperative	Median	Mean	High	Low
Subsidiary	.6507	.6507	.1024	.4350
Federation	.4854	.4499	.4659	.1607
Worker-Owned	.6634	.7090	.5789	.0216
Robert Morris	.2360	-	-	-

TABLE 56

FUNDED DEBT (NONCURRENT) TO TOTAL EQUITY

Cooperative	Median	Mean	High	Low
Subsidiary	1.1804	1.1804	2.2941	.0666
Federation	.1088	.2552	.9753	.0000
Worker-Owned	.1556	.8209	3.3380	.0000
Robert Morris	.1460	-	-	-

TABLE 57

NET EARNINGS AS A PROPORTION OF NET SALES

Cooperative	Median	Mean	High	Low
Subsidiary	.0100	.0100	.0161	.0038
Federation	.0078	.0078	.0802	(.0087)
Worker-Owned	.0184	.0184	.0291	(.0004)
Robert Morris	.0160	-	-	-

TABLE 58

NET AFTER-TAX CASH GENERATION AS A PROPORTION OF NET SALES

Cooperative	Median	Mean	High	Low
Subsidiary	.0147	.0147	.0199	.0094
Federation	.0104	.0188	.0850	(.0040)
Worker-Owned	.0261	.0235	.0274	.0055
Robert Morris	.0200	-	-	-

TABLE 59

ASSET BOOK VALUE

Cooperative	Median	Mean	High	Low
Subsidiary	$191,944	$191,944	$328,791	$ 55,096
Federation	280,590	400,167	657,356	144,225
Worker-Owned	228,404	271,889	690,444	35,355

Worker cooperatives also seem to use these assets more efficiently, obtaining higher revenues per unit of investment in fixed assets than federated cooperatives (Table 60).

Although worker cooperatives exhibited superior performance for sales earnings and cash generation, all cooperatives generated high returns on assets and equity relative to the industry (Tables 61 and 62).

One reason for the superior return on asset results were the lower asset bases of cooperatives. The high return on equity results indirectly due to the lower composite asset base which in turn requires less capital.

Ability to Meet Investor's Required Return

Normally, cooperative members view capital shares and patronage dividends as investment, but not unallocated retained earnings. In this study total equity has been used to represent total investment in order to measure the efficient use of a capital resource. It also serves as a measure of the maximum amount that members could possibly view as their equity base.

Calculation of member required return (K_e) provides the maximum return an investor should expect, while return on equity (ROE) provides the return on the broadest definition of equity base. A calculation of ROE that meets or exceeds K_e indicates that the firm can generate sufficient earnings to meet members' investment requirements (Table 63).

TABLE 60

SALES REVENUE PER UNIT OF INVESTMENT IN NET FIXED ASSETS

Cooperative	Median	Mean	High	Low
Subsidiary	51.3692	51.3692	97.6204	5.1180
Federation	41.9462	117.0966	675.2202	18.4112
Worker-Owned	46.8613	55.0812	121.7470	15.1452
Robert Morris	48.9000	-	-	-

TABLE 61

RETURN ON ASSETS

Cooperative	Median	Mean	High	Low
Subsidiary	.2593	.2593	.4051	.0144
Federation	.0972	.0880	.2609	(.0400)
Worker-Owned	.2328	.2212	.4739	(.0003)
Robert Morris	.0400	-	-	-

TABLE 62

RETURN ON EQUITY

Cooperative	Median	Mean	High	Low
Subsidiary	.4973	.4973	.8995	.0951
Federation	.2106	.1779	.3342	(.0301)
Worker-Owned	.7136	1.0208	2.3163	(.1567)
Robert Morris	.3390	-	-	-

TABLE 63

GROWTH POTENTIAL

Cooperative	ROE (median)	K_e (median)
Subsidiary	.2593	.1372
Federation	.0972	.1156
Worker-Owned	.2328	.1184

Ideally, ROE will incorporate in its calculation, the net present value of the different forms of cooperative wealth return, while K_e is adjusted for nonwealth returns.

Both subsidiary and worker cooperatives dramatically exceed member required return in their generation of earnings. Federated cooperatives, however, fail by a small margin. Federated cooperatives, as second-tier organiation, would be expected to generate less nonwealth returns than the other cooperatives. One might anticipate that without offsetting cooperative characteristics such as providing a critical supply source, federated members may display some discontent.

Coverage

Interest coverage was dramatically higher for all three classifications than the industry (Table 64).

Higher coverage was due to the lower use of funded debt and the lower asset base. It can only be conjectured to what effect an increase in the funded debt and asset base relative to the industry would have on the cooperative industry. Coverage would decline at present earnings level, but an increased asset base would be expected to improve earnings through greater productivity and/or capacity. Indeed, it may be necessary in order to preserve market share.

Summary

Financial strength is dependent in the short run upon financial risk as measured by financial structure, liquidity, and coverage. The debt structure as measured by total liabilities was not

TABLE 64

INTEREST COVERAGE

Cooperative	Median	Mean	High	Low
Subsidiary	17.7258	17.7258	33.1763	2.2752
Federation	6.3211	23.8769	111.0030	.0000
Worker-Owned	9.3219	13.9696	40.5930	.9948
Robert Morris	1.4000	-	-	-

different from the entire industry. Federated cooperatives were the least leveraged, primarily due to their greater use of patronage dividends and member capital shares. Worker cooperatives were particularly dependent upon all debt forms: member debt, trade credit, and funded debt. Subsidiary cooperatives were large users of debt, but they may be utilizing the debt capacity of the parent retail cooperative.

Federated cooperatives were the most liquid, even outperforming the industry. Both worker and subsidiary cooperatives were less liquid than the industry, however, they generated more cash from operations and had a shorter operating cycle.

All classes of cooperative exhibited greater interest coverage than the industry. Federated cooperatives exhibited the greatest interest coverage due to its relatively low use of funded debt.

Financial strength is dependent in the long run upon the ability to grow. Growth potential is measured by the ability to obtain revenue generating assets or debt capacity. Debt capacity is measured by leverage, cash generated, return to owners, and coverage. All three types of cooperative had lower total leverage, greater coverage, and higher return on assets than the industry. While federated cooperatives generated a return just short of member opportunity costs, worker and subsidiary cooperatives generated returns far in excess of member requirements. Based on these observations, debt capacity appears equal or even somewhat better than the industry. The risk dynamics of cooperatives and the difficulties in quantifying risk suggest that extreme caution is necessary before increasing funded debt levels.

CHAPTER IX

SUMMARY AND CONCLUSIONS

Summary

The cooperatively-owned natural foods distribution system pioneered the development of fresh and processed natural foods in this country. Before 1970, natural foods were primarily sold through mail order or by informal producer to consumer direct sales. A growing awareness of health issues created a demand for chemically-untreated food. Due to the primitive nature of natural foods distribution during this period and the resulting high costs, many natural foods advocates formed consumer cooperatives as a means of acquiring an inexpensive and reliable supply source.

These consumer cooperatives quickly formed federations which created wholesale distribution centers to further reduce costs. In some communities, worker-owned cooperative wholesalers were formed (primarily by individuals with some association with consumer retail cooperatives). Less often, an individual consumer retailer formed its own wholesale distribution center as a subsidiary. The formal and informal linkages between the three types of cooperative wholesalers has been strong. Since many wholesalers specialize in particular products, they have developed reciprocal trade arrangements. Some regional networks have been formed between several wholesalers to provide services or to increase buying power. A trade association was formed early on to exchange information and other resources.

During the 1970s, the natural foods industry grew enormously. By 1980, natural foods had gained the attention of many commercial food retailers who began to market those product lines. Cooperatively owned retailers and wholesalers did not grow as fast as the natural foods market and their market share declined rapidly. By 1980, market share had declined to about ten percent. Cooperative sales began to flatten, although the natural foods industry continued to grow. It became clear to the cooperative sector that the situation was serious.

The cooperative sector had opened up the distribution channels, encouraged the formation of natural foods producers, and created consumer awareness of the product. The cooperative sector, however, was unable to follow through with its initial successes and establish control over its supply sources or to expand at a rate commensurate with demand. This failure was caused partly by an emphasis on ideological concerns, resistance to the compromises required in a growth strategy, and a shortage of capital.

The cooperative sector is now addressing those issues which have inhibited growth and performance. An area of critical concern is criteria for making investment choices which maximize the objectives of the cooperative. Simultaneously, these cooperatives need criteria in the selection of capital sources.

Failure of Traditional Methodology

Traditional corporate finance methodology has proven inadequate due to the unique attributes of the cooperative firm.

An investor, in a publicly-traded firm, has a utility function that concerns wealth return and risk. Cooperative members' utility functions also include nonwealth requirements which may impact upon cost (e.g., ideological, stable source of supply or service, competitive yardstick, etc).

Cooperative members do not experience a capital gain or appreciation in their investment. The retention of earnings does not dramatically diminish the return to investors in an investor-owned, publicly-traded firm because the market "recognizes" the increased value of the firm and bids up the value of shares. The investor receives a wealth return whether the earnings are distributed or not. In contrast the cooperative shares are not publicly traded, therefore the member receives a wealth return only from earnings. Therefore, while earnings offer members a wealth return, earnings are also a critical source of equity capital since cooperatives do not have access to the investor markets.

If a cooperative allocates its earnings to its members in proportion to their patronage of the cooperative's services, it is possible to avoid taxation. The cooperative may distribute these allocations at a future time, however, thereby affecting the realized value of these returns.

Unfortunately, an independent theory of financial decision making which incorporates the differences of cooperatives is not available. Consequently, it will be necessary to adjust modern portfolio theory and net present valuation techniques.

Adjustment of Traditional Methodology

Modern portfolio theory through the capital asset pricing model integrates statistical measures of the risk of investments with the theory of investor utility. In equilibrium, the expected return of an asset (or investment) is a linear function of its systematic risk, otherwise known as Beta. Beta is a correlation coefficient measuring the risk of an asset relative to the risk of a portfolio of all freely-traded assets. An investor's expected return thus yields the wealth return an investor requires, and therefore the opportunity cost of that investor's equity in the firm.

Direct measurement and calculation of a cooperative's risk or a cooperative member's required return is not possible. It is possible, however, to use a surrogate measure of risk, the Beta of the industry or a representative sample of similar investor-owned firms. This surrogate Beta, in turn, can be entered into the Capital Asset Pricing Model Formula to derive the member's required return for an investment of similar market risk. This required return (or opportunity cost) will be used directly in calculations for capital structure. It must be adjusted, however, for use in capital budgeting both for the effect of nonwealth returns and financial leverage.

Adjustment of member required returns for the effect of debt follows the relationship described by Miller and Modigliani whereby the cost of equity is a linear function of debt use.[1] An adjustment must be made, however, for the differences in tax shields. The tax shield effect of debt tends to be much less for cooperatives since cooperatives can avoid taxation on member-generated earnings if properly allocated.

Adjustment for nonwealth returns involves estimating the reduction in required wealth returns members would accept to receive services from a new investment. For example, the members of a farm cooperative may have a required return of eleven percent. They would be willing to accept four percent, however, if there was a grain elevator serving their community.

Net present valuation, another corporate finance technique, involves identifying the future stream of cash flows associated with a given investment. The cash flows are discounted by a factor which incorporates the required returns of the capital sources which expect to receive those cash flows, thus yielding a single, present value for a given investment.

Two approaches exist for calculation of the discount factor in net present valuation. Both approaches calculate a composite cost of the different sources of capital. The "weighted average cost of capital," commonly called WACC, weights each capital source by its

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[1] Modigliani and Miller, "Cost of Capital."

proportional use to arrive at a final cost factor. The "Modigliani-Miller" approach, referred to as MM, uses a formula whereby the cost of capital is a function of the cost of equity times its proportional use of debt. The MM approach is recommended due to its incorporation of the effect of debt upon the cost of equity and its relative ease of calculation.

Capital structure determination is the calculation of an appropriate mix of capital sources. Investor-owned firms do not have to be overly concerned with the mix of equity sources. A cooperative's equity structure, however, will affect the return to members, liquidity, and growth. Consequently, capital structure determination involves two steps: (a) quantitative methods that choose a mix of capital sources that maximize the value of returns to members and (b) qualitative methods that incorporate other financial management concerns.

Quantitative Methods for Selecting Capital Structure

LONGER, a linear programming technique, calculates the amount of debt which will maximize the value of the firm. It has a second advantage in that the shadow prices of each project variable in the objective function can be used for capital budgeting. LONGER only considers the amount of debt. It cannot be used to calculate the optimum mix of cooperative equity forms. A second stage of analysis is needed, whereby the net present value of a flow of cooperative wealth returns is maximized subject to meeting the amount of equity needed specified in the LONGER calculation.

Cost minimization, a second method of value maximization, is a linear programming technique whereby the objective functioning of the firm is a cost function of all capital sources. All possible equity structures should be identified in the cost function. An alternative method of calculation is a two-stage approach where the cost of equity is one variable. After the mix of debt and equity is determined, the net present value of the flow of wealth returns is calculated to maximize the value of equity.

The third quantitative approach incorporates the growth objective of the firm. The growth equation calculates the growth rate in capital available for asset investment for a given capital structure utilizing the amount of debt use and the retention rate of internally-generated equity. For each calculation of growth for given assumptions of debt use and retentionr ate, the required rate of return and actual return must be calculated to indicate if the capital structure is viable.

Qualitative Methods for Selecting Capital Structure

Cooperative equity is usually temporary, of limited supply, and of many different forms. Each particular form may affect liquidity, member return, cash flow, tax liability, debt capacity, and member ability to supply capital.

Internally-generated equity is the principal source of equity capital for most cooperatives. It comprises three major forms: (a) unallocated retained earnings, (b) patronage dividend revolving fund, and (c) adjustable revolving fund (permanent fund).

Unallocated retained earnings, or simply retained earnings, refer to the unallocated reserve of permanent capital. They occur when a cooperative, for whatever reason, has taxable income, pays any tax liability, and returns after-tax income for uses that further the lawful purposes of the cooperative. Regardless of their source, unallocated retained earnings, by definition, are not allocated to individuals. The membership has no direct claims upon these after tax earnings even though they may benefit from them.

The use of allocated retained earnings by cooperatives is restricted. Many states require the distribution of funds not actually used for reserves. The federal government also has the right to intervene when a business is building up too large an amount of retained earnings and the business has no clear purpose for it. The federal government also does not view this equity as a portion of the members' capital base. Thus, a member cannot earn a capital rent (dividend or interest payment) on this portion of the equity.

A cooperative must address the following decision variables in using retained earnings: how much to retain, when to retain, when to return retained earnings to members, and in what form. The decision will depend upon the tax management policies and the growth needs of the cooperative.

A patronage equity revolving fund is a means of raising temporary capital. Members must authorize management or the board, in a cooperative's bylaws, in order for a cooperative to defer cash redemption of the allocated patronage refunds. When a cooperative's fund has accumulated a desired amount of capital, its board can revolve out the previously retained patronage refunds as new patronage refunds are retained--hence the name revolving fund.

The revolving fund has been described as the financial intermediation arm or agency of cooperatives. This is because a cooperative that uses a revolving fund is using its short-term liabilities to finance long-term assets. The management of the revolving fund requires attention to the following decision variables: (a) the payment decision, (b) the redemption decision, (c) capital rents, and (d) the form of the retain certificate (paper patronage dividend). These decisions should be made simultaneously because of their interactions with one another, and their joint impact upon the required rate of return.

An adjustable revolving fund is commonly called a permanent fund or base capital plan. An adjustable revolving fund operates as follows:

1. Calculate total capital requirements.

2. Calculate relative patronage of each member.

3. Calculate capital required of each member--proporation of use times capital needed.

4. Calculate patronage dividends due each member, after allowing for each member's required capital contribution.

Decision variables include the number of years to use in determining average patronage, amount of capital underinvested members should provide, redemption plans for overinvested members, and determination of equity capital needed.

Each form of internally-generated equity has its own set of limitations and advantages. In general, cooperatives should explore patronage dividends and one of the various revolving fund management techniques as a source of capital due to their flexibility and tax shielding ability.

Financial Ratio Analysis for Cooperatives

Financial ratios provide a means of measuring capital structure decisions and the effect of these decisions. Ratios will therefore provide a measure of how well cooperative behavior corresponded to theory. Ratios allows comparisons between different types of cooperatives and between cooperatives and investor-owned firms.

Examination of a single ratio can be misleading. Ratio analysis should occur in sets or clusters to provide a complete measure. The following sets have been developed utilizing established practices and the concepts of Part I of this study: (a) membership utility, (b) financial structure, (c) coverage, (d) resource efficiency, and (e) growth.

Member utility cannot be measured directly. Instead, indirect and surrogate measures must be used. Determination of the members' opportunity costs and actual return, however, is possible. Member dissatisfaction is possible when the return to members does not meet their opportunity costs.

Capital structure and member utility interact in the following manner. Debt use affects opportunity costs because risk

increases with debt. Equity structure affects the value of member returns because of the discounting effect of time on the deferred distribution of patronage dividends. Failure to maintain member utility may affect capital structure because of member reluctance to supply equity. The member return ratio set and the member stability set provide information on the utility of a cooperative's membership.

Member return ratios measure the rate of wealth return on the member's investment and its ability to meet the member's opportunity cost. The difficulty in quantifying nonwealth returns normally precludes their use in ratio analysis. There are five member return ratios. Four of these ratios measure the rate of return. The fifth ratio measures the ability to return to cover opportunity costs.

Member stability ratios measure the negative conditions which can lead to member dissatisfaction. These include entry cost, member investment to patronage, cash payout of patronage dividends, gross margin policy, realized return to net savings, retained earnings, members to workers, member turnover, and proportion of new members.

Financial structure ratios measure the nature and proportion of capital provided from different sources. Due to the complexity of cooperative equity, one subset of ratios deals specifically with equity and incorporates cooperative forms of internally-generated equity.

Liquidity ratios measure the ability of a firm to meet its current obligations through liquidation of specific current assets.

Coverage ratios measure the ability to meet the cash obligations of each capital sourced. Traditional coverage ratios measure debt obligations, however, this set includes the obligations to both debt holders and equity holders.

Resource efficiency ratios measure the ability of a firm's assets, operating inputs, and labor to generate earnings.

Growth potential ratios measure a firm's debt capacity, the ability to attract debt capital for growth. These ratios examine the equity base (dependence on internal equity, ability to generate internal equity, and probable internal equity generation), leverage (external debt sources), and cash flow.

Analysis of Sample Data

The intent of this study was to use statistical techniques to make inferences on the industry. Two statistical techniques were under consideration: (a) regression analysis and (b) discriminant analysis. Regression analysis measures the relationship between variables. It is possible to determine what ratio values are associated with financial performance measures such as member return, risk, growth, etc. From these measured associations it is possible to make predictions on specific cooperatives.

Discriminant analysis differs from regression analysis in its assumption that the observations come from two or more universes. This division of a sample into groups enables an analyst to make predictions about an individual firm because it falls within a certain group.

Unfortunately, statistical analysis could not be performed because of the limited information. The information which the cooperatives were unable to provide precluded the calculation of many ratios. The absence of an accepted method for quantifying nonwealth returns means that the cost of equity could not be adjusted for nonwealth returns. The inability to incorporate total risk into a discount factor precludes accurate capital structure analysis for cooperatives with nondiversified memberships.

The information that cooperatives were unwilling to provide precluded the use of statistical techniques. The response rate of the surveys was below fifty percent. Of these responses, only sixteen was usable. For regression purposes, sixteen observations is inadequate.

The quality of the data provided makes comparison between the subgroups within the sample difficult. Many of the accounting statements and survey responses were of poor quality. In addition, the cooperatives exhibited so many differences that comparisons between the main subgroups (worker, federation, subsidiary) must be made with caution.

Although the quantity and quality of the sample responses precludes statistical analysis, there is sufficient information and available theory to complete a general analysis of this industry.

Conclusion on the Strength of the Industry

In determining the financial strength of this industry, attention focuses primarily on financial risk. Risk assessment is critical due to its relationship to required return of the members and the ability of the firm to survive. Growth becomes important in the long run if a firm is to maintain its market share, profitability, and competitive viability.

The analysis of financial risk focuses on financial structure, liquidity, and coverage. The ratio sets described in Chapter VI are used in this analysis.

Federated Cooperatives

The composite of federated cooperatives has a significantly more stable financial structure than the other cooperative forms or the industry. Federated cooperatives used a lower degree of all debt forms than the industry or the other cooperatives. Federated cooperatives aggregated greater amounts of share capital (over half of all equity forms) and minimized the use of retained earnings. Federated cooperatives were the greatest users of patronage dividends, thus prudently minimizing taxes. None of the cooperatives using patronage dividends, however, had a redemption plan in place. Legislative action to force redemption, while remote, remains a risk.

Liquidity as measured by current and quick ratios was superior to all cooperative forms and to the industry. Cash generation was lower than all cooperative forms and to the industry in spite of the lower degree of leverage. This is probably due to the fact that in federated cooperatives the members are the users. They may be requiring greater services which in turn reduce profitability and cash generation.

Interest coverage was superior to the other cooperatives and to the industry. Capital coverage, while lower than the other cooperative forms, was more than adequate at 1.6 to one.

Growth potential, as measured by debt capacity, appeared more robust than the other cooperative forms. Debt use of all forms was less. Interest coverage was significantly higher than the industry. If the members of the federated cooperatives could more efficiently generate member capital at the local level and could more easily access debt capitl, federated cooperatives could experience a dramatic increase in share capital due to the double leveraging effect.

Subsidiary Cooperatives

The strength or weakness of a subsidiary can be misleading since the parent firm may be either supporting or draining the subsidiary. Since it is difficult to ascertain the economic and financial relationship between parent and subsidiary, the subsidiaries are treated as separate concerns.

The subsidiaries appear weaker than the federations due to their reliance upon debt and unallocated retained earnings. Their debt use is the highest of all cooperative forms. The reliance upon debt use has compromised their liquidity. Although the current ratio is superior to both worker cooperatives and the industry, the quick ratio is the lowest.

Coverage is substantially greater than the industry and somewhat superior to worker cooperatives.

Growth potential is weakened by the degree of leverage which is the highest. It would seem unlikely that debt use could increase substantially. However, the parent retail cooperative, in theory, could aggregate substantial amounts of equity capital through member shares and patronage dividends. The two respondents in the sample, however, did not appear to be doing either.

Worker Cooperatives

Worker cooperatives were the lowest users of capital shares and the most leveraged in total debt. In addition to the risks associated with leverage, the worker cooperatives also have the "public-enterprise" risk whereby the organization itself becomes unstable. While total leverage is high, funded debt is still below that of the industry.

Liquidity, as measured by current and quick ratios, was substantially below the federation cooperatives'. The current ratio was the lowest of the cooperative types and lower than the industry. This was offset somewhat by superior cash generation (as a percent of sales).

Overall Strength of the Industry

The cooperative sector has uneven access to debt markets and no access to investor markets. With few exceptions, the cooperative sector of this industry can be characterized as operating at a low level of managerial and financial sophistication. The theoretical weaknesses of cooperatives are largely offset by their strengths--the superior ability to generate internal equity and member recognition of nonwealth returns. The industry under analysis has not effectively utilized these strengths due to the lack of available information and technical assistance.

Federated cooperatives appear to have the greatest opportunity to aggregate capital due to the double leveraging effect of a second tier cooperative and their greater use of patronage dividends.

Worker cooperatives have a greater ability to generate earnings in spite of higher leverage. Few worker cooperatives have effectively used patronage dividends. Those that do, should consider qualified patronage retain certificates in their tax management strategies. Worker cooperatives should be cautious in their use of patronage refund prepayments, because they increase the instability of the cash flow stream.

All cooperatives need to address the issue of equity redemption. A policy of "regular" redemption with flexible maturity may prevent the problems associated with excessive retention of patronage refunds. Equity redemption for exiting members can be aided with the use of annuities. A cooperative can finance a new member purchase of a share, while this cooperative gives the exiting member an annuity whose present value is the value of the share. This method prevents cash drainage, eases entry, and discourages long tenured members from forcing liquidation or litigation.

The elements of financial management (accounting, control, and planning) are in an undeveloped state for most of these cooperatives. This should be the first priority before these cooperatives consider asset selection or adjustment of their capital structure.

Cooperatives need to examine methods of increasing their economies and purchasing power through intercooperative activity. Intercooperative activitiy includes joint business ventures and industrial service organizations. Joint ventures between cooperatives are similar to a federation. Cooperatives come together to share the burden of a larger asset base. Joint ventures, however, may deviate from cooperative principles, and may even involve for-profit enterprises. Examples from farm cooperatives include a large regional truck leasing firm, a livestock research center, and farm chemical manufacturing.

An industrial service organization functions as a combination trade group, lobby, support (technicadl and financial), and sometime disciplinary arm (usually through suasion). Derek Jones points out that in the history of worker cooperatives, every cooperative industry (e.g., shoes, plywood) that experienced a period of success, did so with this type of organization.[1] Presently, other cooperative industries (e.g., credit unions, agricultural cooperatives) have used this structure to great benefit.

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[1] Derek Jones, "U.S. Producer Cooperatives: The Record to Date," Industrial Relations 18, No. 3 (Fall 1979):355-6.

APPENDIX

SURVEY OF FEDERATION AND WAREHOUSE OPERATIONS

Return to: 1981

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SURVEY OF FEDERATION AND WAREHOUSE OPERATIONS

I. General Information

Name of cooperative____________________________________Telephone______

Address____

Person(s) answering survey____

1. How many years has the warehouse been operating?_________________

2. If your organization owns or operates any business in addition to grocery wholesaling, please describe them.

II. Warehouse and Trucking Operations

1. If you supply other warehouses:

   How many are cooperatives?______How many are private firms?______

2. Breakdown the total square feet in your warehouse:

   Office space______ Cold storage______

   Dry good space______ Freezer storage______

3. How many trucks do you own?______Lease?______

4. How many trucks are single body?______Tractor-trailer?______

5. If your warehouse uses a computer, check its uses.

___payroll	___sources and uses statement
___accounts receivable	___inventory
___accounts payable	___patronage accounts
___income statement	___other___________________________
___balance sheet	___other___________________________

III. Organizational Structure

1. The management system that you have today is best described as: (check one)

   ___a. collective (authority lies in group decisions not individuals)

   ___b. differentiated management/worker (authority lies with individuals, but these individuals are accountable to the body of workers)

   ___c. traditional (board hires manager, who has authority over day-to-day operations, workers' participation in decision making limited)

2. The management system that you had three years ago is best described as a: (check one)

   ___a. collective

   ___b. differentiated manager/worker

   ___c. traditional

3. Please explain how the owner/members of the cooperative set policy.

4. Please explain how management is accountable to the owner/members.

5. If your management system is collective or a differentiated management/worker system, please answer the following questions, otherwise go to the next question.

   a. How often does the full body of workers meet to make management decisions?____________________

   b. How long on the average do these meetings last?__________

   c. What types of management decisions are made?____________

   ____

   d. Are management or coordinator positions elected by the full body to manage operations?____________________
   If yes, please describe the scope, length of term, and method of election for these positions.

   e. Are there committees that have decision making power?______
   If yes, please describe the committees and their duties.

6. If you employ a general manager:

   a. How long has this person been general manager?__________

   b. How long has this person worked for your cooperative?______

7. How many workers do you have?____________________
Please indicate how many full-time (or fraction thereof) work in the following areas. Also, give an estimate of the wage rate or salary level and the cost of fringe benefits for each category.

Category	Number	Average wage rate or salary	Average cost of fringes
Trucking			
Warehousing (receiving, piling, breakdown, order picking, and loading)			
Clerical, bookkeeping			
Member services (co-op development, newsletter, management consulting)			
*Financial control General management			
Other (please indicate			

*Do not include board members who perform this function (unless paid a wage or salary)

8. How many workers did you cooperative have two years ago?__________

9. How many workers did your cooperative have two years ago who worked explicitly in the financial control, general management category?__________

10. How many workers have you explicitly hired into the area during the past two years? (Include persons hired to replace departing staff as well as those who filled new positions.)__________

IV. Financial Analysis

1. Does your cooperative have a target debt-asset ratio (for example, long term debt shall be no more than fifty percent of long term assets)?________________________________
If yes, please describe it.

2. Does your cooperative have other financial performance targets that it regularly seeks to attain or maintain (such as a growth in sales target, a profitability target, etc.)?____________
If yes, please describe them.

3. Do you have a loan fund from which members can borrow for improving their business?________________________
If yes:

    a. What is the total dollar amount in the fund?____________

    b. Briefly describe how the fund works, *or* attach any readily available materials.

4. a. How many units does your cooperative supply?____________
Total annual sales to units________________________

    b. How many member units does your cooperative supply?________
Total annual sales to members______________________

    c. Breakdown of total sales and total units:

Unit	Total Units	Total Sales
Supermarkets (units with sales over $1 million annually)	_____	_____
Storefronts	_____	_____

Unit	Total Units	Total Sales
Pre-orders	_____	_____
Individuals	_____	_____
Other (e.g., restaurants, institutions, etc.)	_____	_____

d. Breakdown of total sales by major product class (use gross figures or percentage of total sales):

Frozen food______	General grocery__________	Dairy______
Meat_____________	General merchandise______	Other______
Produce__________	Health and beauty________	Other______

5. Does the cooperative make patronage refunds?_____________________
If yes, please describe this policy.

6. Please describe any significant short term (less than one year) credit policies offered by your suppliers which you use regularly.

7. Does your cooperative have a pro forma (projected budget)?_______
If yes, how often does the budgeting process take place?_________

8. Does the cooperative use long term leasing for assets other than buildings?____

9. Has the cooperative obtained long term loans?____________________
If yes, from whom and at what terms?

10. Does the cooperative have a target net profit rate?_____________
If yes, what is this rate?______________________________________

11. How does the cooperative use the net profit from operations?

V. Pricing Policy

1. a. What is your target mark-up?____________________
   or target gross margin?____________________

   b. How does your percent mark-up vary by product class?

Product class	Mark-up or	Margin
Frozen food	______	______
Meat	______	______
Produce	______	______
General grocery	______	______
General merchandise	______	______
Health and beauty	______	______
Dairy	______	______

2. Are your mark-ups the same for all types of customers regardless of sales volume?____________________
   If they vary, please describe how mark-ups or discounts vary, or attach any material that explains your mark-up policy.

3. If trucking charges are not included in your mark-up, please explain how they are determined or attach any material that describes them.

4. If you have a policy of minimum order sizes, please describe it.

VI. Attachments

1. Please attach copies of your income, year-end balance, and working capital statements for your two most recently completed fiscal years.

2. If you are unable to provide a working capital statement, would you like us to compute one for you?____________________

3. Please attach copies of your articles of incorporation and your by-laws.

4. Please attach a copy of your May product and price list.

5. Please attach a copy of your most recent budget.

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