Investors' Expectations of Equity for NGCs and LLCs and Implications on Financial Performance

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Abstract

New Generation Cooperatives (NGCs), specializing in value-added processing of agricultural output, underwent structural changes to signal both patron and non-patron investors their viability and attract additional equity to alleviate perceived financial constraints. Some of these changes included the acceptance of non-patron investor equity and demutualization into Limited Liability Companies (LLCs). However, the effect of these changes introduced added complexity on equity expectations and on providing incentives for patrons to continue doing business with the cooperative. Using data of stocks traded between cooperative members, the study analyzes the impacts of expectations of change in equity growth and social capital on the realized rate of returns for NGCs and for LLCs. Our findings delineate the usefulness of growth expectations and social capital benefits for attracting non-patron equity to ameliorate perceived financial constraints and their effectiveness at resolving the adverse selection problem for patron and non-patron investors.

Keywords: New Generation Cooperatives, Limited Liability Companies, growth expectations, liquidity, social capital

JEL Classifications: D84, G32, Q13.

Cooperatives[1] in the United States have evolved in waves as a response to market failures (Fulton, 2001).[2] Despite this evolution, signaling the viability of cooperatives as worthwhile investments, which allows them to attract equity capital, remains a major obstacle for New Generation Cooperatives (NGCs). To ameliorate these equity constraints, NGCs transformed their capital structure. The success of two relatively new approaches, demutualization and new financial statutes, are discussed in this article.[3]

Relaxing investment restrictions due to changes in public policy is a strategy used by NGCs to signal investment-worthiness to attract patron and non-patron equity. Cooperatives operating under the Wyoming cooperative law and the Minnesota Chapter 308 B law can attract non-patron equity and still benefit from cooperative tax treatments. Under these statutes, cooperative membership can consist of both patron and non-patron investors, and both groups are allowed to serve on the board of directors (Hensley and Swanson, 2003). Two major challenges faced by the management of NGCs when non-patrons serve on the board are to provide equity growth incentives for non-patrons and to provide incentives for patrons to continue to do business with the cooperative, because they may perceive the core cooperative values to be diluted.[4] Social capital services may offer a viable payoff to patrons to continue doing business with the cooperative (Karlan, 2005).

Social capital benefits refer to services and non-monetary benefits that may flow to investors/patrons by cooperatives (Puaha and Tilley, 2003; Gustafson and Nganje, 2005). In the case of supply cooperatives, which sell inputs to investor/patrons by definition, these benefits will be principally captured by its members, whereas the investors of an LLC may not capture these benefits. Hence, one hypothesis we test is that social capital services provided by NGCs to their patrons are valued higher than non-member patrons of LLCs. In addition, we use social capital to delineate differences in financial performance between NGCs and LLC structures.

Demutualization is a second strategy used by NGCs to relax investment restrictions and signal investment-worthiness to attract patron and non-patron equity (Chaddad and Cook, 2004). Demutualization occurs when cooperative membership rights are converted to unrestricted common stock ownership rights in a corporate organization (e.g., Dakota Growers, 2002). Demutualization is usually followed by public listing, which allows the converting firm to acquire additional capital from investors.

Although the length of time needed to develop equity acquisition expectations is beyond the scope of this paper, it seems reasonable to assume that stockholder perception of the firm's ability to acquire additional capital may be expressed through its stock value. A second hypothesis tested in this article, therefore, is that changes in investor expectations as a result of demutualization or adaptation to the new statutes, can be assessed through variability of stock values or investors' expectations of equity (Ofer, 1975). Data made available through alternative trading systems (e.g., Variable Investment Advisor or Alerus Securities) provides information on stock trade values between member/investors, in the case of NGCs, and between member or non-member investors, in the case of LLCs. The effect of changes introduced by demutualization and the Wyoming and Minnesota Chapter 308 B law have introduced added complexity on equity expectations and the impacts on financial performance are yet to be investigated.

Since financing decisions represent a cooperative's ability to choose how to utilize member equity investment (source), our main objective is to model a cooperative's financing decisions made to leverage member equity, as a function of variables observed by investors, and determine whether change in growth and social capital benefits, while controlling for other variables (market risk and liquidity), affect NGC and LLC financial performance. By including expectations of changes in growth and social capital benefits, this study expands the current literature on investment decisions in NGCs to incorporate services, a growing sector that has gained increasing emphasis in other economic sub-disciplines outside cooperatives, such as finance (Karlan, 2005).

The article proceeds as follows. In the next section, we develop a theoretical model of investor decisions in cooperatives with specific considerations on expectations of change in firm growth and the value of social capital benefits on returns. A two-step econometric model to analyze the impact of investors' expectations, liquidity, social capital, and systematic risk on NGCs' estimates the results of the theoretical model and LLCs' realized returns. The response for NGCs and LLCs is compared. The final section presents a summary, implications for adverse selection and additional infusion of equity capital, and concluding remarks.

Theoretical Model

The decision follows that of a risk-averse investor who is faced with uncertainties associated with the return on investment, r_e. The prospective investor is assumed to have a von Neuman-Morgenstern utility $U(r_e)$ which is defined on r_e, so that $U'(r_e)>0$ and $U''(r_e)<0$. The investor's objective is to maximize his utility, which depends on the level of benefits he gets from his investment. Previous research suggests that cooperative investors/patrons are primarily influenced by profitability and risk when making investment decisions (Lerman and Parliament, 1993). Profits can be used to transmit monetary or non-monetary benefits to investors. Non-monetary investment benefits include increased credit forbearance and social capital benefits. Also, as Ofer (1975) suggests, the investor's utility is affected by their expectations of growth for the targeted firm; if growth exceeds expectation, then utility from returns will be positive, whereas they will be reduced if expectations are not met. For example, non-patrons may continue to infuse equity capital to promote high technology investments in subsequent years if they realize growth from their initial equity investments. Non-patrons expect their investments to yield higher returns through increased stock values, since dividends should not exceed 8% under the new statues.

We assume perfect market conditions exist, with no financial constraints. Under these conditions, there are two sources of risk associated with return on assets. The first source is the variability of monetary returns, $r+\varepsilon_r$, where r is the monetary return, and ε_r is a random variable with mean zero and variance σ_r^2.

The second source of risk is the variability of social capital returns (services), S+ε_s, where *S* is the social capital benefits resulting from the investment, and ε_s is a random variable with mean zero and variance σ_s^2. Given that these returns come from the services provided by the same firm, we assume these two returns are correlated with each other: an increase in monetary returns will increase non-monetary returns such as social capital benefits, as well. Thus, the covariance between the monetary and non-monetary returns is assumed to be positive, $\text{cov}(\sigma_r, \sigma_s) > 0$.

The decision maker chooses a level of debt, *D*, that maximizes the expected utility from equity capital, *E*, at the end of the period, E_1. E_1, is defined as the sum of the beginning-of-period equity, E_0, and the net change in capital, ΔE. The change in capital comes as a result of the monetary and non-monetary returns, such as social capital, earned during the period. The decision maker then completely allocates the newly-acquired debt, $D(\alpha)$, into either an LLC (α =1), an NGC (α =2), or some other investment (α =0), a typical outcome for agricultural producers who are not patrons of cooperatives or LLCs.

If the decision maker has a composite preference for risk and liquidity, λ, then the objective can be written in certainty equivalent terms (Robison and Barry, 1986) as follows:

$$\begin{aligned} max\ y_{CE} &= E(E_0 + \Delta E) - \frac{\lambda}{2}\text{var}(E_0 + \Delta E) \\ &= E(E_1) - \frac{\lambda}{2}\text{var}(E_1) \end{aligned} \quad (1)$$

The equity at the end of the period, E_1, is defined as the sum of the monetary return on assets, *r*, and the social capital return on assets, *S*. From this, we can subtract the cost of debt, $(i+f)D_0$, which comes from interest, *i*, and forbearance, *f*, which is the cost of services purchased by the investor in order to obtain more favorable credit terms and is always positive. Withdrawals, W_d, for consumption outside the investment decision are also subtracted. Finally, a decision maker's expectations of the growth of the cooperative, *m*, are included. *M* represents the difference between expected and actual firm growth; if *m* is negative, then growth exceeds expectations. Fixing the assets at the beginning of the period as the sum of debt, D_0, and equity, E_0, then the expected value of the end-of-period equity, E_1, is

$$\begin{aligned} E(E_1) &= E(mr + S - i - f)D_0 + (1 + mr + S)E_0 - W_d \\ &= (rm + S)(D_0 + E_0) - (i + f)D_0 + E_0 - W_d \end{aligned} \quad (2)$$

The variance of E_1 is

$$\begin{aligned} \text{var}(E_1) &= \sigma_r^2(mD_0 + mE_0)^2 + \sigma_s^2(D_0 + E_0)^2 + 2m(D_0 + E_0)^2 cov(r, S) \\ &= (D_0 + E_0)^2(m^2\sigma_r^2 + \sigma_s^2 + 2mcov(r, S)) \end{aligned} \quad (3)$$

Substituting (2) and (3) into (1) yields:

$$max\ y_{CE} = (rm + S)(D_0 + E_0) - (i + f)D_0 + E_0 - W_d - \frac{\lambda}{2}(D_0 + E_0)^2(m^2\sigma_r^2 + \sigma_s^2 + 2mcov(r, S)). \quad (4)$$

Since debt optimization represents the cooperative's ability to leverage investment, the decision variable in this model is the amount of debt used, based on growth and social capital expectations. At the optimum, the following relationship will hold:

$$\frac{\partial y_{CE}}{\partial D_0} = rm + S - (i + f) - \lambda(D_0 + E_0)(m^2\sigma_r^2 + \sigma_s^2 + 2mcov(r, S)) = 0. \quad (5)$$

When debt levels are high and returns are low, the investor will experience financial distress. The cooperative may fail if this distress is sufficiently large to cause patrons to withdraw from the cooperative. Therefore, solving (5) for D_0 gives the optimal debt at the beginning of the period:

$$\frac{rm + S - i - f}{\lambda(m^2\sigma_r^2 + \sigma_s^2 + 2mcov(r, S))} - E_0 = D_0. \quad (6)$$

Thus, optimal debt depends on expected returns, the costs of borrowing, variance, risk and liquidity preference, and equity at the beginning of the period. In order to analyze investors' expectations of NGC stock values and derive implications of social capital benefits and satisfying growth expectations as signals to attract additional equity capital. we examine the effect of changes in six determinants that affect the returns at the optimal level of debt: growth expectations, *m*, social capital returns, *S*, asset size, (D_0+E_0), liquidity and risk preferences, λ, earnings variability, σ_r^2, and the covariance between monetary and non-monetary returns, $cov(r, S)$.

This accords with our assumption of these two returns being correlated with each other since these returns come from the services provided by the same firm. The effect of each of these determinants is analyzed in the following comparative static results and then estimated empirically.

Solving (6) for *r* gives the return at the optimal level of debt.

$$r = \frac{\lambda(E_0 + D_0)(m^2\sigma_r^2 + \sigma_s^2 + 2mcov(r,S)) - s + i + f}{m}. \quad (7)$$

The comparative static results of the first order condition for the selected determinants are given.

The change in monetary returns with changes in growth expectations, *m*, is

$$\frac{\partial r}{\partial m} = \frac{\lambda(E_0 + D_0)(2\sigma_r^2 + 2cov(r,S)) - [\lambda(E_0 + D_0)(m^2\sigma_r^2 + \sigma_s^2 + 2mcov(r,S)) - s + i + f]}{m^2}. \quad (8)$$

If growth expectations are exceeded, (m<0), this expression is positive when $\sigma_r^2 + 2\,\mathrm{cov}(r,S) > m\sigma_r^2 + \sigma_s^2 + 2m\,\mathrm{cov}(r,S)$.

The change in monetary returns with changes in social capital services is

$$\frac{\partial r}{\partial S} = -\frac{1}{m}. \quad (9)$$

This expression is positive when growth expectations are exceeded, m<0.

The change in monetary returns with changes in asset size, E_0+D_0, is

$$\frac{\partial D_0}{\partial(E_0 + D_0)} = \frac{\lambda(m^2\sigma_r^2 + \sigma_s^2 + 2mcov(r,S))}{m}. \quad (10)$$

If growth expectations are exceeded, (m<0), this expression is positive when $2mcov(r,S) > m^2\sigma_r^2 + \sigma_s^2$. Since this is the condition that holds when the optimal level of debt, D_0, has been selected, we assume these changes come as a result of changes in investor equity, when patrons continue to infuse equity capital to the cooperative as they receive social capital and monetary benefits.

The change in monetary returns with changes in their composite preference for liquidity and risk, λ, is

$$\frac{\partial r}{\partial \lambda} = \frac{(E_0 + D_0)(m^2\sigma_r^2 + \sigma_s^2 + 2mcov(r,S))}{m}. \quad (11)$$

If growth expectations are exceeded, (m<0), this expression is positive when $2mcov(r,S) > m^2\sigma_r^2 + \sigma_s^2$.

The change in monetary returns with changes in earnings variance, σ_r^2, is

$$\frac{\partial r}{\partial \sigma_r^2} = \lambda(E_0 + D_0), \quad (12)$$

which is always positive. Finally, the change in monetary returns with changes in the covariance of returns, $\mathrm{cov}(r,S)$, is

$$\frac{\partial r}{\partial\, \mathrm{cov}(r,S)} = 2\lambda(E_0 + D_0), \quad (13)$$

which is also always positive. The comparative static results suggest the manner in which we might test our hypothesis of investor sensitivity to the level of monetary and social benefits. They also suggest a way to test whether growth expectations and social capital benefits are important determinants of returns at the optimal level of debt.

Empirical Method and Data

From the theoretical model, investors' utility is a function of social capital, growth expectation, risks, profitability, and liquidity preferences. For individual investors and NGCs or LLCs, their utility from social capital benefits and equity growth expectations vary and these must be investigated empirically. In this section, we describe the procedure used to measure each variable or group of variables, derive a measure of social capital benefits and growth expectations, given an optimal level of investment, and evaluate whether the investment signals affect the realized rate of returns. Following the approach of Ofer (1975), this will be measured in terms of the earnings price ratio, *EP*, which is a function of systematic and unsystematic risk, the expected growth rate of equity, *m*, and volume of social capital, *S*.

Measuring the Social Capital Variable

Social capital benefits affect investment decisions in NGCs and LLCs (Hanson and Robinson 2001). Many definitions of social capital benefits are provided in the finance literature. In general, social capital benefits refer to non-monetary benefits that may be provided to investors/patrons by cooperatives (Puaha and Tilley 2003). Robison, Siles, and Schmid (2002) defined social capital benefits as a person's or group's sympathy toward another person or group that may produce a potential benefit, advantage, and preferential treatment for another person or group of persons beyond what is expected in an exchange relationship. This might be the case with NGCs' investments, since they provide many services to their patrons.

Measuring the acquisition of social capital benefits poses several challenges due to the lack of consensus between researchers. For instance, Collier (1998) considers social capital to be an externality created from social interaction.

Grootaert (1999), Narayan and Pritchett (1999), and Malucio, Haddad, and May (2000) view social capital as "externally given" when examining the impact of household membership in groups on household expenditures. In this study, social capital benefits are measured based on the definition of Flora and Robison (2003). According to Flora and Robison, the change in share price is an indirect measure of social capital's influence when the influence of social capital and social-emotional goods alters the price of a physical good involved in an exchange. If investors are attracted by social capital benefits, they may be willing to forego monetary benefits and get lower returns from the NGCs or the LLCs. The social capital influence on NGC and LLC stock might be reflected in the difference between the NGC and LLC return on assets and the market return. We expect a negative relationship between social capital and stock value. Social capital is presented as:

(14) $SC_{it} = (ROA_{it} - R_{mt})$,

where ROA_{it} is return on assets of NGC or LLC *i* at time *t*.

Measuring Expectations of Changes in Growth

Sias (1997) found that individual investor's earnings growth expectations are sensitive to changes in market conditions. Ofer (1975) found that investors' assessment of future growth in earnings must be decomposed in two variables: past growth rate (which is observed) and expectations of changes in earnings growth (which are not observed). He proved that investors reassess growth rates based on past and new information. Investors' expected growth rate of earnings is a function of past growth rates and investors' expectations about changes in NGC and LLC earnings growth, which are assumed to have a linear relationship. The past growth rate of earnings is measured in this study by the growth rate of earnings per share. Firms that have a good growth history may be perceived as less risky than firms with a bad growth history, and we expect a negative relationship between past growth and stock value (Ofer 1975). Earnings growth expectations are modeled as:

(15) $EG_{it} = \beta_1 PG_{it} + \beta_2 Ech_{it}$,

where EG_{it} is the expected growth variable for NGC or LLC *i* stock at time *t*, and Ech_{it} is the expected change of earnings growth for NGC or LLC stock *i* at time *t*.

Expectations of changes in earnings growth, Ech_{it}, are not observed. However, Ofer (1975) proposed to estimate them using the residual from the earnings price ratio estimation:

(16) $Ech_{it} = Pred(EP_{it}) - EP_{it}$,

where $Pred(EP_{it})$ is the predicted earnings price ratio for NGC_i or LLC_i at time *t*. If investors have positive expectations of changes in earnings growth, the predicted stock price will be lower than the actual price. In that case, investors' expectations of changes in earnings growth will have a negative relationship with the stock value (Ofer 1975). The general regression used to estimate the earnings price ratio is presented as a linear relationship between the earnings price ratio and asset size, dividend payout ratio, leverage, earnings variability, beta, social capital, liquidity, and growth expectations of earnings:

(17) $EP_{it} = \lambda_{it} + \alpha_1 AST_{it} + \alpha_2 Div_{it} + \alpha_3 Lev_{it} + \alpha_4 Var_{it} + \alpha_5 Beta_{it} + \alpha_6 SC_{it} + \alpha_7 Liq_{it} + \alpha_8 EG_{it} + \nu_{it}$,

where λ_{it} is the intercept term and ν_{it} is the error term, and the other explanatory variables are as previously defined. Substituting equation (15) into equation (17), we obtain the following:

(18) $EP_{it} = \lambda_{it} + \alpha_1 AST_{it} + \alpha_2 Div_{it} + \alpha_3 Lev_{it} + \alpha_4 Var_{it} + \alpha_5 Beta_{it} + \alpha_6 SC_{it} + \alpha_7 Liq_{it} + \alpha_8 PG_{it} + \alpha_9 Ech_{it} + \alpha_{10} Year_m + \nu_{it}$.

Table 1 lists the other variables used to control for alternative influences on returns.

Table 1. Variables Used in Analysis of NGC/LLC Returns

Vari-able	Equation	Source	Description	Purpose	Data Source
EP_{it}	$\frac{EPS_{it}}{PS_{it}}$		EP_{it} is the earnings price ratio of NGC or LLC *i* at time *t*, EPS_{it} is the earning per unit price of NGC or LLC *i* at time *t*, and PS_{it} is the price per share of NGC or LLC *i* at time *t*	Measurement of Earnings Growth Expectations	Financial statements/VIA/A.S.
AST_{it}	$Ln[TA_{it}]$	Daves et al., 1999; Reilly and Brown, 2000; Ofer, 1975	TA_{it} is the total asset of NGC or LLC *i* at time *t*, and Ln is the natural logarithm operator.	Unsystematic risk	Financial statements
Var_{it}	$Stdev\left(EP_{it}, EP_{i(t-1)}\right)$	Reilly and Brown, 2000	EP_{it} is NGC or LLC *i* earnings price ratio at time *t*, $EP_{i(t-1)}$ is the earnings price ratio for NGC_i or LLC_i at time *t-1*, and $Stdev$ is the standard deviation operator	Unsystematic risk	Financial statements
Div_{it}	$1 - RE_{it}$	Saxena 1999; Reilly and Brown 2000	RE_{it} is NGC or LLC *i* retained earnings at time *t*	Unsystematic risk	Financial statements
Lev_{it}	$\frac{D_{it}}{A_{it}}$	Reilly and Brown 2000	D_{it} is the total debt of NGC_i or LLC_i total debt and A_{it} is the total assets of NGC_i or LLC_i	Unsystematic risk	Financial statements
$Beta_{it}$	$\frac{Cov(R_{it}, R_{mt})}{Var(R_{it})}$	Reilly and Brown 2000; Sharpe 1964; Ofer 1975	$Cov(R_{it}, R_{mt})$ is the covariance between NGC_i or LLC_i returns and the market return at time *t*, and $Var(R_{it})$ is the variance of NGC_i or LLC_i return at time *t*, R_{it} is NGC_i or LLC_i return at time *t*, and R_{mt} is the market return at time *t*.	Undiversifiable risk	Yahoo finance
Liq_{it}	$Ln[Qty_{it}]$	Lihua 2003; Pritsker 2004; Wyss 2004; Reilly and Brown 2000	Qty_{it} is the quantity of NGC or LLC *i* shares sold at time *t*, and Ln is the natural logarithm.	Proxy for stock liquidity	Financial statements
Year	-	-		Capture annual variations in the earnings price ratio	-

* VIA represents Variable Investment Advisors and A.S. represents Alerus Securities.

Realized Rates of Returns, Expectations of Change in Earnings Growth, and Social Capital

Investors' expectations of NGCs and LLCs are assumed to be centered on realized rate of returns rather than the earnings price ratio alone. Hence, a final equation estimates the impact of expectations of changes in growth, social capital, risk, and liquidity on realized rate of returns. A linear regression is estimated to analyze the impact of systematic risk, social capital, liquidity, and expectations of changes in earnings growth on the composition of NGC and LLC realized returns and presented as:

$$\text{Re}_{it} = \alpha_0 + \alpha_1 Beta_{it} + \alpha_2 SC_{it} + \alpha_3 Liq_{it} + \alpha_4 Ech_{it} + \alpha_5 Season_n + \varepsilon_{it}, \quad (19)$$

where beta, social capital, liquidity, and expectations of change in growth are as previously defined. The variable season was entered as a random effect to capture seasonality in sales.

This is needed because NGC and LLC stocks have bids posted every trimester, and the variability of sales with respect to trimesters may affect the valuation of NGC and LLC stocks. Investors are assumed to consider only systematic risk in computing their expected returns because they own diversified portfolios (Ofer, 1975). Three sources of data are used for this study. First, publicly available NGC and LLC financial statements are used to measure asset size, dividend payout ratio, leverage, earnings variability, liquidity, and past growth. Second, S&P 500 data obtained from Yahoo Finance are used to measure the beta coefficient and social capital. Finally, since approximately 75% of stocks traded between patrons are traded by alternative trading systems, the prices of stock trades among NGC and LLC investors are an important indicator of corporate performance for firms which accept non-patron equity through the new financial statutes and functioning as LLCs. These data were obtained from Variable Investment Advisors (VIA) and Alerus Securities (AS). Five hundred and sixty-five observations were obtained for NGCs, covering the period from 1996 to 2004. One hundred and seventy-five observations were obtained for LLCs, covering the period from 2003 to 2004—a time when NGC and LLC stock trading companies conducted a significant volume of stock trade for these firms. Table 1 presents the variables and the data sources used for the analysis and the description of these variables.

Table 2. F-test Results for NGC/LLC Aggregation by Year and Type

Source	F-value	P-value
Split NGC and LLC data by type	6.94	0.0086
Aggregate NGC data from 1996 to 2001 with no consideration for years	13.72	0.0001
Aggregate NGC data from 1996 to 2001 with no consideration for years	5.46	0.0205
Aggregate LLC data from 2003 to 2004 with no consideration for years	0.44	0.5142

Econometric Procedure and Results

The GLM procedure was then used to estimate equations (18) and (19) and to provide efficient unbiased estimators. Prior to estimation, *F*-tests were conducted to determine how NGC and LLC stock data should be aggregated. Table 2 presents the *F*-values and the *P*-values from the *F*-tests. The first *F*-test tested the hypothesis that NGC and LLC data should be disaggregated by type. The *F*-values obtained from the test were statistically significant at the 1% confidence level, implying that NGC and LLC data be separated by type and by years. The applicability of a model of investors' expectations of NGC and LLC equity is based on the assumption that changes in these expectations are reflected in stock price movements. According to Ofer (1975), if investors expect an increase in earnings growth on the basis of new information, then the observed earnings price ratio of that firm would be lower than the predicted earnings price ratio. In this regard, a positive prediction error is reflective of expectations for a decrease in the growth rate of future earnings while a negative expectation reflects an increase in the growth rate of future earnings.

Table 3. Comparing Expected Earnings Price Ratio and Actual Earnings Price Ratio using the Mann-Whitney Test

Cooperative Type and Year	Z-Statistic	P-value
Pure NGC	-0.91	0.1814
1996	-7.73	0.0001**
1997	-28.83	0.0001**
1998	-22.69	0.0001**
1999	-36.05	0.0001**
2000	-1.07	0.1423
2001	-13.12	0.0001**
2003/2004	0.06	0.4761
LLC	-2.46	0.0069**
All Data	-7.41	0.0001**

The applicability of the model of investor expectations is also based on the assumption that stock price data actually measure investor expectations. A Mann-Whitney test was used to determine whether investors' expectations are measured in the stock trade data. The expected earnings price ratio was compared with the actual earnings price ratio for composite data and, where applicable, for annual data. Test results are presented in Table 3. For NGCs, intra-annual comparisons showed a statistically significant difference between predicted and observed earnings price ratios for all years except 2000 and the composite 2003/2004 data. The earnings price ratio and predicted earnings price ratio were statistically similar when composite LLC data were used. A similar result was observed when all data were combined, validating this assumption.

Impact of Growth Expectation and Social Capital on Financial Performance

Cooperatives may expect improved financial performance as a result of the relatively new strategies for acquiring equity capital: passage of Minnesota (2004) and Wyoming statutes and demutualization. If this improvement is realized, then this result should be measured in the realized rates of return from trades of LLC or NGC stocks. Furthermore, if investors have responded favorably to the social capital benefits now available under these options, then a positive effect should be observed in the rates of return for NGCs, but potentially weaker results for LLC, where these services are not as important a part of the equity strategy, since most investors are not patrons of the cooperative and do not have access to these benefits. Equation (9) indicates that when growth expectations are exceeded, these social capital benefits should increase the returns from investor equity. One way to test this result is by estimating the coefficients α_6 in Equation (18) and α_2 in Equation (19) and observing their signs and statistical significance.

Table 4. LLC and NGC Earnings Price Ratio Results over All Years

	LLC		NGC	
Variable	Parameter Estimate	*t*-statistic	Parameter Estimate	*t*-statistic
Asset size	44.40***	3.50	-213.10***	-13.73
Dividend	59.90***	6.04	89.90***	6.98
Leverage	233.70***	2.88	763.20***	13.21
Earnings variability	-0.10***	-5.45	0.20**	2.24
Beta	-2.60	-1.23	0.10	0.21
Social capital	83.8*	1.91	17.00***	2.99
Liquidity	2.30*	1.87	-4.00	-1.62
Past growth	1.50	0.87	-0.00	-0.51
Year 1	-968.6***	-4.11	3616.30***	13.34
Year 2	-936.50***	-3.98	3754.50***	13.56
Year 3			3754.50***	13.63
Year 4			3672.20***	13.54
Year 5			3755.10***	13.57
Year 6			3751.10***	13.52
Year 7			4109.10***	14.54
R^2	0.43		0.62	

* Indicates statistical significance at the 10% confidence level

** Indicates statistical significance at the 5% confidence level
*** Indicates statistical significance at the 1% confidence level

Table 5. LLC and NGC Realized Return Results over All Years

Variable	LLC		NGC	
	Parameter Estimate	*t*-statistic	Parameter Estimate	*t*-statistic
Beta	-0.0314***	-8.25	-0.0015***	-4.35
Social capital	-0.1186	-1.17	0.0002**	2.80
Liquidity	0.0014	0.89	-0.0014	-1.64
Expectations of changes in growth	-0.0001	0.43	0.0001***	2.87
Season 1	0.0339**	2.06	0.0031	0.65
Season 2	0.0298**	2.00	-0.0034	-0.36
Season 3	0.0100	0.68	0.0082	1.40
R^2	0.30		0.06	

* Indicates statistical significance at the 10% confidence level.
** Indicates statistical significance at the 5% confidence level.
*** Indicates statistical significance at the 1% confidence level

The results in Tables 4 and 5 show that social capital benefits tend to increase the earnings price ratio and realized returns for NGCs, but present mixed results for LLCs as predicted. The α_6 coefficient is positive and statistically significant for both LLCs and NGCs. In contrast, the α_2 coefficient is positive and significant for only NGCs and is negative but statistically insignificant for LLCs. These results indicate that investors in NGCs enjoy increased returns from the current strategy of providing social capital benefits, which rewards patrons for their loyalty and has a lesser impact for outside investors in LLCs.

Similarly, investor's growth expectations should be reflected in stock returns. Growth prediction errors may be either positive or negative. Positive errors refer to overestimates of the rate of equity growth in the NGC or LLC, while negative errors represent underestimates of the rate of growth. If these have no effect on returns, then we should expect this variable to have a zero coefficient. When growth expectations are exceeded, Equation (8) indicates that expectations should have a positive effect on returns when the variance on social capital benefits is sufficiently small. The influence of investor's growth expectations will be evaluated by estimating α_9 from Equation (18) and α_4 from Equation (19) and observing its sign and statistical significance.

The results in Table 5 show that expectations of changes in earnings growth are positive and statistically significant for NGCs, but may not be for LLCs. The α_4 coefficient is positive and statistically significant for NGCs, but negative and not significant when only LLC data are used. This indicates that NGC investors receive reduced returns when growth expectations are exceeded, but investors in LLC may enjoy increased realized returns under the same circumstances. On the other hand, the results are inconclusive for the effects of the growth expectations factor on the earnings price ratio: the α_9 coefficient is insignificant for estimates of Equation (18) when either LLC or NGC data are used. The estimates of the effect additional variables have on the earnings price ratio, Equation (18), and on the realized rate of return, Equation (19), are displayed in Tables 4 and 5. First, we summarize these results when only LLC data are used to estimate these equations. Second, we summarize these results for NGCs, highlighting any qualitative difference between LLCs and NGCs.

Asset size is positive and statistically significant, suggesting that as LLC size increases, LLC earnings price increases. Though counter-intuitive, a possible explanation for this result is that investors require higher premiums in compensation to risky investments undertaken by LLC managers (some LLCs invest in high technological and high risk ventures). The dividend payout ratio is also positive and statistically significant, implying that as the dividend payout ratio rises, investors may perceive a high dividend payout ratio as a threat to LLC growth. Leverage is positive and statistically significant, suggesting that investors perceive high leverage as a source of risk; volatile interest rates or repayment of acquired debts are examples.

Earnings variability is negative and statistically significant, implying that investors might be willing to accept some variability in LLC earnings for new investments. Liquidity is positive and statistically significant, suggesting that LLC earnings price increases as its stock becomes more liquid. This likely indicates that investors want to be compensated for the risk of thinly traded LLC stock. The effect of time can also be seen in Equations (18) and (19). LLC stock trades have an increasing effect on the earnings price ratio over time. These results suggest that, since LLC earnings price ratios decrease over time, investors might expect LLCs to have a better performance in the long run. The estimates for Equation (19) indicate that trades are seasonal. The first (January-April) and second (May-August) trimesters positively impact LLC stock trade relative to the third trimester/intercept (September-December). Both trimesters are statistically significant. Possibly, both trimesters are perceived by investors as risky trading periods. Finally, estimating Equation (19) using data for LLCs also results in a negative systematic risk effect on the realized rate of return. Beta is negative and statistically significant. This result suggests that LLC realized returns rise as systematic risk declines. Investors might be willing to accept low returns from LLCs and minimize market risk.

Tables 4 and 5 also report the estimates for Equations (18) and (19) using only NGC data. The results for NGCs are qualitatively the same as for LLCs, with the exception of asset size. Asset size is negative and statistically significant, suggesting that as NGC size increases, investors might perceive them as less risky. NGC stock trades have an increasing effect on the earnings price ratio over time. All years are statistically significant. Possibly, NGCs are perceived as risky by investors.

Concluding Remarks

NGCs, specializing in value-added processing of agricultural output, are undergoing structural changes to signal both patron and non-patron investors their viability and attract additional equity to alleviate perceived financial constraints. These include the acceptance of non-patron investor equity and demutualization into LLCs. Empirical studies have shown that signals to attract outside investor equity can positively or negatively affect firm performance, depending on the size of the firm (Asquith and Mullins, Jr. 1983). For larger firms, this can be perceived as potential financial performance problems, since profitable growth opportunities will be presented to patrons.

For small agricultural cooperatives these can be perceived as financial constraints for high technological investments, like in ethanol cooperatives. However, the effect of these changes has introduced added complexity to satisfy equity expectations for non-patrons and adverse selection problems for patrons who might perceive the cooperative values to be diluted and may not want to continue doing business with the cooperative. We develop an investor decision model and use data of stocks traded between members, a major source of information used by investors, to 1) analyze the impacts of expectations of change in equity growth and social capital on stock values or earnings price ratio and 2) evaluate the degree of association between investors' expectations and social capital on financial performance (realized rate of returns) for NGCs and for LLCs. Results indicate that observed structure of realized rates of return cannot be explained only by risk differentials and limited liquidity of agricultural cooperatives. Changes in growth expectations for LLCs and NGCs and social capital for NGCs must be considered. Social capital benefits tend to increase the earnings price ratio and realized returns for NGCs, but present mixed results for LLCs, as predicted. NGCs should increase social capital service as incentives to retain patrons and avoid potential adverse selection problems of attracting non-loyal, high risk non-patron investors.

Our analysis also reveals that expectations of changes in growth rates and social capital are significant in explaining differentials in returns for NGCs transitioning (demutualization) into LLCs and those adopting relatively new strategies for acquiring equity capital: passage of Minnesota (2004) and Wyoming statutes. Additional capital from non-patron investors or retained earnings will lead to increased size and improved financial performance for NGCs and LLCs. Investors perceive larger NGCs as less risky than smaller NGCs. Size can be increased by retaining more earnings from investing in profitable ventures.

Others results indicate that NGCs and LLCs might need to reduce levels of dividend payout ratios, leverage, and earnings variability because investors seem to perceive them as potential sources of risk. This could be achieved by using futures and contracts to reduce price volatility, by diversification, and by acquiring more equity capital from outside investors. Managers of NGCs and LLCs should maintain NGC and LLC low-risk features in order to build loyalty among current investors and attract more investors. Approximately 75% of all cooperative stock trades between investors are done by alternative trading systems.

There are several other complex issues like transfers that occur between family members; and risk sharing challenges between non-patrons, patrons, and the cooperatives, that need further investigation. It is anticipated that non-patron equity will magnify problems related to risk sharing currently confronted with farmers who rent cooperative stocks.

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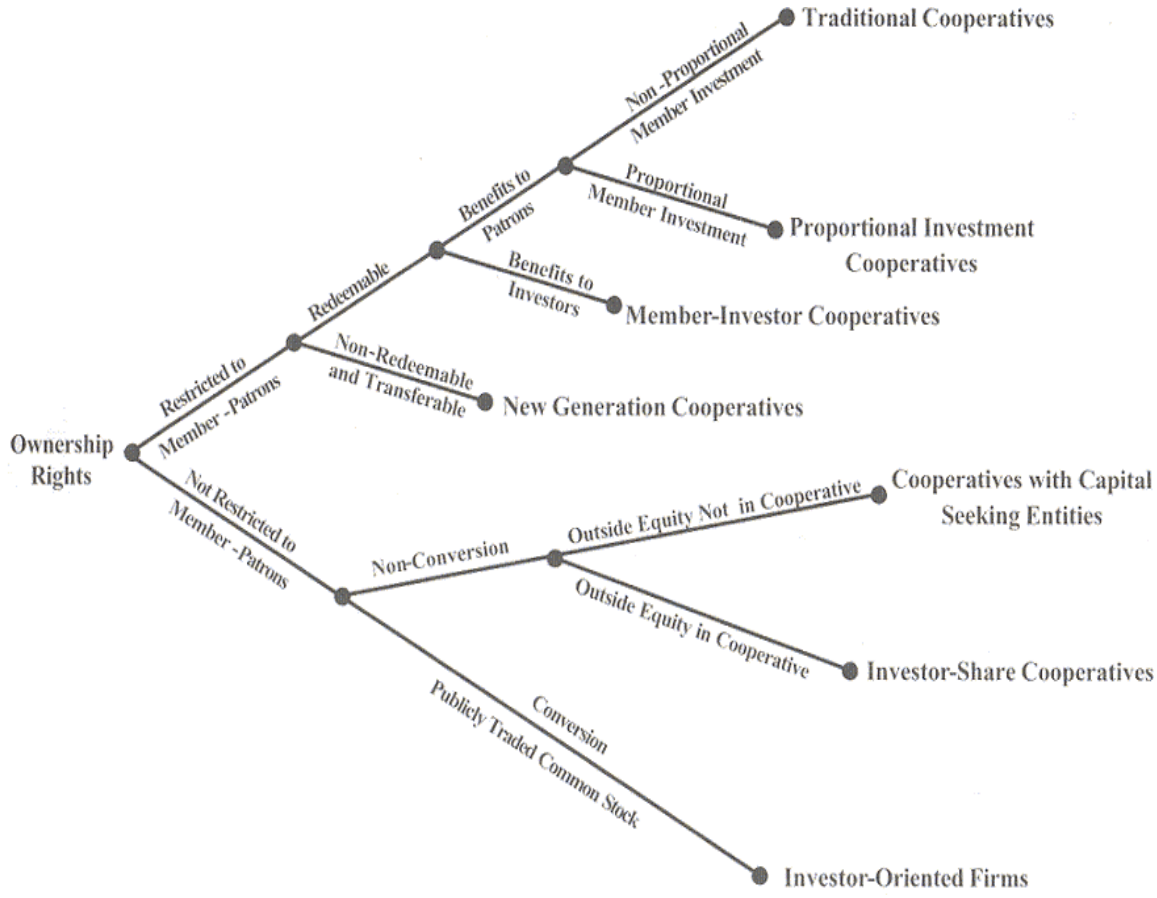
Figure 1. Evolution of cooperative ownership and governance structure



Source: Chaddad and Cook, 2004.

Endnotes

1. According to the U.S. Department of Agriculture, there are more than 47,000 cooperatives in the United States, and 40% of the U.S. population belongs to some form of cooperative. They generate billions of dollars annually and are represented in every sector of the economy including agriculture, health, finance, utilities, housing, and retail (Reynolds, 2001). In 2001, the USDA reported that 3,229 farmer cooperatives generated total revenues of $103.3 billion.
2. In the early 1900s, cooperatives emerged as a response to oligopolistic markets that farmers faced. In the 1940s and 1950s, they emerged in public utilities because urban service providers did not invest in rural areas. In the 1990s, the country experienced a new wave of cooperative activity.
   NGCs were established as alternatives to the traditional cooperative to allow farmers to increase margins through value-added production and to more easily acquire the equity needed to sustain their growth (Egerstrom 1994; Zeuli, 2001)**.** The changes in cooperative ownership structure during this evolution are presented in figure 1 (Chaddad and Cook, 2004).
   Source: Chaddad and Cook, 2004.

Another approach cooperatives have used to secure equity capital for high technological investments has been government support programs, as in the case of ethanol subsidies mandated by President Bush in 2006. These programs relieve the cooperative of the burden of maintaining equity redemption programs. This relief is a great benefit to NGCs since returning equity contributed by patrons and non-patrons can adversely affect the cooperative's financial health. However, subsidy programs may also place a significant burden on society or uneven distribution of federal assistance to wealthier businesses or to some states. For example, a USDA cost survey (2005) revealed that state incentives for ethanol production range from $0 to $0.08 per gallon for the Corn Belt states; in contrast, $0.51 per gallon in subsidies have been received from the federal government for about 4.4 billion gallons of ethanol sold. This volume is expected to increase to 7.5 billion gallons in 2012 (Food and Agricultural Policy Research Institute, 2005). Also, the long-run implications of these value-added subsidies on other sectors (e.g., feed and livestock industry) are yet to be analyzed. It is interesting to note that ethanol cooperatives in the Red River Valley are adopting the Minnesota Chapter 308 B status discussed in this article.

3. It is alleged that non-farmer equity will magnify current risk sharing problems between farmers who rent cooperative shares and those who own these shares but do no longer farm. Farmers often find themselves in vulnerable financial conditions when share owners demand upfront, semi or full payments for rented shares and such arrangements do not consider adverse yield conditions. The situation may be severe enough to force life-long farmers out of business (Pates 2006).