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

by

Chancel Akono Ada, William Nganje, Simeon Kaitibie, and Cole Gustafson*
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Abstract

New Generation Cooperatives (NGCs) are undergoing several structural changes with the acceptance of non-farmer investor equity and demutualization or transformation into investor-oriented ownerships, Limited Liability Companies (LLCs), to ameliorate perceived financial constraints for high technology investments. Using data of stock traded between members, we developed a model of investment decision and analyzed the impacts of expectations of change in growth and social capital, among other variables, on NGC and LLC performance. The findings show the importance of expectations of change in growth on firms' performance for NGCs compared to LLCs. Social capital arising from market transactions play a significant role in building loyalty among current investors and in attracting additional infusion of equity capital for NGCs.

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

*The authors are Former Graduate Student, Associate Professor, Research Assistant Professor, and Professor, respectively, in the Department of Agribusiness and Applied Economics, North Dakota State University, Fargo.

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Cooperatives generate billions of dollars annually and are represented in every sector of the economy including agriculture, health, finance, utilities, housing, and retail. In 2001, the USDA reported that 3,229 farmer cooperatives generated a net business volume of \$103.3 billion. Agricultural cooperatives serve as economic development tools whose future is linked to that of the communities they serve. Sourcing equity capital is a major challenge faced by agricultural cooperatives or New Generation Cooperatives (NGCs) because they currently undertake high technological investments. NGCs are undergoing several changes with the acceptance of non-farmer investors equity, demutualization or transformation into investor-oriented ownerships (example: Limited Liability Companies (LLCs)) and the use of social capital to ameliorate perceived financial constraints for high technology investments. These changes and strategies to attract additional equity for growth and expansion are discussed.

Demutualization or NGCs converting to investor-oriented firm ownership structures like LLCs is one strategy firms are using to acquire more capital from non-member sources (Chaddad and Cook, 2004). Demutualization is usually followed by public listing, which allows the converting firm to acquire additional risk capital from investors.

A second strategy used by NGCs to acquire non-farmer equity is the Wyoming cooperative law and the Minnesota chapter 308 B law which allow cooperative membership to be constituted of both farmers (patrons) and non-farmer investors (Hensley and Swanson, 2003). These statutes have set the stage for non-patrons to serve on the board of directors, which was not the case before. Previously, non-patron sources of equity capital had no representation on the board.

A major challenge faced by NGCs management, when non-patrons serve on the board, is to provide incentives for farmers to invest in NGCs or continue to do business with the cooperative, as they may perceive the cooperative core values to be diluted. Social capital services provide incentives for patrons to continue doing business with the cooperative or invest in NGCs. Economists have recently focused increased attention on the role of social capital in financial markets. Social capital benefits refer to non-monetary benefits that may be allowed to investors/members by cooperatives (Puaha and Tilley, 2003) and it may affect decisions to infuse additional equity to NGCs.

The implications of non-farmer equity on cooperative performance are yet to be investigated. In the case of NGC and LLC, stock values traded between members will serve as an important performance indicator. Until recently, data on such trades were limited. The development of alternative trading systems such as Variable Investment Advisor or Alerus Securities provides opportunities to acquire data for NGC and LLC stock trades. This study will expand the current literature on investors' decision in NGCs to include expectations of changes in growth and social capital. The main objective is to develop a model of investment decision and analyze the impacts of expectations of change in growth and social capital, among other variables (market risk and liquidity), on NGC and LLC performance.

Investment Decisions in NGCs and LLCs

The decision follows that of a risk-averse investor who is faced with uncertainties associated with the return on investment, r_e . The decision on whether to invest in NGCs and LLCs depends on monetary returns r_g and social capital returns r_s ; these two returns make up the returns to investment such that $r_g+r_s = r_e$. We assume that with the associated uncontrollable factors in the investment environment, r_g is a random variable, hence r_e is also a random variable.

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. These benefits can be monetary or non-monetary (social capital benefits). The amount of benefits that the investor gets depends on the number of shares he owns. However, the number of shares the investor owns is limited by their budget and tolerance levels for risk, social capital, and liquidity. The mathematical representation and comparative static findings are not presented in this version of the paper due to space limitation. The utility function is approximated in this study by a linear regression model using the stock value as the dependent variable and assuming that the error term follows a normal distribution (Goodnight, 1978; Ofer, 1975).

Data and Empirical Method

Data from NGC and LLC financial reports were obtained from security filings while NGC and LLC stock prices were obtained from Variable Investment Advisors and Alerus Securities. Five hundred and sixty-five observations were obtained for NGCs, covering 1996 through 2004. One hundred and seventy-five observations were obtained for LLCs, for the period 2003 to 2004, a time period 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 are discussed.

Measurement of Earnings Growth Expectations

Earnings per unit data are obtained from NGC financial statements and share price data from alternative trading systems (Variable investment Advisors and Alerus Securities). The earnings price ratio is computed as the ratio of the earnings price per unit and the price per share and presented in the equation below:

$$(1) \quad EP_{it} = \frac{EPS_{it}}{PS_{it}},$$

where 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 .

The beta coefficient is computed using S&P 500 data obtained from Yahoo Finance. Asset size, dividend payout ratio, leverage, earnings variability, liquidity, and past growth are computed with data from NGC and LLC financial reports. Leverage is estimated with data from NGC and LLC financial statements. Social capital is calculated using S&P 500 index data obtained from Yahoo Finance.

Measuring Risk Variables

Several variables were chosen to capture the risk inherent to the NGC or the LLC. Asset size, earnings variability, dividend payout ratio, and leverage measure the unsystematic component of risk and beta measures its undiversifiable component.

Measuring asset size

The size of the firm impacts stock returns (Daves et al., 1999). In theory, most investors require higher rates of return on risky investments (Reilly and Brown, 2000). Investors may require higher premiums for smaller NGCs than for larger NGCs because large firms are supposed to be less risky than smaller firms (Ofer, 1975). We expect a negative relationship between asset size and the earnings price ratio. The NGC asset size was measured by the natural logarithm of total assets and represented as follows:

$$(2) \quad AST_{it} = Ln[TA_{it}],$$

where TA_{it} is the total asset of NGC or LLC i at time t , and Ln is the natural logarithm operator.

Measuring dividend payout ratio

The dividend payout ratio is the percentage of earnings paid to shareholders in dividends. It provides an idea of how well earnings affect dividend payments and the stock price. According to Saxena (1999), a firm uses dividends as a mechanism for financial signaling to investors regarding the stability and growth prospects of the firm. Consequently, the dividend payout ratio could be used as a proxy for management's evaluation of the uncertainty of future earnings. The dividend payout ratio was computed from NGC financial statements using retained earnings at a point in time t :

$$(3) \quad Div_{it} = 1 - RE_{it},$$

where RE_{it} is NGC or LLC i retained earnings at time t .

Measuring leverage

Leverage is defined as the degree to which a business utilizes borrowed money. Companies that are highly leveraged may be at risk of bankruptcy if they are unable to make payments on their debt; they may also be unable to find new lenders in the future. Leverage is measured using the debt-to-asset ratio:

$$(4) \quad Lev_{it} = \frac{D_{it}}{A_{it}},$$

where D_{it} is NGC or LLC i total debt and A_{it} is NGC or LLC i total assets.

Measuring earnings variability

Earnings variability measures historical fluctuations of NGC earnings. The higher the fluctuations in earnings, the riskier the NGC and the higher the premium required by investors (Reilly and Brown, 2000). A moving standard deviation is used to calculate earnings variability, and is presented as:

$$(5) \quad Var_{it} = Stdev(EP_{it}, EP_{i(t-1)}),$$

where EP_{it} is NGC or LLC i earnings price ratio at time t , $EP_{i(t-1)}$ NGC or LLC i earnings price ratio at time $t-1$, and $Stdev$ is the standard deviation operator.

Measuring beta

Beta is a measure of systematic risk based upon an asset's covariance with the market portfolio (Reilly and Brown, 2000). It originates from portfolio theories and market equilibrium models developed by Sharpe (1964) and Lintner (1965). The beta coefficient is computed using the following equation:

$$(6) \quad \text{Beta}_{it} = \frac{\text{Cov}(R_{it}, R_{mt})}{\text{Var}(R_{it})},$$

where $\text{Cov}(R_{it}, R_{mt})$ is the covariance between NGC or LLC i returns and the market return at time t , and $\text{Var}(R_{it})$ is the variance of NGC or LLC i return at time t , R_{it} is NGC or LLC i return at time t , and R_{mt} is the market return at time t .

Measuring the Social Capital Variable

Social capital is measured based on the definition of Flora and Robison (2003) which posits that the change in price is an indirect measure of social capital's influence if the influence of social capital and social-emotional goods alter the price of a physical good involved in an exchange. In a similar line of reasoning, social capital influence on NGC and LLC stock might be reflected in the difference between the NGC return on assets and the market return. Social capital is presented as:

$$(7) \quad SC_{it} = (ROA_{it} - R_{mt}),$$

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

Measuring the Liquidity Variable

Liquidity is theoretically defined as the ability of an asset to be converted into cash quickly and without any price discount. Liquidity refers to how easily investors can convert their securities into cash or get into and out of investments. Stock liquidity is an important determinant of investment decisions because it affects the cost at which investors can trade stocks (Pritsker, 2004). We adopted Wyss' (2004) trading volume model to measure stock liquidity. The model was modified for scaling purposes and the algebraic representation is presented as:

$$(8) \quad Liq_{it} = Ln[Qty_{it}],$$

where Qty_{it} is the quantity of NGC or LLC i shares sold at time t , and Ln is the natural logarithm.

Measuring Expectations of Growth

Ofer (1975) found that investor's assessment of future growth in earnings must be decomposed into 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 (Ofer, 1975). 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):

$$(9) \quad EG_{it} = \beta_1 PG_{it} + \beta_2 Ech_{it},$$

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 are not observed. However, Ofer (1975) proposed to estimate them using the residual from the earnings price ratio estimation, presented as:

$$(10) \quad Ech_{it} = Pred(EP_{it}) - EP_{it},$$

where $Pred(EP_{it})$ is the predicted earnings price ratio for NGC 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:

$$(11) \quad EP_{it} = \lambda_{it} + \alpha_1 AST_{it} + \alpha_2 Div_{it} + \alpha_3 Lev_{it} + \alpha_4 Var_{it} + \alpha_5 Beta_{it} + \alpha_6 SC_{it} + \alpha_7 Liq_{it} + \alpha_8 EG_{it} + v_{it},$$

where λ_{it} is the intercept term and v_{it} is the error term, and the other explanatory variables are as previously defined. Substituting equation (9) into equation (11), we obtain the following:

$$(12) \quad EP_{it} = \lambda_{it} + \alpha_1 AST_{it} + \alpha_2 Div_{it} + \alpha_3 Lev_{it} + \alpha_4 Var_{it} + \alpha_5 Beta_{it} + \alpha_6 SC_{it} + \alpha_7 Liq_{it} + \alpha_8 PG_{it} + \alpha_9 Ech_{it} + \alpha_{10} Year_m + v_{it}.$$

The *year* variable is added to capture annual variations in the earnings price ratio. Since we cannot observe expectations of changes in earnings growth (Ech_{it}), we estimate equation (13) without the variable Ech_{it} , and then compute the predicted earnings price ratio, $Pred(EP_{it})$. The difference between the observed and predicted earnings price ratios is then used to compute expectations of changes in earnings growth, as presented in equation 10.

Impact of Systematic Risk, Social Capital, Liquidity, and Expectations of Change in Earnings Growth on NGC and LLC Realized Returns

Investors' expectations of NGCs and LLCs are assumed to be centered around realized rate of returns rather than 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 structure of NGC and LLC realized returns and presented as:

$$(13) \quad Re_{it} = \alpha_0 + \alpha_1 Beta_{it} + \alpha_2 SC_{it} + \alpha_3 Liq_{it} + \alpha_4 Ech_{it} + \alpha_5 Season_n + \varepsilon_{it},$$

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. The reason is that 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).

Econometric Procedure

The GLM procedure was used to estimate the equations. *F*-tests were conducted to determine how stock data should be aggregated because they come from the same sources. Table 2 presents the *F*-values and the *P*-values. The first *F*-test tested the hypothesis that NGC and LLC data should be aggregated by type. The *F*-values were highly statistically significant, implying that NGC and LLC data be separated by type and by years.

Empirical Results

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 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.

A Mann-Whitney test was used to determine whether investors' expectations matter. 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 individual year comparisons showed high statistical significance in the difference between predicted and observed earnings price ratios for all years except for 2000 and for the composite 2003/2004 data. For composite LLC data, there was a statistically significant difference between the actual earnings price ratio and predicted earnings price ratio. A similar result was observed when all data were combined.

Earnings Price Ratio Results for Risk Variables

Empirical results on the effects of risk variables, social capital and liquidity on earnings price ratio are presented in Table 4, for both LLCs and NGCs. The results for LLCs show a positive size effect, a positive dividend effect, a positive leverage effect, and a negative earnings variability effect on the earnings price ratio over the years.

Asset size is highly statistically significant. The result suggests that as LLC size increases, LLC earnings price increases. This result is counter-intuitive and a possible explanation is that investors require higher premiums in compensation to risky investments undertaken by LLC managers (some LLCs have invested in high technological and high risk ventures).

Dividend payout ratio is highly statistically significant. This finding implies that as dividend payout ratio rises, LLC earnings price increases. Investors might perceive high dividend payout ratio as a threat to LLC growth. Leverage is highly statistically significant, suggesting that LLC earnings price rises as the degree of leverage increases. Investors might perceive high leverage as a source of risk (volatility of interest rates and repayment of debts acquired). Earnings variability is highly statistically significant. This means that LLC earnings price rises as earnings volatility decreases. Investors might be willing to accept some variability in LLC earnings because LLCs are new investments.

For NGCs, Table 4 reports a negative size effect, a positive dividend effect, a positive leverage effect, and a positive earnings variability effect on the earnings price ratio. Asset size is highly statistically significant. The result shows that as NGC size increases, NGC earnings price

decreases. Investors might perceive large NGCs as less risky than smaller NGCs. Dividend payout ratio is highly statistically significant. This result implies that as dividend payout ratio rises, NGC earnings price increases. It is possible that investors perceive high dividend payout ratio as a threat to NGC performance. Leverage is highly statistically significant. This finding suggests that NGC earnings price rises as the degree of leverage increases. A possible explanation is that investors perceive high leverage as a threat to NGC performance (volatility of interest rates and repayment of debts acquired).

Earnings variability is statistically significant at the 5% confidence level. This result implies that NGC earnings price rises as earnings volatility increases. Investors might require higher returns to compensate for volatile earnings.

Impacts of Social Capital, Liquidity and Growth Expectations on Earnings Price

For NGCs, Table 4 reports a positive social capital effect on the earnings price ratio. Social capital is highly statistically significant, and this result implies that NGC earnings price increases as social capital grows. A possible explanation is that investors perceive high social benefits as a source of risk to NGCs. The year effects have a positive impact on NGC stock trades.

For LLCs, Table 4 reports a positive social capital effect and a positive liquidity effect on the earnings price ratio. Social capital is statistically significant at the 10% confidence level. This result implies that LLC earnings price increases as social capital grows. Investors might perceive social capital as a threat to their monetary profits. Liquidity is statistically significant at the 10% confidence level. This finding suggests that LLC earnings price rises as its stock becomes more liquid and was not expected. Probably, investors want to be compensated for the risk of thinly traded LLC stock. The years have a negative impact on LLC stock trades, and are all highly statistically significant. Investors might expect LLCs to have a better performance the longer they exist.

Impacts on Realized Rate of Return

For NGCs, Table 5 reports a negative systematic risk effect and a positive expectation effect on the NGC realized rate of return. Beta is highly statistically significant. This result suggests that NGC realized returns rise as systematic risk declines. Investors may perceive investment in NGCs as an opportunity to minimize market risks. Expectations of changes in earnings growth are highly statistically significant. This finding implies that NGC realized returns rise as expectations of changes in earnings growth increase. Investors may expect NGC to experience negative changes in their future earnings. Social capital services significantly impact investors realized rate of return and may be serve as incentives to retain farmer patrons in NGCs.

For LLCs, Table 5 reports a negative systematic risk effect on the realized rate of return. Beta is highly statistically significant. This result suggests that LLC realized returns rise as systematic risk declines. Investors might be willing to accept low returns from LLCs (minimizing market risk is a goal to most cooperatives). The first and second trimesters positively impact LLC stock trade, and are both statistically significant. Possibly, both trimesters are perceived by investors as risky trading periods.

Conclusion and Suggestions

This study analyzed the impact of risk, social capital, liquidity, and new information or growth expectations on NGC and LLC performance. The results show that social capital and liquidity are important factors in estimating NGC earnings price ratio and realized rate of return. However, social capital significantly impact LLC earnings price ration but has negligible impact in explaining realized returns for LLCs. In addition, investors may have negative expectations about NGC future earnings growth; however there is no significant expectation effect on LLC realized returns. Furthermore, risk factors (asset size, dividend, leverage, and earnings variability) are important for NGC and LLC earnings price ratio estimation, and systematic risk negatively impacts NGCs and LLCs realized returns. Year and seasonality significantly impact NGC and LLC realized returns.

To improve performance, NGCs and LLCs might need to grow in size because investors perceive larger NGCs as less risky than smaller NGCs. This might be achieved by retaining more earnings. Also, NGCs and LLCs might need to reduce levels of dividend payout ratio, 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 prices volatility, by diversification, and by acquiring more equity capital from outside investors. Managers of NGCs and LLCs should maintain NGC and LLC low-risk feature in order to build loyalty among current investors and attract more investors. NGCs should increase social capital benefits to attract additional infusion of equity from farmer patrons.

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Table 1. Description and Sources of Variables used to Estimate the Earnings Price Ratio

Variables	Description	Data sources
Ep	Earnings price ratio	Financial statements/VIA/A.S.*
Beta _{sp}	Beta coefficient (S&P 500)	Yahoo finance
AST	Asset size	Financial statements
Var	Variability of earnings (\$/share)	Financial statements
Div	Dividend payout ratio	Financial statements
Lev	NGC leverage	Financial statements
PG	Past growth rate of earnings (%)	Financial statements
Liq	Logarithm of quantity of shares sold	Financial statements
SC _{sp}	Social Capital using S&P 500 (%)	Yahoo Finance

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

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

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**

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

Variable	LLC		NGC	
	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**	0.58
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.