

Role of Financial Variables in Explaining the Efficiency of Sample of Farm Supply and Grain Marketing Cooperatives

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Agricultural cooperatives are not immune from recent financial crises facing the economy. In particular, increased working capital requirements associated with the volatility experienced in the wheat market during 2007 have directly impacted grain marketing cooperative throughout the central United States, the most productive wheat growing region, in terms of total yield, in the country. Working capital requirements associated with margin calls, and interest expenses associated with larger credit lines, have changed. For example, the most profitable 25% of North Dakota agricultural input supply and grain marketing cooperatives, in a sample of 120, experienced decreases in liquidity, as measured by the current ratio. The current ratio for this group declined from 1.66 in 2002 to 1.35 in 2005, then increasing to 1.43 in 2006. In contrast, the least profitable 25% of cooperatives in this group experienced steady increases in liquidity, with a current ratio of 1.81 in 2002 and a high of 2.24 in 2005, followed by 2.17 in 2006. At the same time, more profitable firms made relatively greater use of external financing—debt capital—in order to conduct their operations. In addition, real returns on investment in federated cooperatives increased, on average, during the 2002-2007 period. It is possible, therefore, that managers of the most profitable agricultural input supply and grain marketing cooperatives in the central United States sacrificed liquidity in order to achieve or maintain profitability. Does this also imply that that increased working capital constraints have caused cooperative managers to improve the efficiency of their resources, or have managers relied on increased returns from investments in other cooperatives to subsidize inefficient operations?

The purpose of our paper is to assess the impact of financial variables, such as liquidity and profitability, on the economic efficiency of a sample of farm supply and grain marketing cooperatives in the central United States. Our first objective is to assess whether changes in liquidity affected the economic efficiency of agricultural input supply and grain marketing

cooperatives in the central United States. The financial literature indicates liquidity constraints affect the firm development. The relationship between firm size and growth rates has been attributed to financing constraints in manufacturing firms. Liquidity constraints have also been shown to affect the entrepreneurial choices of firm managers. Firms with binding cash flow constraints have greater variability in growth rates. Liquidity may therefore be of importance since the cooperative business model utilizes user-owners and management to balance the member's preference for financial returns from investment in the cooperative with management's preference for spending money on projects beneficial for management, such as perquisite consumption and cross-subsidizing poorly performing projects.

Our second objective is, to determine if economic efficiency is associated with profitability. Increased efficiency has been associated with higher levels of profitability. We note in our data, however, that higher profitability is associated with lower liquidity, suggesting a tradeoff between liquidity and efficiency.

Finally, we assess whether solvency is associated with economic efficiency. Previous research on the efficiency of agricultural cooperatives indicates that purchases of fixed assets may contribute to increased economic efficiency since relatively larger cooperatives tend to be scale efficient. Both positive and negative relationships between efficiency and leverage have been found.

Our analysis is based on a stochastic frontier cost function model which considers cost and technical and economic efficiency as endogenous variables. Measurement of the economic efficiency of agricultural cooperative businesses has been studied previously, even with stochastic frontier models. The contribution of this paper is to examine how changes in the financial status of cooperatives due to volatility in grain markets in 2007 and 2008 affected the

efficiency of agricultural input supply and grain marketing cooperatives.

Preliminary results suggest theoretically consistent and significant relationship between input prices, output quantity and total costs, but no relationship between liquidity, profitability, and efficiency. Labor and capital prices, as well as total output are positively correlated with total production costs for the cooperatives. We also find that technology changes over time lead to decreased costs. No significant relationship is detected between random variations in efficiency and the cooperative's liquidity and profitability. Together these results suggest that volatility in the financial status of agricultural marketing and grain supply cooperatives may not tend to encourage increased efficiency.