Comparative Financial Performance of

Agricultural Cooperatives and Investor-Owned Firms

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Abstract

This study researches the validity of claims that cooperatives are destroying value by comparing the financial performance of agricultural cooperatives with investor-owned firms in four sectors—dairy, farm supply, fruit and vegetable, and grain. Traditional financial ratios measuring profitability, liquidity, leverage and asset efficiency were analyzed for 1991 through 2002. Overall, the financial performances of agricultural cooperatives and their investor-owned counterparts were comparable. Consistent with theoretical expectations, cooperatives demonstrated lower rates of asset efficiency, except in the dairy sector. Cooperatives in all four sectors were less leveraged, while results regarding the relative profitability and liquidity of cooperatives were not conclusive.

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Introduction

Reports regarding the financial difficulties experienced by agricultural cooperatives in the US have been much more common recently than news of cooperatives' successes. In particular, the bankruptcy of Farmland Industries, the nation's largest agricultural cooperative, has received considerable media attention. In California, news about cooperatives has centered on Tri Valley Growers' bankruptcy and the dissolutions of the Rice Growers Association of California and Blue Anchor.

An international management consulting firm, McKinsey & Company, issued a report in 2002 alleging that agricultural cooperatives "destroy value" because few cooperatives "…have changed the way they operate…" (Dempsey, Kumar, Loyd and Merkel). Several financial ratios for cooperatives (revenue growth, return on assets and operating margins) were calculated which indicated weak performance in the cooperative sector. Another performance measure, "valued created," was also analyzed; it was based on "return on invested capital," which was calculated by dividing total net operating profits by the total dollar value of capital invested. Distribution of the report led to discussions among top management of agricultural cooperatives and academics regarding rates of return generated by agricultural cooperatives.

Such news creates doubt about the viability of the cooperative form of business in agriculture, causing members to question their cooperative's performance and/or become reluctant to proceed in organizing a future venture under the cooperative structure. Furthermore,

it raises concerns among cooperatives' lenders. Are such doubts justified? What is the future for agricultural cooperatives in California?

One approach to evaluating this issue objectively is to compare the financial performance of agricultural cooperatives with that of investor owned firms (IOFs) in similar industries. To develop this research, findings from previous studies are reviewed and the implications of the cooperative principles on cooperative behavior are discussed.

Previous Studies

As noted in a comprehensive review by Sexton and Iskow, there are two categories of empirical studies regarding the efficiency of cooperatives—those based on concepts of economic efficiency and those involving financial ratios. Among the economic efficiency studies, Porter and Scully utilized a production function approach to conclude that dairy cooperatives were less efficient than their IOF counterparts. Sexton, Wilson and Wann tested the allocative efficiency of cotton ginning cooperatives and rejected the argument that cooperatives tend to underutilize capital. Akridge and Hertel tested costs differences between grain and farm supply cooperatives and IOFs using a generalized translog multiproduct cost function. They found that the cooperatives had a small efficiency advantage but it was statistically insignificant. Sexton and Iskow noted that these studies failed to consider the field services, market information, lobbying and ancillary services often provided by cooperatives; such ancillary services will increase a cooperative's production costs, leading to the incorrect conclusion that cooperatives are inefficient.

Three extensive studies of the comparative financial performance of agricultural cooperatives and IOFs were conducted during the late 1970s and 1980s. Schrader, et al.

summarized the findings of their study related to Midwestern cooperatives conducted between 1979 and 1983 using financial reports and opinion surveys; their results were mixed. They found that IOFs and cooperatives operating cheese plants, grain elevators and farm supply firms had similar rates on return on assets. However, large, diversified agribusiness IOFs had significantly higher rates of return on assets than did comparable cooperatives. With regard to capital structure, Schrader, et al. found that IOFs operating cheese plants, grain elevators and farm supply firms were more highly leveraged than comparable cooperatives. However, large, diversified agribusiness IOFs had significantly less leverage than did comparable cooperatives. In the grain elevator, farm supply and cheese plant sectors, they determined that cooperatives were less efficient with their assets (had lower asset turnover ratios) than their IOF counterparts; however large, diversified agribusiness cooperatives were more efficient than comparable IOFs.

Lerman and Parliament analyzed financial data from 1976 through 1987 in their study comparing the financial performance of 18 regional cooperatives with that of comparable IOFs. Their study was limited to firms with average asset size between $10 million and $100 million. They determined that in both the fruit and vegetable processing and dairy sectors, cooperatives and IOFs were leveraged similarly and generated similar rates of return to equity. Both the liquidity and asset efficiency of fruit and vegetable processing IOFs were greater than that of cooperatives, but these results were reversed in the dairy sector. Thus, their findings were mixed, similar to those reported by Schrader, et al.

Parliament, Lerman and Fulton compared the financial performance of the two types of dairy firms between 1976 and 1987. They concluded that the cooperatives performed significantly better than the IOFs with respect to leverage, liquidity and asset efficiency. However, the differences between the two types of firms regarding rates of return to equity were

not statistically significant. They also reviewed a broad range of nonmarket benefits that cooperatives can provide to their members.

Sexton and Iskow pointed out how such analyses of financial ratios, although popular, is not based on economic theory. Furthermore, they noted that cooperatives represent the vertical integration of the producers' firms; thus, it is inappropriate to evaluate "..performance of the joint entity by examining data for only a portion of the entity…"(p.22). In particular, different outcomes regarding profitability measures can be obtained likely by merely shifting income from one entity to the other. A cooperative could be less profitable than an IOF and still be desirable to a member—as long as the member's discounted stream of returns from the cooperative were greater than those from marketing the commodity directly or through an IOF.

These criticisms are all valid; however, the theoretically sound approaches are impractical to use because of data limitations. Furthermore, critical stakeholders associated with cooperatives—members, management and lenders—are more concerned with financial ratios than they are about measures of economic efficiency. Thus, this study will be based on financial ratios; hypotheses regarding the relative financial performance of cooperatives and IOFs are developed in the following section using the theory of cooperative behavior.

Implications of Cooperative Behavior on Financial Performance

Cooperatives operate differently from IOFs because of the three basic cooperative principles that define the essence of a cooperative enterprise: user-owned, user-benefit and user-control. These principles have been incorporated into government regulations, and the federal and state tax

codes. This legal integration of the cooperative principles has significantly affected the organizational behavior of agricultural cooperatives in the US. Hypotheses regarding their impact on key indicators of financial performance—profitability, liquidity, leverage and asset efficiency—are developed below using analyses from previous studies.

In their review, Sexton and Iskow summarized various studies that evaluate how the cooperative structure can affect relative financial performance. They cite several studies that hypothesized how cooperatives are inefficient relative to IOFs because of the principal-agent problem (such as Porter and Scully). Porter and Scully also argue that the horizon problem has caused cooperatives to focus on short-term earnings at the expense of long-term opportunities. Cooperatives' profitability is also impaired when they lack sufficient patronage to achieve the cost-minimizing scale of operation. Furthermore, Gruber, Rogers and Sexton determined that cooperatives are more likely than IOFs to participate in commodity-oriented markets with considerable product homogeneity and low margins. Conversely, Sexton and Iskow also described how cooperatives can achieve cost savings by internalizing transactions through vertical integration and having better information flows than their IOF counterparts.

In presenting their hypotheses regarding the comparative financial performance of cooperatives and IOFs, Lerman and Parliament stated that the differences are due to divergences in "objectives and strategy" between the two types of firms. They discuss how cooperatives are not considered to be rate-of-return maximizers; their members traditionally expect to receive their returns in the form of improved market access or lower input prices, rather than a direct return on their equity investment in their cooperative. These service benefits reduce cooperatives' rates of return by lowering revenues and increasing costs. It is expected that the net effect of these considerations on cooperatives' relative profitability is negative.

Due to the user-financed principle, most cooperatives obtain most of their equity capital through capital retains imposed on member-producers. Lerman and Parliament hypothesized that the illiquid nature of cooperatives' equity constrains their ability to raise capital from their members; consequently, cooperatives need to rely more heavily on debt financing than IOFs. Furthermore, they assert that the cooperative structure encourages moral hazard behavior, resulting in higher debt and more risk taking than their IOF counterparts.

This hypothesis is contrary to the well-known Modigliani-Miller theory of capital structure which argues that the US tax laws foster the high use of debt financing by shareholder corporations (Ross, Westerfield and Jaffe). Since cooperatives have the ability to pass through earnings on their patronage income without taxation to their members, they do not have the same incentive as shareholder corporations to maximize their use of debt financing. When these tax considerations are combined with cooperatives' restricted access to equity capital, the net effect on the relative use of leverage by the two types of firms becomes unclear.

With regard to asset efficiency, Lerman and Parliament assert that moral hazard considerations suggest that cooperatives are less discriminating in undertaking investments than IOFs, increasing their relative leverage (and decreasing their relative liquidity). They may also not acknowledge the opportunity cost of member equity. Such behavior could also lead them to carry higher inventory levels relative to their sales, further impairing their overall asset efficiency.

As discussed above, there are numerous behavioral differences between cooperatives and IOFs that are attributable to the cooperative principles. These differences have implications on cooperatives' financial performance--particularly their profitability, capital structure, liquidity

and asset efficiency. The financial ratios used in this study are displayed in Table 1, along with the expected relationships of these ratios between cooperatives and IOFs.

Description of the Data

Key financial ratios of West Coast agricultural cooperatives are compared to those of similar IOFs in select sectors, using data reported in the firms' annual reports over the 12-year period, 1991 through 2002. The data for the research included a sample of 41 cooperatives in California, Oregon and Washington. Listed below is the sectoral mix of cooperatives:

- 5 cooperatives from the dairy sector
- 14 cooperatives from the farm supply sector
- 11 cooperatives from the fruit and vegetable sector
- 11 cooperatives from the grain sector

Financial statements of cooperatives were provided by CoBank, the largest lender to agricultural cooperatives in the US. Financial ratios were calculated from their qualified annual reports for the period 1991-2002. For each observation year, the aggregates of two variables comprising each ratio were calculated; then these aggregates were used to compute the ratios for each year for each sector. For example, the current ratio for dairy sector was calculated by adding the current assets of all five cooperatives in the sector and dividing this sum by the sum of current liabilities for these five cooperatives. Hence, 24 time series (six ratios for each sector) of 12 aggregated ratio observations were derived.

Financial data for comparable IOFs were difficult to obtain. Data for publicly traded companies are readily available from their required report filings and services that compile databases from these reports; however, such companies proved to be much larger (as measured

by sales) than the cooperatives in the data set. Previous experience indicated that making direct requests for time series of financial data from nonpublic companies would be unsuccessful. Instead, published financial data for IOFs were obtained from Risk Management Association (RMA) Annual Statement Studies, which report a selection of median financial ratios as well as aggregated financial variables for a wide range of industries. The data are reported by the association's bank members; the vast majority of the data set is for nonpublic companies.

Clearly, it is a major shortcoming that these IOF data represent aggregated observations of companies within a SIC code rather than the individual company data; however, no other sources for such data were found. Given the nature of the RMA data, the data for the individual cooperatives were aggregated similarly to maintain their comparability. This aggregation method effectively weighted the sample by firm size.

Financial ratios were calculated from these aggregate financial variables for IOFs, rather than using the median financial ratios provided by RMA, to match the ratios calculated for the cooperatives. IOFs with operations comparable to the cooperatives were represented by the following SICs:

- Dairy:
    - 2021: Manufacturers-Dairy Products/Manufacturing Creamery Butter
    - 2022: Manufacturing-Natural, Processed & Imitation Cheese
    - 2026: Manufacturing-Fluid Milk
- Farm Supply:
    - 5191: Wholesalers Farm Supplies
- Fruits & Vegetables:

- 2033: Manufacturers-Canned & Dried Fruits & Vegetables/Manufacturers - Canned Fruits, Vegetables, Preserves, Jams & Jellies
- 2037: Manufacturers-Frozen Fruits, Fruit Juices & Vegetables
- 5148: Wholesalers - Fresh Fruits & Vegetables

- Grain:
  - 2041: Manufacturers-Flour & Other Grain Mill Products
  - 5153: Wholesalers-Grain & Field Beans

Over the range of years covered by the study, the number of IOFs included in the RMA database ranged from:

20 to 162 for dairy sector

297 to 1024 for farm supply sector

27 to 268 for fruits & vegetables sector

28 to 291 for grain sector

In addition to being comparable in operations, the IOFs were comparable to the cooperatives with respect to their average total assets (Table 2).

Model and Results

To detect significant differences between the financial performance of cooperatives and IOFs, the time series of aggregated financial ratios in each sector were analyzed using simple linear regression.

Model: $R^{i}_{jt} - R^{c}_{jt} = b_{0j} + b_{1j}T_t$

R^i_{jt} = IOF financial ratio

R^c_{jt} = Cooperative financial ratio

b_{0j} = Intercept coefficient

b_{1j} = Slope coefficient

T_t = Time in years (0, 1….11)

H_0: $b_{0j} = 0$

H_1: $b_{1j} = 0$

Significance level = 0.05

This approach differs considerably from the tests for significant differences utilized in the Lerman-Parliament (Kruskal-Wallis) and Parliament-Lerman-Fulton (Wilcoxon rank-sums) studies. Their tests did not capture the time series nature of their data. This regression model is structured as a paired differences tests; it estimates whether there is a linear pattern in how differences in financial performance between the two types of firms change over time. The time trend specifically tests the claim made by McKinsey & Company that there has been recent deterioration in cooperatives' performance. If this were to be the case, the intercept coefficient could be zero but the slope coefficient for each financial indicator would be positive, with the exception of the debt-equity ratio (where cooperatives' recent deterioration would be signaled by a negative coefficient). If, instead, the differences in profitability between the two types of firms remained constant over the entire time series, then the R^2 would be zero but the estimated intercept coefficient would be highly significant. Different combinations of significant coefficients are interpreted in Table 3.

The regression results were tested for autocorrelation using the Durbin Watson test (DW). While the DW test requires a minimum of 15 observations, the test was conducted on

only 12 observations using the values for 15 observations from the DW table as an approximation. Autocorrelation was corrected for using the Cochrane-Orcutt iterative method.

The regression results are presented in Table 4. The proportion of variation in the difference in ratios between IOFs and cooperatives that is explained by the estimated equations ranges from .00 to .67. It is also informative to review the graphs for each ratio within each sector; these are included at the end of this report.

Interpretation of Regression Results

The significance and signs of the estimated coefficients are displayed below for each ratio. The poor fit of the estimated equations is attributable partly to the small number of observations.

Profitability

	DAIRY		FRUIT and VEG		GRAIN		FARM SUPPLY	
	constant	time	constant	time	constant	time	constant	time
ROE	no +	yes -	no -	no +	yes -	no +	no +	no +
ROA	no +	no -	no -	no +	yes -	no +	no -	no +
OM	yes +	no +	yes -	no +	yes -	yes +	no +	no +

Profitability results for the dairy sector were mixed (Figures 1, 2 and 3). While cooperatives' ROEs were increasing significantly relative to those of their IOF counterparts over time (with a similar result regarding their ROAs that was weakly significant), cooperatives' operating margins remained .81 percentage points lower than the IOFs during the entire period of analysis. As previously noted, cooperatives' lower operating margins may be due to their general tendency to market a larger proportion of generic, undifferentiated products.

All three profitability measures for fruit and vegetable cooperatives (Figures1, 2 and 3) indicate cyclical returns that are not experienced by their stable IOF counterparts. The cyclical earnings could be attributable to cooperatives' tendency to concentrate on generic, low value-

added products whose profitability is more vulnerable to international market conditions than that of more differentiated products. Over the time period, however, cooperatives averaged higher margins than the IOFs, as indicated by the statistically significant negative coefficient for the intercept.

The estimation results for all three profitability measures indicated that while grain cooperatives had higher profitability initially than their IOF counterparts, they have been losing this advantage. As indicated in Figures 1, 2 and 3, the profitability measures for grain cooperatives and IOFs were essentially equal in 2002.

For the farm supply sector, both the regression results and graphs (Figures 1, 2 and 3) indicate that the profitability of farm supply cooperatives and IOFs are comparable.

Liquidity

	DAIRY		FRUIT and VEG		GRAIN		FARM SUPPLY	
	constant	time	constant	time	constant	time	constant	time
CR	no +	no +	yes +	no -	yes +	yes -	yes -	yes +

The liquidity of both types of firms has remained relatively stable over time (Figure 4). The negative significant constant coefficient for the fruit and vegetable sector, along with the graph in Figure 4, indicate that the liquidity of IOFs has been a steady .2 points higher than that of their cooperative counterparts throughout the time period. Meanwhile, grain cooperatives have improved their liquidity relative to IOFs. Conversely, the estimated coefficients for the farm supply sector indicate that the liquidity of cooperatives was declined relative to that of IOFs.

Debt/Equity

	DAIRY		FRUIT and VEG		GRAIN		FARM SUPPLY	
	constant	time	constant	time	constant	time	constant	time

D/E	yes +	no -	yes +	no +	yes +	no +	yes +	no -

In each sector, cooperatives consistently maintained significantly lower leverage than their IOF counterparts (Figure 5). There were no significant changes in these differences over time. These leverage results are the most consistent findings in this study. As previously noted, this could be attributable to the debt financing incentives created by the corporate income tax code; this incentive is much weaker for cooperatives because patronage income is generally passed through to members without taxation.

Fixed Asset Turnover Ratio

	DAIRY		**FRUIT and VEG**		**GRAIN**		**FARM SUPPLY**	
	constant	time	constant	time	constant	time	constant	time
FATR	yes -	yes +	yes +	no +	yes +	yes -	yes +	no -

In three of the four sectors, cooperatives started with significantly lower asset efficiency than their IOF counterparts; however, grain cooperatives improved their asset utilization over time. The fruit and vegetable cooperatives' significantly lower asset utilization is very noticeable (Figure 6); the cooperatives averaged $6 less in sales per dollar of fixed assets than their IOF counterparts. Dairy cooperatives initially had higher asset efficiency than the IOFs, but their relative advantage declined over time.

Summary and Conclusions

This twelve-year review of the comparative financial performance of cooperatives and IOFs covered four major agricultural sectors. It was expected that cooperatives would be less profitable than IOFs in the same sector. The only consistent finding regarding profitability was

that all three of the profitability ratios of grain cooperatives were higher than those of their IOF counterparts; however, the grain cooperatives' relative advantage decreased over time. For the other three sectors, relative performance varied with the specific profitability measure.

In two of the four sectors, cooperatives had less liquidity than their IOF competitors; this was expected because cooperatives are under pressure to redeem member equity. Farm supply cooperatives initially had higher liquidity than the IOFs, but this advantage diminished over time. Conversely, the relative liquidity of grain cooperatives improved over time.

Cooperatives consistently maintained lower leverage levels than their IOF counterparts. These results are similar to those of Schrader, etal., and contrary to those of Lerman and Parliament who had found similar levels of leverage for both types of fruit and vegetable firms and dairy firms. It appears that the effects from US tax laws fostering the high use of debt financing by shareholder corporations outweigh the effects from cooperatives' constrained access to equity capital. Another explanation for cooperatives' lower leverage levels could relate to the fact that it is more difficult for cooperatives than IOFs to spread their risks by diversifying into other business activities; thus, cooperatives' management may be more risk averse and pursue more conservative business strategies than their IOF competitors. Cooperatives' lower leverage levels warrant further research.

The regression results and visual observation indicate that cooperatives had lower asset efficiency than their IOF counterparts in three of the four sectors evaluated (grain, fruit and vegetable and farm supply). This is consistent with the theory of cooperative behavior; cooperatives are expected to provide a home for their members' product and need to maintain excess capacity. It is not surprising that this hypothesis did not hold for dairy cooperatives, since

dairy producers tend to have consistent production volumes and market their production through only one source—reducing their cooperative's need for excess capacity.

Overall, cooperatives had the strongest relative financial performance in the grain sector. They had less leverage than their IOF counterparts, and their relative performance was improving with regard to liquidity and asset utilization. Grain cooperatives and IOFs have recently been comparable with regard to profitability, although cooperatives were stronger initially.

Among the four sectors included in this analysis, cooperatives in the fruit and vegetable sector displayed a general weakness. Cooperatives' tendency to market a high proportion of undifferentiated, low value-added products could explain both the fruit and vegetable cooperatives' sharply lower asset utilization rates and cyclical profitability. If the IOFs market a higher proportion of value-added products, they are more likely to maintain year-round utilization of their processing equipment and generate returns that are less susceptible to the highly competitive international market for undifferentiated canned fruits and vegetables. This sector warrants further analysis; cooperatives' long-term viability may depend on their ability to reduce their costs substantially as processors of undifferentiated products or to enhance their capabilities as marketers of more value-added products.

Initially, cooperatives had significantly higher performance levels for eight of the 24 ratios evaluated, while IOFs had significantly higher performance levels for six ratios. There was no consistent evidence of declining relative performance over time by cooperatives; of the six time trend coefficients that were statistically significant, three indicated cooperatives were getting stronger while the other three signaled a relative weakening by cooperatives.

In conclusion, there were no consistent differences between the financial performance of cooperatives and IOFs, except for cooperatives' lower levels of leverage. When these regression results are compared against the hypotheses developed from the theory of cooperative behavior, the overall findings are as inconclusive as they were in the previous studies conducted by Lerman and Parliament, and Schrader, etal. None of the hypotheses was consistently accepted or rejected using regression analysis for any of the ratios analyzed.

Claims that cooperatives are destroying value do not stand up to this analysis of recent trends in financial performance of agricultural cooperatives on the West Coast. These findings should alleviate some of the concerns expressed by producers and lenders regarding the viability of agricultural cooperatives. These results, when combined with the fact that cooperatives ensure secure markets for their members' products, demonstrate that cooperatives continue to promote the economic welfare of agricultural producers.

Table 1. Ratios analyzed

Ratio	Performance Indicator	Definition	Expected Relationship
Return on Equity (ROE)	Profitability	Income/Equity (%)*	Coop < IOF
Return on Assets (ROA)	Profitability	Income/Total Assets (%)*	Coop < IOF
Operating Margin (OM)	Profitability	Operating Profit/Net Sales (%)	Coop < IOF
Current Assets (CR)	Liquidity	Current Assets/ Current Liabilities	Coop < IOF
Debt-Equity Ratio (D/E)	Leverage	Non-Current Liabilities/Equity	Coop ? IOF
Fixed Asset Turnover Ratio (FATR)	Asset Efficiency	Net Sales/Fixed Assets	Coop < IOF

* Adjustment for Income: Income = Income tax + Tax payable + Net Income

Table 2. Size characteristics of IOFs and cooperatives

Sector	IOF Average Asset Range During 12 Year Period	Coop Average Asset Range During 12 Year Period
Dairy	$18m – $36m	$26m - $71m
Farm Supply	$7m – $15m	$5m - $11m
Fruits & Vegetables	$13m – $22m	$14m - $23m
Grain	$6m – $15m	$14 - $19m

Table 3. Interpretation of Results for Coefficients

Intercept Significant	Slope Significant	Interpretation
No	No	No significant difference was observed between the performances of IOFs & cooperatives over the duration of the time series
No	Yes	No significant difference was observed initially between the performance of IOFs & cooperatives; however, the relative performance of cooperatives declined relative to IOFs over time
Yes	No	The performance of cooperatives was worse than that of IOFs by a constant amount over the duration of the time series
Yes	Yes	The performance of cooperatives was initially worse than that of IOFs, and it deteriorated further over time

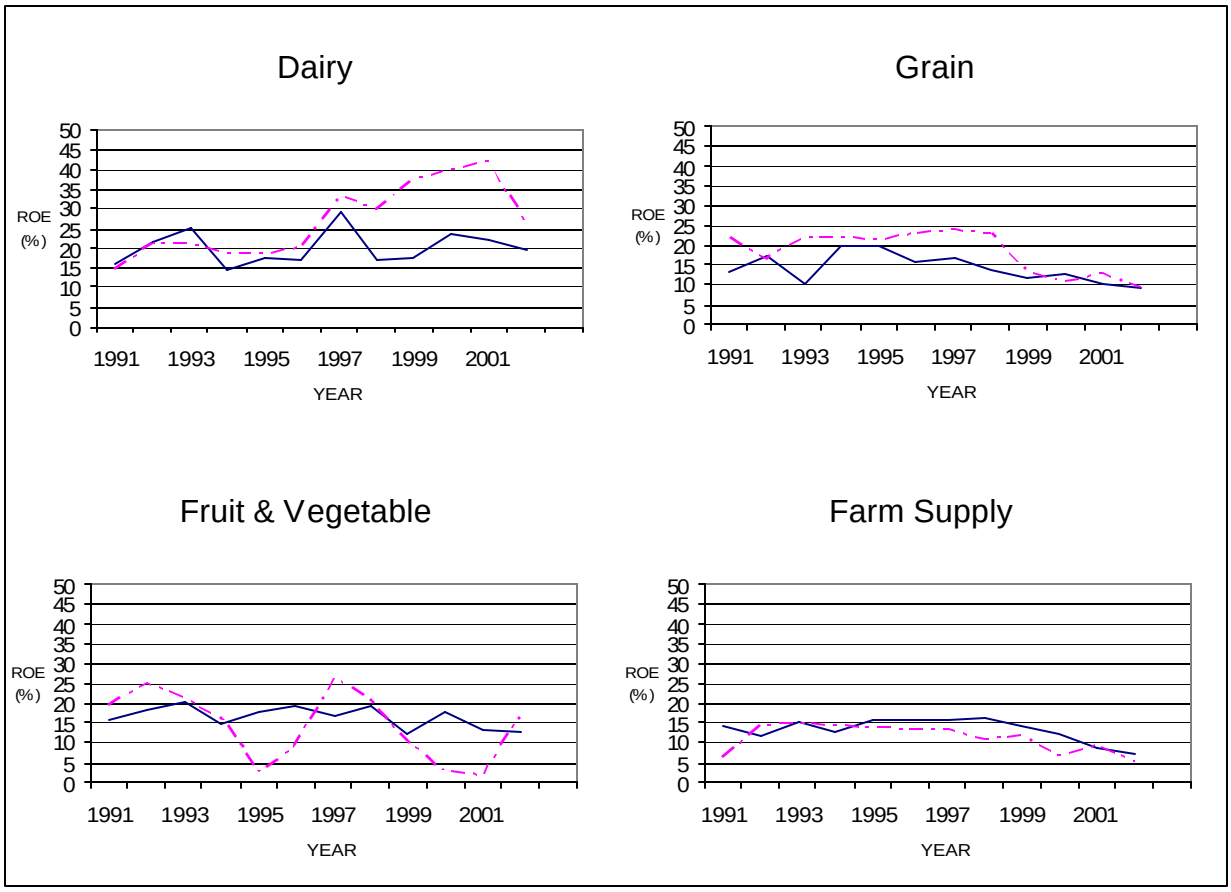
Note: The above interpretation is applicable for positive values of significant coefficients for Return on Equity, Return on Assets, Operating Margin, Current Ratio and Fixed Asset Turnover Ratio and negative values of significant coefficients for the Debt-Equity ratio. The interpretation would have to be reversed for negative values of significant coefficients for Return on Equity, Return on Assets, Operating Margin, Current Ratio and Fixed Asset Turnover Ratio and positive values of significant coefficients for the Debt-Equity ratio.

Table 4. Regression Results

Sector	Ratio	Constant		Time		R-square	Durbin Watson
		Coefficient	p-value	Coefficient	p-value		
Dairy	ROE	3.50	0.25	-1.84	0.00	0.64	1.54
	ROA	1.78	0.06	-0.28	0.06	0.32	1.77
	OM	0.81	0.01	0.06	0.18	0.17	1.58
	CR	0.05	0.48	0.02	0.08	0.28	2.08
	D/E[1]	0.20	0.05	-0.01	0.65	0.17	2.72
	FATR[1]	-4.94	0.01	0.53	0.05	0.55	1.59
F&V	ROE	-1.75	0.72	0.75	0.32	0.10	1.73
	ROA	-0.31	0.85	0.20	0.43	0.07	1.63
	OM	-5.48	0.02	0.49	0.15	0.19	1.62
	CR	0.21	0.02	-0.42	0.74	0.01	2.19
	D/E[1]	0.29	0.02	-0.01	0.41	0.56	1.31
	FATR[1]	6.28	0.00	0.02	0.83	0.16	1.93
Grain	ROE	-6.75	0.02	0.51	0.19	0.17	2.53
	ROA	-3.77	0.00	0.21	0.15	0.20	2.57
	OM	-1.83	0.00	0.15	0.05	0.34	2.43
	CR	0.30	0.00	-0.04	0.00	0.67	1.48
	D/E	0.16	0.00	0.01	0.26	0.12	2.02
	FATR	4.73	0.00	-0.40	0.00	0.66	1.43
Farm Supply	ROE	1.68	0.36	0.08	0.78	0.01	2.01
	ROA	-1.58	0.13	0.15	0.32	0.10	2.15
	OM	0.25	0.43	0.00	0.93	0.00	1.58
	CR	-0.22	0.00	0.02	0.04	0.35	1.53
	D/E	0.24	0.00	-0.01	0.09	0.26	1.60
	FATR[1]	3.03	0.01	-0.04	0.81	0.34	1.75

*Significance level = 5%
Durbin Watson Approximated to 15 observations
[1]Corrected for autocorrelation using Cochrane-Orcutt Iterative method, with Durbin-H statistic reported instead of Durbin-Watson statistic

Figure 1. Rate of return on equity



_____ IOFs

— . — . — . Cooperatives

Figure 2. Rate of return on assets

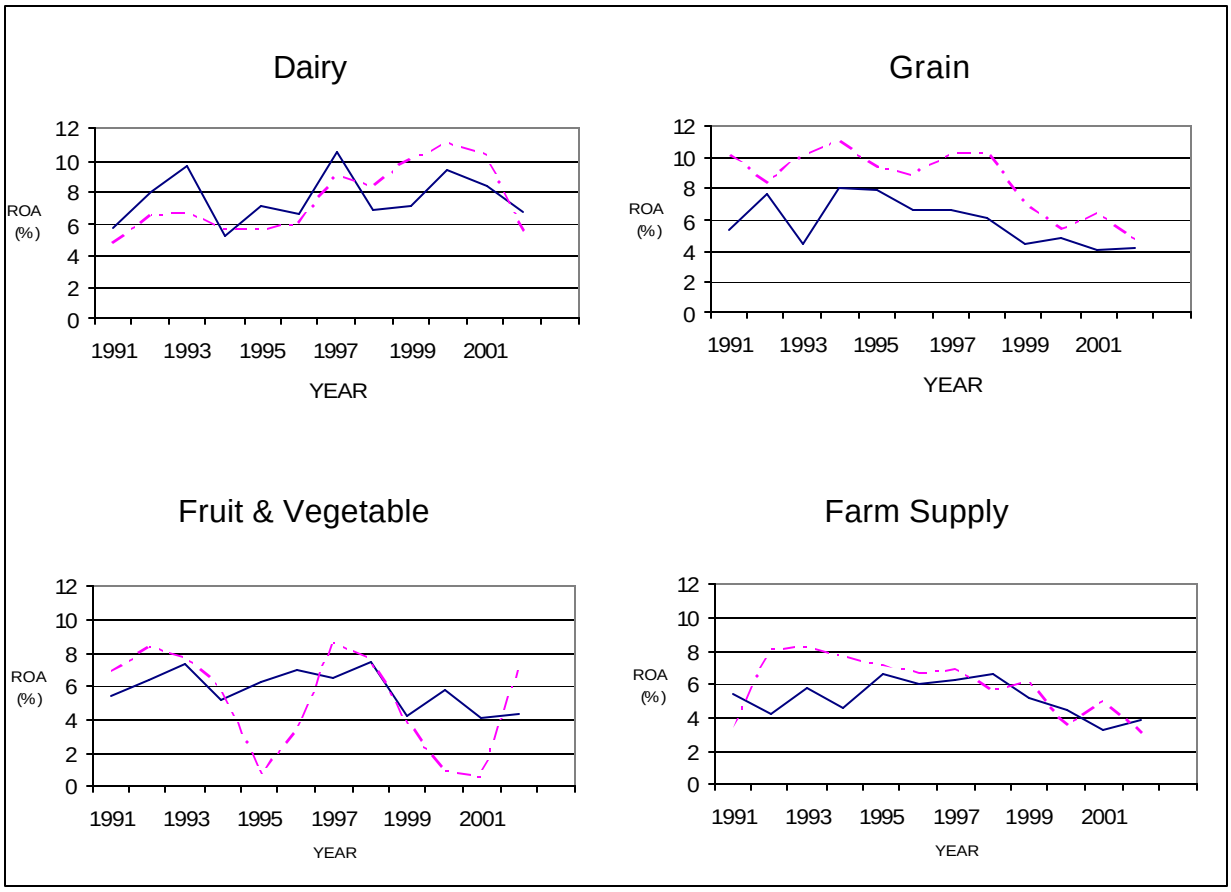


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Figure 3. Operating margin

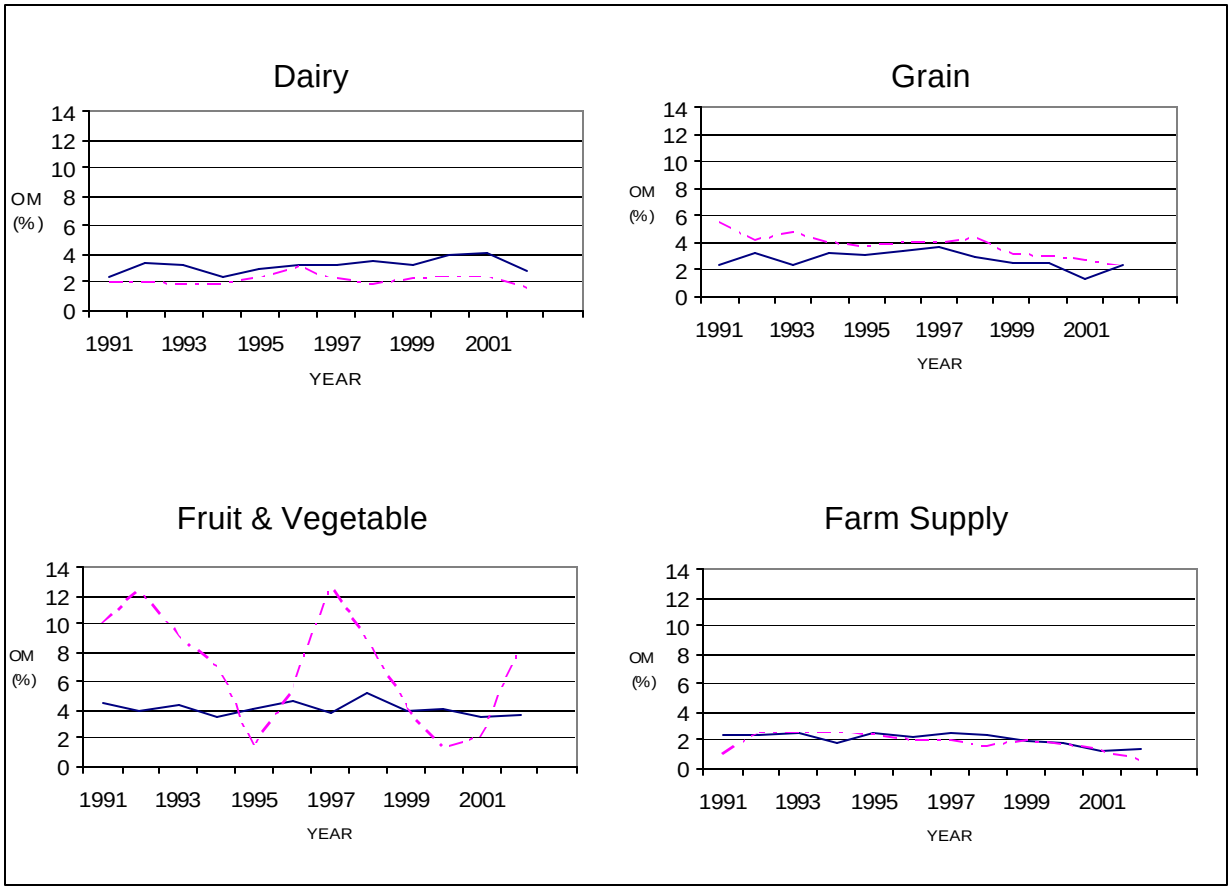

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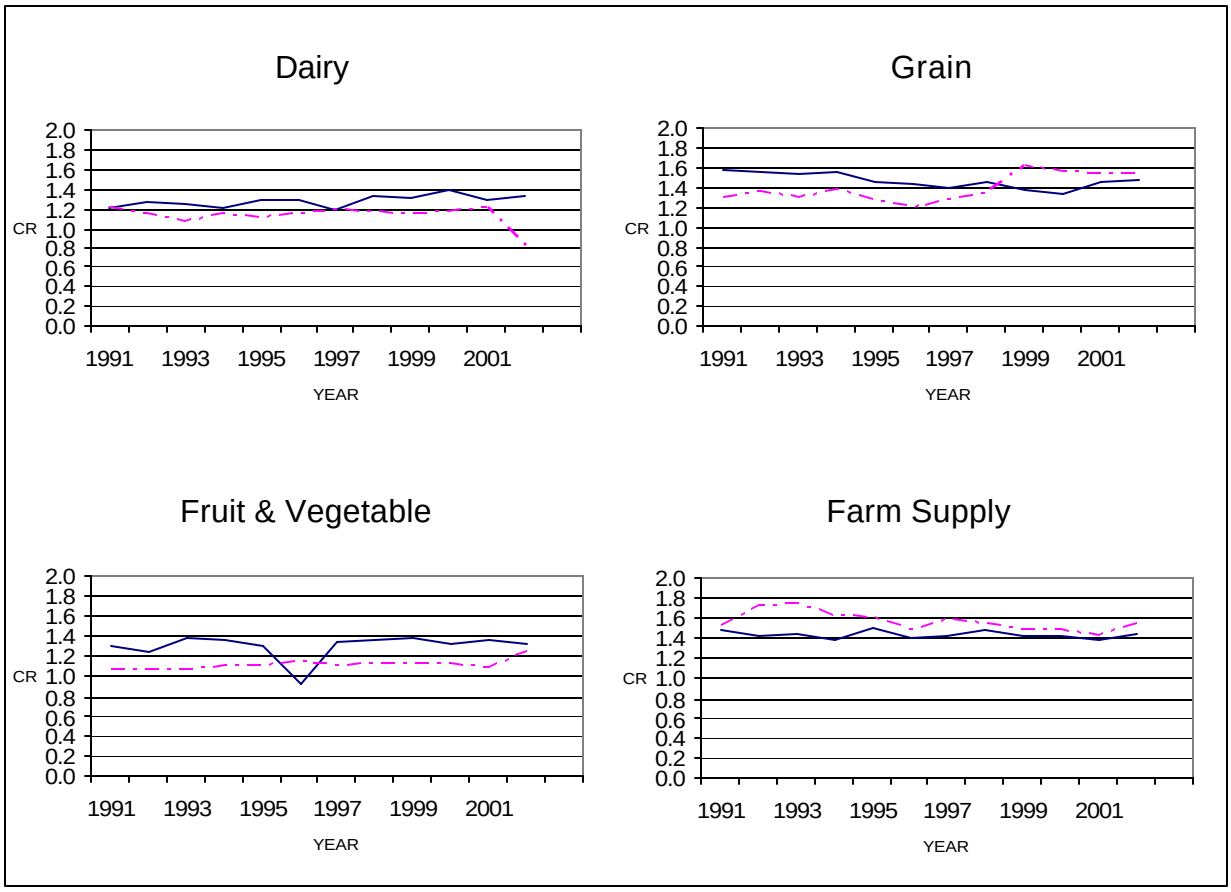
Figure 4. Current ratio



_____ IOFs

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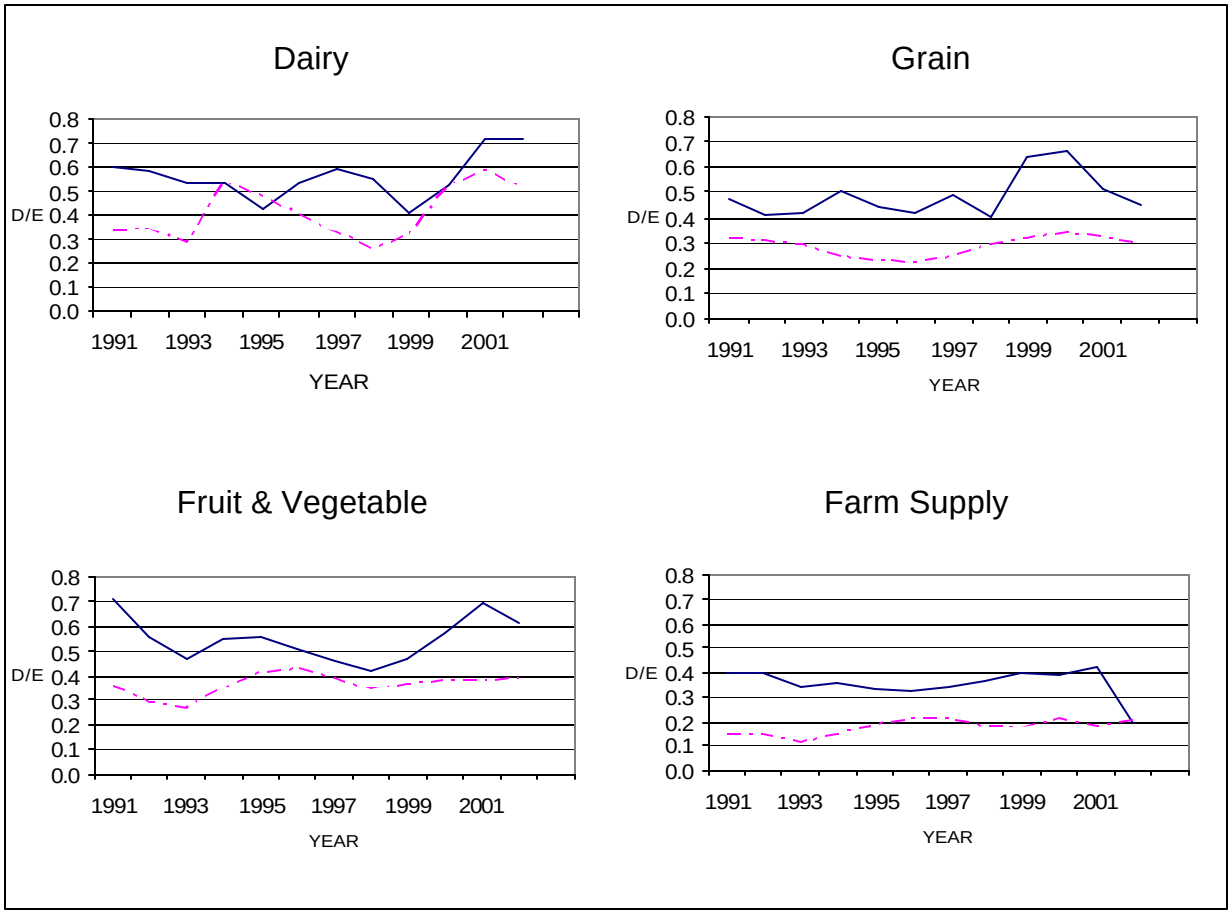
Figure 5. Debt-equity ratio



_____ IOFs

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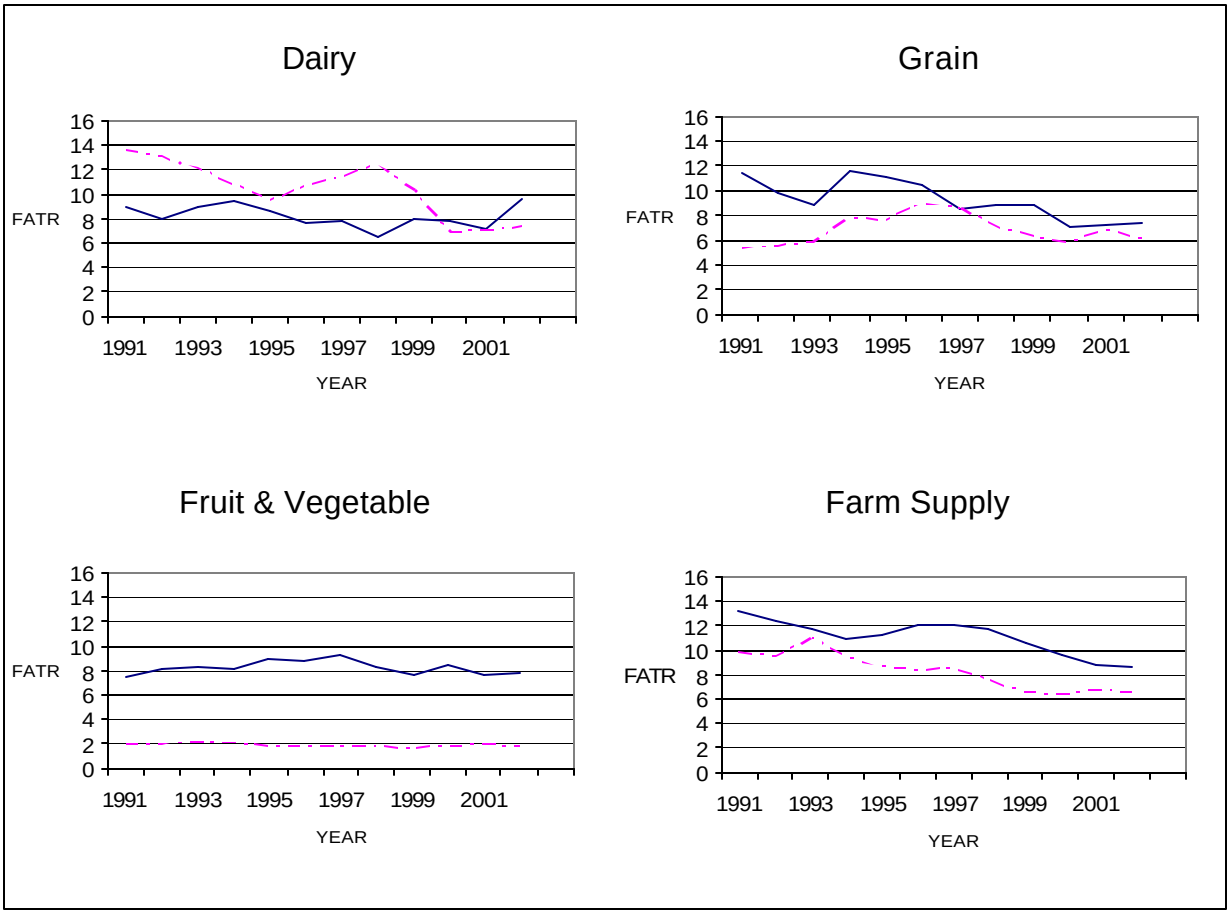
Figure 6. Fixed asset turnover ratio



_____ IOFs

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