Persistence in Financial Performance

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Abstract

The objective of this paper was to examine the persistence of financial performance measures for a sample of farms over a five-year period. The profit margin ratio and asset turnover ratio were computed for each farm and year, and for the 2004 to 2008 period. The number of years each farm was in the top and bottom performance quartiles was also computed and discussed.

Results indicated that it was relatively difficult for a farm to consistently be in the top quartile over time. However, using five-year average data, there was a substantial difference in financial performance between farms in the top and bottom quartiles. Results suggest that using one year of data to benchmark is problematic. Therefore, benchmarking using data for a longer time period is essential in determining whether a farm has a competitive advantage.

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Introduction

It is a widely established fact that profitability, efficiency, and per-unit costs vary significantly among farms and ranches (Fox, Bergen, and Dickson, 1993; Babcock, 1999; Nivens, Kastens, and Dhuyvetter, 2002; and Yeager and Langemeier, 2009). Are these differences in performance due to random events such as weather or to factors such as managerial ability?

The answer to the above question has a direct bearing on benchmarking and the search for competitive advantage. If performance differences are primarily due to weather, benchmarking is not nearly as relevant to farms as it would be if performance differences are due to managerial ability or some other resource advantage (see Barney and Clark, 2007, for further discussion of the importance of identifying unique resource advantages). An examination of the data from a group of farms to determine whether some farms consistently outperform other farms, would be useful to farm operators, farm advisors, and policy makers.

The objective of this paper was to examine persistence in financial performance for a sample of farms over a five-year period. Financial performance was measured using the operating profit margin ratio and the asset turnover ratio. These ratios and corresponding farm characteristics were compared across financial performance quartiles.

Methods

The operating profit margin ratio and the asset turnover ratio were used to measure financial performance for each farm and year using a sample of Kansas farms. The operating profit margin ratio is a commonly used profitability measure while the asset turnover ratio is a commonly used financial efficiency measure (Farm Financial Standards Council, 2008).

The operating profit margin ratio was calculated by adding interest expense and subtracting unpaid family and operator labor from net farm income and dividing the result by the value of farm production. Unpaid operator and family labor was computed using the number of operators on each farm and average family living expenditures. The asset turnover ratio was measured by dividing value of farm production by average total assets. Assets were valued at market values.

The number of years each farm was in the top or bottom quartile for each financial performance measure was computed. Financial performance was also compared across quartiles for each financial performance measure. Variables compared across quartiles included value of farm production, net farm income, interest, unpaid family and operator labor, total assets, total debt, total expense ratio, adjusted total expense ratio, economic total expense ratio, operating profit margin ratio, asset turnover ratio, debt to asset ratio, percent of farms with positive cash flow, percent of farms financially stressed, percent of farms with expense ratios below 1.00, and percent of farms in four value of farm production categories (i.e., less than $100,000; between $100,000 and $250,000; between $250,000 and $500,000; and greater than $500,000). The total expense ratio was computed by adding cash costs, accrual adjustments to costs, and depreciation, and dividing the result by value of farm production. The adjusted total expense ratio was found by adding unpaid family and operator labor to the expenses included in the total expense ratio and dividing by value of farm production. An adjusted total expense ratio below 1.00 indicates that a farm was able to cover accrual expenses, depreciation, and unpaid family and operator labor. The economic total expense ratio was calculated by adding the opportunity cost of owned assets to the expenses in the adjusted total expense ratio and dividing by value of farm production. An opportunity rate of eight percent was used in determining opportunity cost of

owned assets. If the economic total expense ratio is below 1.00, the farm is meeting all accrual and opportunity expenses, and is earning an economic profit. A farm was considered financially stressed if it had an adjusted total expense ratio above 1.00 and a debt to asset ratio greater than 0.70. To determine whether specific variables were significantly different between farms in the top and bottom quartiles, t-tests and a five percent significance level were used.

Data

Data for 1,062 farms in the Kansas Farm Management Association (KFMA) with continuous data from 2004 to 2008 were used in this study. These 1,062 farms represent approximately 73 percent of the farms with whole-farm analysis data in 2008. The data were obtained from the Kansas Farm Management Association databank. Information pertaining to the variables available in the KFMA databank, as well as additional summary information, can be found in Langemeier (2003) and on the KFMA web site (KFMA, 2010). To be included in this study, a farm had to have usable income, expense, and balance sheet data. Income and expense were expressed on an accrual basis. Value of farm production included crop income, livestock income, income from government payments and crop insurance proceeds, and miscellaneous income sources such as patronage dividends and custom work income. Livestock income was expressed on a value-added basis. Specifically, accrual livestock purchases were subtracted from accrual livestock sales to arrive at accrual livestock income.

Table I presents summary statistics for the 1,062 farms. Value of farm production averaged $355,001. The average profit margin was 0.1604 or 16.04 percent while the average asset turnover ratio was 0.3305. The average total expense ratio, adjusted total expense ratio, and economic total expense ratio were 0.760, 0.893, and 1.065, respectively. As indicated by the percent of farms with an adjusted total expense ratio below 1.00, approximately 65 percent of the

farms covered accrual expenses, depreciation, and unpaid family and operator labor. Approximately 28 percent of the farms met all accrual and opportunity costs and thus were earning an economic profit. Approximately 5.6 percent of the farms were financially stressed.

Table I. Summary Statistics for 1,062 KFMA Farms with Continuous Data from 2004-2008.

Item	Average
Value of Farm Production (VFP)	$355,001
Net Farm Income	$85,239
Interest	$19,074
Unpaid Family and Operator Labor	$47,370
Total Assets	$1,074,187
Total Debt	$312,954
Total Expense Ratio (TER)	0.760
Adjusted Total Expense Ratio (ATER)	0.893
Economic Total Expense Ratio (ETER)	1.065
Operating Profit Margin Ratio	0.1604
Asset Turnover Ratio	0.3305
Debt to Asset Ratio	0.2913
Percent of Farms with Positive Net Cash Flow	93.79%
Percent of Farms Financially Stressed	5.56%
Percent of Farms with TER less than 1.000	92.28%
Percent of Farms with ATER less than 1.000	65.07%
Percent of Farms with ETER less than 1.000	28.34%
Percent of Farms with VFP less than $100,000	13.47%
Percent of Farms with VFP between $100,000 and $250,000	34.18%
Percent of Farms with VFP between $250,000 and $500,000	32.11%
Percent of Farms with VFP greater than $500,000	20.24%

Source: Kansas Farm Mangement Association 2008 Databank.

Results

Table II shows the number of farms and percent of farms by profit margin category. Farms in the first category were in the top or bottom quartile for all five years. Only 26 farms, or 2.45 percent of farms, were in the top profit margin quartile for all five years. Approximately 18 percent were in the top profit margin category for three, four, or five years (i.e., in the first, second, or third profit margin categories). Conversely, approximately 20 percent of farms were in the bottom profit margin category for three or more years. It is important to note that approximately 46 percent of farms were never in the bottom profit margin category. This result can be found by examining the percentage of farms in the sixth bottom profit margin category.

Table II. Number of Farms and Percent of Farms by Profit Margin Categories.[a]

Item	Number of Farms	Percent of Farms
Top Profit Margin Category		
First Category	26	2.45%
Second Category	57	5.37%
Third Category	111	10.45%
Fourth Category	187	17.61%
Fifth Category	260	24.48%
Sixth Category	421	39.64%
Bottom Profit Margin Category		
First Category	63	5.93%
Second Category	61	5.74%
Third Category	85	8.00%
Fourth Category	142	13.37%
Fifth Category	227	21.37%
Sixth Category	484	45.57%

[a] Farms in the first category were in the top or bottom quartile for all five years. Farms in the second category were in the top or bottom quartile for four of the five years. Farms in the third category were in the top or bottom quartile for three of the five years. Farms in the fourth category were in the top or bottom quartile for two of the five years. Farms in the fifth category were in the top or bottom quartile for one of the five years. Farms in the sixth category were not in the top or bottom quartile during the five year period.

Variable comparisons among the profit margin quartiles can be found below. Before discussing this information, some of the characteristics of the 26 farms consistently in the top profit margin quartile will be discussed. These farms had five-year average profit margins ranging from 0.2839 to 0.4586, and an average asset turnover ratio of 0.3991. The average value of farm production for this group was $656,860 or approximately $302,000 higher than that for the entire sample of farms. All these farms were covering accrual expenses, depreciation, and unpaid family and operator labor. Moreover, approximately 81 percent of the farms in this group were earning an economic profit.

The number of farms and percent of farms in each asset turnover category is presented in Table III. Farms in the first category were in the top or bottom asset turnover ratio quartile for all five years. Approximately 13 percent of farms, or 140 farms, were in the top asset turnover quartile for all five years. The fact that it was relatively easier to consistently be in the top asset turnover ratio quartile than in the top profit margin ratio quartile is intuitively plausible. The components of the profit margin ratio, particularly net farm income, tend to be more variable than those making up the asset turnover ratio. It was also relatively easier for farms to stay out of the bottom asset turnover ratio quartile. Approximately 61 percent of farms were never in the bottom asset turnover ratio quartile during the five-year period.

Table III. Number of Farms and Percent of Farms by Asset Turnover Categories.[a]

Item	Number of Farms	Percent of Farms
Top Asset Turnover Category		
First Category	140	13.18%
Second Category	62	5.84%
Third Category	55	5.18%
Fourth Category	65	6.12%
Fifth Category	82	7.72%
Sixth Category	658	61.96%
Bottom Asset Turnover Category		
First Category	139	13.09%
Second Category	64	6.03%
Third Category	52	4.90%
Fourth Category	62	5.84%
Fifth Category	94	8.85%
Sixth Category	651	61.30%

[a] Farms in the first category were in the top or bottom quartile for all five years. Farms in the second category were in the top or bottom quartile for four of the five years. Farms in the third category were in the top or bottom quartile for three of the five years. Farms in the fourth category were in the top or bottom quartile for two of the five years. Farms in the fifth category were in the top or bottom quartile for one of the five years. Farms in the sixth category were not in the top or bottom quartile during the five year period.

Tables IV and V show summary statistics for both the profit margin ratio and asset turnover ratio quartiles. These tables were created using five-year average data for each farm. Statistical differences for all variables except the percentage variables were computed using information from the top and bottom profit margin ratio and asset turnover ratio quartiles. Though not denoted in the tables, all variables were significantly different when comparing the top and bottom quartiles for each financial performance measure. The farms in the top profit margin quartile had an average operating profit margin ratio of 0.2804 or 28.04 percent (Table IV). In

contrast, the farms in the bottom profit margin quartile had an average operating profit margin ratio of -0.1419. The farms in the bottom profit margin quartile also had a relatively low asset turnover ratio and relatively high expense ratios. In fact, none of farms in the bottom profit margin quartile earned an economic profit and only 70 percent of the farms covered accrual expenses and depreciation (i.e., had a total expense ratio below 1.00). Over two-thirds of the farms in the top profit quartile earned an economic profit. It is important to note that the asset turnover ratio for the second, third, and fourth quartiles was not significantly different. Thus, having an average asset turnover ratio did not preclude a farm from being in the top profit margin quartile.

Table IV. Summary Statistics for Operating Profit Margin Ratio Quartiles.[a]

Item	Profit Margin Quartile			
	First	Second	Third	Fourth
Value of Farm Production (VFP)	$128,531	$310,053	$452,291	$528,932
Net Farm Income	$8,371	$49,930	$102,486	$180,237
Interest	$8,664	$19,502	$24,049	$24,058
Unpaid Family and Operator Labor	$35,270	$45,559	$52,645	$55,993
Total Assets	$625,226	$906,357	$1,213,741	$1,551,531
Total Debt	$144,629	$301,857	$391,714	$413,362
Total Expense Ratio (TER)	0.935	0.839	0.773	0.659
Adjusted Total Expense Ratio (ATER)	1.209	0.986	0.890	0.765
Economic Total Expense Ratio (ETER)	1.508	1.142	1.035	0.937
Operating Profit Margin Ratio	-0.1419	0.0770	0.1634	0.2804
Asset Turnover Ratio	0.2056	0.3421	0.3726	0.3409
Debt to Asset Ratio	0.2313	0.3330	0.3227	0.2664
Percent of Farms with Positive Net Cash Flow	80.75%	96.24%	98.87%	99.25%
Percent of Farms Financially Stressed	11.70%	9.40%	0.75%	0.38%
Percent of Farms with TER less than 1.000	70.94%	98.12%	100.00%	100.00%
Percent of Farms with ATER less than 1.000	0.38%	61.65%	98.50%	99.62%
Percent of Farms with ETER less than 1.000	0.00%	5.26%	39.47%	68.68%
Percent of Farms with VFP less than $100,000	44.53%	6.02%	1.50%	1.89%
Percent of Farms with VFP between $100,000 and $250,000	44.53%	48.50%	26.69%	16.98%
Percent of Farms with VFP between $250,000 and $500,000	10.94%	33.08%	46.24%	38.11%
Percent of Farms with VFP greater than $500,000	0.00%	12.41%	25.57%	43.02%

[a] The first quartile is represented by farms with the lowest operating profit margin ratio. The fourth quartile is represented by farms with the highest operating profit margin ratio.

The farms in the top asset turnover ratio quartile had an average asset turnover ratio of 0.6653 while those in the bottom asset turnover ratio quartile a ratio of only 0.1424 (Table V). It is important to note that the asset turnover ratio is dependent on farm type and percent of acres

owned. It is particularly important to note that farms that own a relatively high percentage of their acreage tend to have relatively lower asset turnover ratios. Farms in the bottom asset turnover quartile owned approximately 62 percent of their acreage. In contrast, the farms in the top asset turnover quartile owned approximately 11 percent of their acreage. The average profit margin for the farms in the bottom asset turnover ratio quartile was 0.0565. In contrast, the average profit margin for the farms in the top asset turnover ratio quartile was 0.1619. However, the operating profit margins for the second, third, and fourth quartiles were not significantly different. Thus, consistent with the results with respect to the operating profit margin, having a high asset turnover ratio is not essential to obtaining a high operating profit margin.

Table V. Summary Statistics for Asset Turnover Ratio Quartiles.[a]

Item	Asset Turnover Quartile			
	First	Second	Third	Fourth
Value of Farm Production (VFP)	$164,461	$349,693	$438,688	$466,866
Net Farm Income	$34,771	$91,856	$107,355	$106,866
Interest	$10,765	$20,358	$23,880	$21,268
Unpaid Family and Operator Labor	$36,236	$49,491	$51,197	$52,534
Total Assets	$1,154,755	$1,319,425	$1,119,760	$701,710
Total Debt	$178,865	$344,449	$396,410	$331,661
Total Expense Ratio (TER)	0.789	0.737	0.755	0.771
Adjusted Total Expense Ratio (ATER)	1.009	0.879	0.872	0.884
Economic Total Expense Ratio (ETER)	1.484	1.102	1.004	0.947
Operating Profit Margin Ratio	0.0565	0.1794	0.1824	0.1619
Asset Turnover Ratio	0.1424	0.2650	0.3918	0.6653
Debt to Asset Ratio	0.1549	0.2611	0.3540	0.4726
Percent of Farms with Positive Net Cash Flow	87.92%	93.61%	96.61%	96.98%
Percent of Farms Financially Stressed	1.13%	3.38%	6.77%	10.94%
Percent of Farms with TER less than 1.000	81.89%	94.74%	96.24%	96.23%
Percent of Farms with ATER less than 1.000	41.51%	66.54%	77.44%	74.72%
Percent of Farms with ETER less than 1.000	0.38%	13.16%	39.85%	60.00%
Percent of Farms with VFP less than $100,000	39.62%	5.26%	3.76%	5.28%
Percent of Farms with VFP between $100,000 and $250,000	42.64%	43.61%	27.07%	23.40%
Percent of Farms with VFP between $250,000 and $500,000	15.85%	30.83%	40.60%	41.13%
Percent of Farms with VFP greater than $500,000	1.89%	20.30%	28.57%	30.18%

[a] The first quartile is represented by farms with the lowest asset turnover ratio. The fourth quartile is represented by farms with the highest asset turnover ratio.

The farms in the top profit margin ratio and top asset turnover ratio quartiles tended to be larger than those in the bottom quartiles. None of the farms with a value of farm production above $500,000 were in the bottom profit margin ratio quartile. Approximately 2 percent of the farms in the bottom asset turnover ratio quartile had a value of farm production above $500,000.

Summary and Implications

This paper examined the persistence of financial performance for a sample of farms over a five-year period. Financial measures examined included the operating profit margin ratio and the asset turnover ratio.

Results suggest that weather and other external factors made it difficult for a farm to consistently be in the top profit margin ratio or top asset turnover ratio quartiles over time. However, using five-year average data there was a substantial difference in financial performance between farms in the top and bottom quartiles. For example, farms in the top profit margin ratio quartile had an average operating profit margin ratio of 0.2804 and an average asset turnover ratio of 0.3409. In contrast, farms in the bottom profit margin ratio quartile had an average operating profit margin ratio of -0.1419 and an average asset turnover ratio of 0.2313. Farms did not necessarily need to have an above average asset turnover ratio to be in the top operating profit margin quartile. However, farms in the bottom operating profit margin ratio had below average asset turnover ratios.

Results also stress the importance of using several years of data to benchmark financial performance and suggest that it is possible for farms to have a sustained competitive advantage. Given the wide variability of financial performance documented in this study, further examination of the characteristics of the farms in the top quartiles, including obtaining information pertaining to management styles, experience, and decision making abilities, would be a fruitful area for further research.

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