



## COMPARATIVE ADVANTAGE

Understanding a farm's strategic position is increasingly important in today's competitive environment. For a farm to be successful over a long period of time it must respond rapidly to competitive and market changes, benchmark to achieve best practices, and establish a few core areas of strength. A farm can outperform other operations only if it can establish a difference that can be preserved. To do this, a farm must either deliver greater value to customers, create comparable value at lower cost (i.e., improve efficiency), or do both. Delivering greater value allows a farm to charge relatively higher prices for its products while improving efficiency results in lower per unit costs.

Table 1 presents the relationship between comparative advantage (sometimes referred to as competitive advantage), relative price per unit, and relative cost per unit. The combinations of price and cost that lead to a comparative advantage are indicated in purple while the combinations that lead to a comparative disadvantage are indicated in red. To obtain a comparative advantage, a farm must receive relative higher per unit prices and have average to below average per unit costs; or receive average per unit prices and have below average per unit costs. Most farms try to achieve the later and thus attempt to be in box "2" in table 1.

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Two examples of identifying a comparative advantage are highlighted in this article. The first example is illustrated in figure 1. This figure presents the economic total expense ratio for KFMA farms with five years of continuous data from 2006 to 2010. Farms with an economic total expense ratio below one are earning an economic profit. Approximately 33 percent of the farms earned an economic profit over the five-year period. For a comparison of expense ratios and financial performance among profit margin quartiles, see the second article in this newsletter.

The second example is illustrated in table 2. The data in table 2 was generated using data from KFMA farms with continuous data from 1988 to 2007. The cost shares were computed by dividing the cost items by value of farm production. Return on assets does not include capital gains on land. The farms in the first column had above average levels of cost efficiency over the 20-year period. In contrast, the farms in the third column had below average levels of cost efficiency over the 20-year period. The percent of farms represented in the first, second, and third column of table 1 was 30, 42, and 28 percent, respectively. It is important to note that there was a significant difference between all of the variables for the farms with above average and below average cost efficiency levels. The farms with above average cost efficiency levels, on average, were larger, were more cost efficient, and had higher profit margin, asset turnover, and return on asset

ratios. These results illustrate that it is possible for a farm to have a sustained comparative advantage which allows the farm to grow at a faster rate or make relatively larger off-farm investments.

I encourage you to use the framework outlined in this article to identify your comparative

advantage. Benchmarking technical and economic performance can be used to ascertain whether a farm has a comparative advantage.

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**Table 1. Identifying a Farm's Comparative Advantage.**

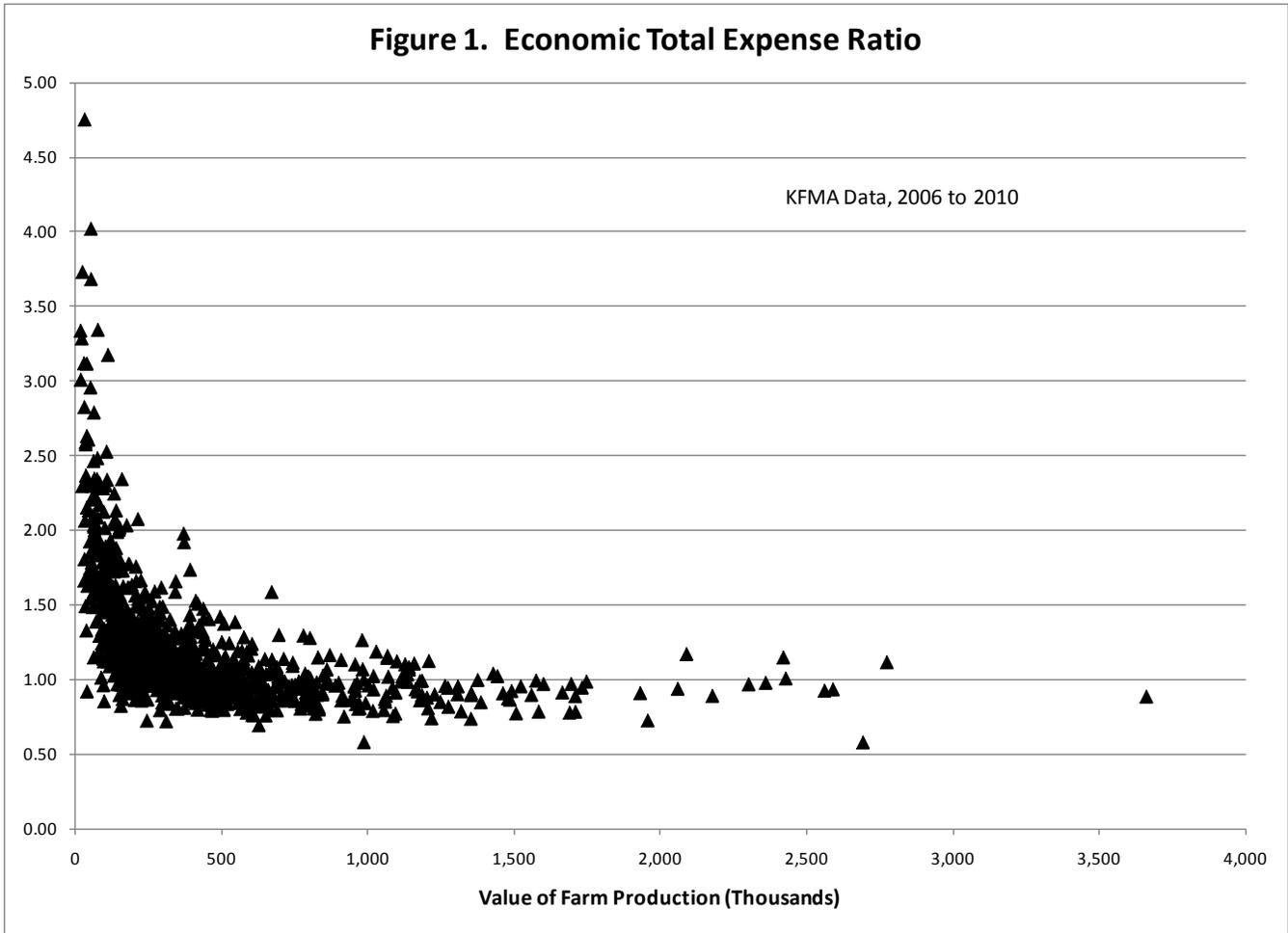
		Relative Price per Unit		
		Lower	Average	Higher
Relative Cost Per Unit	Lower	1 - Indeterminate Position	2 - Comparative Advantage	3 - Comparative Advantage
	Average	4 - Comparative Disadvantage	5 - Parity Position	6 - Comparative Advantage
	Higher	7 - Comparative Disadvantage	8 - Comparative Disadvantage	9 - Indeterminate Position

Adapted using information from *A General Theory of Competition* written by Shelby Hunt.

**Table 2. Characteristics of Farms with Above Average, Average, and Below Average Cost Efficiency, 1988-2007.**

Variable	Above Average	Average	Below Average
Value of Farm Production	332,709	211,173	109,601
Net Farm Income	93,815	46,858	21,734
Total Acres	2,127	1,856	1,216
Crop Labor Percentage	68.91%	74.89%	75.03%
Labor Cost Share	14.30%	14.66%	19.21%
Purchased Input Cost Share	39.93%	33.77%	24.74%
Capital Input Cost Share	45.77%	51.57%	56.05%
Cost Efficiency	0.696	0.589	0.453
Economic Total Expense Ratio	1.039	1.191	1.542
Operating Profit Margin Ratio	0.212	0.136	-0.024
Asset Turnover Ratio	0.338	0.263	0.169
Return on Assets	0.072	0.036	-0.004

Source: Yeager and Langemeier (2009)



## PERSISTENCE IN FINANCIAL PERFORMANCE

This article examines the persistence of financial performance measures for a sample of farms over a five-year period. Specifically, using KFMA whole-farm data, the profit margin ratio is computed for each farm and year, and for the 2006 to 2010 period. The number of years each farm was in the top and bottom performance quartiles is computed and discussed. Also, the operating profit margin ratio and corresponding farm characteristics are compared across financial performance quartiles.

The operating profit margin ratio was computed 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.

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 in value of farm production; value of farm production between \$100,000 and \$250,000; value of farm production between \$250,000 and \$500,000; and value of farm production 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 computed 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 computed by adding the opportunity cost of owned assets to the expenses included in the adjusted total expense ratio and dividing by value of farm production. If the economic total expense ratio is below 1.00, the farm is covering 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 had a debt to asset ratio above 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.

Table 1 presents the summary statistics for the 1,016 farms with continuous data from 2006 to 2010. Value of farm production averaged \$430,427. The average profit margin was 0.1834 or 18.34 percent while the average asset turnover ratio was 0.3259. The average total expense ratio, adjusted total expense ratio, and economic total expense ratio were 0.747, 0.865, and 1.045, 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 33 percent of the farms covered all accrual and opportunity costs and thus were earning an economic profit.

Approximately 4.4 percent of the farms were financially stressed.

Table 2 presents 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 28 farms, or 2.8 percent of the farms, were in the top profit margin quartile for all five years. Approximately 19 percent of the farms 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 21 percent of the farms were in the bottom profit margin category for three or more years. It is important to note that approximately 46 percent of the farms were never in the bottom profit margin category.

Variable comparisons among the profit margin quartiles can be found below. Before discussing this information, some of the characteristics of the 28 farms that were consistently in the top profit margin quartile will be discussed. These farms had five-year average profit margins ranging from 0.2902 to 0.4737, and an average profit margin of 0.3843. The average value of farm production for this group of farms was \$705,383 or approximately \$275,000 higher than the average value of farm production for the entire sample of farms. All of these farms were covering accrual expenses, depreciation, and unpaid family and operator labor. Moreover, approximately 82 percent of the farms in this group were earning an economic profit.

Table 3 presents the summary statistics for the profit margin ratio quartiles. This table was created using five-year average data for each farm. Statistical differences for all of the variables except the percentage variables were computed using information from the top and bottom profit margin ratio quartiles. Though not denoted in the table, all of the 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 0.3127 or 31.27 percent (Table 3). In contrast, the farms in the bottom profit margin quartile had an average operating profit margin ratio of -0.1541. 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). In contrast, almost three-fourths of the farms in the top profit quartile earned an economic profit. The farms in the top profit margin ratio tended to be larger in terms of value of farm production and total assets than the farms in the bottom quartile.

In summary, this paper examined the persistence of financial performance for a sample of farms over a five-year period. Results suggest that weather and other external factors made it difficult for a farm to consistently be in the top profit margin ratio 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. For example, farms in the top profit margin ratio quartile had an average operating profit margin ratio of 0.3127 and an average asset turnover ratio of 0.3466. In contrast, farms in the bottom profit margin ratio quartile had an average operating profit margin ratio of -0.1541 and an average asset turnover ratio of 0.2061.

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 comparative advantage. Given the wide variability of financial performance documented in this study, a 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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**Table 1. Summary Statistics for 1,016 KFMA Farms with Continuous Data from 2006-2010.**

Item	Average
Value of Farm Production (VFP)	\$430,427
Net Farm Income	\$108,994
Interest	\$20,908
Unpaid Family and Operator Labor	\$50,945
Total Assets	\$1,320,806
Total Debt	\$352,880
Total Expense Ratio (TER)	0.747
Adjusted Total Expense Ratio (ATER)	0.865
Economic Total Expense Ratio (ETER)	1.045
Operating Profit Margin Ratio	0.1834
Asset Turnover Ratio	0.3259
Debt to Asset Ratio	0.2672
Percent of Farms with Positive Net Cash Flow	94.59%
Percent of Farms Financially Stressed	4.43%
Percent of Farms with TER less than 1.000	92.13%
Percent of Farms with ATER less than 1.000	65.06%
Percent of Farms with ETER less than 1.000	32.78%
Percent of Farms with VFP less than \$100,000	10.33%
Percent of Farms with VFP between \$100,000 and \$250,000	27.76%
Percent of Farms with VFP between \$250,000 and \$500,000	33.76%
Percent of Farms with VFP between \$500,000 and \$1,000,000	20.18%
Percent of Farms with VFP greater than \$1,000,000	7.97%

Source: Kansas Farm Management Association 2010 Databank.

**Table 2. Number of Farms and Percent of Farms by Profit Margin Categories.<sup>a</sup>**

Item	Number of Farms	Percent of Farms
<u>Top Profit Margin Category</u>		
First Category	28	2.76%
Second Category	61	6.00%
Third Category	105	10.33%
Fourth Category	163	16.04%
Fifth Category	245	24.11%
Sixth Category	414	40.75%
<u>Bottom Profit Margin Category</u>		
First Category	48	4.72%
Second Category	76	7.48%
Third Category	87	8.56%
Fourth Category	126	12.40%
Fifth Category	213	20.96%
Sixth Category	466	45.87%

<sup>a</sup> 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 category for two of the five years. Farms in the fifth category were in the top or bottom category for one of the five years. Farms in the sixth category were not in the top or bottom category during the five year period.

**Table 3. Summary Statistics for Operating Profit Margin Quartiles.<sup>a</sup>**

Item	Profit Margin Quartile			
	First	Second	Third	Fourth
Value of Farm Production (VFP)	\$156,564	\$377,366	\$535,076	\$652,701
Net Farm Income	\$9,769	\$61,734	\$130,860	\$233,611
Interest	\$10,804	\$22,516	\$25,857	\$24,453
Unpaid Family and Operator Labor	\$44,701	\$51,106	\$54,038	\$53,936
Total Assets	\$759,758	\$1,121,232	\$1,519,019	\$1,883,214
Total Debt	\$173,444	\$357,030	\$441,737	\$439,308
Total Expense Ratio (TER)	0.938	0.836	0.755	0.642
Adjusted Total Expense Ratio (ATER)	1.223	0.972	0.856	0.725
Economic Total Expense Ratio (ETER)	1.523	1.134	1.017	0.902
Operating Profit Margin Ratio	-0.1541	0.0878	0.1919	0.3127
Asset Turnover Ratio	0.2061	0.3366	0.3523	0.3466
Debt to Asset Ratio	0.2283	0.3184	0.2908	0.2333
Percent of Farms with Positive Net Cash Flow	80.31%	98.82%	100.00%	99.21%
Percent of Farms Financially Stressed	7.87%	9.45%	0.39%	0.00%
Percent of Farms with TER less than 1.000	70.08%	98.43%	100.00%	100.00%
Percent of Farms with ATER less than 1.000	0.00%	61.42%	99.21%	99.61%
Percent of Farms with ETER less than 1.000	0.00%	12.99%	44.88%	73.23%
Percent of Farms with VFP less than \$100,000	35.04%	4.33%	0.39%	1.57%
Percent of Farms with VFP between \$100,000 and \$250,000	48.82%	33.07%	16.14%	12.99%
Percent of Farms with VFP between \$250,000 and \$500,000	14.17%	44.09%	44.88%	31.89%
Percent of Farms with VFP between \$500,000 and \$1,000,000	1.97%	12.60%	29.13%	37.01%
Percent of Farms with VFP greater than \$1,000,000	0.00%	5.91%	9.45%	16.54%

<sup>a</sup> 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.

## RECOMMENDATIONS FOR FURTHER READING

The purpose of this section of the newsletter is to briefly discuss articles and web sites that may be of interest to readers. In general, the articles discussed will not report on original research. Rather, the articles will contain citations to web sites and articles that discuss topics of general interest.

This month's recommended readings will focus on federal budget issues. Given the recent discussion and disagreement on how to structure current and future government programs, this focus seems fitting. The first article briefly discusses the unsustainability of Medicare. The second article discusses social security and the third article discusses taxes and revenue generation.

William Galston in an article entitled "Both Democrats and Republicans Must Convince Americans that Medicare is Unsustainable" indicates that the status quo is unsustainable. Thus, it is important to persuade voters of this basic fact. The author notes that the Medicare trustees estimate that revenues would have to increase by 24 to 74 percent, or benefits reduced 17 to 36 percent, to close the gap between expected future revenue and expenses. The large differences in these ranges of percentages are due to differences in key assumptions regarding current and future legislation. The higher percentages are deemed more "realistic". More information can be found in the article which is posted on my contributor site on the Ag Manager web site under "Recommendations for Further Reading".

Henry Aaron of the Brookings Institution has been investigating changes to social security policies for decades. In a recent article in the *National Tax Journal* entitled "Social Security Reconsidered", he discusses the gap between program revenue and costs, and the impact of possible changes to social security suggested to close the gap. The author notes that social

security combines three major functions: old age pensions, life insurance through survivor benefits, and disability insurance. It is important to note that social security is the largest domestic program of the federal government with fiscal year outlays of approximately \$750 billion. The author contends that due to asset volatility, changes in pension plans from defined benefit to defined contribution plans, shorter job tenure, and many other reasons, the need for a social insurance program is as great as ever. The author indicates that the gap between program revenue and costs can be closed with modest changes in tax increases or benefit reductions. More information related to specific possible changes in the social security program can be found in the article which is posted to my contributor site on the Ag Manager web site under "Recommendations for Further Reading".

In a recent article entitled "Reforming Taxes and Raising Revenue", William Gale and Benjamin Harris discuss fiscal deficits and possible revenue sources. The authors start out by noting that the current and projected fiscal shortfalls are unprecedented and that restoring balance will likely require both spending reductions and revenue increases. If changes are not made to federal budgets, the debt-to-GDP ratio will pass the 1946 high of approximately 109 percent in the early 2020s. However, unlike the post-war period, unless large changes to the federal budget are made, the federal debt in relationship to GDP is not expected to decline after it hits the 1946 level. The authors focus on the revenue side of the ledger. The main sources of federal revenue in 2009 were as follows: individual income tax (43.5 percent), payroll tax (42.3 percent), corporate tax (6.6 percent), and excise taxes (3.0 percent). The authors go on to provide an excellent discussion of tax expenditure reform, consumption taxes (e.g., value added tax), and carbon emission taxes. More information can

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be found in the article which is posted to my contributor site on the Ag Manager web site under “Recommendations for Further Reading”.

The three articles above feature writers associated with the Brookings Institution which is a nonprofit policy organization base in Washington, D.C. For those interested in more

information pertaining to macroeconomics and economic policy, I encourage you to check out the web site for the Brookings Institution ([www.brookings.edu](http://www.brookings.edu)).

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The Kansas Farm Management Association (KFMA) Newsletter is distributed monthly to provide farm management information to farm decision makers. Further farm management information can be found on the KFMA program website: [www.agmanager.info/kfma](http://www.agmanager.info/kfma); and, on the Extension Agricultural Economics website: [www.agmanager.info](http://www.agmanager.info). The Newsletter is edited by Michael Langemeier, Professor, Department of Agricultural Economics, Kansas State University.



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