An Examination of Financial Performance among Age Cohorts

Department of Agricultural Economics

Kansas State University

Gabriel Weeden and Michael Langemeier

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Financial performance and productivity often varies by age of operator. This paper documents differences in financial performance among sole proprietors in the Kansas Farm Management Association (KFMA) based upon the age of the operator. Farmers are split into four age groups; under or equal to 45 years, 46 to 55 years, 56 to 65 years, and greater than 65 years old. Age groups are compared to one another using variables pertaining to farm size and tenure, specialization, efficiency, liquidity, and solvency ratios. Farm size and tenure variables examined include value of farm production, net farm income, total assets, total acres, and percent acres owned. Efficiency ratios examined include the profit margin, asset turnover ratio, return on assets, return on assets with capital gains, total expense ratio, adjusted total expense ratio, economic total expense ratio, and value of farm production per worker. The inverted current ratio and the debt asset ratio are used to examine differences in liquidity and solvency among age groups. With the exception of the return on assets with capital gains ratio, the financial ratios and measures are defined in the KFMA Annual Report and the KSU farm management guide entitled *Financial Ratios Used in Financial Management*. Return on assets with capital gains is computed by subtracting unpaid family and operator labor and adding capital gains on land to net farm income, and dividing the result by average total assets.

Summary statistics for 964 KFMA farms classified as sole proprietors are presented in Table 1. To be included in the study, a farm had to have continuous data for the 2002 to 2006

period. Using these five years of data, a cross-sectional data set was created by computing five-year averages for each farm. The mean age of farmers was 55.49 years old. The average farm had a value of farm production of $220,355, net farm income of $41,643, total assets of $840,584, total acres of 1,698, and owned approximately 35% of the total acres operated.

T-tests were used to test if the variable means were significantly different among age groups. In Table 2, if a variable for two age groups has the same superscript letter, there was no significant difference between the means for that variable. Conversely, if a variable for two age groups has a different superscript letter, there was a significant difference between the means for that variable.

Based on the t-test results, groups one, two, and three all had similar values of farm production, but group four was significantly different. Group four had the lowest value of farm production with $138,781 and group one had the largest with $245,303. Group one had a net farm income of $50,613 while group four's net farm income was $25,233. The net farm income for group four was also approximately $20,000 less than that for groups two and three. The fourth age group had the second largest asset base with $901,342, which was significantly different than the first age group, which had $640,205 of total assets. For total acres, age groups one and four were not significantly different, but group two and three were significantly different from these two groups. Age group four had the lowest total acre average with 1,444 acres. All age groups had a significantly different percent acres owned, ranging from 22% for group one to 56% for group four.

T-test results indicated that the operating profit margin was significantly different among all age groups. The fourth age group had the lowest profit margin with a value of 0.0110, while

the first age group had the highest profit margin with a value of 0.1164. Approximately 55% of the farms in group four had a negative profit margin while only 26% of the farms in group one had a negative profit margin. The asset turnover ratio was significantly different among age groups. The fourth age group had the lowest asset turnover ratio with a value of 0.1539 and the first age group had the highest ratio with a value of 0.3831. The asset turnover ratio results illustrate inefficiencies in asset utilization for farms in the fourth age group. T-test results also showed significant differences among age groups for the return on assets ratio. Group four had the lowest rate of return at 0.0017 or 0.17%, while group one had the highest return with a value of 0.0446 or 4.46%. The return on assets ratio reflects operating performance, but does not include capital gains on land. The return on assets with capital gains ratio reflects both operating performance and capital gains on land. As expected, including capital gains increased the rate of return for all age groups. Though more similar in magnitude compared to return on assets (which does not include capital gains on land), there was a significant difference between the return on assets with capital gains for group one (0.0896) and for group four (0.0709).

The total expense ratio was not significantly different among age groups. This ratio only contains operating expense and depreciation. The other two expense ratios include opportunity costs. T-test results for the adjusted total expense ratio showed that group four was significantly different from all other groups. Group four had the highest ratio with a value of 1.0426 while group one had the lowest ratio value (0.9514). This ratio showed that group four, on average, was not covering unpaid family and operator labor. Approximately 32% of the farms in group four had an adjusted total expense ratio below one, compared to 57% for group one. The economic total expense ratio was significantly different for all age groups. The fourth age group had the highest economic total expense ratio with a value of 1.4648 and group one had the lowest

ratio value at 1.0605. Although on average, none of the age groups were earning an economic profit, group four had the hardest time covering unpaid family and operator labor, and opportunity changes on owned assets. Approximately 27% of the farms in group one earned an economic profit. In contrast, there were zero farms in group four that earned an economic profit. Labor productivity was measured using value of farm production per worker. T-test results showed that group four was significantly different from all other age groups with respect to this variable. Value of farm production per worker was $207,112 and $129,327 for groups one and four, respectively.

The last two ratios in Table 2 are the inverted current ratio and the debt to asset ratio. The current ratio had to be inverted because of farms with zero debt and therefore is listed as the inverted current ratio in both tables. For discussion purposes, this ratio was converted back to the current ratio. T-test results for the inverted current ratio showed significant differences among all age groups. Group four had an inverted current ratio of 0.2571 and when converted back to the current ratio it had a value of 3.89. Group one had an inverted current ratio of 0.5173 and when converted back to the current ratio it had a value of 1.93. Looking at the debt to asset ratio, groups one, two, and three were not statistically different while group four was significantly different from the other groups. Group four had the lowest debt to asset ratio with a value of 0.0142, and group one had the highest ratio value at 0.4476.

Though not shown in Table 2, the percent of income derived from specific enterprises was computed and compared among the age groups. The percent of income for a specific enterprise was computed by dividing enterprise income (e.g., wheat) by total crop and livestock income. Percent of income from corn was the highest for group one (16.9%) and the lowest for group four. In contrast, the percent of income from wheat was the lowest for group one (22.0%)

and the highest for group four (32.0%). There was no significant difference in the percent of income derived from grain sorghum, soybeans, and hay among age groups. Group one had the lowest percent beef income (23.1%) while group four had the second highest (29.8%), only topped by group three (30.7%). Group one had the highest percent income for swine, dairy, and poultry with respective percents of 2.5%, 5.7%, and 1.8% while group four had the lowest percent income for swine, dairy, and poultry with respective percents of 0.5%, 0.2%, and 0.0%. There was no significant difference among sheep income between age groups.

The results of this study indicate that financial performance for farmers in the oldest age group was lower than that of farmers in youngest three age groups. There may be many reasons why the fourth age group has relatively low financial performance. To begin with, it is possible that the older farmers are subsidizing younger relatives that are trying to expand a farm of their own, which will help the efficiency of the younger farmers and decrease the efficiency of the older farmers. It is also possible that the older farmers are sharing crop or livestock income with their children. Also, the older farmers may be satisfied with a low return as long as they are covering cash costs. Finally, the fourth age group may value labor differently and may not be concerned with the fact that they are not covering unpaid family and operator labor.

Table 1. Summary Statistics for 964 KFMA Farms, 2002-2006.

	Average	Standard Deviation
Farm Size and Tenure		
Age	55.49	12.05
Value of Farm Production	220,355	190,569
Net Farm Income	41,643	49,000
Total Assets	840,584	719,294
Total Acres	1,698	1,256
Percent Acres Owned	0.3503	0.4822
Efficiency Ratios		
Profit Margin	0.0876	0.2884
Asset Turnover	0.2621	0.2649
Return on Assets	0.0103	0.0614
Return on Assets with Capital Gains	0.0633	0.0632
Total Expense	0.8110	0.8224
Adjusted Total Expense	0.9805	0.8970
Economic Total Expense	1.1816	1.1147
Value of Farm Production per Worker	178,859	250,683
Liquidity and Solvency		
Inverted Current Ratio	0.4462	0.6962
Debt to Asset Ratio	0.3039	0.4996

Table 2. Variable Differences Among KFMA Age Groups.

	Group 1	Group 2	Group 3	Group 4
<u>Farm Size and Tenure</u>				
Value of Farm Production	245,303^a	243,225^a	236,407^a	138,781^b
Net Farm Income	50,613^a	44,436^a	44,042^a	25,233^b
Total Assets	640,205^a	815,447^b	965,655^c	901,342^{bc}
Total Acres	1,530^a	1,809^b	1,879^b	1,444^a
Percent Acres Owned	0.2199^a	0.2874^b	0.3766^c	0.5577^d
<u>Efficiency Ratios</u>				
Profit Margin	0.1164^a	0.0901^b	0.0958^c	0.0110^d
Asset Turnover	0.3831^a	0.2982^b	0.2448^c	0.1539^d
Return on Assets	0.0446^a	0.0269^b	0.0235^b	0.0017^c
Return on Assets with Capital Gains	0.0896^a	0.0790^{ac}	0.0803^{ab}	0.0709^c
Total Expense	0.7936^a	0.8172^a	0.8136^a	0.8181^a
Adjusted Total Expense	0.9514^a	0.9787^a	0.9776^a	1.0426^b
Economic Total Expense	1.0605^a	1.1451^b	1.1918^c	1.4648^d
Value of Farm Production per Worker	207,112^a	190,362^{ab}	177,776^b	129,327^c
<u>Liquidity and Solvency</u>				
Inverted Current Ratio	0.5173^a	0.4589^b	0.4909^c	0.2571^d
Debt to Asset Ratio	0.4476^a	0.3450^a	0.3070^a	0.0142^b

Note: Unlike superscripts in a row signify significant differences.