



Production and Farm Management Report

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Department of Agricultural and Resource Economics, Fort Collins, CO 80523-1172

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PROFITABILITY MEASURES AND FINANCIAL STRUCTURE: A COMPARISON OF LOW-SALES, MEDIUM-SALES, AND LARGE FAMILY FARM OPERATIONS IN THE UNITED STATES

Dawn Thilmany,¹ Dustin Pendell,¹ Kamina Johnson,² Ann Seitzinger,² and James Pritchett¹

Introduction – Questions raised about the challenges facing small and mid-sized farming operations in the United States gave rise to this analysis of data from the 2008 Agricultural Resource Management Survey (ARMS) conducted by USDA's Economic Research Service (ERS) and National Agricultural Statistics Service (NASS).³ This paper⁴ explores marketing and production characteristics of:

- (1) low-sales farms (gross sales <\$100,000);
- (2) medium-sales farms (gross sales between \$100,000 and \$249,999); and
- (3) large family farms (gross sales between \$250,000 and \$499,999)

where operators reported farming as their major occupation. This analysis excludes small family farms with less than \$250,000 in gross sales whose operators report that they are either retired or have a major occupation other than farming. It also excludes very large family farms with gross sales of \$500,000 or more and nonfamily farms.

Analysts use financial ratios to evaluate the performance and sustainability of businesses including farms and ranches. In this fact sheet we evaluate the performance of farms and ranches ranked according to their return on assets (ROA).⁵ Financial ratios of analysis are defined in the Appendix, Table A1. The operations

¹ Authors are Professor, Assistant Professor and Associate Professor in the Department of Agricultural and Resource Economics, Colorado State University, Fort Collins, Colorado 80523-1172.

² Authors are Agricultural Economists, USDA:APHIS:Veterinary Services.

³ For 2008, the full Phase III sample from the Agricultural Resource Management Survey (ARMS) was 34,000 farm operations. These operations returned 21,816 usable surveys. Specific information is found at the ARMS Websites: <http://www.ers.usda.gov/Data/ARMS/GlobalDocumentation.htm> and <http://www.ers.usda.gov/DATA/ARMS/FarmsDocumentation.htm>.

⁴ This fact sheet is published as part of a three part series. An Executive Summary (<http://dare.colostate.edu/pubs/PFMR11-01.pdf>) and two additional fact sheets titled *Operator and Operation Characteristics* (<http://dare.colostate.edu/pubs/PFMR11-02.pdf>) and *Production Resources and Management* (<http://dare.colostate.edu/pubs/PFMR11-03.pdf>) and are available at the listed websites.

⁵ Rate of return on assets is defined as net farm income plus interest expenses minus estimated charges for operator labor and management, divided by total assets. This ratio reveals the returns received by the farm operator for both debt and equity capital invested.

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are divided into classes by sales volume, so that high, average and low financial performance is compared both within and across sales classes. These comparisons provide insights into the nature and cause of variation in performance across operations.

Financial performance is evaluated in the categories of profitability, capital structure (debt and liquidity), financial efficiency, as well as the role that government payments and off-farm income play in financial outcomes for the operations.

Profitability Ratios – Profitability ratios are key indicators of operational efficiency and resource management among farm operations. They provide information about cash flow potential, pay-back periods, and perhaps most importantly, they indicate the potential for growth in the overall wealth of the operators. Whether a farm remains viable depends on many factors, the most important of which is the efficiency with which assets are used to generate income and wealth.

Figure 1 shows that the rate at which profits are generated from assets varies greatly, both across sales classes and among the best and worst performers within those sales classes. It is interesting to note that the medium-sales operations have the tightest range for ROA (an issue we return to later in the discussion of asset efficiency).

Similarly, we can examine the rate of Return on Equity (ROE) for the farms using Figure 2. In this case, we

more narrowly examine the return to capital invested that is owned by the farm operator (or organization), and we can see mixed results. A relatively high percentage of operations have negative rates of return to equity, and for the low-sales farms, few operations report a positive ROE. The range of returns for the large family farms is greater. Capital structure is one potential cause of this difference, and we will examine this cause in more detail.

The ratio of operating profits to total sales is a contributor to ROA, serving as an indicator of operational efficiency, so it is expected to vary significantly among high and low performing operations. Figure 3 shows the operating profit ratio, and the similarity in returns among the top performing operations of all sizes is interesting, but the low and negative margins, particularly for the low sales operations, suggest that costs (or charges for management labor) cannot be supported by current sales. If these charges relate to efforts to establish and grow the operation in the long run, such losses may be justified, but without further information, it appears there are significant scale economies in terms of operating activities.

Figure 4 shows a similar set of operating returns in terms of absolute dollars, but subtracts only cash operating expenses from gross revenue, so that the result is the net cash available after covering those operational costs to service debt and pay management returns for its investment in operations. These numbers suggest cash flows are sufficient, but still, relatively small

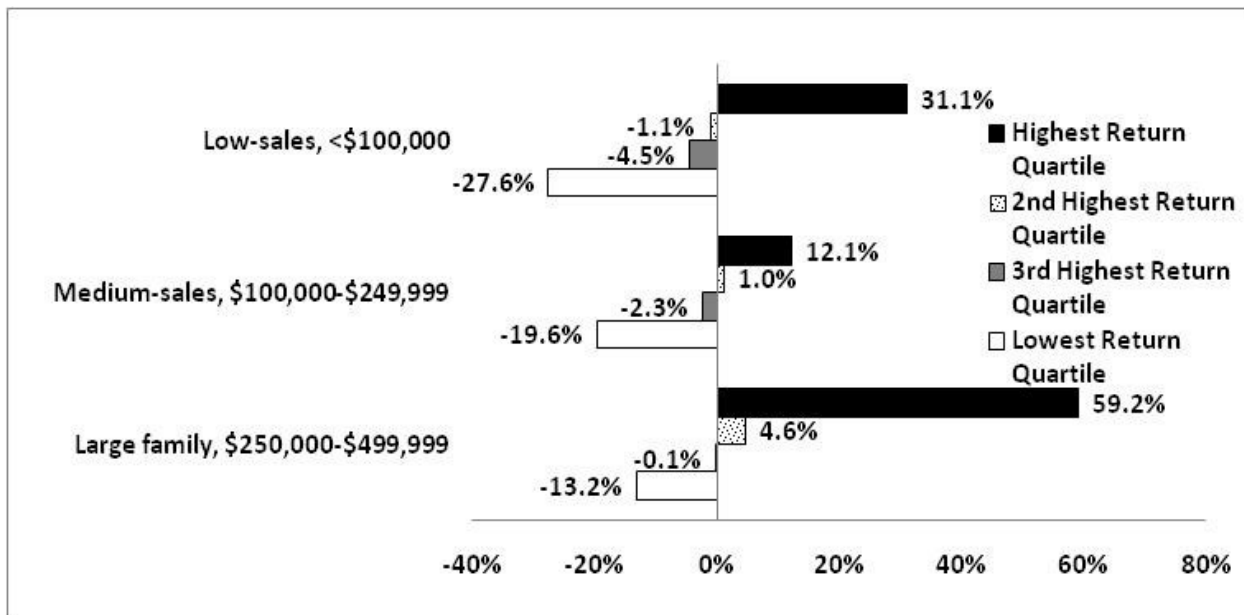


Figure 1: Return on Assets (ROA), by Farm Sales and Quartile.

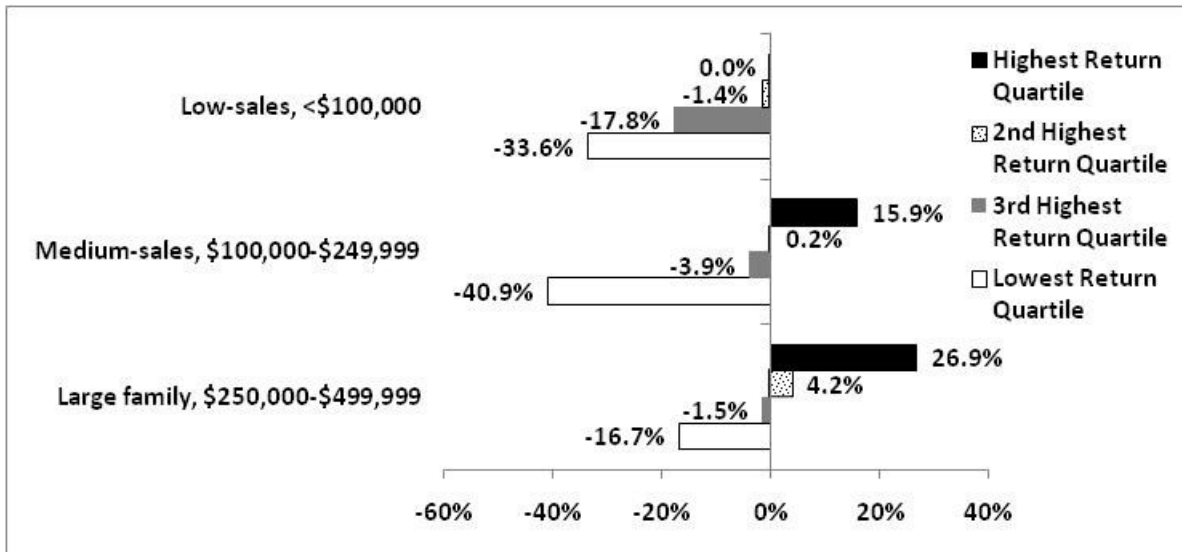


Figure 2: Rate of Return to Equity (ROE), by Farm Sales and Quartile.

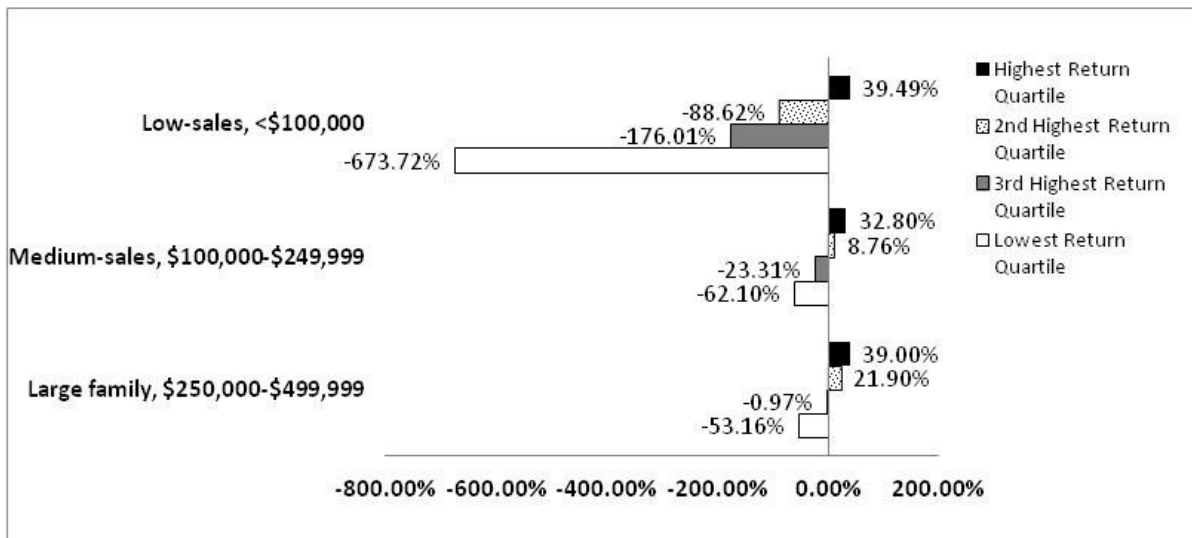


Figure 3: Operating Profit Margin, by Farm Sales and Quartile.

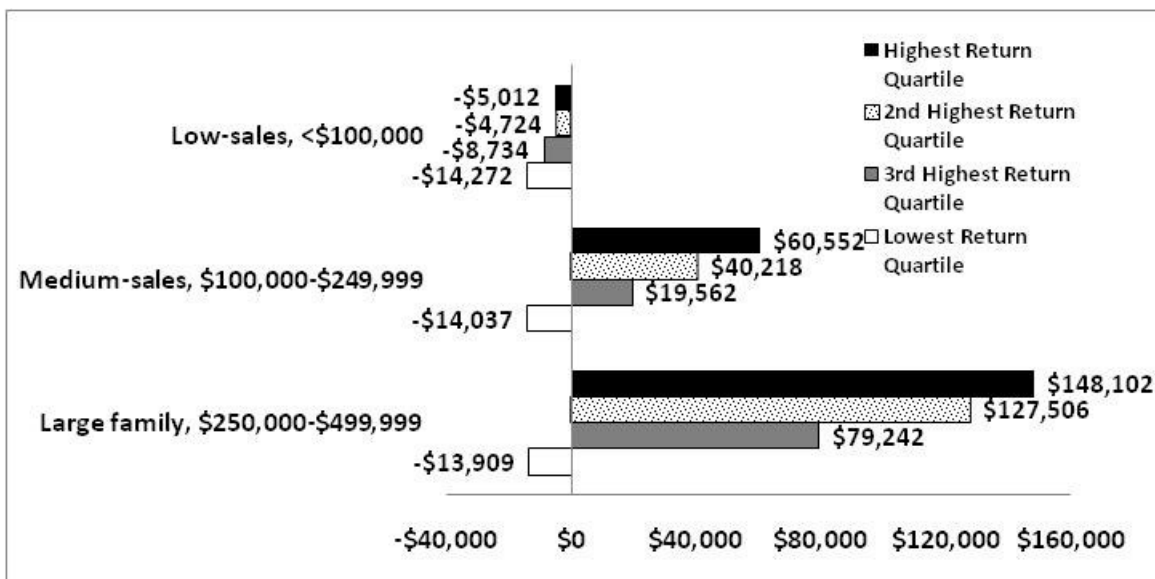


Figure 4: Net Cash Availability, by Farm Sales and Quartile.

margins of potential “repayment capital” may be one reason we see fairly low debt usage among operations. In short, there is not enough excess cash flow to assure farm operators they could service more debt.

For profitability and cash flow, one potential problem area could be the cash expenses associated with interest paid on existing debt, which appears to be around 5 percent of all cash expenses (Figure 5). As discussed later in debt analysis, this low figure also is influenced by the relatively low use of debt capital, with many operations using minimal or no external financing. Figure 5 shows that there are minor differences across sales classes or the best and worst performing farm operations within sales classes in terms of interest expense (relative to other expenses). Still, the financial challenges faced by low-sales operations may be partially driven by their relatively high share of cash expenses that are dedicated to interest costs. With such tight profit margins, a few percentage points going to debt servicing rather than owner profits could be significant. To explore this issue further, we can examine the liquidity of farm operations.

Liquidity Ratios – The current ratio (the most commonly used liquidity ratio) looks at how quickly an operation can convert assets into cash without suffering a loss or disrupting business operations. Since an operator should always have at least enough cash and liquid assets (including ready to market inventories) on hand to cover short-term bills, this ratio should be 1 or

greater. Figure 6 shows how liquidity varies across sales classes and quartiles. The best performing, low-sales operations are quite liquid compared to the large family and medium-sales operations, but some operations in each sales class have significant liquidity challenges. The 2nd highest quartile of the large family farms is unique in its high current ratio, but this finding may be influenced by the capital structure of these operations since they own relatively few assets and use them effectively to create cash returns. These results suggest a further exploration of capital structure may provide more information regarding financial performance.

Debt Ratios – The debt ratios illustrate an operation’s level of indebtedness and their ability to service these debts. These are more broadly called capital structure indicators and can affect the cash flow, growth and viability of a farm.

With respect to overall indebtedness, the debt to asset ratio is used to examine capital structure. Figure 7 shows that there is little debt used overall regardless of the sales class, and the highest share is used by large family farms. And, it is important to realize that a high share of farms use no long-term debt, and rely only on short term financing arrangements to fund operations over a production season. For instance, they may only use trade credit from input suppliers, but never carry a mortgage against land. Although low-sales operations use less debt, we saw earlier that their interest expense

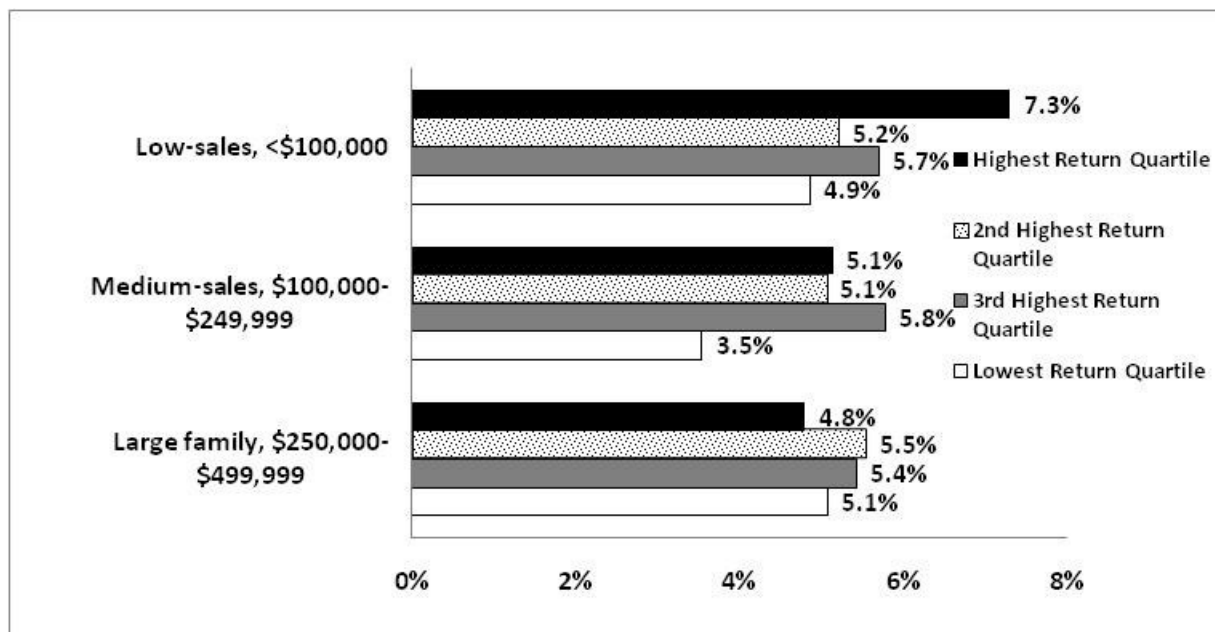


Figure 5: Interest expense as a Percent of Total Cash Expenses, by Farm Sales and Quartile

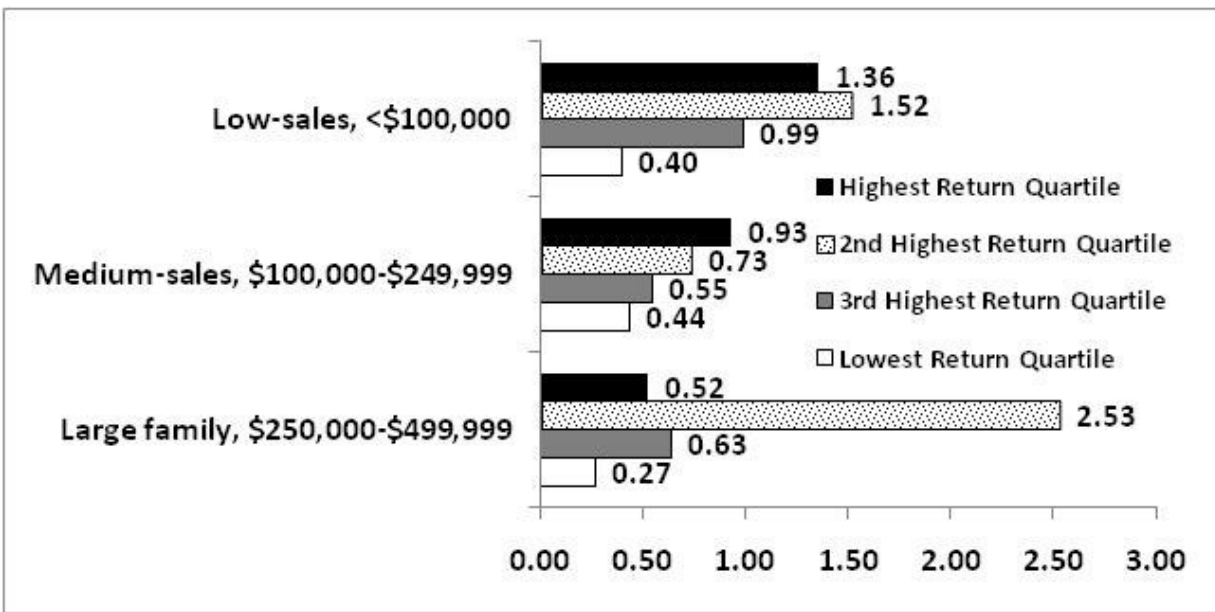


Figure 6: Current Ratio, by Farm Sales and Quartile.

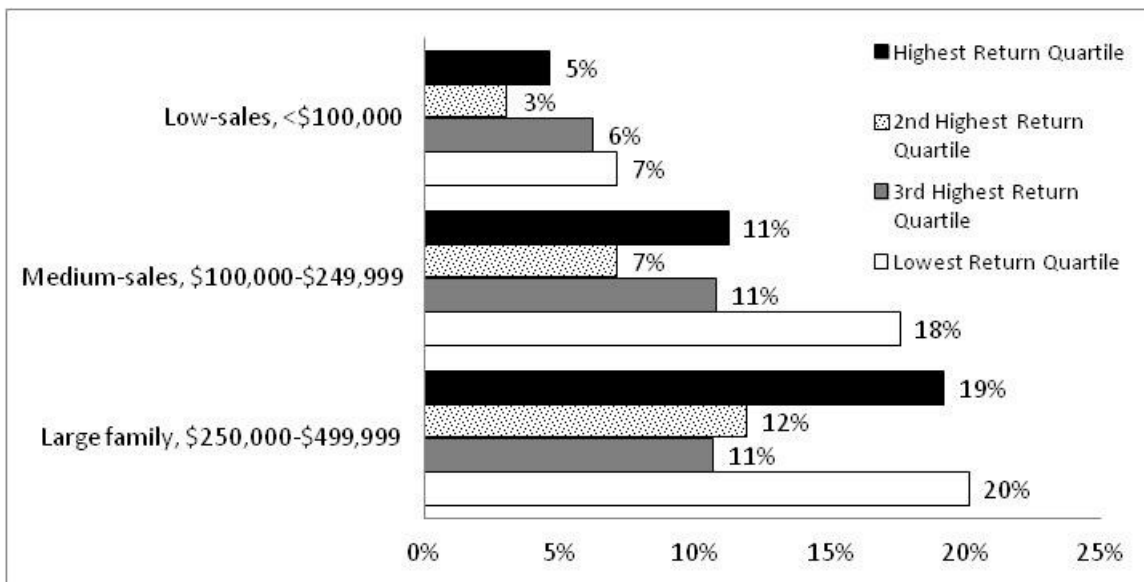


Figure 7: Debt to Asset Ratio, by Farm Sales and Quartile.

is quite high as a share of total cash expenses, which may suggest they pay relatively more for access to capital.

Conventional wisdom suggests that the least profitable operations carry the most debt, as it may signal they are using debt to “shore up” capital they are not creating through returns. Results in Figure 7 support this notion: the lowest performing quartiles also have the

highest proportion of assets financed through debt. The preference would be to use debt primarily by farms with high returns and use new capital to leverage successful operational growth.

Activity Ratios - The asset turnover ratio is the most commonly used of the activity ratios. These ratios are often referred to as management ratios as they can provide indications of the owner’s/management’s ability

to run the farm and create revenues with the invested capital and assets. In essence, they indicate whether the resources invested in assets are being used aggressively to create revenues. These factors are usually directly controlled by management and may point to potential problems if not addressed early.

Figure 8, which characterizes the gross revenues divided by total assets for each sales class, shows marked differences between low and high performing farm operations. These numbers suggest that the best performing operations are likely driven mostly by their ability to use resources efficiently to create products and revenues. However, the operations that fall within the lowest quartiles are not the worst performing in this measure, and seem to do better than the middle performing operations. One possible explanation, again, is that their capital structure and debt usage are keeping them from being profitable even if they are productive at creating sales. Another possible explanation is their higher labor costs (see Pendell et al's fact sheet on Production Decisions).

One unique element of farm and ranch enterprises is the potential for improved financial returns due to

assistance in the form of government farm payments. Figure 9 shows that all sales classes, regardless of financial performance, rely somewhat on government payments to improve their overall returns. While the absolute dollar amounts do not seem large in comparison to gross sales, these monies may be important given the tight profit margins we reported above. It is likely that operators use the payments as part of a broader financial strategy to secure more certain returns for their farm investment (regardless of yields and price fluctuations). In short, more analysis is needed to determine whether government payments show better performance, and we begin by evaluating their relative importance to profits.

Figure 10 shows the government payments as a share of gross farm revenues as a way to standardize the relative reliance on those payments. Among the most profitable operations in the low-sales operations there is a slightly higher reliance on the payments, but there are more consistent shares among all other operations. Although it may seem small in importance, the tight profit margins shared above would be even more slight (or more negative) without these government payments.

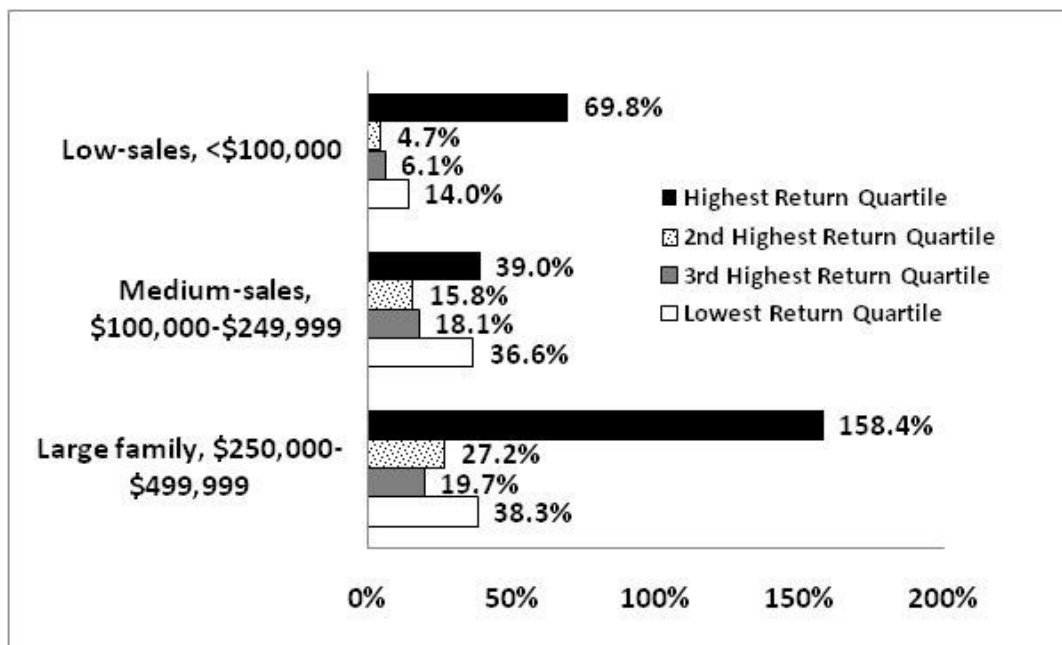


Figure 8: Asset Turnover Ratio, by Farm Sales and Quartile.

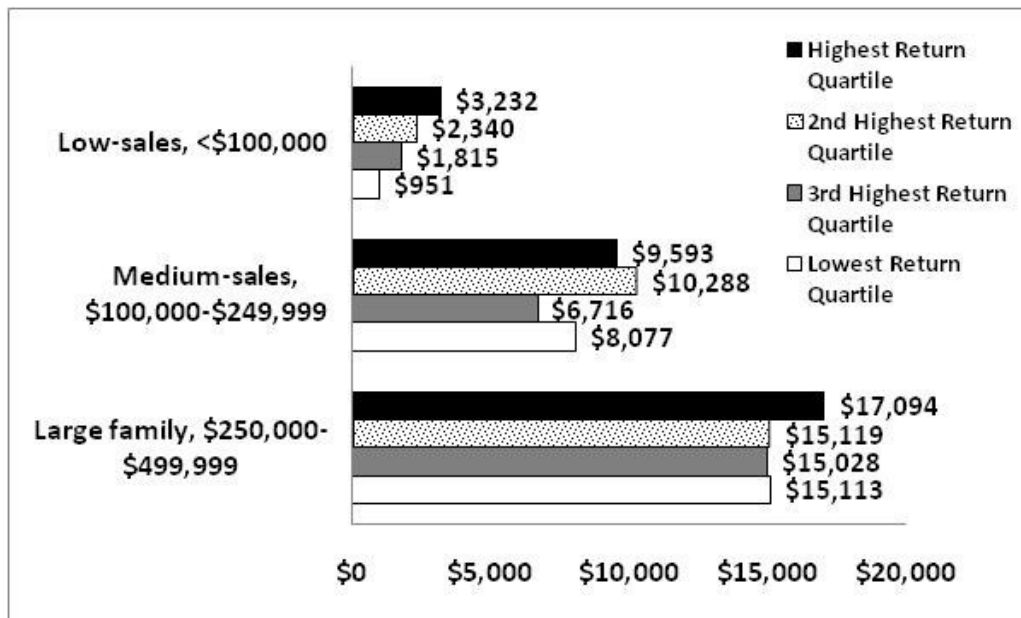


Figure 9. Average Level of Government Farm Payments, by Farm Sales and Quartile.

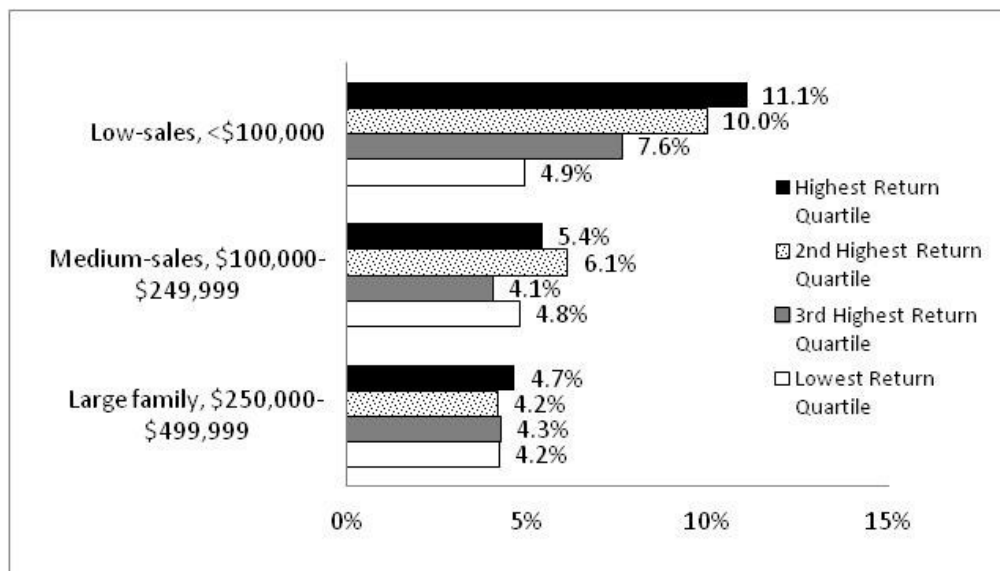


Figure 10. Government Payments as a Percent of Gross Farm Revenues, by Farm Sales and Quartile.

Another interesting issue to explore in future analysis of financial performance is whether the reliance on government payments gives operators confidence they can service more debt, hold less liquid assets, or reliance on other income sources.

One potential source of financial resources is off-farm income. Figure 11 show that all sales classes receive a

fair amount of off-farm income from members of the household or capital gains, regardless of the financial performance of their farming enterprises. In some cases, off-farm income approaches the same level as the gross sales less cash expenditures shown in Figure 4.

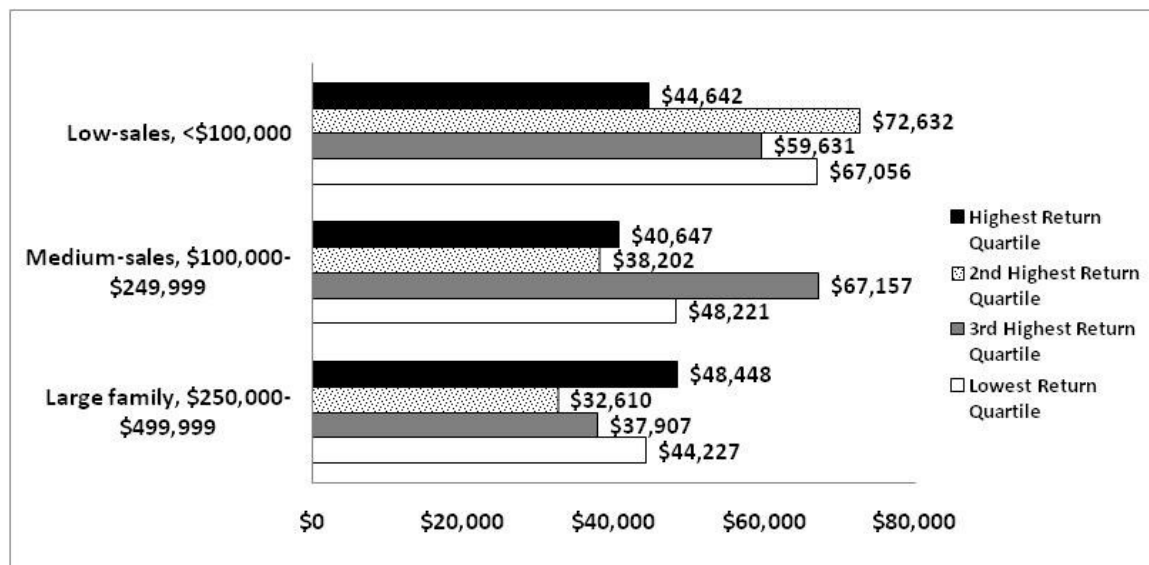


Figure 11: Average Off-Farm Income with Capital Gains, by Farm Sales and Quartile

This suggests that off-farm income and capital gains are likely to be an important element of the financial portfolios for farming households. This is especially the case for low-sales farms, where cash returns do not seem to suggest they could support an average US household without another income source. However, even farm operations that would seem to be of a scale that is more viable appear to rely on some outside monies to support their households (government payments and employment). Off-farm income may provide stable income or non-salary benefits, such as health insurance, to these households.

Net worth of a farm or ranch household is the best representation of the wealth that has accumulated within a farm enterprise because of capital investments or operators retaining their earnings within the operations. Figure 12 shows the net worth for all sales classes, a number that is also part of the ROE calculations shared earlier (and may include household dwellings if the operator lives on-site). It is hard to analyze these levels as performance indicators, but instead, one should remember that the average age of operators suggests these households are nearing retirement and may need such resources for that stage of life (see Johnson et al's fact sheet on Operator and Operation Characteristics).

Conclusion – Financial performance indicators provide some insight into differences in the rate of return on assets of low-sales, medium-sales and large family farms. Asset efficiency is quite different among the

highest and lowest performing quartiles within each sales class, with the strongest performers having the highest asset turnover ratios. So, one could conclude most of the difference among operations in terms of financial success are related to the efficiency of their operations rather than innovative financing strategies.

Government payments and off-farm income both tend to stabilize cash flows to operations. All sales classes receive government payments, and government payments are relatively more important for the farm operations performing well in the smallest sales class. Off-farm income contributes to all sales classes and may be a source of stability and health insurance/retirement benefits. Given these large payment inflows from nonfarm activities, one must consider whether such inflows are more important in explaining differences than operational returns. It should be noted that all operations have fairly significant net worth and off-farm incomes, so that household viability may be above the levels that motivated historic concerns about the well-being of farm operators and families.

Capital structure is another important element to consider, especially since equity and off-farm income both appear to be potential sources of financing to offset the need for debt capital. The low-sales farms tend to have the lowest proportion of its assets financed by debt, but tends to have the largest share of its operating expenses comprised by interest expense. In contrast, large family farms make the greatest use of debt to finance their asset base but pay a lower share of their operating

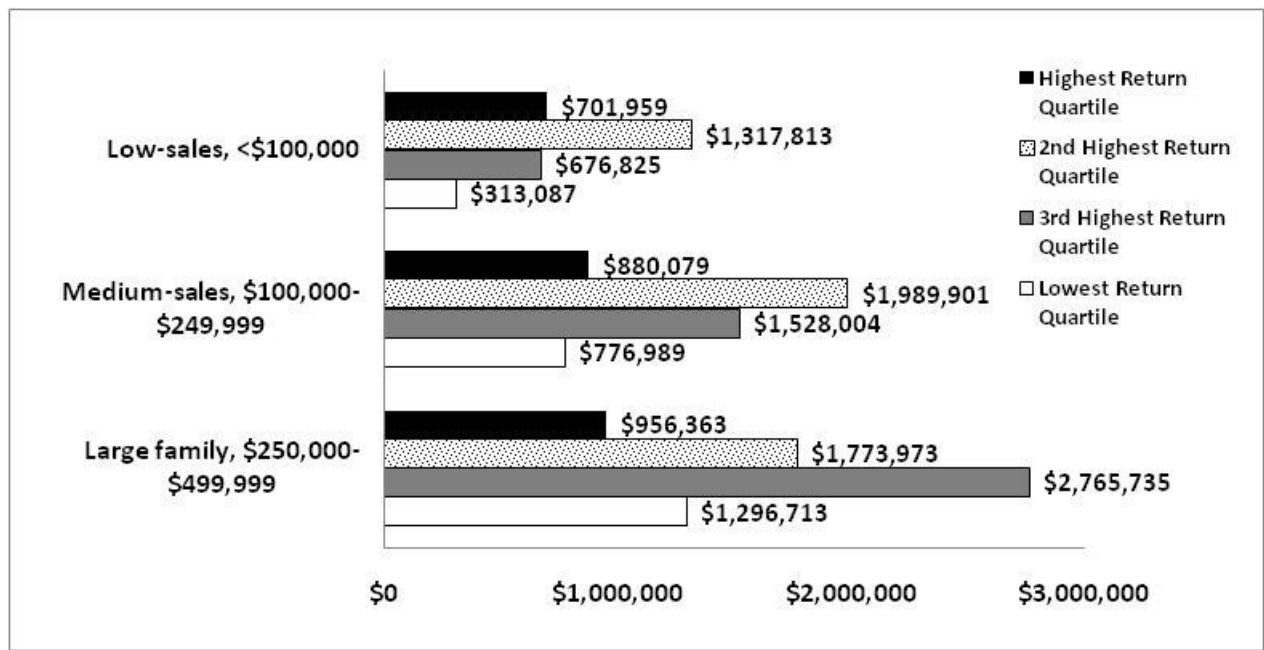


Figure 12. Net Worth, by Farm Sales and Quartile

expenses to interest. Debt structure and debt management appear to be significant differences among sales classes.

References

- Hoppe, R.A., and D.E. Banker. 2010. "Structure and Finances of U.S. Farms: Family Farm Report, 2010 Edition." USDA Economic Research Service, Economic Information Bulletin No. 66, July.
- Johnson, K., A. Seitzinger, D. Thilmany, D. Pendell, and J. Pritchett. 2011. "Operator and Operation Characteristics: A Comparison of Low-sales, Medium-sales, and Large Family Sales Farm Operations in the United States." Available at: <http://dare.colostate.edu/pubs/extension.aspx>, PFMR 11-02.
- MacDonald, J., and P. Korb. 2011. "Agricultural Contracting Update: Contracts in 2008." USDA Economic Research Service, Economic Information Bulletin No. 72, February.
- Pritchett, J. D. Thilmany, D. Pendell, K. Johnson, and A. Seitzinger. 2011. "Demographics, Production Characteristics and Financial Performance Executive Summary: A Comparison of Low-sales, Medium-sales, and Large Family Farm Operations in the United States." Available at: <http://dare.colostate.edu/pubs/extension.aspx>, PFMR 11-01.
- Thilmany, D., D. Pendell, K. Johnson, A. Seitzinger, and J. Pritchett. 2011. "Profitability Measures and Financial Structure: A Comparison of Low-sales, Medium-sales, and Large Family Farm Operations in the United States." Available at: <http://dare.colostate.edu/pubs/extension.aspx>, PFMR 11-04.

APPENDIX:

Table A-1

<u>Profitability</u>	
Operating Profit Margin	Operating Profit Margin/Gross Sales
Rate of Return on Equity	(Net Farm Income-Mgmt Charge+Interest)/Net Worth
Rate of Return on Assets	(Net Farm Income-Mgmt Charge)/Total Assets
<u>Debt/Solvency</u>	
Debt to Assets	Total Liabilities/Total Assets
Interest Share of Cash Expenses	Interest expense/Cash Operating Expenses
Net Cash Availability	Gross Farm Income-Cash Operating Expenses
<u>Liquidity</u>	
Current Ratio	Total Current Assets/Total Current Liabilities
<u>Efficiency Ratios</u>	
Asset Turnover Ratio	Gross Farm Income/Total Assets
<u>External Support</u>	
Payment Share of Farm Income	Government Payments/Gross Farm Sales