

Financial Performance in Meat and Poultry Manufacturing And Wholesaling: An Historical Perspective*

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Abstract

The financial performance of meat and poultry manufacturing and wholesaling firms is examined for the period from 1970 to 1986. Measures of liquidity, solvency, profitability, cash generation, and efficiency reported in the *Robert Morris Associates Annual Statement Studies* are used to examine relative performance across the different industries. The results suggest similar performance in the wholesaling and manufacturing industries across the period in terms of liquidity. Profitability levels are similar for meat and poultry firms, although the poultry firms show a higher level of variability across the period. It appears that poultry firms leveraged themselves relatively more than did meat firms during the period. In terms of cash generation and efficiency the meat manufacturing industry performs slightly better than the other industries.

Introduction

In recent years the meat and poultry manufacturing and wholesaling industries have

experienced significant change. Declines in the demand for red meat, coupled with excess capacity in cattle and hog slaughtering have squeezed returns. Concurrent with these declines in the red meat sector has been significant growth in the poultry industry. Demand expansion, stimulated by convenience-oriented processed products and increasing diet and health concerns, has led the industry to expand production and push back the limits of processing capacity. The impacts of these changes on firm performance have not been widely examined.

It is tempting to draw inferences regarding the relative profitability of each industry based on the above changes. Such an analysis is however flawed and inadequate. To appropriately examine the performance of firms involved in meat and poultry manufacturing and wholesaling requires a review of financial performance within and across the industries. The necessary data for such analyses, however, are not readily available.

The purpose of this paper is to examine the financial performance of firms involved in

* The research reported herein was supported under HATCH 05-0352, University of Illinois Agricultural Experiment Station.

meat and poultry manufacturing and wholesaling. Data from the annual publication *Robert Morris Associates Statement Studies* (RMA Statement Studies) are used to examine the relative performance of firms in each industry based on a number of commonly reported financial ratios (similar to the analysis by Ellinger, et al. for farm firms). Although not comprehensive with regard to the inclusion of all firms in the industry, the historical observations on common financial measures nonetheless provide a useful basis for examining performance. The results of the inquiry provide insight into general financial performance over time and should be of interest to those interested in the performance of the red meat and poultry industries.

Data and Methods

All data were taken from the *Robert Morris Associates Statement Studies* released between 1970 and 1986.¹ The RMA Statement Studies are assembled through voluntary cooperation of RMA member banks. Firms are included in the sample based on their involvement with an RMA member bank. Data were collected for the following industries: manufacturers of meat and meat products (e.g., meat packers), wholesalers of meat and meat products, manufacturers of poultry and poultry products (e.g., dressing plants) and wholesalers of poultry and poultry products.²

Following Kohl and Lins, financial performance measures were selected to allow examination of liquidity, solvency, efficiency, profitability, and cash generation. The following ratio measures were gathered:

- Liquidity -- *Current Assets to Current Liabilities*
- Solvency -- *Debt to Net Worth*
- Profitability -- *Profit before Taxes to Total Assets*
- Cash Generation -- *Sales to Receivables*
- Efficiency -- *Sales to Total Assets*

These ratios were selected to facilitate comparison between industries, because of their accuracy in reflecting performance in the respective areas, and for their ease of calculation from commonly available data.

The RMA Statement Studies report financial ratios on a quartile break basis by size of firm. Four firm sizes are provided based on total assets of \$0-1, \$1-10, \$10-50, and \$50-100 million. In addition, an aggregate or average of all firms reporting is provided.

Table 1

Number of Firms Reporting by Subperiod, 1970 through 1986

	Meat Manufacturers	Poultry Manufacturers	Meat Wholesalers	Poultry Wholesalers
1970-75				
Average	135	24	193	98
Max	146	27	212	106
Min	116	21	177	90
1976-80				
Average	127	22	239	118
Max	142	28	248	127
Min	111	17	225	112
1981-86				
Average	127	28	237	59
Max	142	39	254	67
Min	108	19	209	43

NOTE: Max and min refer to the maximum and minimum numbers of firms reporting in any given year during the subperiod.

Due to the nature of the data, it is likely that the number of firms reporting has changed across time. Table 1 provides a summary of the number of firms reporting, along with the minimum and maximum number during any given year, for the following subperiods: 1970 through 1975, 1976 through 1980, and 1981 through 1986.³ The data in Table 1 suggest that the sample contains a relatively constant number of firms throughout the period. The only industry with an obvious change in the number of firms reporting is the poultry wholesaling industry which shows a marked decline in the later subperiod. This may in part be due to forward integration in the poultry manufacturing sector during the late 1970s.

In general the information in Table 1 suggests that the number of firms reporting is fairly consistent across the data period. It should be noted, however, that the data do not provide any insight into which individual firms report. Therefore, the analysis below focuses only on the relative performance of firms, based on the quartile breaks provided, within the context of the ratios identified above.

Results

Two analytical approaches were employed. First, plots of the quartile breaks for each of the above ratios were generated for the industry averages. These plots were examined for evidence of systematic patterns within and across industries and for differences related to quartile breaks. Next, tests of equality of means between the quartile breaks within and across industries were conducted using the industry averages for the data period.

Graphical Analysis

Figure 1 presents the time path of quartile breaks for industry averages of the current ratio for firms in meat manufacturing, poultry manufacturing, meat wholesaling, and poultry wholesaling. The graphs for each ratio are plotted with a common scale to facilitate comparison across industries.

The current ratios for firms in the four industries reveal interesting patterns across the data period. The general levels of the current ratio are similar for each of the industries. In addition, the quartile breaks occur at similar levels in each industry. The upper quartiles tend to show a wider gap from the middle quartiles than do the middle quartiles from the lower quartiles. Further, in all industries the two lower quartiles are generally more stable. All of the

industries generally show improvement or leveling off late in the period, particularly the upper quartiles.

In terms of debt to net worth (Figure 2) there is a general tendency toward an upward trend for all quartiles throughout the period.⁴ Again, firms in the upper quartile show a wider differential from the middle quartile than the middle quartile to the lower quartile. The debt positions of the poultry firms improved from 1983 to 1985, although firms in the upper quartile increased debt in the following year.

Firms in the middle and lower quartiles of both poultry manufacturing and poultry wholesaling show a slight downward trend in debt to net worth late in the period. In contrast, the meat wholesaling and manufacturing industries show a slight upward trend during this period. In part, this may be due to the relative age of manufacturing and wholesaling facilities in the industries. The poultry industry underwent a demand fueled expansion late in the period and may have been able to pay off some long term debt. In contrast, the meat industry has been forced to refurbish a number of old plants, while closing others. This may have led to increased debt.

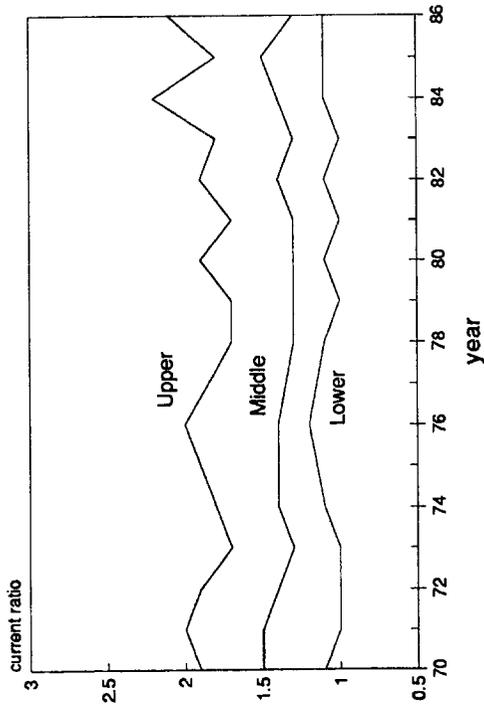
Figure 3 shows the quartile breaks for profitability as a percentage of total assets for the four industries. There appears to be a slight downward trend in profitability of the meat manufacturing and processing industries, although the firms in the top quartile show a slight upward move during the last five years. In part this may be due to a slight recovery in demand during the data period.

Profitability in the poultry manufacturing and wholesaling industries is more variable than in the meat industries. In particular, poultry manufacturers experienced fluctuations in profits relative to assets during the 1980s with an apparent bottom in 1982. Expansion of the industry, implemented during the mid-1980s may in part be responsible as the asset base of the industry was increased. Poultry wholesalers experienced less variability in profitability with firms in the upper quartile showing a slight upward trend near the end of the period.

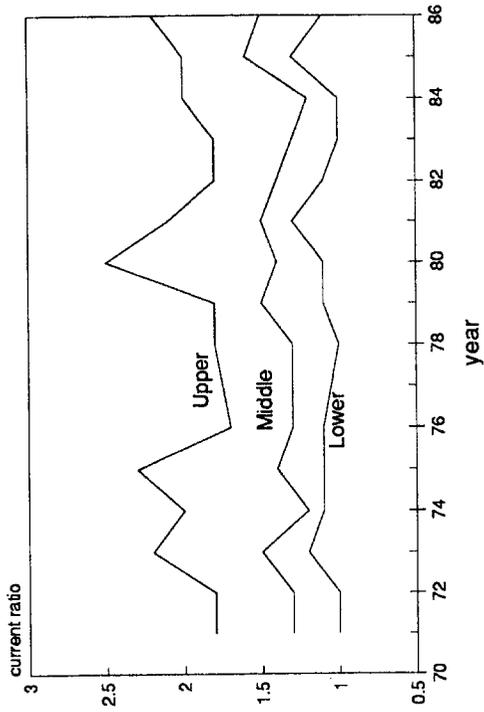
Quartile breaks for sales to receivables, an indication of the cash generation potential, are presented in Figure 4. The numbers shown reflect the number of times per year that trade receivables turn over. Firms in the meat manufacturing and meat wholesaling industries show a higher rate of cash generation across the period

Figure 1. Upper, Middle, and Lower Quartile Breaks for Current Ratio, by Industry, 1970 Through 1986.

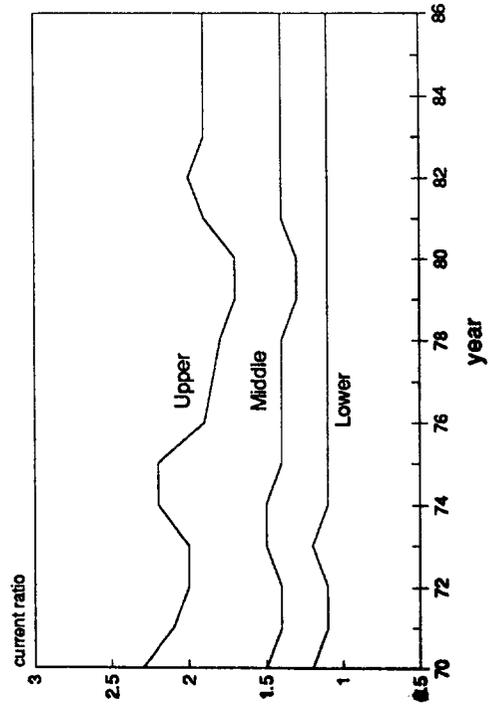
Meat Manufacturers



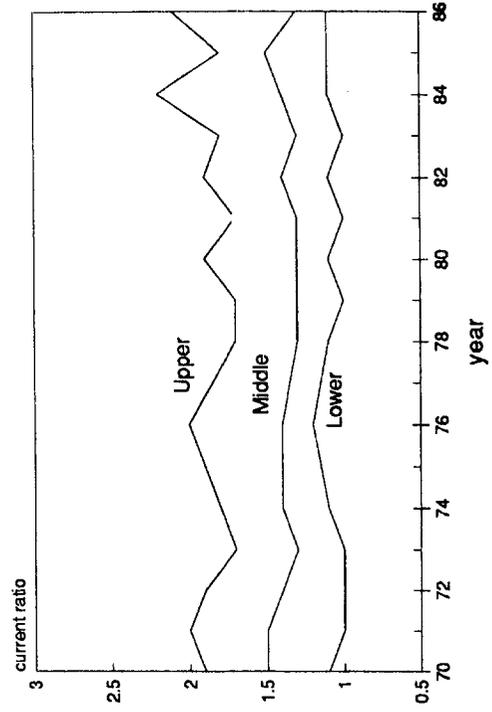
Poultry Manufacturers



Meat Wholesalers



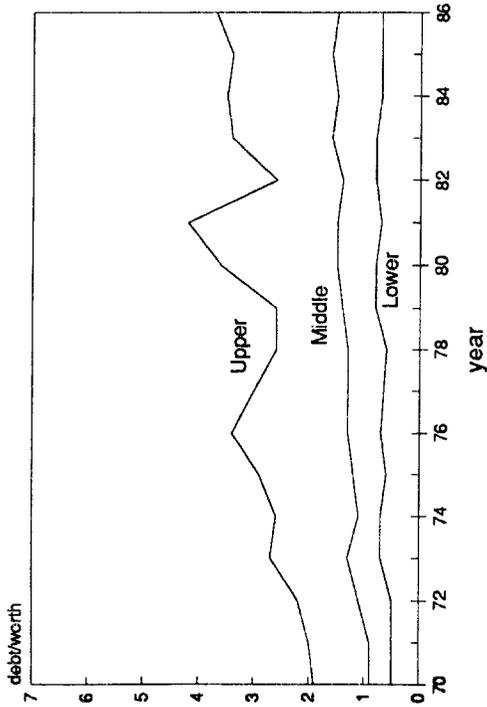
Poultry Wholesalers



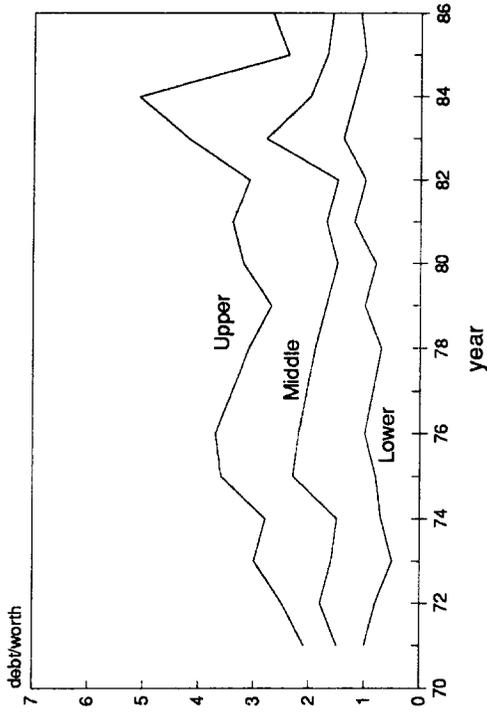
Source: Calculated from Robert Morris Associates Annual Statement Studies.

Figure 2. Upper, Middle, and Lower Quartile Breaks for Debt to Net Worth, by Industry, 1970 Through 1986.

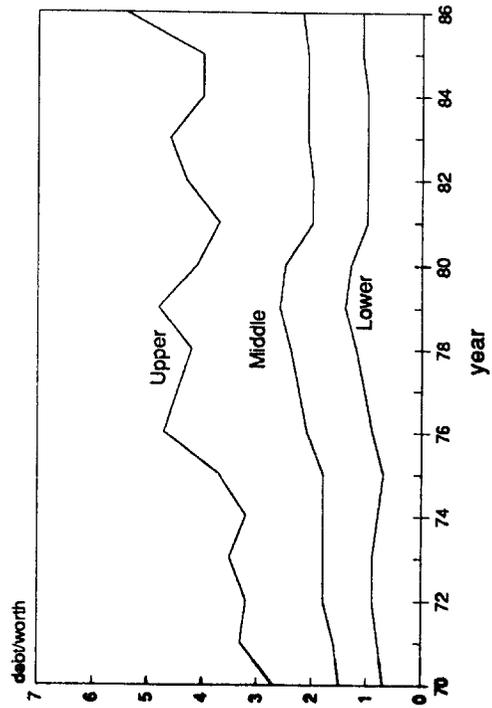
Meat Manufacturers



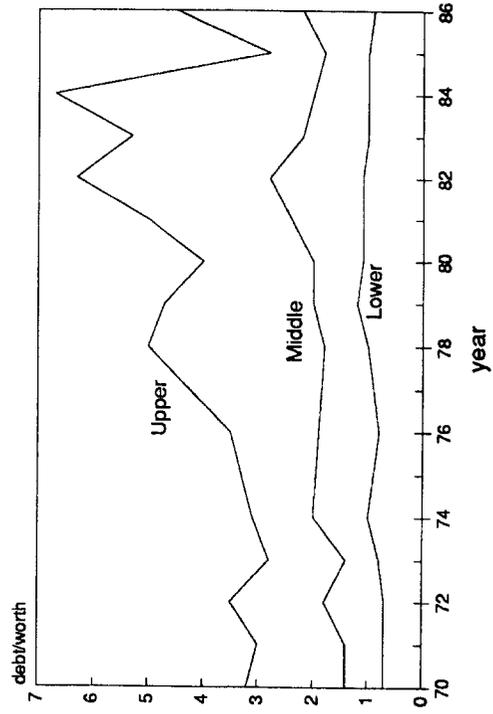
Poultry Manufacturers



Meat Wholesalers



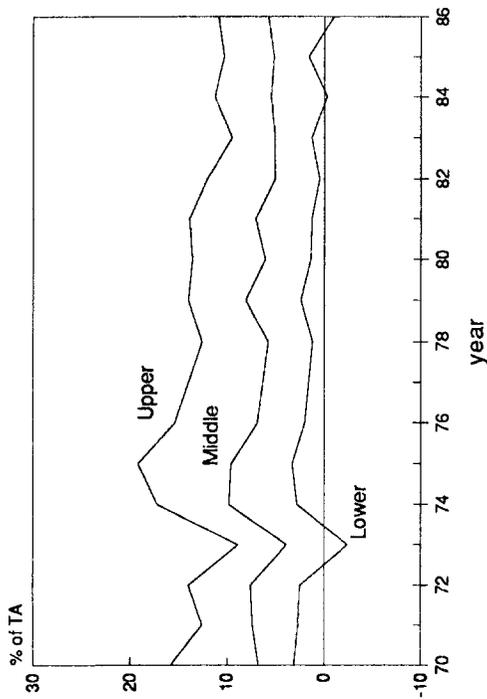
Poultry Wholesalers



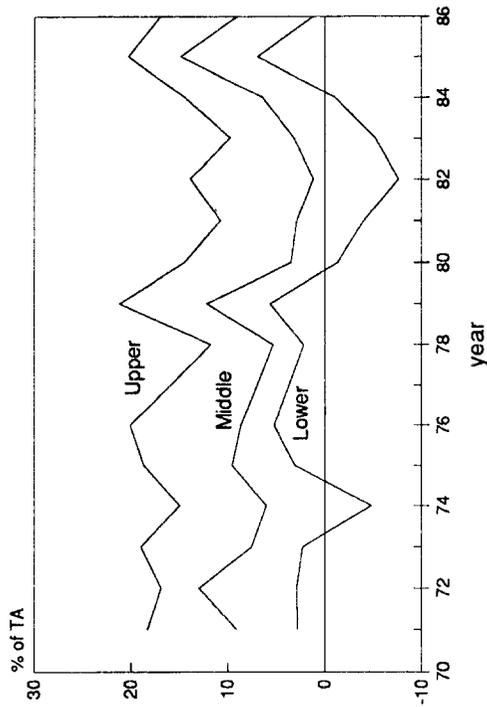
Source: Calculated from Robert Morris Associates Annual Statement Studies.

Figure 3. Upper, Middle, and Lower Quartile Breaks for Profitability as a Percentage of Total Assets, by Industry, 1970 Through 1986.

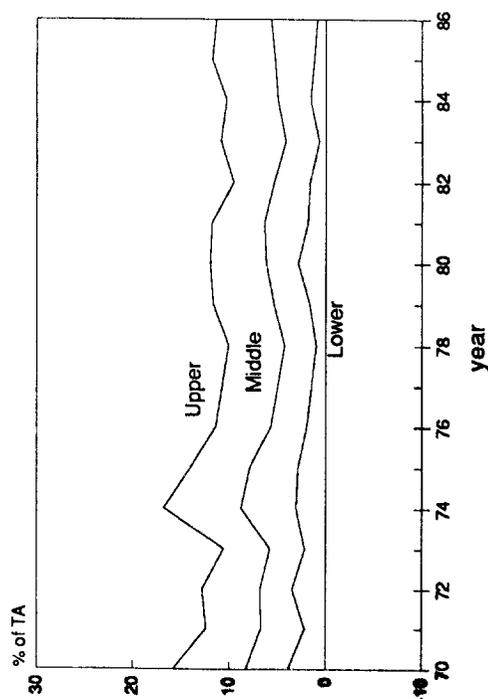
Meat Manufacturers



Poultry Manufacturers



Meat Wholesalers



Poultry Wholesalers

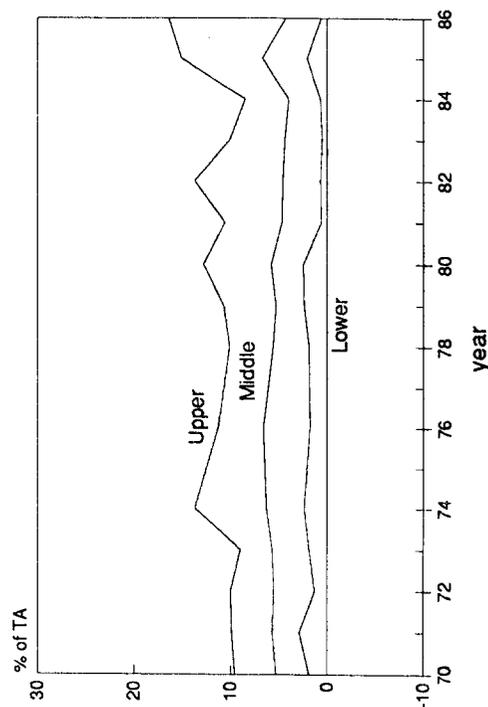
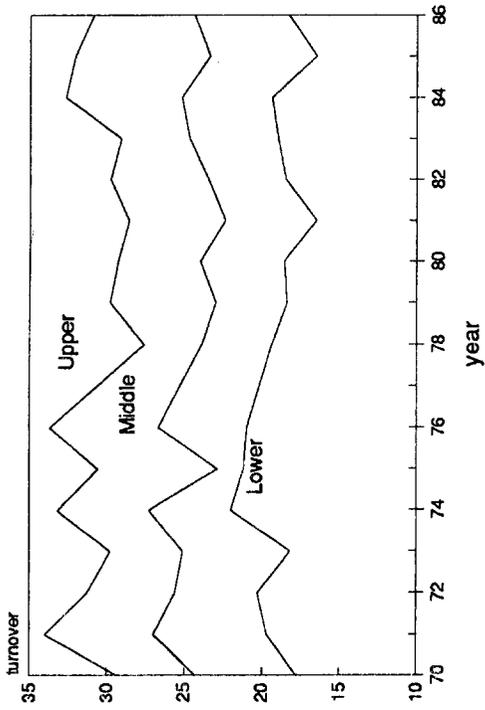
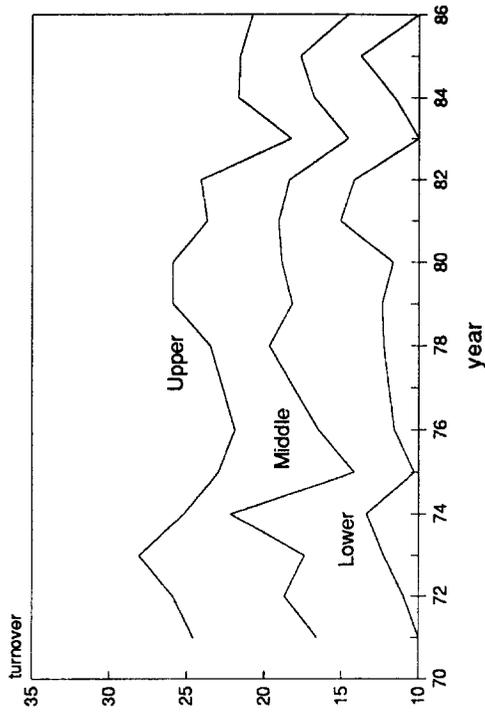


Figure 4. Upper, Middle, and Lower Quartile Breaks for Sales to Receivables, by Industry, 1970 Through 1986.

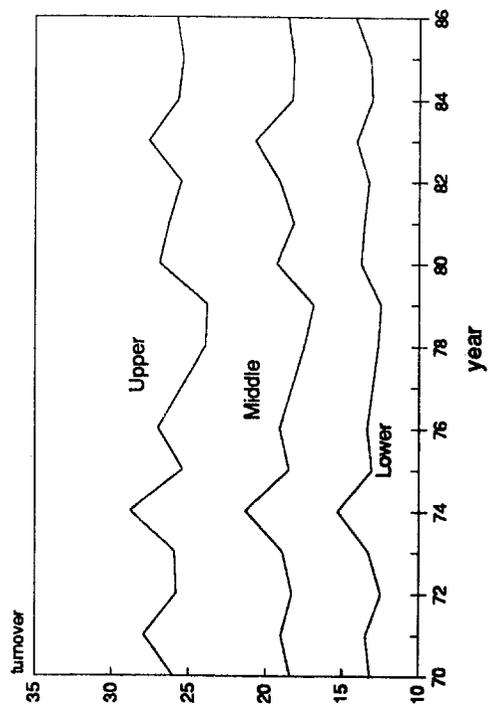
Meat Manufacturers



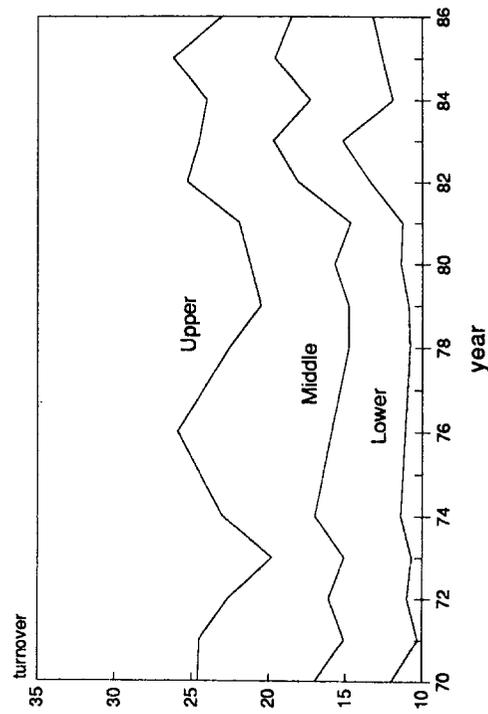
Poultry Manufacturers



Meat Wholesalers



Poultry Wholesalers



Source: Calculated from Robert Morris Associates Annual Statement Studies.

than do poultry manufacturing or wholesaling firms. The differentials between the upper and middle and the middle and lower quartiles remain fairly constant throughout the period in all four industries.

Figure 5 provides evidence related to the efficiency of the four industries in terms of sales to total assets. RMA did not report this ratio prior to 1976, thus the gaps in the plots shown. The largest differences within and across industries appear in efficiency. The meat manufacturing and wholesaling industries show much higher levels for each respective quartile than do the poultry manufacturing and wholesaling industries. The poultry wholesaling industry, however, shows much higher levels of sales to total assets than does the poultry manufacturing industry for firms in the all quartiles.

In summary, the relative performance of the four industries is remarkably similar throughout the period. There are no clear differences in liquidity across the four industries. As expected, the meat industry (both manufacturing and wholesaling) has experienced an increase in debt and a decrease in profitability during the period. The poultry industry (both manufacturing and wholesaling) has seen variable profits, with the less profitable firms experiencing a number of years of negative profits during the period. Debt levels in the four industries have also fluctuated widely during the period and move generally lower late in the period, except for firms in the upper quartiles. In terms of cash generation, meat manufacturing and wholesaling firms outperform poultry firms with higher quartile breaks at each level, particularly in manufacturing. Sales to total assets also indicate a higher level of efficiency in the meat industries, although poultry wholesaling appears generally more efficient than does poultry manufacturing.

Tests of Means

Two tests for equality of means of the five financial performance measures were conducted. First, the means for the upper quartile of each ratio were compared using the meat manufacturing industry as a base. A t-test was used to examine significant differences in means of each ratio from the base. The results are summarized in Table 2. A second test, summarized in Table 3, was conducted to determine whether the means for the middle quartile differed from the means for the upper quartile and whether the means for the lower quartile differed from those for the middle quartile in each industry.

Using a .05 level of significance, the means of the upper quartiles show a number of significant differences across the four industries (Table 2). The only significant differences between meat manufacturing and meat wholesaling appear between the upper quartile breaks for the current ratio and the sales to receivables ratio, which are both lower for the wholesaling industry.

The comparisons between the upper quartile breaks for the two poultry industries identify a number of differences from meat manufacturing. Meat manufacturers have significantly higher current ratios than do poultry wholesalers. There are, however, no significant differences in the debt to net worth ratios across industries. In terms of profitability, the upper quartile break for poultry manufacturing is significantly higher than for meat manufacturing. In contrast, the poultry wholesaling industry has a significantly lower level of profitability than has the meat manufacturing industry. The meat manufacturing industry's mean sales to receivables ratio is significantly larger than those in either poultry manufacturing or wholesaling. In terms of sales to total assets, both the poultry manufacturing and wholesaling industries show a significantly lower upper quartile break than does the meat manufacturing industry.

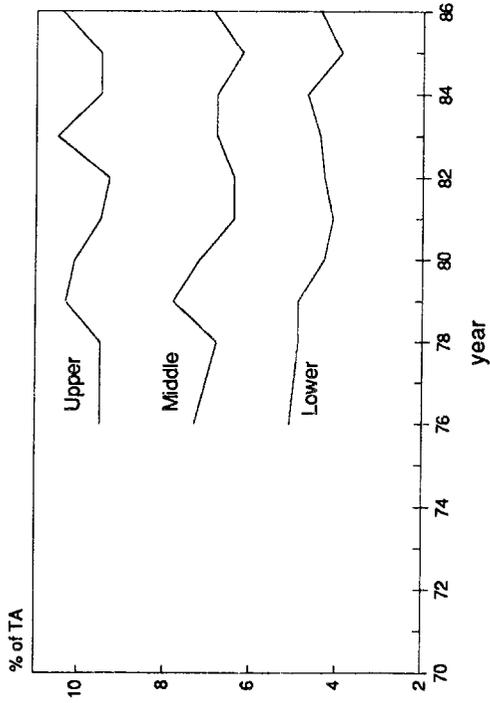
Table 3 presents the means and standard deviations for the lower and middle quartile breaks for each of the four industries. The means for each of the middle quartiles are all significantly smaller than the means for the upper quartiles in each industry (shown in Table 2). Similarly, the means for the lower quartiles are significantly lower than those for the middle quartile for all industries and ratios; except the sales to receivables ratio for poultry manufacturers which shows no significant difference.

Implications

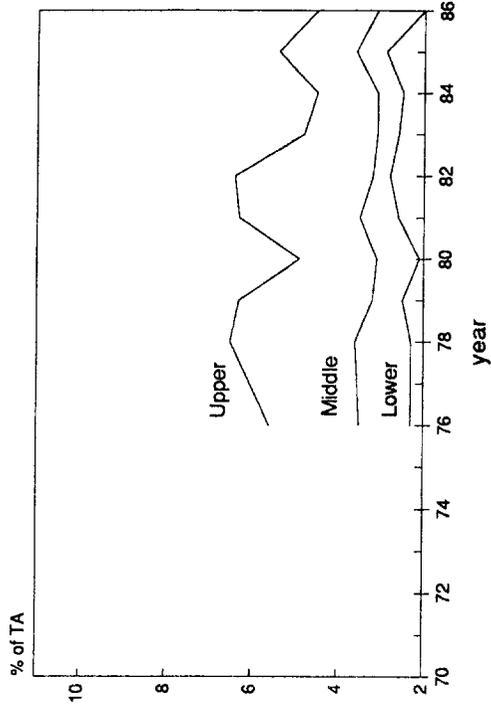
The results presented above suggest a number of implications regarding the financial performance of the meat and poultry manufacturing and wholesaling industries. Generally, similar levels of performance are observed between manufacturing firms and wholesaling firms in the two industries.⁵ It is likely that this similarity of performance is in part related to the high degree of competition between the red meat and poultry industries. Other observations include:

Figure 5. Upper, Middle, and Lower Quartile Breaks for Sales to Total Assets, by Industry, 1970 Through 1986.

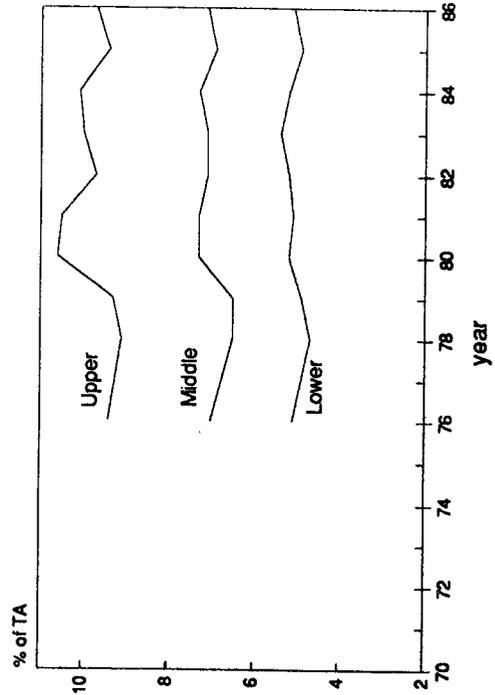
Meat Manufacturers



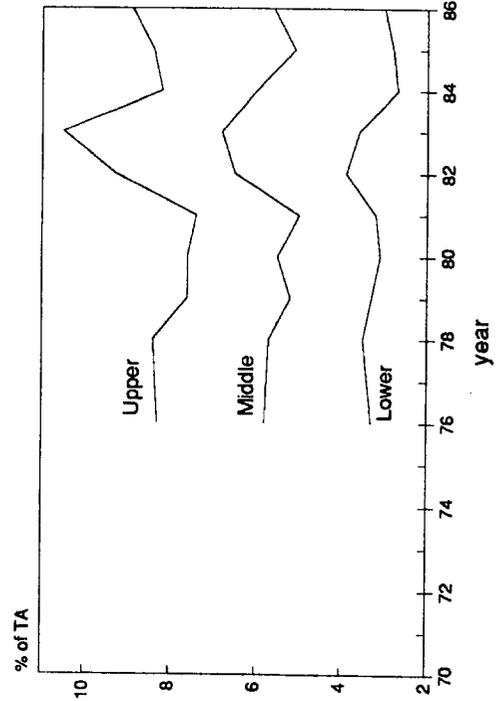
Poultry Manufacturers



Meat Wholesalers



Poultry Wholesalers



Source: Calculated from Robert Morris Associates Annual Statement Studies.

Table 2

**Mean of Upper Quartile Breaks for Financial Performance Measures,
By Industry, 1970 through 1986**

Ratio	Meat Manufacturers	Poultry Manufacturers	Meat Wholesalers	Poultry Wholesalers
<i>Current liabilities to current assets</i>	2.356 (0.1504)	1.987 (0.2326)	1.963* (0.1708)	1.873* (0.1534)
<i>Debt to net-worth</i>	0.675 (0.1065)	0.947 (0.2326)	0.988 (0.1996)	0.940 (0.1639)
<i>Profitability as a % of total assets</i>	13.206 (2.7922)	16.120* (3.5712)	12.088 (1.9745)	11.433* (2.3506)
<i>Sales to receivables</i>	30.744 (1.9173)	23.613* (2.4891)	26.106* (1.3198)	23.300* (1.9272)
<i>Sales to total assets</i>	9.810 (0.4581)	5.520* (0.8135)	9.780 (0.5095)	8.460* (0.9288)

* Indicates that the mean for the industry is significantly different from the mean for the meat manufacturing industry at the .05 level of significance.

NOTE: Figures in () are standard deviations.

- The financial performance criteria examined suggest that the lower quartile breaks have remained fairly constant over time. In contrast, the upper quartile breaks show more volatility across time. This may reflect decisions by some successful firms to sacrifice short term financial performance and position to take advantage of opportunities which may yield long term benefits.
- In terms of liquidity, there are no apparent differences between the meat manufacturing and wholesaling industries and the poultry manufacturing and wholesaling industries.
- Poultry manufacturers appear to be leveraging themselves to capitalize on the current market expansion. In contrast, the older and more established meat manufacturing firms appear to be maintaining or improving solvency positions. In all industries, firms which are highly levered experienced wide fluctuations in debt to net worth positions during the period.
- Profitability levels appear to be similar in the meat and poultry industries examined here, although they are clearly more variable for the poultry firms. However, this may be misleading due to the measure used which

adjusts for assets. Since the poultry industry has expanded in recent years, profitability as a percentage of assets may understate the success of the industry.

- With regard to cash generation, the meat manufacturing industry shows a significantly higher rate of turnover than the other industries. Interestingly, the poultry manufacturing industry shows an apparent decline in the rate of turnover during the 1980s. A similar pattern of behavior is seen with the efficiency measure, sales to total assets. Here again it is likely that the expansion of the asset base in the poultry industry during the recent period adversely affects the industry's ratios.

Concluding Remarks

Data from a widely available and specialized source has been used in this study to provide evidence regarding financial performance in the meat and poultry manufacturing and wholesaling industries. Although not comprehensive, the results nonetheless are informative. In particular, it is interesting to note the similarities in performance within and across industries.

Table 3

**Mean of Middle and Lower Quartile Breaks for Financial Performance Measures,
By Industry, 1970 through 1986**

<i>Ratio Quartile</i>	Meat Manufacturers	Poultry Manufacturers	Meat Wholesalers	Poultry Wholesalers
<i>Current liabilities to current assets</i>				
Middle	1.594* (0.0772)	1.380* (0.1207)	1.406* (0.0574)	1.373* (0.0799)
Lower	1.150* (0.0516)	1.100 (0.1000)	1.113* (0.0342)	1.067* (0.0617)
<i>Sales to receivables</i>				
Middle	24.587* (1.4832)	17.573* (2.1409)	18.769* (1.0688)	16.627* (1.7198)
Lower	19.050* (1.5522)	11.927* (1.6833)	13.425* (0.6991)	11.813* (1.3021)
<i>Debt to net-worth</i>				
Middle	1.319* (0.2257)	1.820* (0.3707)	2.025* (0.3066)	1.940* (0.3814)
Lower	2.956* (0.6623)	3.173* (0.7611)	3.963* (0.7051)	4.227* (1.2555)
<i>Profitability as a % of total assets</i>				
Middle	6.613* (1.6329)	6.860* (3.8318)	6.119* (1.3268)	5.367* (0.8295)
Lower	1.400* (1.5646)	1.247* (5.4170)	2.088* (0.9500)	1.613* (0.8132)
<i>Sales to total assets</i>				
Middle	6.860* (0.4789)	3.300* (0.2211)	7.010* (0.2998)	5.720* (0.5865)
Lower	4.500* (0.3859)	2.450* (0.3064)	5.080* (0.1989)	3.240* (0.3658)

* Indicates that the mean for the middle quartile break is significantly different from the mean for the upper quartile break or that the mean for the lower quartile break is significantly different from the middle quartile break. All tests are at the .05 level of significance.

NOTE: Figures in () are standard deviations.

A number of limitations should be noted and considered in interpreting the results presented above. The data employed in the analysis provide for relative comparisons based on general levels of financial measures for liquidity, solvency, profitability, cash generation and efficiency. Firm by firm comparisons are not possible with the aggregate data provided in the RMA studies. Also, it is likely that firms move around within the quartile breaks across the data period and that some firms are not included throughout the entire data period. Despite these limitations, the analysis presented provides useful information with regard to the performance of a subgroup of firms (namely those associated with RMA member banks) in each industry across a recent historical time period.

Further work in this area should be encouraged to tie the financial performance results here to specific firms or sizes and types of firms. Among the more interesting questions to consider are performance differences between: (1) public and private firms, (2) firms in different product markets (e.g., fresh, frozen, or further processed), (3) firms operating in different geographic areas, and (4) vertically integrated and non-integrated firms.

Endnotes

- [1] In 1976/77 the RMA Statement Studies were changed from a calendar year basis to a fiscal year basis. Due to the comparative nature of the analysis and the fact that only a few months of data were lost in the transition, no adjustment was necessary to account for this change.
- [2] Based on data from the *1982 Census of Manufactures* and the *1982 Census of Wholesale Trade*, the firms in this study represent 19.3 percent of meat manufacturers, 12.1 percent of poultry manufacturers, 16.7 percent of meat wholesalers, and 49.4 percent of poultry wholesalers.
- [3] These subperiods were defined to provide an approximately equal number of years in each period.
- [4] It should be noted that in contrast to the other performance measures where the upper quartile reflects preferred performance, the debt to net worth upper quartile reflects poor performance and the lower quartile reflects preferred performance.
- [5] The observations offered in this section are based on the assumption that firms in each quartile reflect the general level of performance associated with that quartile. As noted by Sonka, Hornbaker, and Hudson, it is possible (and perhaps likely) that firms move in and out of quartiles across the sample period. The implications which follow should be interpreted with this limitation in mind.