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Empirical Evidence on the Motives for Mergers and Acquisitions in Eight Food Industries

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ABSTRACT

This paper investigates the motives for mergers and acquisitions in eight U.S. food products industries from1977-92. Results show that acquired plants were highly productive before mergers and realized an increase in productivity growth in the post-merger period.

KEYWORDS: Food product industries, mergers and acquisitions, labor productivity.

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Introduction

United States food products industries have undergone dramatic business consolidations over the past two decades. The meat packing industry has perhaps had the most striking shift. In cattle slaughter, the four largest firms handled 36% of all steer and heifer slaughter in 1960, but by 1994, only three firms, IBP, Excel and Monfort slaughtered 81% of all steers and heifers (see, Ingersoll, 1996). During a similar time, meat and poultry firms engaged in numerous mergers and acquisitions (M&As), peaking over the 1977-82 period. Based on data derived from the U.S. Bureau of the Census' Longitudinal Research Database (LRD), the value of acquired meat products plants between 1977 and 1982 amounted to $14.10 billion in value of shipments, i.e. 30.43% of 1977 U.S. meat products industry shipments (SIC 201). This is in sharp contrast with the 1972-77 period when acquired plants accounted for only 3.84% of the industry's 1972 total value of shipments.

Other food industries have also experienced major changes. More than one-third of all dairy plants left their industry over the 1977-82 period and by 1992 only about 20 percent of the plants that existed in 1972 still remained. Similar changes occurred in sausage making (SIC 2013), poultry processing (SIC 2015), flour milling (SIC 2041), and feed products (SIC 2048). Of the eight food industries considered in this report, only oil seeds which lost about 50 percent of the plants that existed in 1972 by 1992 deviated substantially from this pattern.

Mergers and acquisitions have played an important role in consolidation of the food industries. The oil seed crushing and poultry processing industries had the highest merger and acquisition rates with 36 and 29 percent respectively of their 1972 plants changing hands from

1972-92. Meat packing and sausage making had the lowest levels with only about 5-percent of their 1972 plants involved in mergers and acquisitions. The other food industries in our sample had merger and acquisition levels ranging from 11-18 percent of 1972 plants.

Changes in industry structure have caused concern about abuses of market power. Congressional hearings held in 1985 and 1990 focused on cattle prices and rancher losses. The 1990 hearings demonstrated the greatest concern, emphasizing packer concentration and the growing control of the three major cattle slaughter firms. Subsequent to these meetings, the U.S. Congress mandated that the U.S. Department of Agriculture (USDA) study the potential monopolistic pricing practices and M&As in the meat packing industry. The USDA used this mandate to contract with several universities to study price determination in slaughter cattle procurement, the effect of concentration on prices paid for cattle, vertical coordination in hog production, hog procurement in the Eastern corn belt, and the role of captive supplies in beef packing. The results were inconclusive but were consistent with results obtained from previous studies (see chapter 7, USDA, 1996).

The USDA report also recommended a study of entry, exit, mergers, market shares, and other market factors. The motives for M&As are a particular concern. If M&As raise industry productivity, then prices to buyers would drop and benefit buyers. However, if they grant market power to particular firms, then they may concentrate purchasing power in commodity procurement and selling power in product marketing activities and adversely affect suppliers and buyers alike. Thus, Federal authorities closely scrutinize mergers and acquisitions and ongoing firm activities for potentially anti-competitive impacts. Federal authorities, for example, prevented a merger between Conagra and Archer-Danials Midlend in the late 1990s because of concerns about potentially anti-competitive behavior. Even without the merger, Census data shows that the four largest firms in the soybean processing industry stood at about 80 percent and the four largest firms in the other oil-seed, mainly cottonseed, industries was about 66 percent. Besides these investigations of M&As, the Grain Inspection and Stockyards Administration of USDA conducted 27 investigations of potentially anti-competitive behavior in the meat packing industry in 2001. These cases addressed attempted restrictions of competition, apportionments of territory, and failures to compete.

Mergers and Acquisitions: Motives and Consequences.

There are several theories on why M&As occur. One group of economists views them as a way to gain monopoly power or pursue some other antisocial activity (Mueller, 1999; Roll, 1986). Under this theory, firms combine in order to gain market share so they can either charge high prices to buyers or pay low input prices to suppliers.

Another group of economists asserts that opportunistic managers undertake mergers in order to build an empire (Baumol, 1967; Mueller, 1999) or entrench themselves (Shleifer and Vishny, 1989) or, suffer from hubris, thinking mistakenly that they can improve the acquired firms' performance (Roll, 1986). A final group of economists contends that efficiency motives drive M&As, arguing that only efficient firms survive while inefficient ones are taken over (Manne, 1965; Mead, 1968; Jensen, 1988).

Two "efficiency" theories often cited in recent empirical studies are "disciplinary mergers" and "synergistic" mergers. The theory of disciplinary mergers asserts that M&As discipline target firms' managers who pursue objectives other than profit maximization. The theory of synergistic mergers, on the other hand, asserts that firm mangers achieve efficiency gains by combining the businesses of the acquired and acquiring firm. Empirically, the theory of disciplinary mergers suggests that acquiring firms merge with poorly performing firms and improve their performance, while the synergistic theory implies that target firms (or plants) perform well both before and after mergers. Under either theory, gains could be achieved by improving productivity in manufacturing plants or combining marketing, research and development, or other activities.

Efficiency theories and market power explanations for M&As are not mutually exclusive. When firms with superior management buy highly productive plants in their industry and increase their productivity, they must increase their market share unless the new acquisition only allows them to keep pace with growth in demand. The gain in market power could have an anti-social impact if the firm becomes so large that it could influence prices.

Empirical studies offer sharply differing perspectives of the motives for M&As. Early empirical studies in the fields of industrial organization and finance found little evidence of efficiency gains from M&As[1]. With the development of the LRD at the U.S. Bureau of the Census, comprehensive data have been available on the operations of U.S. manufacturing plants both before and after mergers. Using these data, researchers have conducted a number of empirical studies. Lichtenberg and Siegel (1992) used a balanced panel of large continuous U.S. manufacturing plants to study the relationship between ownership changes (through M&As) and the productivity performance of acquired plants before and after acquisitions. They found that ownership changes are negatively related to plants' pre-acquisition productivity. They also found that acquired plants improve their productivity significantly after mergers. Thus, they concluded that ownership change is motivated by lapses in the productive efficiency of firms.

McGuckin and Nguyen's (1995) study used plant-level data taken from the LRD for the entire U.S. food and beverage industry (SIC 20) to study the relationship between ownership change and productivity for the period 1977-87. They found that ownership change is positively related to both initial productivity and productivity growth after acquisitions. Their results are consistent with Lichtenberg and Siegel's (1992) finding that ownership change is negatively related to initial productivity for large firms. However, their results differ in that they found a positive relationship for smaller plants whereas Lichtenberg (1992) did not. Like Lichtenberg and Siegel (1992), they also found a positive relationship between productivity growth and ownership change. They concluded that firms acquire poorly performing large targets in order to discipline managers and make smaller acquisitions for synergistic reasons.

While the above studies are important, they either used data for the entire U.S. manufacturing sector (Lichtenberg and Siegel, 1992) or for a broadly defined industry, such the U.S. food and beverage industry (McGuckin and Nguyen, 1995). Thus, their "representative" results may not hold for more narrowly defined industries. Below, we consider the efficiency of M&As in eight, separate food industries: meat packing, sausage making, poultry slaughter and processing, cheese, milk, flour milling, feed products, and oil seeds.

Empirical Model

According to the theory of disciplinary mergers, firms with incompetent managers perform poorly before a merger and, under a more competent management, have improved performance afterwards. The theory of synergistic mergers, on the other hand, suggests that acquiring firms target only productive firms and improve their performance after the merger.

A Probit Model of M&As:

The foregoing discussion suggests that the probability of a firm being acquired is partly a function of its pre-merger performance. Following McGuckin and Nguyen (1995) and Lichtenberg and Siegel (1992), we specify the following probit model:

$$(1) \qquad AC_{t,\,t+1} = a_0 + a_1Log(P_t) + a_2Log(S_t) + a_3Log(SR_t) + a_4OM + a_5NF + a_6Log(P_t).Log(S_t) + a_7Log(P_t).Log(SR_t) + a_8Log(P_t).OM_t + a_8Log(P_t).NF_t + u_i,$$

where $AC_{t,\,t+1}$ is a dummy variable equal to one if the plant was acquired over the period from time = t to t+1 and zero if not acquired. P and S denote the plant's pre-merger performance and plant size. SR denotes plants' primary specialization ratio. The variables OM and NF represent plants that produce products outside of the industry under consideration, e.g. meat packing for the study of that industry and non-food products (i.e., not in SIC 20).

Equation (1) is similar to those used by McGuckin and Nguyen (1995) and Lichtenberg and Siegel (1992) in that it includes P and S as independent variables. We use pre-merger relative labor productivity (P) as a measure of performance. A positive coefficient for P suggests that acquirers purchased efficient plants and supports the synergy hypothesis. Conversely, a negative coefficient on P would support the managerial discipline theory.

Following McGuckin and Nguyen (1995) and Lichtenberg and Siegel (1992), we use total employment as a measure of size, S. Those studies found that size is an important factor affecting the likelihood of a plant being acquired. Earlier, Dunn, Roberts and Samuelson (1989) found that large plants have lower failure rates than small plants.

MacDonald et al. (2001) and Ollinger et al. (2001) found that plants shifted dramatically toward a greater specialized output mix over 1967-92, thus we include the specialization ratio (SR) to control for product mix. The other variables control for plant type differences.

M&A and Productivity Change:

Consistent with previous studies, we examine the change in productivity with the following equation:

$$(2) \qquad \Delta P = a_0 + a_1 Pr(AC_t) + a_2 O_t + a_3 Log(P_t) + a_4 Log(S_t) + a_5 \Delta(K/L)_t + a_6 Age + a_7 MULTI_t + a_8 OM_t + a_{10} NF_t + a_{11} \Delta(NW/PW)_t + a_{12} Log(S_t).Log(P_t) + a_{13} Log(S_t).Pr(AC_t) + a_{14} Log(S_t).O_t + u_{t.}$$

where ΔP, is the change in the plant's relative labor productivity; Pr (AC) is an instrumental variable for the probability of a plant being acquired. The dummy variable O identifies whether the plant was originally owned by an acquiring firm in 1977 (for the period 1977-82) or in 1982 (for the period 1982-87) and indicates the productivity growth of other plants owned by an acquiring firm. The changes in the plant's capital/labor ratio $\Delta(K/L)$ and the non-production (white-collar) worker to production worker ratio ($\Delta(NW/PW)$) controls for the changes in plant capital intensity and worker skill mix. Plant age is controlled for with AGE. Other variables are defined above. The instrumental variable is the fitted value of AC, which was estimated in equation (1) and is constructed as Pr(AC) = q(- ACHAT), where q is the cumulative density function for the standard normal variable and ACHAT as the fitted value of AC.

Data and Performance Measurement

Firm versus Plant-level:

Economists considered M&As have a choice of using either the firm or plant as the unit of analysis. The firm may be appropriate as the unit of analysis for studies of market power, but using it in a study of the efficiency of M&As confounds the analysis in two ways. First, consider what constitutes an acquisition. An acquiring firm can buy an entire firm, all of the plants of a firm in one industry, some of the plants a firm owns in one or more industries, or a single plant. Additionally, acquiring firms could sell plants in the same industry in which it makes acquisitions or in other industries.

The second problem with using the firm as the unit of analysis deals with the measurement of plant performance? Firm performance is average plant performance across all plants. Thus, a firm could perform superbly in one plant but poorly in others, might do well in one of its industries but not in another, or may do poorly or well in all of its plants in all of its industries.

Plant level analysis avoids many problems inherent to a firm analysis. A plant-level analysis can accommodate plants owned by firms that sell only one plant or all of their plants or are both buyers and sellers of plants. Similarly, a plant-level analysis avoids mixing productivity across units since a single plant is unaffected by the productivity of other plants.

Data Sources:

The plant level data come from the Longitudinal Research Database (LRD) and the Ownership Change Database (OCD) at the Bureau of the Census. The LRD includes data on the total value of shipments, capital investments, labor, energy, materials, and selected purchased services. It also has various plant classifications, such as plant location, primary industry, and status codes, which identify, among other things, birth, death, and ownership changes.[2] The OCD is also a plant-level database that was constructed by linking data in the U.S. Census of Manufactures and Annual Survey of Manufactures for the period 1963-92. This database contains U.S. manufacturing plants that were acquired at least once during this period.[3]

Sample Coverage:

We examine eight food industries over 1977-92: meat packing (SIC 2011), sausage-making (SIC 2013), poultry slaughter (SIC 2015), cheese (SIC 2022), milk (SIC 2026), flour milling (SIC 2041), feed grains (SIC 2048), and oil seeds (SIC 2046, 2074, and 2075 combined). We evaluate plant productivity in 1977 to that achieved in 1987 for plants acquired from 1977-82 and, similarly, consider productivity in 1982 and 1992 for plants acquired from 1982-87.

There are several reasons for focusing on mergers occurring over the 1977-92 period. First, the period encompasses four censuses of manufactures (1977, 1982, 1987, and 1992). Census years are advantageous over non-census year because the data contain all plants in census years but only a sample of plants in non-census years. Second, the period encompasses the beginning years of the latest merger movement, which extended until 1987. Third, and perhaps most important, the use of the 1977-92 period allows us to evaluate the performance of plants and firms 5 to 9 years after acquisitions. This provides sufficient time for the acquiring firm to integrate acquired plants into their operations, or to dispose of them.

M&As in the Food Industries

Using the OCD, we identified all meat, poultry, dairy, and grain plants that were acquired during the 1977-82 and 1982-87 periods. After noting firm ownership, we identified all manufacturing plants in the industry of interest owned by acquiring and non-acquiring firms at the beginning of the period (1977 or 1982), whether or not they were located in the meat, poultry, dairy, or grain industries. For cattle slaughter, data reveal that firms acquired 251 meat-packing plants from 1977-82 and that these firms owned a total of 684 plants in 1977 that did not change hands by 1982. Meat-packing firms that made no acquisitions, on the other hand, owned 2,042 plants in 1977 that were not acquired by 1982. For the other industries, the number of acquisitions varied from 178 in sausages to 439 in feed and the number of plants owned by buyers ranged from 984 in the oil seeds to 2,690 in feed. From 1982-87, the number of acquisitions in the 8 industries varied from 175 in cheese to 480 in flour milling.

Productivity:

Productivity can either be measured for each single input, such as labor (labor productivity), or for all inputs, total factor productivity (TFP). Theoretically, TFP is superior to labor productivity because it takes into account all inputs. However, like most other researchers, we use labor productivity because plant capital data are not available.

Measurement problems do arise with labor productivity. It is preferable to define labor productivity as real output divided by labor inputs. However, we do not have output prices and the value of output varies across plants and over time due to price dispersion and inflation.[4]

Thus, we use relative labor productivity (RLP) -- the ratio of plant labor productivity (LP) to average industry labor productivity (ALP).

(3) $RLP_{ij} = LP_{ij} / ALP_j$,

where i and j denote plant i and four-digit SIC industry j, respectively. Plant labor productivity, LP and ALP are measured as value of output in current dollars, divided by the total work hours.[5]

M&As and Productivity:

For the eight food industries in our sample, we normalized estimated relative productivity to their sample means. The data show that acquired plants generally have above industry-average labor productivity -- ranging from 0.93-1.43 in meat and poultry, 1.08-1.43 in dairy, and 0.78-1.25 for grains -- suggesting that, on average, the pre-merger labor productivity of acquired plants exceeded the industry average. Acquired oil seed plants had lowest productivity measures.

Average 1977 relative labor productivity of plants owned by buying firms in 1977 that they kept until 1987 ranged from 0.90-1.30 in meat and poultry. By contrast, plant productivity for plants owned and retained until 1987 by non-acquiring firms was about 0.82. The plants that these firms sold had much higher productivity levels, ranging from 0.82 to 1.20. For the dairy industry, productivity varied from 0.85-1.49 and 0.74-1.45 for plants kept until 1987 by buying and non-buying firms, respectively. Plants sold by nonacquiring firms had productivity levels of about 1.40. The trends in labor productivity are similar for the 1982-92 period. These data reveal that non-buying firms sold their most productive plants while buyers kept their plants with the highest productivity and closed or resold the others[6].

The foregoing data strongly suggest that acquirers purchased relatively productive plants. Other factors could also account for differences in productivity across ownership change status, so it is necessary to evaluate the model of mergers and acquisitions described in equation 1.

Empirical Results

Productivity and M&As:

Tables 1-3 contain the estimates of the probit regressions for the motives for M&As during the 1977-82 and 1982-87 periods. Columns (1), (3) and (5) have the 1977-82 results and columns (2), (4) and (6) contain the 1982-87 results. The tables show that initial relative labor productivity (PROD), plant size (SIZE)), and plant specialization (SPEC) have generally significant and positive effects on M&As. Only cheese (both periods) and milk and oil seeds for 1977-82 deviate from the positive and significant pattern for productivity and only oil seeds over the 1977-82 period does so for plant size. For plant specialization, only cattle slaughter (1982-87), feed (1982-87), and oil seeds for both periods differ from the generally positive results.

Productivity results are consistent with those of McGuckin and Nguyen (1995). Their estimated coefficients of productivity for the entire food industry in 1977 equaled 0.454, whereas our results, except for oil seeds, ranged from 0.08-0.54 in 1977 and 0.07-0.70 in 1982. .

The interaction between productivity and size was generally significant and positive in 1977 but of mixed signs in 1982. This result differs somewhat from McGuckin and Nguyen (1995) who found the interaction term to be significantly negative in 1977.

Our general finding that firms acquired productive plants supports the synergistic theory of mergers and is consistent with McGuckin and Nguyen (1995) but differs somewhat from Lichtenberg and Siegel (1992). Differences with Lichtenberg and Siegel (1992) are likely due to the types of plants considered -- their study considered only plants with at least 250 employees. Our analysis, on the other hand, controls for a number of intervening factors and is based on all plants in eight food industries producing commodity-type products.

Results differ from McGuckin and Nguyen (1995) and Lichtenberg and Siegel (1992) in that they show that plant specialization also encourages plant acquisitions. This result is consistent with the trend to greater specialization in the meat industry over the 1963-92 period as observed by MacDonald, et al. (2001).

We use the parameter estimates of the non-linear probit models to calculate the probabilities of plant acquisitions for plants in the meat packing, sausage, and poultry slaughter industries. The probability of an acquisition changes dramatically with both average labor productivity and plant size. For meat packing, the probability of plant ownership change ranges from less than 1% for plants with relative labor productivity and plant size in the 10th percentile for 1977-82 and 1982-87 to almost 50% and 25% for plants with relative labor productivity and size in the 95th percentile during the 1977-82 and 1982-87 periods. For meat sausages, probability of ownership change ranged from less than 1% at the 10th percentile for both periods to 25% and 50% at the 95th percentile for both periods. Finally, for poultry slaughter, the probability of ownership change ranged from about 3% at the 10th percentile for both periods to about 50% at the 95th percentile for both periods.

Summarizing, our regression and probability analyses indicate that M&As are positively correlated with productivity and plant size. The results are consistent with findings by Ravenscraft and Scherer (1987), Matsusaka (1993) and McGuckin and Nguyen (1995) but differ from Lichtenberg and Siegel's (1992) general conclusion that low productivity leads to ownership change. These results suggest that a synergistic efficiency motive could be the motivating force underlying mergers and differ from those results required for a managerial discipline explanation. If firms intend to build empires or monopolies, the results suggest that they do it in an efficient way by acquiring the very best assets (existing plants).

Post-Merger Productivity Performance:

Tables 4-6 contain the results of the productivity growth regressions. For each table, the odd number columns show the results for 1977-87 and the even number columns contain the estimates for 1982-92. We are mainly interested in the performance of plants that are likely to be acquired. The estimated coefficient for the probability of ownership change -- Pr(AC) – is positive and significant in 6 of the 8 industries and negative in only one industry over 1977-87 and positive and significant in 4 of the industries and, again, negative in only 1 industry over 1982-92. The interaction of probability of ownership change and plant size – Pr (AC) Log (SIZE) -- is negative and significant in 7 of the 8 industries over 1977-87, but only 3 of 8 industries over 1982-92. In 4 of the 1982-92 cases, results were negative but insignificant.

Results are generally consistent with McGuckin and Nguyen (1995) in that smaller plants experienced productivity growth while larger ones did not. For example, acquired plants with more than 250 employees in the meat packing industry and with more than 350 employees in sausages had lower growth than their nonacquired competitors.

Results differ from McGuckin and Nguyen (1995) and Lichtenberg and Siegel (1992) in that this report shows a much more detailed view of the sources of productivity growth. Our model considers plant age, plant investments (the change in capital stock over the growth period), and changes in the quality of the workforce. It also considers type of firm (buyer or seller) owning the plant. Results show that changes in capital stock and quality of the workforce but not type of firm or plant age have effects on productivity growth.

Discussion:

Results of the model of the impact of plant mergers on productivity show that acquired food plants in eight industries were highly productive before mergers and that smaller plants improved their productivity growth from 1977-87 and 1982-92. In none of the eight industries did we find that buying firms acquired unproductive plants and in only two (poultry for 1977-87 and feed for 1982-92) did we find that acquisition had a negative impact on plant productivity.

Results are consistent with McGuckin and Nguyen’s (1995) finding for the food and beverage industry (SIC 20). They are also consistent with Baldwin (1991) who found that acquired Canadian manufacturing plants of all types had higher average productivity than other Canadian plants. Finally, results are consistent with Lichtenberg and Siegel (1992) who found that plants involved in leverage buyouts in U.S. manufacturing had above average relative productivity during the three years before their buyouts.

Results support the hypothesis that synergy is a central motive for M&As. If managerial discipline was the motive for mergers, then firms would buy under-performing plants rather than the highly productive plants that they actually purchased.

The finding that plant acquisitions lead to productivity growth is consistent with other research on M&As (Baldwin; Lichtenberg and Siegel, 1992; McGuckin and Nguyen, 1995) and supports both the synergy and managerial-discipline theories, which predict that firms make M&As in order improve plant performance in the post-acquisition period.

Notice that our results for M&As and productivity growth are not entirely consistent with previous studies. There was a decline in productivity growth in poultry slaughtering from 1977-87 and feed from 1982-92 and no significant improvement in productivity after M&As in milk during the 1977-87 period and poultry, flour milling and oil seeds over 1982-92.

Many of these differences may be due to growth prospects in the industries. Poultry demand from export and domestic markets grew very rapidly over the 1977-92 period as per capita poultry consumption rose by 50 percent (MacDonald et al, 2000). Meanwhile, per capita red meat consumption declined by about 15 percent (MacDonald et al, 2000) and overall demand stagnated. This change in demand led to a rapid consolidation among meat products firms while the number of poultry plants changed very little. Another difference is that the meat industry is much more heterogeneous than the poultry industry in terms of plant size and productivity performance, meaning there exists a wide variety of plants from which to make an acquisition. For example, very few chicken and turkey slaughter plants with fewer than 100 employees existed by 1992 and most output was produced by plants with more than 400 employees (Ollinger et al, 2001). In cattle slaughter, on the other hand, there are hundreds of plants with less than 20 employees even though the industry is dominated by a few very large firms that increased their size dramatically over the 1977-92 period. Taken together, these features suggest that meat-packing and sausage firms could be selective in the types of plants that they bought because excess capacity and a diversity of troubled plants in their industries enabled them to acquire highly productive underused assets that they could better exploit than their original owners. Poultry firms, on the other hand, needed more capacity and could have purchased fully utilized plants that allowed for little increase in productivity growth.

Overall the results are consistent with McGuckin and Nguyen (1995) for the food industry. However, they do illustrate that conduct and performance of an individual industry can and does differ from that of a broadly defined industry. Thus, studies at the individual industry level, such as this one, are necessary to evaluate the impact of certain types economic activity, such as M&As, on the performance of an individual industry.

Many of those who follow the food industries have been concerned about rising industry concentration and market power. Results presented here do not directly address those questions. However, they do show that, if market power results from a merger, then the acquiring firm acted efficiently by purchasing only the best performing plants and providing superior management that improved productivity.

Concluding Comments

This analysis provides evidence that food firms preferred to acquire highly productive plants. Moreover, with the possible exception of two industries, these acquired plants experienced significant improvements in productivity during the post-merger period. Taken together results suggest that synergies and related efficiencies are important motives for M&As.

Note that our analysis of the impact of M&As on plants' productivity is based on surviving plants. Yet, acquiring firms did close and resell a significant number of plants that they acquired, raising the possibility that productivity gains are due to displacement of jobs and plant closings. If this is the case, the overall benefits of M&As are not so clear. Our future work will take a closer look at the impact of M&As on employment, wages and plant closings.

Endnotes

1. See Jensen and Ruback (1983), Smith (1986), and Jerell, Brickley and Netter (1998) for finance study reviews and Mueller (1993) for industrial organization reviews.

2. A more complete description of the LRD is given in McGuckin and Pascoe (1988).

3. For a detailed description of the OCD, see Nguyen, 1998

4. Using plant-level 1982 Census of Manufactures data, Abbott (1989) found that 7-digit product level prices vary substantially across plants,

5. This relative productivity ranking approach was suggested by Christensen, Cummings, and Jorgenson (1981), and has been applied in recent productivity analyses using plant level data from the LRD (e. g., Olley and Pakes, 1990; Bartelsman and Dhrymes, 1992; Bailey et al., 1992, McGuckin and Nguyen, 1995). An important property of this productivity measure is that it does not depend on an output deflator because output in all plants is measured in current year dollars. Accordingly, it can be used in intertemporal comparisons (see Bailey et al., 1992, p.192).

6. The productivity of closed plants could be overstated because plants could be identified as "closed" that actually were reclassified as non-manufacturing plants. These plants would have disappeared from the Census of Manufacturers and would have been counted as closed. In addition, it is likely that sales from inventory and labor reductions around the time of closing may have "inflated" labor productivity.

Table 1: Probit Regression of Acquisitions in the Meat and Poultry Industries over the 1977-82 and 1982-87 Periods (standard errors in parentheses)

Variable	Meat Packing Product (SIC 2011)		Sausages and Other Prepared Meats (SIC 2013)		Poultry Slaughtering and Processing (SIC 2015)	
	1977-82	1982-87	1977-82	1982-87	1977-82	1982-87
Intercept	-3.56***	-2.17***	-4.44***	-3.21***	-2.22***	-2.68***
	(0.18)	(0.22)	(0.24)	(0.19)	(0.06)	(0.22)
Log (PROD)	0.30***	0.70***	0.18*	0.35***	0.35***	0.19*
	(0.08)	(0.09)	(0.11)	(0.07)	(0.10)	(0.10)
Log (SIZE)	0.30***	0.25***	0.29***	0.29***	0.25***	0.27***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Log (SPEC)	0.23***	-0.08*	0.39***	0.17***	0.25***	0.09*
	(0.04)	(0.05)	(0.05)	(0.04)	(0.04)	(0.05)
NOTMEAT	0.25***	0.98***	-	-	-	-
	(0.03)	(0.03)				
NOTSAUS	-	-	0.73***	0.61***	-	-
			(0.04)	(0.03)		
NOTPOLT	-	-	-	-	0.76***	0.61***
					(0.03)	(0.03)
NOTFOOD	0.23***	0.95***	0.16***	0.59***	0.52***	0.33***
	(0.03)	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)
Log (SIZE)*	0.090***	-0.07***	0.045*	0.03**	0.027	0.046***
Log (PROD)	(0.016)	(0.02)	(0.024)	(0.015)	(0.017)	(0.018)
NOTMEAT*	-0.64***	-0.64***	-	-	-	-
Log (PROD)	(0.05)	(0.05)				
NOTSAUS*	-	-	-0.45***	-0.43***	-	-
Log (PROD)			(0.07)	(0.05)		
NOTPOLT*	-	-	-	-	-0.53***	-0.26***
Log (PROD)					(0.06)	(0.06)
NOTFOOD*	-1.09***	-1.09***	-1.02***	-0.73***	-0.76***	-0.90***
Log (PROD)	(0.06)	(0.06)	(0.09)	(0.07)	(0.08)	(0.08)
Log Likelihood	-6277	-6277	-4167	-7193	-5933	-6028
N	2977	2977	1804	2078	1272	1207

*, **, *** significant at the 10, 5, and 1 percent level, respectively.

Table 2: Probit Regression of Acquisitions in Dairy Industry over the 1977-82 and 1987-92 Periods (standard errors in parentheses)

Variable	**Cheese Products (SIC 2022)**		**Milk Products (SIC 2026)**	
	1977-82	1982-87	1977-82	1982-87
Intercept	-3.21^{***} (0.25)	-5.10^{***} (0.30)	-3.64^{**} (0.15)	-2.64^{***} (0.21)
Log (PROD)	-0.18^{*} (0.10)	0.07 (0.10)	0.09 (0.07)	0.45^{***} (0.08)
Log (SIZE)	0.31^{***} (0.01)	0.36^{***} (0.01)	0.24^{***} (0.01)	0.29^{***} (0.01)
Log (SPEC)	0.22^{***} (0.05)	0.50^{***} (0.06)	0.06^{***} (0.015)	0.14^{**} (0.043)
NOTCHES	0.46^{***} (0.04)	0.74^{***} (0.04)	-	-
NOTMILK	-	-	0.43^{***} (0.02)	0.45^{***} (0.03)
NOTFOOD	-1.17^{***} (0.09)	0.61^{***} (0.06)	-0.26^{***} (0.03)	-0.29^{***} (0.04)
WEST	-0.23^{***} (0.06)	-0.03 (0.05)	-0.16^{***} (0.03)	0.06^{**} (0.03)
Log (PROD)* Log (SIZE)	0.16^{***} (0.02)	-0.07^{***} (0.02)	0.06^{***} (0.015)	-0.047^{***} (0.02)
NOTCHES* Log (PROD)	-0.11^{*} (0.07)	0.28^{***} (0.07)	-	-
NOTMILK* Log (PROD)	-	-	-0.22^{**} (0.04)	-0.45^{***} (0.04)
NOTFOOD* Log (PROD)	-1.19^{***} (0.09)	0.14^{***} (0.08)	-0.67^{***} (0.06)	-0.05 (0.06)
WEST* Log (PROD)	0.36^{***} (0.09)	0.26^{***} (0.08)	0.17^{***} (0.05)	0.41^{***} (0.05)
Log Likelihood	-4117	-3716	-9114	-7301
N	1199	1079	2797	1823

*, **, *** significant at the 10, 5, and 1 percent level, respectively.

Table 3: Probit Regression of Acquisitions in the Grain Industry over the 1977-82 and 1982-87 Periods. (standard errors in parentheses)

Variable	Flour Milling (SIC 2041)		Feed Products (SIC 2048)		Oil Seeds—corn, cottonseed, and soy (SIC 2046,2074,2075)	
	1977-82	1982-87	1977-82	1982-87	1977-82	1982-87
Intercept	-2.74***	-3.45***	-2.43***	-0.63***	-0.29*	0.01
	(0.15)	(0.17)	(0.12)	(0.14)	(0.16)	(0.15)
Log (PROD)	0.54***	0.36***	0.48*	0.68***	0.08	0.13**
	(0.09)	(0.08)	(0.06)	(0.05)	(0.08)	(0.065)
Log (SIZE)	0.14***	0.28***	0.13***	0.25***	-0.015	0.078***
	(0.01)	(0.01)	(0.01)	(0.10)	(0.01)	(0.01)
Log (SPEC)	0.21***	0.28***	0.12***	-0.58***	-0.016	-0.17***
	(0.03)	(0.04)	(0.03)	(0.03)	(0.036)	(0.03)
NOTFLOUR	0.45***	0.59***	-	-	-	-
	(0.04)	(0.04)				
NOTFEED	-	-	0.94***	0.40***	-	-
			(0.03)	(0.03)		
CORN	-	-	-	-	-0.48***	-0.11
					(0.08)	(0.07)
COTTONSEED	-	-	-	-	-0.48***	-0.91***
					(0.07)	(0.14)
SOY	-	-	-	-	-0.57***	-0.05
					(0.06)	(0.05)
NOTFOOD	0.17***	0.05***	-0.14***	-0.32***	-0.15***	-0.023
	(0.05)	(0.03)	(0.04)	(0.04)	(0.03)	(0.027)
Log (PROD)*	0.03*	0.039**	-0.07***	-0.07***	0.017	-0.10***
Log (SIZE)	(0.016)	(0.016)	(0.02)	(0.016)	(0.017)	(0.014)
NOTFLOUR*	-0.95***	-0.77***	-	-	-	-
Log (PROD)	(0.08)	(0.07)				
NOTFEED*	-	-	-0.08*	-0.72***	-	-
Log (PROD)			(0.05)	(0.05)		
CORN*	-	-	-	-	-0.64***	0.07
Log (PROD)					(0.13)	(0.11)
COTTONSEED	-	-	-	-	-0.22*	0.66***
*Log (PROD)					(0.12)	(0.15)
SOY*	-	-	-	-	-0.95***	0.44***
Log (PROD)					(0.09)	(0.08)
NOTFOOD*	0.42***	0.30***	-0.27***	0.001	-0.26***	-0.024
Log (PROD)	(0.05)	(0.05)	(0.05)	(0.06)	(0.05)	(0.027)
Log Likelihood	-6530	-8260	-8708	-7750	-5420	-8311
N	1633	1563	2690	2099	984	1374

*, **, *** significant at the 10, 5, and 1 percent level, respectively.

Table 4: Productivity Growth Regressions for the Meat and Poultry Slaughter and Processing Industries over the 1977-87 and 1982-92 Periods. (t-statistics in parentheses)

Variable	**Meat Packing (SIC 2011)**		**Sausages and Other Prepared Meat (SIC 2013)**		**Poultry Slaughter and Processing (SIC 2015)**	
	1977-87	**1982-92**	**1977-87**	**1982-92**	**1977-87**	**1982-92**
Intercept	-0.53***	-0.61***	-0.59***	-0.25*	0.32***	0.05
	(0.05)	(0.08)	(0.06)	(0.07)	(0.12)	(0.12)
Log (PROD)	-0.74***	-0.40***	-0.89***	-0.70***	0.11	-0.20*
	(0.06)	(0.08)	(0.10)	(0.07)	(0.13)	(0.11)
Log (SIZE)	0.11***	0.12***	0.13***	0.04**	-0.08***	0.003
	(0.015)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
Pr. (AC)	1.07***	0.94**	2.48***	0.76*	-0.73*	0.33
	(0.27)	(0.46)	(0.53)	(0.44)	(0.43)	(0.42)
BKEP	0.56***	0.09	-0.08	0.01	0.21	-0.32**
	(0.14)	(0.17)	(0.27)	(0.13)	(0.15)	(0.13)
NOTMEAT	0.012**	0.27***	-	-	-	-
	(0.055)	(0.08)				
NOTSAUS	-	-	-0.07	0.22***	-	-
			(0.08)	(0.06)		
NOTPOLT	-	-	-	-	-0.05	0.15**
					(0.07)	(0.06)
NOTFOOD	-0.04	-0.007	-0.07	0.01	-0.15*	-0.09
	(0.07)	(0.10)	(0.13)	(0.07)	(0.09)	(0.07)
MULTI	0.04	0.02	0.07	-0.02	0.02	-0.11**
	(0.05)	(0.06)	(0.06)	(0.04)	(0.06)	(0.05)
AGE72	-0.07*	-0.04	-0.06	0.05	0.01	-0.07
	(0.04)	(0.05)	(0.04)	(0.04)	(0.05)	(0.05)
AGE77	-	-0.08	-	0.06	-	-0.11
		(0.06)		(0.05)		(0.065)
Δ (CAP/SALE)	-0.49***	-0.56***	-0.50***	-0.53***	-0.59***	-0.53***
	(0.07)	(0.06)	(0.07)	(0.06)	(0.08)	(0.07)
Δ (NONPW/PW)	-0.11***	0.03	-0.09***	0.01	-0.08**	0.0001
	(0.03)	(0.04)	(0.03)	(0.02)	(0.04)	(0.02)
Log (PROD)*	0.09***	0.01	0.10***	0.058***	-0.11***	0.02
Log (SIZE)	(0.016)	(0.02)	(0.025)	(0.016)	(0.03)	(0.02)
Pr. (AC)*	-0.21***	-0.20***	-0.47***	-0.12*	0.19**	-0.03
Log (SIZE)	(0.05)	(0.07)	(0.09)	(0.07)	(0.08)	(0.07)
BKEP*	-0.10***	-0.02	-0.018	-0.01	-0.03	0.06**
Log (SIZE)	(0.027)	(0.03)	(0.05)	(0.03)	(0.03)	(0.025)
Adj. R^2	0.31	0.21	0.37	0.32	0.30	0.23
N	922	843	658	1035	554	609

*, **, *** significant at the 10, 5, and 1 percent level, respectively.

Table 5: Productivity Growth Regressions for Dairy Industry over the 1977-87 and 1982-92 Periods.

Variable	Cheese Products (SIC 2022)		Milk Products (SIC 2026)	
	1977-87	1982-92	1977-87	1982-92
Intercept	-0.60*** (0.08)	-0.27*** (0.08)	-0.27*** (0.07)	-0.02 (0.07)
Log (PROD)	-0.61*** (0.10)	-0.50*** (0.04)	-0.66*** (0.02)	-0.41*** (0.03)
Log (SIZE)	0.13*** (0.02)	0.002 (0.04)	0.07*** (0.02)	0.006 (0.03)
Pr. (AC)	1.02** (0.43)	0.55** (0.25)	0.48 (0.39)	0.53* (0.32)
BKEP	0.40** (0.18)	0.09 (0.06)	0.08 (0.13)	0.04 (0.05)
NOTCHES	0.025 (0.06)	0.03 (0.11)	-	-
NOTMILK	-	-	0.20*** (0.05)	-0.02 (0.05)
NOTFOOD	0.01 (0.08)	-0.45*** (0.17)	-0.13** (0.05)	-0.07 (0.07)
WEST	0.18 (0.24)	-0.025 (0.07)	0.04 (0.12)	0.09** (0.04)
MULTI	0.10 (0.08)	0.21** (0.09)	0.13** (0.05)	0.10* (0.054)
AGE72	-0.00 (0.06)	0.04 (0.06)	-0.10** (0.05)	-0.19*** (0.06)
AGE77	-	0.03 (0.08)	-	-0.19** (0.08)
Δ (CAP/SALE)	-0.63*** (0.10)	-0.70*** (0.10)	-0.39*** (0.05)	-0.51*** (0.08)
Δ (NONPW/PW)	-0.07** (0.03)	-0.09*** (0.03)	-0.04*** (0.01)	-0.01 (0.01)
Log (PROD)* Log (SIZE)	0.06** (0.025)	0.08** (0.03)	0.06*** (0.02)	0.05** (0.02)
Pr. (AC)* Log (SIZE)	-0.23*** (0.07)	-0.22** (0.10)	-0.16** (0.07)	0.07 (0.14)
BKEP* Log (SIZE)	-0.10** (0.04)	-0.02 (0.05)	-0.03 (0.03)	-0.03 (0.04)
WEST* Log (SIZE)	-0.04 (0.06)	0.03 (0.06)	-0.01 (0.03)	0.09** (0.04)
Adj. R^2	0.28	0.40	0.28	0.27
N	575	462	981	759

Notes:
*, **, *** significant at the 10, 5, and 1 percent level, respectively.
standard errors are in parentheses

Table 6: Productivity Growth Regressions for the Grain Industry over the 1977-87 and 1982-92 Periods.

Variable	Flour Milling (SIC 2041)		Feed Products (SIC 2048)		Oil Seeds-corn, cottonseed, and soy[1] (SIC 2046, 2074, 2075)	
	1977-87	1982-92	1977-87	1982-92	1977-87	1982-92
Intercept	-0.52***	-0.17*	-0.31***	-0.10*	0.15	-0.26
	(0.08)	(0.10)	(0.06)	(0.06)	(0.31)	(0.44)
Log (PROD)	-0.32***	-0.44***	-0.46***	-0.31***	-0.34***	-0.35***
	(0.08)	(0.08)	(0.07)	(0.03)	(0.12)	(0.11)
Log (SIZE)	0.10***	0.001	0.07***	0.09***	-0.01	0.04
	(0.024)	(0.03)	(0.02)	(0.03)	(0.07)	(0.21)
Pr. (AC)	1.60***	0.44	0.75**	-0.61**	0.65*	0.32
	(0.44)	(0.40)	(0.38)	(0.30)	(0.40)	(1.17)
BKEP	0.048	0.05	0.22*	-0.01	0.05	-0.07
	(0.13)	(0.19)	(0.12)	(0.04)	(0.20)	(0.16)
NOTFLOUR	0.015	0.10	-	-	-	-
	(0.05)	(0.06)				
NOTFEED	-	-	-0.08	0.20***	-	-
			(0.09)	(0.05)		
CORN	-	-	-	-	-0.53	-0.74**
					(0.43)	(0.32)
COTTONSEED	-	-	-	-	-0.39	-0.64
					(0.42)	(0.62)
SOY	-	-	-	-	0.19	-0.27
					(0.33)	(0.32)
NOTFOOD	0.21***	-0.11**	-0.01	-0.08	-0.44**	-0.03
	(0.05)	(0.05)	(0.06)	(0.05)	(0.23)	(0.18)
MULTI	0.11*	0.16***	0.12**	0.27***	-0.16	0.17
	(0.06)	(0.06)	(0.05)	(0.07)	(0.31)	(0.29)
AGE72	0.03	0.05	-0.09**	-0.05	-0.09	-0.07
	(0.05)	(0.06)	(0.04)	(0.04)	(0.06)	(0.06)
AGE77	-	-0.02	-	-0.04	-	-0.09
		(0.07)		(0.05)		(0.07)
Δ (CAP/SALE)	-0.26***	-0.38***	-0.33***	-0.27***	-0.28***	-0.23***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)
Δ (NONPW/PW)	-0.03	-0.07***	-0.05**	-0.06***	-0.03	0.0001
	(0.018)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Log (PROD)*	0.01	0.02	0.02	-0.2	0.005	0.02
Log (SIZE)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
Pr. (AC)*	-0.35***	-0.02	-0.14**	-0.03	-0.13*	-0.03
Log (SIZE)	(0.09)	(0.07)	(0.06)	(0.09)	(0.076)	(0.19)
BKEP*	0.003	-0.003	-0.03	-0.02	-0.02	0.00
Log (SIZE)	(0.03)	(0.04)	(0.03)	(0.04)	(0.05)	(0.03)
Adj. R^2	0.29	0.27	0.23	0.19	0.27	0.30
N	730	810	988	1092	476	771

*, **, *** significant at the 10, 5, and 1 percent level, respectively.

1. The dummy variables CORN, COTTONSEED, SOY, NOTFOOD, and MULTI were included in the model, but are suppressed. Only one of the ten coefficients is significant.

References

Abbot, T.A. "Price Dispersion in U.S. Manufacturing," Discussion paper no. CES 89-7, Center for Economic Studies, U.S. Bureau of the Census, 1989.

Bailey, M.N., D. Campbell, and C. Hulten, "The Distribution of Productivity in Manufacturing Plants," Brookings Papers: Microeconomics, The Brookings Institution, Washington, D.C., 1992.

Bartelsman, E.J. and P.J. Dhrymes, "Productivity Dynamics: U.S. Manufacturing Plants, 1972-86," Discussion Paper No. CES 92-1, Center for Economic Studies, Bureau of the Census, 1992.

Baumol, W.J. Business Behavior, Value, and Growth, New York: Harcourth, Brace, and World, 1967.

Bureau of the Census, Longitudinal Research Data Base, Washington, DC: Bureau of the Census,

1972-92.

Bureau of the Census, Ownership Change Data Base, Washington, DC: Bureau of the Census, 1972-92.

Christensen, L.R., D. Cummings, and D.W. Jorgenson, "Relative Productivity Levels, 1947-73: An International Comparison," European Economic Review, Vol. (16), 1981, pp. 61-94.

Dunne, T., M.J. Roberts, and L. Samuelson, "The Growth and Failure of U.S. Manufacturing Plants," The Quarterly Journal of Economics, November, 1989, pp. 671-98.

Healy, P.M., K.G. Palepu, and R.S. Ruback, "Do Mergers Improve Corporate Performance?" Unpublished Paper, October, 1989.

Holmes, T., and J. Schmitz, "A Theory of Entrepreneurship and Its Application to the Study of Business Transfer," Journal of Political Economy, April, 1990.

________________ "On the Turnover of Business Firms and Business Managers," CES Discussion Paper, CES 92-6, July, 1992.

________________ "Managerial Tenure, Business Age and Small Business Dynamics," CES Discussion Paper, CES 92-11, September, 1992.

Jarrel, G.A. and J.M. Netter, "The Market for Corporate Control: The Empirical Evidence Since 1989," Journal of Economic Perspectives, No. (2) 1988, pp. 49-68.

Jensen, M.C., "The Takeover Controversy: Analysis and Evidence," in J.C. Coffee, Jr., L. Lowenstein, and S. Rose-Ackerman (eds.), Knights, Raiders, and Targets: The Impact of Hostile Takeover, Oxford: Oxford University Press, 1988.

________________ "Takeovers: Their Causes and Consequences," Journal of Economic Perspectives, No. 1, Winter 1988, pp. 21-48.

Jensen, M.C. and R.S. Ruback, "The Market for Corporate Control: The Scientific Evidence," Journal of Financial Economics, Vol. (11) 1983, pp. 5-50.

Jovanovic, B., "Job Matching and the Theory of Turnover," Journal of Political Economy, 87, October, 1979, pp. 972-90.

________________ "Selection and Evolution of Industry," Econometrica, 1982, pp. 649-70.

Lichtenberg, F., Corporate Takeovers and Productivity, Cambridge, Massachusetts: The MIT Press, 1992.

Lichtenberg, F., and D. Siegel, "Productivity and Changes in Ownership of Manufacturing Plants," in Corporate Takeovers and Productivity, F. Lichtenberg, ed., Cambridge, Massachusetts: The MIT Press, 1992, pp. 25-43.

MacDonald, James M., Michael Ollinger, Kenneth Nelson, and Charles Handy, *Consolidation in U.S. Meatpacking,* AER-785, U.S. Department of Agriculture, Economic Research Service, 2000.

Manne, H.G., "Mergers and the Market for Corporate Control," Journal of Political Economy, No. 73, April, 1965, pp. 110-20.

Matsusaka, J. G., "Target Profits and Managerial Discipline During the Conglomerate Merger Wave," Journal of Industrial Economics, 1993, 41, pp. 179-189.

McGuckin, R. H. and S. V. Nguyen, "On Productivity and Plant Ownership Change: New Evidence from the LRD," The Rand Journal of Economics, 1995, 26 (2), pp. 257-276.

McGuckin, R.H., and G. Pascoe, "The Longitudinal Research Database: Status and Research Possibilities," Survey of Current Business, November, 1988.

Meade, J.E., "Is the New Industrial State Inevitable?" Economic Journal, No. 78, June, 1968, pp. 372-92.

Mueller, D.C., "A Theory of Conglomerate Mergers," Quarterly Journal of Economics, No. 83, November, 1969, pp. 643-59.

________________ "Mergers and Market Share," Review of Economics and Statistics, No. 24, 1985, pp. 259-67.

________________ "Mergers: Theory and Evidence," in Guiliano Mussati, ed., Mergers, Markets and Public Policy, Dordrecht: Kluwer, 1993.

Nguyen, S. V. "The Manufacturing Plant Ownership Change Database: Its Construction and Usefulness," Journal of Economic and Social Measurement, 1998, No. 24, pp. 209-232.

Olley, S.G. and A. Pakes, "The Dynamics of Productivity in the Telecommunications Equipment Industry," Working Paper No. (3977), National Bureau of Economic Research, 1992.

Ollinger, Michael, James MacDonald, and Milton Madison. *Structural Change in U.S. Chicken and Turkey Slaughter,* AER-787, U.S. Department of Agriculture, Economic Research Service, 2000.

Ravenscraft, D.J., and F. M. Scherer, The Mergers Selloff and Economic Efficiency, Washington, Brookings Institution, 1987.

Roll, R., “The Hubris Hypothesis of Corporate Takeovers,” Journal of Business, No. 59, April, 1986, pp. 197-216.

Shleiffer, A. and R.W. Vishney, “Management Entrenchment: The Case of Manager-Specific Investments,” Journal of Financial Economics, Vol. (25) 1989, pp. 123-39.

Smith, C.W. Jr., “Investment Banking and the Capital Acquisition Process,” Journal of Financial Economics, Vol. (15) 1986, pp. 3-29.

U.S. Department of Agriculture, Concentration in the Red Meat Packing Industry, Packers and Stockyards Programs, Grain and inspection, Packers and Stockyards Administration (February, 1996).