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# Bureau of the Census **Statistical Brief**

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## Acquired Plants in the Food Manufacturing Industry Show Improved Performance

*In the U.S. food manufacturing industry, plants that were purchased (i.e., acquired) became more productive after an ownership change. The study — which covered all 28,407 manufacturing plants in the industry, 1977-87 — also found that, with the exception of large plants, plants with above average productivity were the ones most likely to be acquired.*

*These findings suggest a more benign view of mergers and acquisitions than is often advanced in discussions among academics, policymakers, the media, and the public.*

*Data from the U.S. Census Bureau's Longitudinal Research Database (LRD), housed at the Center for Economic Studies, provided the basis for this study.*

### **Skepticism has often greeted acquisitions . . . .**

Mergers and acquisitions — the transfer of all or part of a company to new ownership —

have long been viewed with concern by economists and policymakers who argue that such transfers may lead to market inefficiencies, for example:

- By monopolizing the market, or
- By improving the fortunes of managers (through empire-building, higher salaries, and the like) at the expense of shareholder returns.

### **. . . .But new data show that ownership changes in food manufacturing are linked to increases in productivity.**

The present research demonstrated that one of the chief measures of efficiency — productivity — *improved* at food manufacturing plants that underwent an ownership change:

- Plants that were purchased during 1978-82 — and kept by acquirers until 1987 — experienced *6-10 percent higher labor productivity growth rates* compared to nonpurchased plants during that same period.
- Plants acquired during 1983-87 had *3-6 percent higher labor productivity growth rates* compared to nonpurchased plants.

These results hold whether productivity is defined as labor productivity or total factor productivity:

- Labor Productivity (the value of the output divided by the cost of the labor input).
- Total Factor Productivity (the value of the output divided by the weighted sum of the costs of labor, capital and materials used to manufacture the product, and the energy applied in the manufacturing process).

### **These data give substance to leading theories.**

Diverse theories concerning the incentives for acquisitions and mergers predict productivity improvement after the ownership change:

- The “*synergy*” theories postulate that the combination of the new owners’ assets with the acquired properties’ assets works in unison to raise the productivity of the acquired plant to a higher level than it was at the time of its purchase.
- The *managerial discipline* theory, on the other hand, argues that acquisition of a poorly performing plant (or firm) replaces bad management with the superior management skills of the acquiring firm. Therefore, performance improves after the acquisition.



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The present study

- Provides evidence of productivity improvement consistent with the claims of each theory.
- Identifies the conditions under which each theory is most likely to be valid.

### 1977 is the pre-acquisition benchmark year.

In order to study the relationship between productivity and ownership change, this research used 1977 as the pre-acquisition benchmark year. The 1977 labor productivity of each plant, relative to its own industry, was the measure of the plant's pre-acquisition productivity.

Each plant was tracked from 1977 until 1987 to determine (a) if the plant was purchased by another firm, (b) if the plant remained under the ownership of its 1977 firm, (c) if the plant was purchased and then resold, or (d) if the plant closed or dropped out of the manufacturing sector. As a result of this tracking, it was possible to identify the relationships among pre-acquisition productivity, plant ownership change, and productivity growth over a 10-year interval.

### Synergy theories are supported.

The data show that plants that were purchased between 1978-82 were good businesses — *enjoying pre-acquisition productivity that was above the average productivity for their industry grouping* — compared to nonpurchased manufacturing plants. The “industry grouping” was at the four-digit Standard Industrial Classification (SIC) level — for example,

iced cream and frozen desserts (2024), dog and cat food (2047), distilled and blended liquors (2085), and the like. Setting the average productivity equal to 1.00 — within each four-digit SIC group — for the pre-acquisition year, 1977, figure 1 shows that:

- *Purchased plants had a pre-acquisition productivity ratio of 1.19* — that is, 19 percentage points *above* the average of all manufacturing plants in that four-digit industry.
- *Nonpurchased plants had a 1977 productivity ratio of .98* — that is, 2 percentage points *below* the average of all

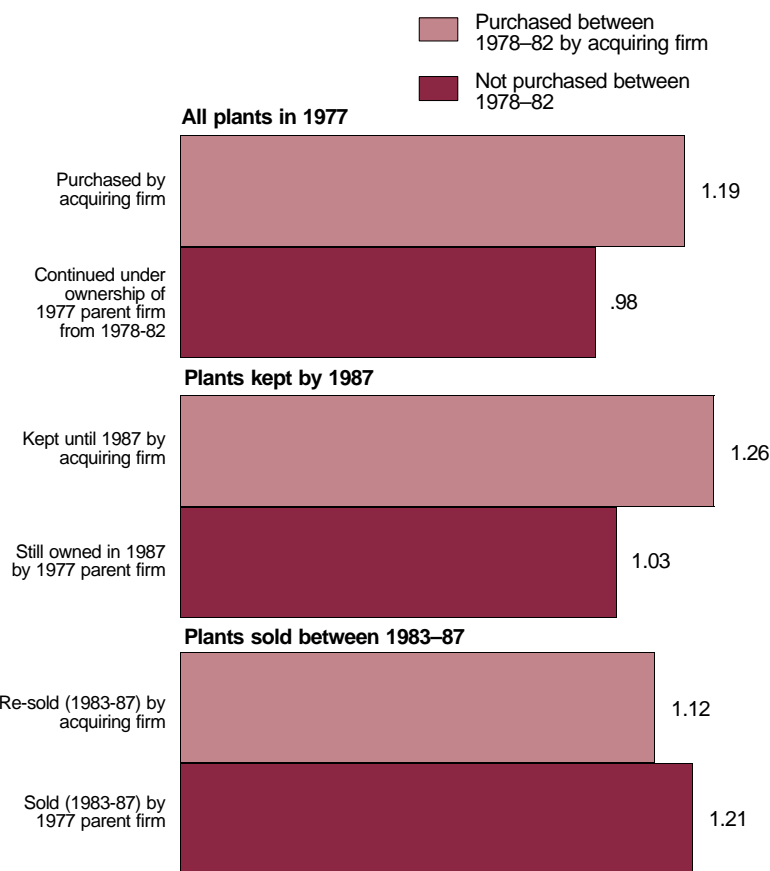
manufacturing plants in the same SIC grouping. Clearly, below-average performing plants were *not* attractive to acquiring firms.

Figure 2 shows that these results were even more pronounced for smaller plants — those with fewer than 250 employees — which constituted 90 percent of the plants in the food manufacturing industry in 1977. For smaller plants:

- *Purchased plants had a pre-acquisition productivity ratio of 1.24.*
- *Nonpurchased plants had a 1977 productivity ratio of only .94.*

Figure 1.

### Pre-Acquisition (1977)—Average Relative Labor Productivity<sup>1</sup> of Food Manufacturing Plants



<sup>1</sup> Relative Labor Productivity (RLP) means “in comparison to the productivity of other plants in the **same industry grouping.**”

Moreover, purchased plants subsequently *improved their productivity* after their acquisition and assimilation into the acquiring firm within the 5- to 10-year interval covered by the study. Therefore, synergy theories can be used to explain most ownership change in the food manufacturing industry during the period 1978-82.

**“Managerial discipline” theory also is applicable.**

However, the *larger* food manufacturing plants (250 or more employees) were an exception to the general finding that acquired plants were above average in productivity prior to acquisition. These larger plants constituted about 10 percent of all manufacturing plants in the food industry in 1977. Research

results uniformly showed that — *in the case of these larger plants — purchased plants had pre-acquisition productivity at or below the average for their industry and size grouping.*

Nonetheless, there are reasonable explanations for why acquiring firms might have purchased these larger-sized plants whose productivity was low. These plants may have been “good business properties” — with sizable, highly skilled labor forces, advanced technology, and quality buildings and machinery — but they may simply have had poor management because of being older with bigger, more bureaucratic management structures.

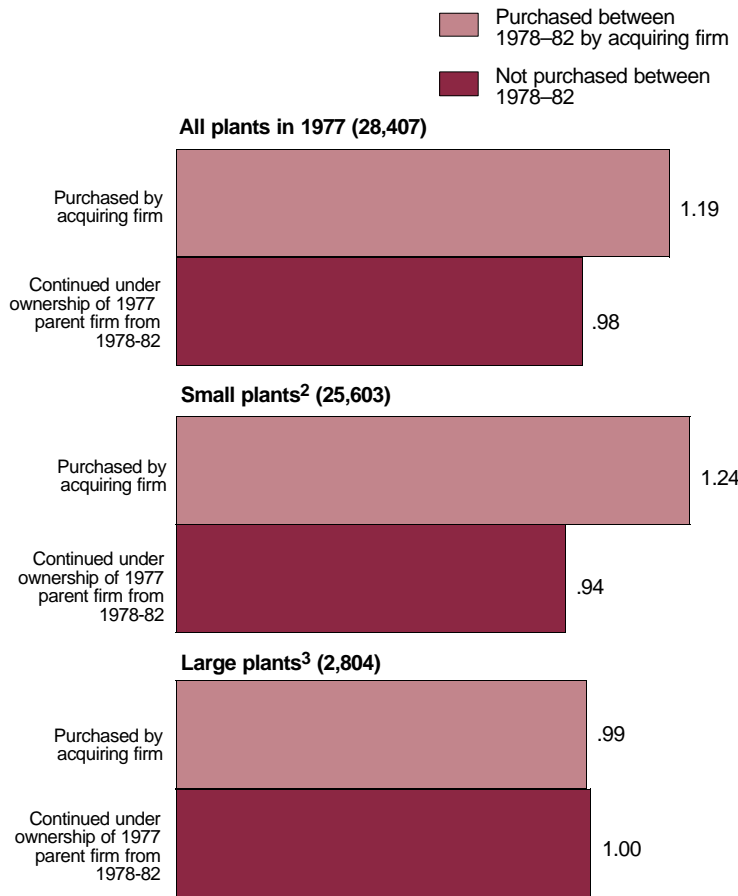
The present study found that *the productivity of the larger manufacturing plants* that were acquired was initially only average, or below average, (with a productivity ratio of .99), but *improved after acquisition* during the time interval covered by the study. This finding lends credence to the “*managerial discipline*” theory as most appropriately applying to ownership change with respect to larger plants.

**Conclusions**

Conclusions revolve around three principal findings — suggesting that acquisitions are productivity-enhancing and that firms acquire small and large targets with different motives:

- After being acquired, purchased plants — both smaller and larger — improved their productivity for the period 1977-87.
- During 1978-82, plants with high productivity were the most likely to be purchased, unless the plants were large.

Figure 2.  
**Pre-Acquisition (1977)—Average Relative Labor Productivity<sup>1</sup> of Food Manufacturing Plants by Plant Size**



<sup>1</sup> Relative Labor Productivity (RLP) here means “in comparison to the productivity of other plants in the same industry and size grouping.”  
<sup>2</sup> Small plants (those with fewer than 250 employees) constituted 90.1 percent of all plants in the food manufacturing industry, 1977.  
<sup>3</sup> Large plants (those with 250 employees or more) constituted 9.9 percent of all plants in the food manufacturing industry, 1977.

■ For larger plants, ownership change was correlated with just average, or below average, pre-acquisition productivity.

This research sheds light upon firm restructuring and the incentives that lead to mergers and acquisitions. The *acquisition of productive properties by productive firms* — interested in expanding their successful operations — *was the prevailing motive for ownership change among food manufacturing plants of fewer than 250 employees from 1977-87.*

*The full research report upon which this information is based*

*contains complete descriptions of the data bases, the statistical methods used, and data limitations. See “On productivity and plant ownership change: new evidence from the Longitudinal Research Database” by Robert H. McGuckin and Sang V. Nguyen in The RAND Journal of Economics, Vol. 26, No. 2, summer 1995, pp. 257-276.*

*This Brief is one of a series that presents information of current interest based upon research conducted at the Center for*

*Economic Studies (CES) of the U.S. Census Bureau. The CES houses highly specialized longitudinal microdata files, under-*

*takes research on important economic issues, and — with confidentiality protection — provides researcher access to the files. For further information, contact Robert H. McGuckin, 301-457-1848.*

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