



# Outsourcing effects on firms' operational performance

## An empirical study

Bin Jiang

*Department of Management, Kellstadt Graduate School of Business,  
DePaul University, Chicago, Illinois, USA, and*

Gregory V. Frazier and Edmund L. Prater

*Information Systems and Operations Management Department,  
College of Business Administration, The University of Texas at Arlington,  
Arlington, Texas, USA*

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### Abstract

**Purpose** – This research aims to empirically investigate the effect of outsourcing on firm level performance metrics, providing evidence about outsourcing influences on a firm's cost-efficiency, productivity and profitability.

**Design/methodology/approach** – This study is concerned with empirically examining the impact of outsourcing on a firm's performance. The results are based on a sample of 51 publicly traded firms that outsourced parts of their operations between 1990 and 2002. Publicly available accounting data are used to test for changes in operating performances that result from outsourcing decisions. Operating performances are examined over a four-quarter period after the outsourcing announcement.

**Findings** – This research provides evidence that outsourcing can improve a firm's cost-efficiency. While existing literature on outsourcing has also sought to draw anecdotal and conceptual evidence that highly visible companies have improved their productivity and profitability as well through outsourcing, the research reveals no evidence that outsourcing will improve a firm's productivity and profitability.

**Research limitations/implications** – This research is limited to what is available in public databases. Also, financial data pertain to the firm as a whole and not just to the outsourcing department or division, which would obscure the real outsourcing effects on the particular department or division.

**Practical implications** – This research makes two contributions to both practice and theory. First, this is the first empirical study to examine the link between outsourcing implementation and firm-level performance metrics. Second, empirical evidence is provided of the difference between outsourcing firms' performance and their non-outsourcing competitors'. Outsourcing firms have an obvious significant advantage in cost efficiency over their counterparts which do not outsource any activities at the same time. They also may obtain more available resources from outsourcing to invest in other productive capacities.

**Originality/value** – This research on outsourcing effects is the first to empirically test the relation between the outsourcing decision and the firm's productivity and profitability. Never before has outsourcing played such an important role in business, yet the overall impact of outsourcing on performance remains largely an unexplained puzzle. The research explores opportunities for further research to investigate the returns on outsourcing.

**Keywords** Outsourcing, Cost analysis, Productivity rate, Profit

**Paper type** Research paper



## Introduction

Based on transaction cost theory, when a firm has already integrated its operational functions, the decision to outsource such functions to the market should be made if it is necessary to create or protect firm value. By outsourcing tasks to specialist organizations, firms may better focus on their most value-creating activities, thereby maximizing the potential effectiveness of those activities. In addition, as outsourcing increases, costs may decline, and investment in facilities, equipment, and manpower can be reduced. The rationale for outsourcing looks simple and compelling.

Outsourcing research can be divided into three areas: decision-, process- and result-oriented. Jiang and Qureshi (2006) demonstrate that, during the last decade, most academic studies have focused on understanding outsourcing decision determinants and outsourcing process control (Table I).

While contracting out is now broadly understood to be an attractive option, its specific impact on firms' performance, i.e. outsourcing result, has not yet been well confirmed by research. When executives are asked about the financial impact of their outsourcing initiatives, they often respond that it cannot be readily quantified (Bryce and Useem, 1998). When researchers look to measure the financial impact, they have usually been forced to rely on managers' estimates in place of tangible metrics. As a result, much of the evidence is anecdotal and case study-oriented, often based on non-financial metrics.

These anecdotal accounts of outsourcing effects raise some fundamental questions for empirical research. In an age in which management carefully weighs the costs and benefits of every discretionary investment dollar, finding evidence of the results of outsourcing is critical. In particular, research considering the context surrounding an outsourcing decision's result is likely to be essential and useful to corporate outsourcing management. According to Jiang and Qureshi (2006), thus far, there are only four archival financial data analysis studies of outsourcing impact on firm's performance. Although they provide hard evidence regarding outsourcing results, their contributions are limited to narrow areas. Table II provides a summary of the limitations of the four studies.

Because most of the currently available evidence is based on perceptual or self-reported data, it is not clear how well the evidence correlates to actual performance. To address this gap, we use financial metrics to provide a more objective evaluation of a firm's outsourcing impact than is provided by the perception-based intermediate metrics typically used in case studies and surveys.

This research makes two contributions to both practice and theory. First, it adds to the small number of empirical studies that examine the outsourcing impact on firms'

	Determinant	Process	Result
Case study	34	54	15
Survey	31	28	14
Conceptual framework	24	19	8
Mathematical modeling	7	13	11
Archival data analyses	1	N/A	4
Total	97	114	52

Source: Jiang and Qureshi (2006)

**Table I.**  
Numbers of existing studies on outsourcing, categorized by research methodology and scope

performance by audited financial data rather than subjective perceptual measures. Second, it offers the first empirical study to compare the differences between outsourcing firms and their most closely matched non-outsourcing firms.

The paper proceeds as follows: the next section develops three research hypotheses. Following that, we provide methodological details on treatment and control group selection, and describe the metrics we apply in this research to examine outsourcing impact on firms' performance. This is followed by a presentation of results from a sample of 51 outsourcing implementations. A concluding section summarizes the contributions of this research, points out its limitations, and outlines the further research agenda.

### Research hypotheses

Smith *et al.* (1998) derive a set of performance metrics to study pre-outsourcing firm characteristics. They group the firm performance metrics into six categories: cost efficiency, productivity, profitability, growth, cash management, and market ratios. The purpose of these metrics is to provide a comprehensive view of the financial characteristics of the firm at the time of outsourcing. In this research, we concentrate on the operational performance of the firm rather than financial characteristics. So we use three out of these six performance metrics categories: cost efficiency, productivity, and profitability.

#### *Cost efficiency*

Cost efficiency remains the primary explanation for outsourcing. Firms evaluate outsourcing to determine whether current operating costs can be reduced and if saved resources can be reinvested in more competitive processes. Some researchers contend that an important source of cost reductions is the outsourcing firm's access to economies of scale and the unique expertise that a large outsourcing vendor can deliver (Anderson and Weitz, 1986; Roodhooft and Warlop, 1999). Since these outsourcing contract receivers typically serve many clients, they often achieve lower unit costs than can any single company. Specialist outsourcing vendors can also afford to invest more in new technologies and innovative practices than can many outsourcing contract-granting firms (Alexander and Young, 1996). Specialists in payroll processing, for example, typically handle this task for a number of companies, thus spreading fixed costs and achieving economies of scale. Such specialists have the focus

Research	Limitation
Jones (2000)	Only examine outsourcing impact on single functional division rather than the whole firm
McCarthy and Anagnostou (2004)	Use government statistics to examine outsourcing impact on the whole industry rather than individual firms
Barrar <i>et al.</i> (2002)	Only examine outsourcing firm's employee productivity
Hays <i>et al.</i> (2000)	Only examine outsourcing impact on firm's value rather than outsourcing impact on firm's performance

**Table II.**  
Limitations of previous archival data analyses research on the results of outsourcing

needed to identify areas that are candidates for improvement and the knowledge needed to act successfully on that awareness (economies of skill). On the other hand, outsourcing contract-granting firms generally engage in several different activities besides the core activity. By outsourcing some of these activities, they can concentrate their resources on the core business in which they have unique economies of skills or knowledge. As a result, the outsourcing contract-granting firms can reduce their operations expense and overhead expense.

Cost efficiency metrics describe the ratio of outputs to inputs. Output is measured through the total revenue or sales of the firm. Inputs are measured through total costs and overhead costs incurred to generate outputs. The two measures of cost efficiency used in this study are overhead expense, i.e. selling, general and administrative expenses (SG&A) and operating expense, i.e. cost of good sold (COGS) + SG&A, both expressed as a percentage of sales to enable us to compare firms of different sizes. The *H1*, stated in alternate form (as are all hypotheses in this study) are:

- H1a.* The outsourcing firm will demonstrate an improvement of SG&A/sales compared to its control firm.
- H1b.* The outsourcing firm will demonstrate an improvement of Op exp/sales compared to its control firm.

### *Productivity*

Several studies seek to explain the relationship between productivity growth and outsourcing. Abraham and Taylor (1996) find that firms “contract out” services with the objectives of smoothing production cycles and benefiting from specialization. Ten Raa and Wolff (2001) find a positive association between the rate of outsourcing and productivity growth.

Efficient firms allocate their resources to activities for which they enjoy comparative advantage. Other activities are increasingly outsourced. Contracting out production of goods and services to a firm with competitive advantages in terms of reliability, quality and cost is emphasized by Perry (1997). The outsourcing contract-granting firms assess the productivity of their in-house service functions and only undertake outsource actions if outside producers can provide comparable services better. The cost reductions due to differences in labor costs lead to outsourcing and positive changes in labor input, and output produced is altered by profits and productivity growth. Outsourcing not only results in a shift of labor but also exacerbates the productivity differential between outsourcing contract granting firms and outsourcing contract receiving firms (Siegel and Griliches, 1992). Contracting out allows the firm to rely on management teams in other organizations to oversee tasks at which it is at a relative disadvantage, and to increase managerial attention and resource allocation to those tasks that it does best.

Productivity metrics represent ratios of outputs and inputs. Output is measured through the total revenue or sales of the firm, inputs through the number of employees, total assets or inventory required to generate the output. Based on the above literature review on productivity, the *H2* cluster of this research is:

- H2a.* The outsourcing firm will demonstrate an improvement of assets turnover (= sales/assets) compared to its control firm.

*H2b.* The outsourcing firm will demonstrate an improvement of PPE turnover (= sales/PPE) compared to its control firm.

*H2c.* The outsourcing firm will demonstrate an improvement of inventory turnover (= sales/inventory) compared to its control firm.

*H2d.* The outsourcing firm will demonstrate an improvement of employee productivity (= sales/number of employees) compared to its control firm.

### *Profitability*

Traditionally, when business is booming, the temptation is to hire more staff, expand facilities, and bring more of the business “in-house,” where firms hope to better control costs. However, today’s knowledge- and service-based economies offer innumerable opportunities for well-run companies to increase profits through outsourcing (Quinn, 1999). When used properly, outsourcing can boost profitability in many ways, including:

- *Staffing.* The use of independent contractors provides employers with the flexibility to hire help only when they need it, for only as long as they need it. Outsourcing of staffing also allows firms to avoid having to provide costly benefits.
- *Capabilities.* Outsourcing enables even the smallest firms to have a marketing expert, researcher, or other specialist on staff. While it may not pay for them to “own” that expertise, firms can “rent” it without adding to their payroll.
- *Facilities.* While firms may need additional facilities to serve short-term needs, pouring cash into buildings may not match their long-term plans. When possible, firm should focus on reducing inventory, another cash drain, to minimize the need for additional facilities. When more space is needed, firms may lease and still avoid long-term investment obligations.
- *Payroll.* Salaries are a large part of a business’s costs, particularly in service industries. Independent contractors are a direct way to outsource – hire for the task. Thus, when sales are up, revenue is available to cover the higher salary expenses. When sales are down, firms are not tied to unrealistic salary costs.

Profitability is arguably the most important criterion for evaluating the performance of a firm. Profitability metrics measure the return that the firm’s owners receive from their investments. We use return on assets (IBE/assets) and net profit margin (IBE/sales) to paint a firm’s profit picture. IBE is the income before extraordinary expenses, which we use to better isolate the results from unusual situations and differences in accounting practices (Smith *et al.*, 1998). Our research hypotheses on profitability are:

*H3a.* The outsourcing firm will demonstrate an improvement of asset return compared to its control firm.

*H3b.* The outsourcing firm will demonstrate an improvement of net profit margin compared to its control firm.

## Research methodology

Outsourcing effects may become fuzzy in the long-term, but they are still directly measurable and can be examined in the short-term, as long as we design a reasonable experiment to filter out uncontrollable factors. In this research, we use a treatment group (outsourcing firms) and a control group (non-outsourcing firms which are most closely similar to treatment firms). We compare the performance differences between the two groups. Also, within the treatment group, we compare their performance differences before and after the outsourcing decision. Here we provide our research methodologies in details.

### Sample selection

Outsourcing announcements were gathered from the Factiva™ database. Factiva.com combines the *Dow Jones Interactive* and *Reuters Business Briefing* databases, offering the latest news from leading business resources.

Firms publicly announcing an outsourcing contract from January 1, 1990 through December 31, 2002 were included in the initial sample. A keyword search was employed using a combination of the following search terms: “outsourcing” and “contract” or “announcement”. First, we fixed Factiva Intelligent Indexing at “subject”; second, we select “corporate/industrial news” in the subject category; finally, we selected “contracts/orders” to fix the announcement search scope. To screen out heterogeneous macroeconomic factors from different countries, we also fixed the geographic “region” at the USA. That means that only the US firms are studied.

Next we selected the source of the event announcements. Many researchers have used announcements that appeared in the *Wall Street Journal* (Beaver, 1998) and *Dow Jones News Service* (Hendricks and Singhal, 2003). We also used these two sources to collect outsourcing announcements.

Based on the selection of search engine, search category, search range, search source and key word, the search yielded an initial sample of 686 announcements. Of those announcements, 125 duplicate or non-outsourcing were eliminated. Further, we selected only firms for which performance data are available publically. In general, these firms are large. A small outsourcing contract in term of dollars cannot bring significant impact on them. So we considered only outsourcing contracts of more than 10 million dollars. The resulting sample size was 381.

Because we are interested in the outsourcing effects only on firms' performance, we sought announcements of other events such as lawsuits, strikes, acquisitions, mergers, etc. that could obscure the impact of outsourcing. Using the treatment firms' names as keywords, we sought such announcements made during the year after the outsourcing event and eliminated the firms concerned from the sample, leaving 72 firms.

Finally, some firms had to be deleted due to the unavailability of data from the COMPUSTAT database[1], leaving a sample of 51 (Table III, panel A). In the sample, 27 firms come from agricultural or manufacturing industries (SIC codes < 5000) and 24 firms from service industries (SIC codes > 5000); and they also almost equally come from most industrial sectors (Table III, panel B). Because this sample is not seriously biased to any particular industries, we believe it is representative enough to generalize our findings from it.



**Table III.**  
Summary of sample

	Number of firms
<i>Panel A: sample size for operational performance study</i>	
Sample size after deletion of duplicates and non-outsourcing items	561
Less: no-US public firms and small outsourcing amount	- 180
Less: announcements impacted by other company news	- 309
Less: missing COMPUSTAT data	- 21
Usable sample size	51
<i>Panel B: industrial sectors of treatment firms</i>	
Industry groupings (SIC codes)	
Agriculture, natural resources (0001-1999)	1
Food, tobacco, textiles, lumber, paper, chemicals (2000-2999)	6
Rubber, leather, stone, metals, machinery, equipment (3000-3569, 3580-3659, 3800-3999)	7
Computers, communications, electronics (3570-3579, 3660-3699, 3760-3789)	6
Automobiles, aircraft, transportation (3700-3759, 3790-3799)	4
Logistics, supply (4000-4999)	3
Wholesale and retailing (5000-5999)	3
Financial, insurance, real estate (6000-6999)	4
Personal and business service (7200-7320)	3
Computer and software service (7370-7373)	7
Automotive repair, services, and parking (7513-7549)	2
Health services (8011-8099)	3
Commodities and transactions not classified (9000-9999)	2
Total	51

#### *Control group*

To provide a benchmark for the performance of the sample of outsourcing firms and to control for potential industry- and economy-wide influences, we created a control group. It is reasonable to assume that firms in the same industry and of similar size are subject to similar economic and competitive factors (Hendricks and Singhal, 1997).

Two approaches are commonly used to construct control groups. The first and more commonly used includes all other firms in the same industry as a treatment firm's control group (Palepu, 1986). In the second approach, the quasi-experimental control group method, one firm that most closely matches a treatment firm in terms of size and industry sector is chosen as the control, and post-event deviations in performance are measured. The basic premise in quasi-experimental research is the same as in experimental research: a group of firms can be identified to create the comparison or baseline from which the change caused by the treatment (outsourcing event) can be inferred. Although assignment of firms in the sample to be treated occurs non-randomly, a control group of firms must be selected in such a manner as to create that aspect of a true experiment. Once an acceptable control group has been identified, the difference between the control firms and the treated firms on an outcome measure is the inferred effect of the treatment (Isserman and Beaumont, 1989). Even though the second approach is greatly affected by the choice of the control firm, and the results obtained might change dramatically if another control firm is chosen

instead, it is more appropriate for determining the effects of an event (such as outsourcing) on performance because it chooses a firm that most closely matches the treatment firm in terms of pre-event performance, size, and other characteristics, and looks for post-event deviations in performance (Smith *et al.*, 1998). In this research, we employ the second approach to establish the control group.

The matching process we chose, SIC code matches and constraints on size mismatches, is similar to that used in the literature (Hendricks and Singhal, 2001; Barber and Lyon, 1996; Denis and Denis, 1993). For each treatment firm, a control firm was identified as the firm that has the same four-digit SIC code and is nearest in size to the treatment firm in the period of outsourcing. Size is measured as the book value of assets. Firm  $i$  was matched to other firms with the same four-digit SIC code, and with book value of total assets within 50-300 percent of firm  $i$ 's. When firms had no firm of similar size with the same four-digit SIC code, we sought one at the three-digit SIC code level, and so on, until we found a group of suitable controls. We picked those firms whose sizes were closest to the outsourcing firm in the sample. There were usually only 2-5 qualified firms. Then we used these potential control firms' names as keywords to input them to the Factiva database, checking whether these firms also outsourced or made other announcements (lawsuits, strikes, acquisitions, mergers, etc.) during the one-year post-event window. Finally, we put the most qualified firm into the control group. For 44 of the 51 control firms, the primary SIC codes match at the four-digit level; for four, the primary SIC codes match at the three-digit level; for two other control firms, the SIC codes match at the two-digit level; one control firm matches its counterpart in the treatment group at the one-digit level.

#### *Performance metrics*

*Cost efficiency.* We use SG&A/sales and operating exp/sales to describe a firm's cost efficiency, both expressed as a percentage of sales to enable us to compare firms of different sizes.

*Productivity.* We employ assets turnover (sales/assets, asset productivity), PPE turnover (sales/PPE, fixed asset productivity) and inventory turnover (sales/inventory, inventory productivity) to measure a firm's productivity. Since the number of employees is not available by quarter in the COMPUSTAT database, we had to abandon the metric of employee productivity.

*Profitability.* We use return on assets (IBE/assets) and net profit margin (IBE/sales) to paint a firm's profit picture. Here, IBE is the income before extraordinary expenses.

We define the outsourcing announcement quarter as Quarter 0. The first quarter, second quarter, third quarter, and fourth quarter after the announcement are Quarter 1, 2, 3, and 4, respectively. Our analysis focuses on changes in performance over the quarter intervals rather than annual intervals, and the changes in performance are calculated:

$$\text{Change percentage} = \frac{\text{Metric}@Q(i) - \text{Metric}@Q(0)}{\text{Metric}@Q(0)}$$

There are two reasons for this. First, the pattern of continuous changes in performance:



$$\frac{\text{Metric}@Q(i) - \text{Metric}@Q(i - 1)}{\text{Metric}@Q(i - 1)}$$

may only show a non-significant result on a regular basis, which could add up to significant effects over longer time periods. To test the outsourcing effects on firm's performance after outsourcing implementation, we use Quarter 0's metrics level as the initial standard, and calculate the change rate from each post-event quarter  $Q(i)$  to the original point  $Q(0)$ . Second, although outsourcing can yield longer-term gains as well as immediate payoffs, it is difficult to totally screen out extraneous noise on the outsourcing effects over a long-term. Because the quarterly financial report is the shortest time interval report we can get from a public firm, we decide to use firms' quarterly data to monitor its outsourcing effects. Table IV tabulates and describes the metrics and their categories.

### Results and analyses

Before investigating the post-event differences, we need to check whether any pre-event differences existed. To establish a baseline that inspires confidence, it is necessary to show that the paired firms' performance was not already diverging before the outsourcing incident, i.e. to show for several quarters preceding the outsourcing event that the firms performed similarly relative to each other. Table V lists the pre-event performance paired  $t$ -test results between the treatment and control groups. Among the total 28 comparisons, two of them (marked by shadow) favor to the treatment group, five of them favor to the control group, and the remainder are not statistically different. This means that before the outsourcing event, the outsourcing firms performed at roughly the same pace as their non-outsourcing pairs.

We report the post-outsourcing hypothesis test results in two main forms: within the treatment group and between treatment and control group, i.e. outsourcing impact on a particular metric is tested within the treatment and between the treatment and control group. For each main form, it is further divided into two sub-forms: the cumulative effect over a four-quarter period and individual-quarter effect, quarter by quarter. The cumulative effect is the average change rate of a metric over the four-quarter observation period; the individual-quarter effect is the change rate in each observation quarter compared to the original level in Quarter 0, in which the outsourcing contract was announced.

Metric	Definition	Units	Comments	Favorable change rate sign
<i>Cost efficiency</i>				
SG&A/S	SG&A/sales	Ratio	Overhead expenses	-
Operating exp/S	(COGS + SG&A)/sales	Ratio	Total expenses	-
<i>Productivity</i>				
Asset turnover	Sales/assets	Ratio	Asset productivity	+
PPE turnover	Sales/PPE	Ratio	PPE productivity	+
Inventory turnover	Sales/inventory	Ratio	Inventory productivity	+
<i>Profitability</i>				
Return on assets	IBE/asset	Percentage	Use of assets	+
Net profit margin	IBE/sales	Percentage	Profit	+

**Table IV.**  
Firm performance metrics

Pre-event performance between treatment and control group (two-tail paired <i>t</i> -test)					
Favorable change rate sign	Q -4	Q -3	Q -2	Q -1	
SG&A/sales	-	-0.045 **	0.013	-0.004	0.025
Op exp/sales	-	-0.083	0.047	0.016*	-0.039
Asset turnover	+	0.163	-0.028*	-0.115 **	-0.003*
PPE turnover	+	-0.159	0.021	-0.047	-0.051 **
Inventory turnover	+	-0.077	-0.048	-0.085*	0.096
Return on assets	+	-0.263	-0.102	-0.049	0.038
Net profit margin	+	1.273	2.519*	-0.844	-3.541

**Notes:** We define the outsourcing announcement quarter as Quarter 0; the first quarter, second quarter, third quarter, and fourth quarter before the announcement are Quarter 1, 2, 3, and 4, respectively; our analysis focuses on changes in performance quarter by quarter, which are calculated: Change percentage =  $(\text{Metric}@Q(i+1) - \text{Metric}@Q(i))/(\text{Metric}@Q(i))$ ; for the two tail paired *t*-test, \*10 percent level, \*\*5 percent level, and \*\*\*1 percent level

**Table V.**  
Pre-event performance  
tests

For within treatment report, we use one-sample one-tail *t*-statistics to test whether the mean values of treatment firms' performance metrics change rates are significantly favorable. For example, the lower the SG&A/sales ratio is, the better that outsourcing result is. After outsourcing, a decrease of SG&A/sales ratio is favorable. In other words, the negative change rate of SG&A/sales ratio represents a favorable result of outsourcing. So we run a lower-tailed *t*-test to examine the hypotheses:

$H_0$ . SG&A/sales change rate for the outsourcing firms will be greater than or equal to those of the comparison firms during the four quarters after the outsourcing announcement.

$H_1$ . SG&A/sales change rate for the outsourcing firms will be significantly less than those of the comparison firms during the four quarters after the outsourcing announcement.

For the between treatment and control group analysis, we use one-tail paired *t*-tests to determine whether differences in the performance metrics change rates between the treatment and the control group are statistically significantly favorable.

#### Cost efficiency

The most frequently mentioned potential and realized benefit of outsourcing is cost savings. Our archival data analysis supports this assertion. According to the left part of table IV, over the four-quarter period, the outsourcing event does significantly impact outsourcing firms' cost efficiency metrics. Outsourcing firms' SG&A/sales ratio decreases 2.7 percent totally over the four-quarter period, and begins to significantly decrease starting in the third quarter. Even though the Op exp/sales ratio does not have a significant improvement (at the 0.10 level) over the total four-quarter period, it keeps an improving track and obtains a significant improvement (at the 0.10 level) in the fourth quarter. In this last quarter, outsourcing firms' Op exp/sales ratio decreases 2.3 percent from the original level in Quarter 0 before outsourcing contracts were in effect.

Based on the right-hand part of Table VI, the outsourcing firms have an obvious significant advantage in cost efficiency over their counterparts which do not outsource

**Table VI.**  
Empirical results of cost  
efficiency

	Within treatment group (mean change rate)				Between treatment and control group (treatment – control)					
	Individual-quarter effects <sup>a</sup>				Individual-quarter effects <sup>b</sup>					
	Cumulative effects	Q1	Q2	Q3	Q4	Cumulative effects	Q1	Q2	Q3	Q4
SG&A/sales	-0.027*	0.017	-0.020	-0.055**	-0.033*	-0.052	0.016	-0.029	-0.086**	-0.084**
Op exp/sales	-0.017+	-0.006	t	-0.021	-0.023*	-0.031*	-0.028*	-0.022	-0.031++	-0.043

**Notes:** <sup>a</sup>Percent change from Quarter 0; negative value reflects improvement, <sup>b</sup>treatment group percent change from Q0 minus control group percent change from Q0; negative value favors outsourcing firms, when the *t*-test's and the Wilcoxon test's results are consistent, we only report the *t*-test results; when they are not consistent, we report both of them, for the one tail *t*-test, \*10 percent level, \*\*5 percent level, and \*\*\*1 percent level; for the Wilcoxon signed-rank test, +10 percent level, ++5 percent level, and +++1 percent level

any activities at the same time. Here, the negative sign of the difference (treatment firms' metric – control firms' metric) reflects favorably on outsourcing. That means that the outsourcing firms' cost efficiency ratios decrease more deeply than non-outsourcing firms' after outsourcing. For instance, in the third quarter, outsourcing firms' mean change rate of SG&A/sales is – 5.48 percent, i.e. comparing to the Quarter 0 level, outsourcing firms' SG&A/sales ratio is improved 5.48 percent; in the mean time, non-outsourcing firms' SG&A/sales ratio mean change rate is +3.11 percent, i.e. comparing to the Quarter 0 level, non-outsourcing firms' SG&A/sales ratio is worsened by 3.11 percent. So the overall difference between outsourcing firms' SG&A/sales and non-outsourcing firms' in Quarter 3 is – 8.59 percent ( $= -5.48 - 3.11$  percent).

By COMPUSTAT definition, SG&A does not include the direct costs associated with making the product or service but includes many of the costs that allow for the production of those products, such as the salaries of management, the sales staff, and the internal company accountants. In other words, it is the overhead cost. The difference between operation expenses and SG&A is that the COGS which is included in Op exp ( $= \text{COGS} + \text{SG\&A}$ ). In general, COGS includes direct costs, direct labor, maintenance and repairs, supplies, warehouse expense, transportation, heat, light and power, etc. So we can say that SG&A represents the indirect costs and COGS represents the direct costs. The importance of SG&A/sales ratio is that it represents the overhead cost efficiency of operating the business; the Op exp/sales ratio provides a firm's total cost efficiency information.

Outsourcing arrangements that transfer outsourcing firms' assets to a vendor can convert fixed amortization and operating expenses to variable usage charges. On the application side, outsourcing can reduce the commitment to fixed-cost, full-time human resource expenses and other overhead costs through contracts that provide development skills on an as-needed basis. As a result, outsourcing can improve firms' cost efficiency.

### *Productivity*

We find insufficient evidence to conclude that outsourcing firms obtain significant productivity growth over the four-quarter period (Table VII). On the contrary, outsourcing firms' productivity is even worse than that of non-outsourcing firms. Here, a positive sign indicates productivity improvement.

In the left-hand part of Table VII, we see that, even though the mean change rates of asset turnover are negative both over the four-quarter period and in each individual quarter, they are not significant at the 0.10 level. The magnitudes of change are also small – none is over –2 percent. That means that outsourcing firms' asset productivity is not significantly changed by outsourcing. In the right part of Table VII, although all the comparisons between outsourcing firms' asset turnover change rate and non-outsourcing firms' are positive, which is favorable to outsourcing, none are significant at the 0.10 level. Based on these results, we do not reject the null hypothesis and, therefore, state that we fail to find evidence that outsourcing significantly improves firms' asset productivity.

When we look at the inventory turnover change rate, we cannot find any certain trends at significant levels in Table VII. That means that, after outsourcing, outsourcing firms' inventory turnover rate is not significantly changed, and is not

**Table VII.**  
Empirical results of  
productivity

	Within treatment group (mean change rate) Individual-quarter effects <sup>a</sup>				Between treatment and control group (treatment – control) Individual-quarter effects <sup>b</sup>					
	Cumulative effects	Q1	Q2	Q3	Q4	Cumulative effects	Q1	Q2	Q3	Q4
Asset turnover	-0.012	-0.009	-0.001	-0.016	-0.019	0.037	0.013	0.041	0.050 <sup>†</sup>	0.049 <sup>††</sup>
PPE turnover	-0.144 <sup>*</sup>	-0.136	-0.095	-0.202 <sup>*</sup>	-0.149 <sup>**</sup>	0.032	0.092 <sup>†</sup>	0.038	-0.125	0.107 <sup>**</sup>
Inventory turnover	0.004	-0.02 <sup>*</sup>	-0.010	0.011	0.039	-0.007	-0.012	-0.026	-0.009	0.018

**Notes:** <sup>a</sup>Positive value reflects improvement, <sup>b</sup>positive value favors outsourcing firms, when the *t*-test's and the Wilcoxon test's results are consistent, we only report the *t*-test results; when they are not consistent, we report both of them, for the one tail *t*-test, <sup>\*</sup>10 percent level, <sup>\*\*</sup>5 percent level, and <sup>†</sup>1 percent level; for the Wilcoxon signed-rank test, <sup>†</sup>10 percent level, <sup>††</sup>5 percent level, and <sup>†††</sup>1 percent level

significantly different from that of the control group. Based on this result, we do not reject the null hypothesis and, therefore, state that we fail to find evidence that outsourcing significantly improves firms' inventory productivity.

For the PPE turnover, however, there are significant results both within group and between groups. Over the four-quarter period, outsourcing firms' PPE turnover mean change rate worsens 14.4 percent from its original level in the Quarter 0. Since the third quarter, outsourcing firms' PPE turnover mean change rate becomes significantly worse. Compared to non-outsourcing firms, outsourcing firms' PPE turnover mean change rate steadily deteriorated and is worse by almost 10.7 percent in the fourth quarter. This implies that the worsening of the firms' PPE productivity after outsourcing is not by chance.

By definition, PPE are tangible assets, or fixed assets, that a firm holds for its own use or for rental to others and which the entity expects to use during more than one period. The assets included are buildings; land on which the buildings sit; and equipment, tools, furniture, and fixtures used in operating the business (Appendix 1). Simply speaking, all these above PPE items are closely related with relevant industries' core activities.

A major challenge facing managers of most businesses is managing the level of productive capacity (that is, the size of a firm's PPE) in the long-term. If managers underestimate the need, the firm will not be able to produce goods or services that are in demand and will miss the opportunity to earn revenue. On the other hand, if needed productive capacity is overestimated, the firm will incur excessive costs that will reduce profitability. Issues surrounding PPE have a pervasive impact on a firm in terms of strategy, competitive advantage and profitability.

According to the structure of assets in a balance sheet (Appendix 2), if, after outsourcing, a firm's PPE dramatically increases but the total assets remain almost stable, a reasonable explanation is that the firm decreases some other assets to enhance its PPE. From our analysis results, outsourcing firms' inventory does not dramatically change. Also a firm cannot dramatically change its long-term investments and intangible assets over a four-quarter period. It is also reasonable to assume that outsourcing cannot dramatically change a firm's payment policy (account receivable and prepaid). Generally, other current assets and miscellaneous assets occupy only a small proportion of total assets so that they cannot significantly influence a firm's asset pattern. Based on the above discussion, one possible explanation of the dramatic change in PPE occurring with only a slight change in total assets is that outsourcing firms invest their cash or short-term investments to increase or modernize their PPE to enhance their core competitive competency. This explanation coincides with the core competency theory according to which, after outsourcing their non-core activities to specialist organizations, firms may better use the released resources to strengthen their most value-creating activities, updating current PPE or investing in new PPE.

Comparing the left and right-hand parts of Table VII for PPE turnover, there is another interesting observation. Although outsourcing firms have dramatically increased their PPE investments, the comparisons between outsourcing firms' mean change rate of PPE turnover and those of control firms' are not significant over the four-quarter period and in the first three quarters after outsourcing. A possible explanation is that, when outsourcing firms are enhancing their PPE, their competitors



are doing the same thing. However, outsourcing firms may obtain more available resources, e.g. cost savings from outsourcing, to invest in their productive capacity (the size of PPE). As a result, in the Q4 period, outsourcing firms significantly surpass their competitors in PPE investments.

*Profitability*

We find insufficient evidence to conclude that outsourcing has a significant impact on firms' profitability (Table VIII). This is a marked deviation from existing anecdotal and conceptual research, which generally finds that outsourcing significantly impacts firms' profitability.

By definition, return on assets measures how much the firm earned for each dollar of investment. It is the broadest measure of profitability and management effectiveness, independent of financing strategy. Firms with a higher return on assets are doing a better job of selecting new investments, all other things being equal. On the other hand, net profit margin measures how much of every sales dollar generated during the period is profit. A rising net profit margin signals more efficient management of sales and expenses and a declining margin of less-efficient management. Differences of return on assets and net profit margin among competitors in the same industry reflect how each company responds to changes in competition (and demand for the product or service) and changes in managing sales volume, sales price, and costs. Return on assets and net profit margin can be increased by increasing sales volume, increasing sales price, or decreasing expenses. However, the decisions that management makes to maintain the company's return on assets or net profit margin in the current period may have negative long-run implications. For example, if a firm is failing to invest in R&D or in modernization of plant and equipment, such a strategy will decrease expenses and thus increase profitability in the short run. However, this strategy normally results in future declines in profitability as the firm's products and plant and equipment reach the end of their life cycles. As a consequence, we should evaluate profitability in the context of a firm's business strategy.

The deviation between our empirical discovery and earlier anecdotal and conceptual results is perhaps due in part to competitive pressure. Competition and, to a great extent, profitability are relative issues, i.e. firms do not operate in isolation, their profit performance is relative to that of their competitors. So any desired improvement in outsourcing might only result in the company maintaining its current relative performance. This is known as the "Red Queen Effect" (McCarthy, 2002). To meet customer demands under extreme pricing pressures, firms have to keep reducing their profit margins. Hence, despite positively improving their cost efficiency by outsourcing, firms share their cost savings with their customers in order to enhance their competitiveness. For example, Matsushita outsourced its "Panasonic" microwave oven production to China. Even though Matsushita saved around one third of manufacturing costs by this outsourcing decision, it still cut down its microwave oven price 40 percent in order to increase its market share (Jiang and Hansen, 2003). Another possible explanation for outsourcing not having a significant impact on profitability is perhaps due to reinvestment of cost savings. In such instances, outsourcing firms are better able to reinvest those released resources in the growth of their core businesses to pursue future competitive advantages.

	Within treatment group (mean change rate)				Between treatment and control group (treatment – control)					
	Individual-quarter effects <sup>a</sup>				Individual-quarter effects <sup>b</sup>					
	Cumulative effects	Q1	Q2	Q3	Q4	Cumulative effects	Q1	Q2	Q3	Q4
Return on assets	0.005	-0.022	-0.010	0.011	0.039	-0.01	-0.013	-0.026	-0.009	0.008
Net profit margin	1.731	2.211	-0.509	4.899	0.175	3.059	4.217	-0.204	6.967	0.721

**Notes:** <sup>a</sup>Positive value reflects improvement, <sup>b</sup>positive value favors outsourcing firms, when the *t*-test's and the Wilcoxon test's results are consistent, we only report the *t*-test results; when they are not consistent, we report both of them, for the one tail *t*-test, \*10 percent level, \*\*5 percent level, and \*\*\*1 percent level; for the Wilcoxon signed-rank test, †10 percent level, ††5 percent level, and †††1 percent level

**Table VIII.**  
Empirical results of profitability

### Conclusions

We have empirically investigated the effect of outsourcing on the performance metrics of the outsourcing firm. There are three research hypotheses. We examine the influence of outsourcing influence by investigating firms' performance metrics within the treatment as well as between the treatment and the control group. We fail to reject two out of three null hypotheses, i.e. there are no significant improvements in outsourcing firm's productivity and profitability.

For not rejecting two of the null hypotheses, we offer three explanations: first, according to the core competency theory, outsourcing firms invest their released resources or cost savings from outsourcing to enhance their core competitive competency. As a result, outsourcing firms' productivity and profitability are not significantly improved in such a short-term (four quarters). Second, facing the competitive pressure on prices, outsourcing firms must keep reducing their profit margins. So there is no significant increase in profitability. Third, while in the past, outsourcing is often associated with automatic cost reduction and performance improvement, Barthelemy and Adsit (2003) believe that this overly optimistic view of outsourcing derives from the fact that most articles about outsourcing were written during the so-called "honeymoon" period (i.e. just before or after the contract is signed). At that time, the reported benefits were not realized but only projected.

This research makes two contributions to both practice and theory. First, this is the first empirical study to examine the link between outsourcing implementation and firm-level performance metrics. Most studies refer to the outsourcing impact as a conceptual combination of cost reduction, productivity growth, and profitability improvement approaches. However, our results provide evidence to support the argument of cost savings while not supporting claims of positive short-term gains in productivity and profitability.

Second, we provide empirical evidence of the difference between outsourcing firms' performance and that of their non-outsourcing competitors. Outsourcing firms have an obvious significant advantage in cost efficiency over their counterparts which do not outsource any activities at the same time. They also may obtain more available resources from outsourcing to invest in other productive capacities.

### Limitations and future research

Before accepting the research findings and their implications as conclusive, some limitations of the present study need to be considered. There are a number of weaknesses inherent in the use of archival financial data. We are limited to what is available in public databases. Also, financial data pertain to the firm as a whole and not just to the outsourcing department or division, which would obscure the real outsourcing effects on the particular department or division. Our measures for outsourcing effects are based on financial statement data extracted from the COMPUSTAT database. While this avoids the response bias from which survey research tends to suffer, the measures are subject to noise. Furthermore, because only major outsourcing deals are reported in the trade press, our analyses consider only large public firms with strategic outsourcing implementations.

Another limitation comes from the quasi-experimental design. Since this is a quasi-experimental study in which random assignment of subjects to treatments is not possible, factors other than the independent variable may cause the effects so that

selection differences are noted as a possible threat to the internal validity of the study. In other words, this method cannot totally screen out all possible confounding factors as a pure experimental design does, so the confidence level of the cause-effect relationship from the quasi-experimental design is lower than it would be from a pure experimental design.

Our research on outsourcing effects is the first to empirically test the relation between the outsourcing decision and the firm's productivity and profitability. Never before has outsourcing played such an important role in business, yet the overall impact of outsourcing on performance remains largely an unexplained puzzle. Our research explores opportunities for further research to investigate the returns on outsourcing. Further studies on the impact of outsourcing on firms' performance by archival data might follow the research agendas as follows.

#### *Opportunities derived from related accounting literature*

As we mentioned in the literature review section, so far there are only four papers using accounting techniques to study the results of outsourcing. We need to know whether the current accounting treatment of outsourcing results is appropriate given the recent findings. Accounting researchers have long performed the kind of research that is still in its infancy in outsourcing research. In addition, many of the theories and techniques developed have yet to be applied in an outsourcing context.

#### *Combination of archival data analysis and longitudinal case study/survey*

Compared to case-studies and surveys, archival data analysis is objective but with inevitable noise. In case studies and surveys, researchers can get direct answers to their research questions, but with self-reported data or perceptual information. Outsourcing outcomes are composed of measurable results (such as cost savings) and immeasurable results (such as flexibility, morale). If we run an archival data analysis and a longitudinal case study or survey on the same outsourcing sample, we can obtain a much better understanding of outsourcing results.

#### **Note**

1. COMPUSTAT provides superior accounting statement information on companies from around the world by covering approximately 9,000 active companies with up to 20 years and 48 quarters of history. Available information includes income statement, balance sheet and statement of cash flow items, monthly stock price data, business segment data, geographic segment data and company address and name information.

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### Further reading

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### Appendix 1

In the COMPUSTAT database, different industries include different PPE items:

- (1) Airline companies' deposits and advances on flight equipment.
- (2) Banking companies' savings and loan companies' office premises and equipment.
- (3) Beverage producers' bottles, kegs and cases.
- (4) Broadcasting companies' broadcast rights.
- (5) Extractive industries':
  - exploration and development expenditures;
  - investment in oil and gas properties at cost;
  - mining concessions and undeveloped leases;
  - patents and franchises on foreign property;
  - prepaid mine development and stripping; and
  - seismic libraries.
- (6) Finance and insurance companies' title plants.
- (7) Forestry and paper companies' timberlands and timber rights.
- (8) Motion picture production companies':
  - noncurrent film costs;
  - noncurrent inventory; and
  - franchise rights and broadcast licenses.
- (9) Manufacturing companies' equipment, tools and dies.
- (10) Real estate companies' and land developers' land held for development and sale.
- (11) Shipping companies' statutory reserve funds and allowances from the maritime administration for vessels traded in (to be used for vessels under construction).

### Appendix 2

Typically a firm's assets on its balance sheet are classified as follows.

#### Total assets

- (1) Current assets:
  - cash and cash equivalents;
  - short-term investments (marketable securities);
  - accounts receivable;



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- inventory;
- prepaid expense; and
- other current assets.

(2) Non-current assets:

- long-term investments (in real estate and stocks or bonds of other firms);
- PPE;
- intangible assets (patents, trademarks, copyrights, and goodwill); and
- other (miscellaneous) assets.

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**Corresponding author**

Bin Jiang can be contacted at: [bjiang@depaul.edu](mailto:bjiang@depaul.edu)

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