The Impact of Private Equity Acquisitions and Operations On Capital Spending, Sales, Productivity, and Employment

Robert J. Shapiro and Nam D. Pham

January 2009

SONECON

The Impact of Large Private Equity Acquisitions and Operations On Capital Spending, Sales, Productivity, and Employment

Robert J. Shapiro and Nam D. Pham

I. INTRODUCTION

Private equity investments in the United States have generally expanded for many years and for some time have been an important source of financing for companies undertaking major restructuring or operational changes. Most private equity firms share a common business strategy, despite many differences in investment approach, style and favored sectors: Purchase a major stake in companies that are undervalued or have untapped potential, invest funds drawn from their own capital and borrowed funds, make changes in the firm's management and/or business strategies, increase its financial returns, and eventually resell the acquired enterprise. The economic significance and effects of these operations, however, have become matters of professional debate and some public concern. Some commentators point to high-profile leveraged buyouts (LBOs) in the 1980s which disassembled and sold off, piece by piece, several large companies, and conclude that short-term financial gains drive most LBOs, and most private-equity operations end up cutting long-term investment, jobs, and overall sales. However, empirical research examining the economic impact of LBOs across a range of companies, considered by size, time period and industry, has produced mixed conclusions.

Here, we examine the economic performance of a particular group of private equity operations: Large purchases (at least $250 million each) by major private equity firms (eight of the 10 largest firms) in the current period (purchased between 2002 and 2005). We focus on large purchases and operations by major private equity firms in this period because speculation about their economic impact has been a source of concern among members of Congress and the media. This analysis should contribute to the continuing public debate about the benefits and risks of the private equity sector.

For this effort, we examined data from 70 large companies purchased by major private equity firms, including 21 manufacturing companies and 49 service and other non-manufacturing companies. We tracked their capital expenditures, overall sales, and employment levels at the time of their acquisitions and in the years following their acquisitions, and compared the results with those from other U.S. manufacturing and non-manufacturing companies. We found that the purchase and subsequent operations of large companies by private equity firms in the current period generally produce increases in those acquired companies' capital expenditures, overall sales, sales-per-employee and jobs that are substantial and consistently greater than the average of all U.S. manufacturing or non-manufacturing enterprises.

Summary of Findings

The major findings of this analysis include:

- Large, private equity-backed companies, on average, substantially expand their capital expenditures following their acquisitions, often after an initial one-year lag.
    - Among 53 private equity-backed companies that could provide the necessary data on their capital investments, 45 firms or 85 percent increased those investments in the subsequent three years; and

total capital spending by all 53 firms grew by an average of 14.6 percent per-year. By contrast, capital spending by all U.S. companies in this period grew at an average annual rate of 3.5 percent.

  - This group of 53 companies includes 20 manufacturing and 33 non-manufacturing firms. Capital spending by the 20 manufacturers increased by 9.1 percent per-year, compared to capital spending growth by all U.S. manufacturers of just 0.5 percent per-year. Similarly, capital spending by the 33 non-manufacturing companies grew by 17.3 percent per-year, compared to 4.1 percent per-year for all non-manufacturing companies.
  - At the time of their acquisitions, the private equity-backed companies also had lower average capital spending as a percentage of their sales, of 4.4 percent of sales, than the national average of 5.3 percent. Within three years of their acquisitions, the private equity-backed firms increased their capital spending rates to 7.9 percent of their sales.
  - Most of the gains in capital spending as a share of sales occurred in the non-manufacturing concerns acquired by private equity firms. Among those companies, capital spending as a share of sales rose over three years from 5.2 percent to 10.2 percent, compared to the national average of 5.7 percent. Among the private equity-backed manufacturers, capital spending increased over three years from 2.8 percent of sales at the time of their acquisitions to 3.6 percent of sales, compared to a national average for all manufacturers of 3.8 percent of sales.

- Consistent with these increases in capital expenditures, companies purchased by private equity firms also generally outperformed national and industry averages in the growth of their total sales.
  - Among 62 private equity-backed companies that could provide data on their sales at the time of their acquisitions and at least one subsequent year, total sales increased at an average annual rate of 10.8 percent, compared to the national average of 6.1 percent. This includes substantial increases in 53 of the 62 companies or 85 percent.
  - By sector, total sales by the manufacturing companies in this set grew 13.9 percent per-year, compared to a national annual average of 4.9 percent; and sales by the non-manufacturing firms in the set grew 9.5 percent per-year compared to the national average of 6.5 percent per-year.
  - Total sales of the private equity-backed firms initially increased slowly and then accelerated. Among 34 companies in the group that could provide sales data in their years of acquisition and three subsequent years, total sales by the manufacturing companies in this set increased 1.9 percent in the first year after acquisition, 11.1 percent in year two, and 4.7 percent in year three. Similarly, total sales by the non-manufacturing companies in this sub-group grew 5.2 percent in the first year, 15.4 percent in year two, and 8.8 percent in year three.
  - Sales-per-employee at these private equity-backed companies, which provides a measure of their gains in efficiency and labor productivity, also rose significantly following their acquisitions. Sales-per-employee at 27 firms increased at an average rate of 12.3 percent per-year, compared to gains of 5.5 percent per-year for all U.S. companies in this period. Within this group, both private equity-backed manufacturing and non-manufacturing companies reported gains of 12.3 percent per-year, or substantially more than increases of 7.8 percent per-year for all manufacturing firms and 5.4 percent per-year for all non-manufacturing concerns.

- As expected, the strong gains in capital expenditures and overall sales for private equity-backed firms also were accompanied by significant new job creation.

  - Among 42 private equity-backed companies that could provide jobs data for the time of their acquisitions and subsequent years, their combined labor force grew by 8.4 percent, compared to 5.5 percent for all U.S. companies over the same period. The 12 manufacturing firms in this group recorded job gains of 8.6 percent, while the job increases by the 30 non-manufacturing concerns were 8.4 percent.
  - A sub-group of 26 private equity-backed companies could provide jobs data distinguishing their domestic and worldwide labor forces. These firms expanded their U.S. workforces at an average annual rate of 5.7 percent, or more than five times the annual gains of 1.1 percent for all U.S. companies and 11 times the annual job creation rate for large U.S. companies of 0.5 percent per-year.
  - Among these 26 companies, the seven manufacturing firms in this sub-group expanded their U.S. employment by 0.5 percent per-year, while all U.S. manufacturing jobs shrank 1.5 percent per-year in the same period. The 19 non-manufacturing concerns in the sub-group expanded their U.S. workforces at an average annual rate of 6.5 percent per-year, compared to 1.5 percent per-year for all U.S. non-manufacturing companies in the same years.
  - The job gains by private equity-backed firms, especially manufacturing companies, also exhibit a modified "J curve" pattern in which their workforces grow slowly initially or even contract, followed by substantial job expansions in subsequent years. Among a sub-group of 20 private equity-backed firms that could provide continuous jobs data for the time of their acquisitions and three subsequent years, their combined workforces grew 0.7 percent in the first year after their acquisitions, 1.6 percent in year two, and 2.2 percent in year three.

Dataset and Samples

This analysis draws on data provided by eight major private equity firms on 70 transactions of at least $250 million each occurring between January 2002 and December 2005.[1] To our knowledge, this is the first analysis of the economic effects of private equity operations based on fairly comprehensive, empirical data provided by the major private equity firms themselves. The sample is comparable in numbers to those used in previous academic analyses and should provide particular insight into the impact on capital spending, sales, productivity and employment from purchases in the last five years of relatively large companies by major private equity firms and their subsequent operations. The data set was constructed by asking the eight large U.S. private equity firms to provide as comprehensive data as possible on their 10 largest deals transacted in the years 2002 through 2005, with a minimum value of $250 million each. The consequent data cover 70 large U.S. companies acquired in this period, including 50 acquisitions which private equity firms still held and 20 from which they have subsequently exited.[2] This set of private equity acquisitions includes 21 manufacturing enterprises and 49 non-manufacturing companies; and at the time of the acquisitions, 29 of the 70 compa-

1 To preserve confidentiality, this analysis reports only aggregate data and cannot provide specific information on the acquired companies in the sample.

2 For the 20 acquisitions that the eight private equity firms had already exited, the average holding period was 2.75 years. Other studies have found that leveraged-buyout firms typically take acquired companies public or resell them some 3 to 5 years following the LBOs. See, for example, Fox, Isaac and Marcus, Alfred, "The Causes and Consequences of Leveraged Management Buyouts," Academy of Management Review, 1992; Fruhan, William, "The Role of Private Equity Firms in Merger and Acquisition Transaction," Harvard Business School, 2007.

nies were privately-owned, 14 were publicly-traded companies, and 27 were subsidiaries of publicly-traded companies. The combined value of these 70 acquisitions was $144.5 billion: The 21 manufacturing companies' acquisitions account for $37.5 billion of this total, with an average deal size of $1.8 billion; and the 49 non-manufacturing firm acquisitions account for $107 billion, with an average deal size of $2.2 billion.

The four areas examined in this analysis draw on samples from this dataset which is based on the eight private equity firms' abilities to provide data. The dataset includes 10 acquisitions in 2002, 14 acquisitions in 2003, 24 acquisitions in 2004, and 22 acquisitions in 2005. Therefore, when we tracked capital spending, sales, productivity or job creation from the time of acquisition and several subsequent years, acquisitions in 2005 could not generate as much data as earlier acquisitions. In other cases, the private equity firms could not locate reliable data for certain years, especially if the acquired company had been resold. However, in all the analyses included here, the sub-samples were sufficiently representative of the dataset to provide results that were highly reliable statistically. For example, the data on trends in capital spending covered 53 companies representing 74 percent of the acquisitions and 73 percent of the funds' total large investments in this period; and the analysis of capital spending as a share of sales covers 49 companies representing 70 percent of the acquisitions and 71 percent of the funds' total investments. Similarly, the data on trends in sales covered 62 of the 70 companies representing nearly 89 percent of the acquisitions and 94 percent of the total investments by the eight private equity firms over this period; and the analysis of productivity gains through sales per-employee covered 27 companies representing nearly 40 percent of the deals and 50 percent of the total investments by the eight funds. Finally, the data on job creation covered 42 of the 70 companies, representing 60 percent of the deals and 67 percent of the total investments by the eight private equity firms. This sample of 42 acquired companies includes 76 percent of all the large acquisitions from which these funds had not exited, plus four which had been exited but for which data were still available.

Table 1. Number and Value of Large Private Equity Acquisitions, 2002-2005, By Year, Sector, and Status at Acquisition ($ million)[3]

	Companies	Total Deal Value	Average Deal Value
Total	70	$144,540	$2,064.9
Manufacturing	21	$37,499	$1,785.7
Non-manufacturing	49	$107,041	$2,184.5
Year of Acquisition			
2002	10	$18,928	$1,892.8
2003	14	$19,816	$1,415.4
2004	24	$36,759	$1,531.6
2005	22	$69,038	$3,138.1
Status at Acquisition			
Privately-held firm	29	$31,616	$1,090.2
Public firm	14	$50,392	$3,599.4
Subsidiary of Public Firm	27	$62,532	$2,316.0

3 Data provided by Apollo, Bain, Blackstone, Carlyle, Kohlberg Kravis Roberts, Providence, Silver Lake and Texas Pacific Group. Data collected by McKinsey and Company for the Private Equity Council.

II. HOW PRIVATE EQUITY ACQUISITIONS AND OPERATIONS AFFECT ACQUIRED COMPANIES AND THE ECONOMY

The economic significance of private equity transactions, including buyouts and venture financing, has expanded greatly in recent decades. New capital investments by private equity firms, not including funds borrowed to complete the transactions, have soared from an average of $230 million per-year in the 1970s to some $81 billion per-year from 2000 to 2007. In 2007, private equity investors completed 7,777 transactions involving $110.2 billion in direct capital from private equity funds. From 1970 to 2007, the number of private equity firms rose from 92 to 2,823, and the average size of their direct investments increased from $3.5 million to $14.2 million (2007 dollars).[4] Moreover, buyouts account for most of the recent growth in private equity investment, with most of those buyouts involving entire companies which often are privately-held firms.[5] Apart from the $31.1 billion private equity acquisition of RJR Nabisco in 1988, the ten largest buyouts on record all occurred in 2005, 2006, and 2007.[6]

The common practice of private equity funds is to take over under-performing companies and to reform or reorient their operations with new capital and management expertise, and thereby enable them to expand or at least increase their financial returns. Economic theory suggests that these operations can have both adverse and positive effects on a company's economic and financial performance. Steps to increase a firm's efficiency by cutting costs and selling off less productive operations can produce job layoffs, while other measures to expand sales and increase revenues may entail hiring more employees.[7] There has been some, limited empirical research in this area over the last 25 years, but with few conclusive results. Some studies in the 1980s and 1990s, for example, found modest job gains following LBOs while others found no statistically significant job changes or modest declines in employment.[8] More recently, an Ernst & Young study found that 80 percent of the 100 largest U.S. private equity-backed companies exited in 2006 maintained or expanded employment during their period of private-equity ownership,[9] and that almost half of their profit growth came from sales gains, or twice the share attributed to cost cutting.[10] Yet, a 2008 study of 5,000 U.S. companies acquired in private equity transactions from 1980 to 2005 found employment falling more rapidly in private equity-backed firms than the overall economy.[11] Similarly, other researchers found that private equity-backed companies showed small gains in sales and more significant improvements in gross profits, operating in-

4 VentureXpert, Thomson Financial. All investment figures represent investments by private equity firms excluded financial leverages.

5 Buyout-related investments in the 1970s totaled $425 million in 353 deals, compared to $1.9 billion in 2,159 venture investments; from 2000 to 2007, buyouts totaled $299.3 billion in 14,408 deals, compared to $350.7 billion in 38,976 venture deals. However, the clear distinction between venture and buyout funds is not always fixed. From 2000 to 2007, 16 percent of investments by venture capital funds involved buyout-related activities, and 14 percent of investments by buyout funds involved venture capital activities. VentureXpert, Thomson Financial.

6 The ten largest private-equity transactions are: TXU ($43.8 billion, 2007), Equity Office Properties ($38.9 billion, 2006), HCA ($32.7 billion, 2006), RJR Nabisco ($31.1 billion, 1988), Harrah's Entertainment ($27.4 billion, 2006), Clear Channel Communications ($25.7 billion, 2006), Kinder Morgan ($21.6 billion, 2006), Freescale Semiconductor ($17.6 billion, 2006), Albertson's ($17.4 billion, 2006) and Hertz ($15 billion, 2005); New York Times (2007, February 26). "The Top 10 Buyouts.

7 Fox, Isaac and Marcus, Alfred, "The Causes and Consequences of Leveraged Management Buyouts," *Academy of Management Review*, 1992.

8 For example, Brown, C. and Medoff, J., "The Impact of Firm Acquisitions on Labor," Corporate Takeovers, 1988; Kaplan, S., "Management Buyouts, Efficiency Gains or Value Transfers," Working Paper 244, University of Chicago, 1988; Long, W. and Ravenscraft, D., "The Record of LBO Performance," Paper prepared for the Conference on Corporate Governance, Restructuring and the Market for Corporate Control, 1989.

9 "How Do Private Equity Investors Create Value? A Study of 2006 Exits in the U.S. and Western Europe," Ernst & Young, 2007.

10 Ibid.

11 Davis, Steven, Haltiwanger, John, Jarmin, Ron, Lerner, Josh and Miranda, Javier, "Private Equity and Employment," *The Global Economic Impact of Private Equity Report 2008*, 2008.

come, and operating margin, but no improvement in net, after-tax income and sales-per-employee.[12] Other studies from the University of Chicago show capital expenditures also declined following buyouts, reflecting reductions in wasteful investments.[13] Yet, another study of 65 buyouts in the 1980s found that these firms had significantly higher sales in the three preceding their re-sales (through new public offerings) than their industry averages.[14]

This study focuses on the impact of private equity acquisitions on capital spending, sales growth, productivity and job creation by the acquired companies in a defined group of such transactions. To assess these effects, we analyzed data on changes in capital expenditures, sales, productivity and workforce size for 70 large companies purchased and operated by eight major private equity firms in 2002 to 2007. As we will show, these private equity-backed companies outpaced the averages for all U.S. businesses in all four areas.

III. PRIVATE EQUITY ACQUISITIONS AND CAPITAL EXPENDITURES

Changes in capital expenditures are central to understanding the economic significance of private equity purchases and operations. The most common criticism of private equity activities claims that such funds apply a short-term calculus to the management of their acquisitions, taking apart firms to sell off their assets or cutting costs, which in turn strongly implies that capital spending should decline or at a minimum underperform other peer companies. Similarly, one common defense of private equity activities insists that such funds are prepared to invest themselves in improving the long-term performance of acquired companies, which in turn suggests that capital spending should rise at even outperform other firms.

Our analysis of capital expenditures by large companies acquired by major private equity firms during the period from 2002 through 2005 finds that their capital spending both accelerated after their acquisitions and grew five to 12 times faster than the averages for all U.S. businesses, both manufacturing and non-manufacturing.

Among the 70 large companies acquired in recent years by eight major private equity funds, 53 companies could provide data on their capital expenditures in their acquisition years and in at least one subsequent year.[15] These companies represent 75.7 percent of all large acquisitions by the eight major private equity firms and 73.2 percent of the total investment by those funds over this period. These 53 companies include 20 manufacturing and 33 non-manufacturing enterprises (Table 2, below). In their acquisition years, the capital expenditures of the 20 manufacturing companies totaled $843.1 million, or an average of $42.2 million per company; among the 33 non-manufacturing firms, those expenditures totaled nearly $2 billion or an average of $60.1 million per-company.

12 Muscarella, Chris and Vetsuypens, Michael, "Efficiency and Organizational Structure: A Study of Reverse LBOs," *The Journal of Finance*, 1990.

13 Kaplan, S. "The Effects of Management Buyouts on Operating Performance and Value," *Journal of Financial Economics*, 1989; Smith, A., "Capital Ownership Structure and Performance: The Case of Management Buyouts," *Journal of Financial Economics*, 1990.

14 Singh, Harbir, "Management Buyouts: Distinguishing Characteristics and Operating Changes Prior to Public Offering," *Strategic Management Journal*, 1990.

15 We excluded one outlier non-manufacturing acquired company. Its capital expenditures at the acquisition accounted for almost half of total capital expenditures of combined 53 acquisitions and approximately 55 percent of combined non-manufacturing acquired companies. The inclusion of this outlier non-manufacturing would skew the analysis heavily on this particular non-manufacturing company.

Table 2. Capital Expenditures by 53 Private Equity-Backed Companies In the Years of Their Acquisitions, 2002-2005 ($ million)[16]

	Companies	Total Cap-Ex In Year of Acquisition	Average Cap-Ex Per-Firm In Year of Acquisition
Total	53	$2,824.8	$53.3
Manufacturing	20	$843.1	$42.2
Non-Manufacturing	33	$1,981.8	$60.1
Year of Acquisition			
2002	6	$499.4	$83.2
2003	9	$266.2	$29.6
2004	21	$931.7	$44.4
2005	17	$1,127.5	$66.3

We then tracked the capital expenditures of these 53 companies in subsequent years. In 45 of the 53 cases, or 84.9 percent, the capital expenditures of the acquired firms increased in subsequent years. As an initial measure of these increases, we tracked the highest annual capital expenditures for each company in the three years following its acquisition. By this gauge, the 53 companies expanded their total capital spending from $2.8 billion in the years of their acquisitions to nearly $3.8 billion, a 35.2 percent increase. As the 53 companies provided an average of 2.4 years of data on these capital expenditures, their capital spending increased by an average of 14.6 percent per-year.

These data also show variations in the capital spending patterns of manufacturing compared to non-manufacturing companies. The capital expenditures by the 20 manufacturing companies in this large sample increased from $843 million in the years of their acquisitions to maximum levels of $1,038 million, for a total increase $195 million or 23.1 percent. Since the 20 manufacturing companies could provide an average of 2.6 years of capital spending data, their capital investment grew by an average of 9.1 percent per-year. Among the 33 non-manufacturing companies, total capital spending rose from $1,982 million in the years of their acquisitions to maximum levels of $2,782 million, an increase of $800 million or 40.4 percent. The 33 non-manufacturing companies provided an average of 2.3 years of data, and therefore their capital investment grew by an average of 17.3 percent per-year (Table 3, below).

Further, private equity-backed companies increased their capital spending substantially more than all U.S. manufacturing and non-manufacturing firms over the same years. From 2002 through 2006, capital spending grew at average rates of 3.5 percent per-year for all U.S. companies, including 0.5 percent per-year for all manufacturing concerns and 4.1 percent per-year for all non-manufacturing companies. Therefore, annual capital spending increased 4.17 times faster among those 53 private equity-backed companies than among all U.S. companies in this period, with capital expenditures by the 20 acquired manufacturing concerns increasing 18.2 times faster than across all U.S. manufacturers, and capital spending by the 33 acquired non-manufacturing companies rising 4.22 times faster than all U.S. non-manufacturers.

16 Data collected by McKinsey and Company for the Private Equity Council.

Table 3. Capital Expenditures by 53 Private Equity-Backed Companies
And All U.S. Companies, 2002-2007 ($ millions)[17]

	Total	Manufacturing Companies	Non-Manufacturing Companies
Private Equity-Backed Companies			
Number	53	20	33
CapEx in year of acquisition ($ million)	$2,825	$843	$1,982
CapEx change ($ million)	$995	$195	$800
Percentage change	35.2%	23.1%	40.4%
Number of years	2.4	2.6	2.3
Average change per-year	14.6%	9.1%	17.3%
All U.S. Companies			
CapEx in 2002 ($ million)	$917,490	$156,891	$760,599
Average increase per-year, 2002-2006	3.5%	0.5%	4.1%
How much more private equity-backed companies expanded capital spending than other enterprises	**417%**	**1,820%**	**422%**

A distinct pattern of capital investment by private equity-backed companies also is apparent in these data. Capital spending, measured as a share of sales revenues, by large companies acquired by major private equity firms in this period was relatively low at the time of their acquisition, and then increased substantially in the years following their acquisitions. Among the 70 large companies acquired by eight major private-equity firms in 2002-2005, 49 could provide data for both capital expenditures and sales in the years of their acquisitions and at least one subsequent year, including 17 manufacturing and 32 non-manufacturing companies. This group represents 70 percent of all acquisitions and 71 percent of all investment by the eight major private equity funds over this period. Capital spending as a percentage of sales by these 49 companies was considerably lower than the average for all U.S. companies at the time of their acquisitions, for both manufacturing and non-manufacturing enterprises. In the years following these acquisitions, the acquired companies' capital expenditures as a share of sales increased sharply (see Table 4, below). At their highest levels, capital spending as a share of sales by the non-manufacturing companies acquired by large private equity funds rose to nearly twice the levels for all U.S. non-manufacturing companies, and most of the gap in these expenditures between private equity-backed manufacturers and all U.S. manufacturing concerns closed. For all of the 49 companies acquired by private equity firms, capital spending as a percentage of their sales reached levels nearly 50 percent greater than those of all U.S. companies within several years of their acquisitions (Table 4, below).

17 U.S. Census Bureau and data collected by McKinsey and Company for the Private Equity Council.

Table 4. Capital Expenditures as a Percentage of Sales,
49 Large Private Equity Acquisitions and All U.S. Companies[18]

	Total	Manufacturing	Non-Manufacturing
Private Equity-Backed Companies			
Number	49	17	32
CapEx as a Share of Sales			
Year of Acquisition	4.4%	2.8%	5.2%
Highest Level in Next Three Years	7.9%	3.6%	10.2%
All U.S. Companies			
Average Annual Level, 2002-2006	5.3%	3.8%	5.7%

IV. PRIVATE EQUITY ACQUISITIONS AND COMPANY SALES

Generally, increases in a company's capital spending are directed to expand its production and sales, either directly or indirectly. Therefore, the rising capital expenditures by companies acquired by private equity firms in recent years should be associated with increases in their sales. The data show that connection: In the years following their acquisitions, the large companies acquired by major private equity firms increased their sales, and at a rate nearly 60 percent greater than the average for all U.S. companies, both manufacturing and non-manufacturing. Furthermore, the increases in sales per-employee by these private equity-backed companies, a rough measure of productivity and efficiency, also were twice as great as in all U.S. companies.

Among the 70 large companies acquired in 2002-2005 by eight major private equity firms, 62 firms could provide data on their sales in the years of their acquisitions and at least one subsequent year. These 62 companies represent 89 percent of the purchases and 94 percent of the total investments by the eight major private equity funds in this period, and include 17 manufacturing and 45 non-manufacturing companies. The annual sales of these 62 companies totaled $87.9 billion in the years of their acquisitions, with the 17 manufacturing firms accounting for total sales of $23.1 billion, or an average of $1.36 billion per-company, and the 45 non-manufacturing companies reporting total sales of $64.8 billion or an average of $1.46 billion per-company (see Table 6, below).

Our tracking of the subsequent sales performance of these 62 acquired companies found that their combined sales increased by $22.5 billion or 25.6 percent, from increases in 53 of the 62 cases or 85.5 percent. The sales data covered an average of 2.4 years per-company following acquisition, so the reported total sales gains of 25.6 percent reflect average annual sales growth of 10.8 percent (Table 6). Sales growth was strongest among manufacturing companies: Total sales for 17 manufacturing companies in this group expanded $8.5 billion, an increase of 36.8 percent from their sales in the years of their acquisitions; while sales by 45 non-manufacturing companies grew $14 billion, an increase of 21.6 percent over the years of their acquisitions. Since the dataset includes an average of 2.6 years of sales information for the manufacturing companies and 2.3 years of sales information for the non-manufacturing firms, we found that manufacturing companies acquired by large private equity firms in this period increased their sales by an average of 13.9 percent

18 U.S. Census Bureau and data collected by McKinsey and Company for the Private Equity Council.

per-year, and non-manufacturing companies acquired by those funds increased their sales by an average of 9.5 percent per-year (Table 6).

In both cases, these sales gains substantially outpaced the average for all U.S. companies and separately for all U.S. manufacturing and all U.S. non-manufacturing enterprises. Over this period, sales by all U.S. companies grew by an average of 6.1 percent per-year, with annual average gains of 4.9 percent for manufacturing concerns and 6.5 percent for non-manufacturing companies. Therefore, the large companies acquired by eight major private equity funds in this period increased their average annual sales at a rate 77 percent greater than all U.S. companies (gains of 10.8 percent per-year, versus 6.1 percent per-year). Large manufacturing firms acquired by the major private equity funds increased their sales nearly three times faster than all U.S. manufacturing companies (average annual gains of 13.9 percent, compared to 4.9 percent), while the non-manufacturing companies acquired by private equity firms expanded their sales at a rate 46 percent greater than all U.S. non-manufacturing companies (average annual gains of 9.5 percent, compared to 6.5 percent).

Table 6. Sales and Sales Growth by 62 Companies Acquired by Large Private Equity Firms, Compared to All U.S. Companies, 2002-2007 ($ millions) [19]

	Total	Manufacturing	Non-Manufacturing
Private Equity-Backed Companies			
Number of Companies	62	17	45
Total Sales at Time of Acquisition	$87,943	$23,121	$64,822
Total Increases in Sales	$22,524	$8,510	$14,014
Total Percentage Increase in Sales	25.6%	36.8%	21.6%
Average Number of Years Covered	2.4	2.6	2.3
Average Annual Increase in Sales	10.8%	13.9%	9.5%
All U.S. Companies			
Sales in 2002	$16,633	$3,850	$12,783
Average Annual Increases in Sales, 2002-2006	6.1%	4.9%	6.5%
How Much Faster Private Equity-Backed Companies Increased Their Sales than All U.S. Companies	**77.1%**	**283.7%**	**46.2%**

A subset of 34 companies could provide sales data for at least three years following their acquisitions, representing nearly half of the purchases and more than 45 percent of the total investments by the eight major private equity firms over this period. The sales data for this group, which includes 12 manufacturing and 22 non-manufacturing enterprises, show a pattern of strong growth after the first year. The combined annual sales by this group in their acquisition years totaled $44.7 billion. These sales increased modestly in the first year, to $46.4 billion, and then rose more markedly in year two to $52.7 billion and increased again in year three to $56.4 billion. Therefore, annual sales by these 34 companies increased 3.8 percent in the first year after their acquisitions, 13.6 percent during the second year, and 7.1 percent during the third year (see Table 7, below).

19 U.S. Bureau of Economic Analysis and data collected by McKinsey and Company for the Private Equity Council.

This pattern of strong sales gains in the second and third years after acquisition is evident in both the manufacturing and non-manufacturing companies in the subset. However, in contrast to the larger set of companies analyzed earlier, the non-manufacturing companies in this group exhibited stronger sales growth than the manufacturing companies. The combined sales of the 12 manufacturing companies in this sample increased 1.9 percent in the first year after their acquisitions, 11.1 percent in the second year, and 4.7 percent in the third year. Among the 22 non-manufacturing firms, combined sales increased 5.2 percent in the first year after their acquisitions, 15.4 percent in the second year, and then 8.8 percent in the third year (see Table 7, below).

Table 7. Total Sales and Increases in Sales Over Three Years by 34 Companies Acquired by Private Equity Firms, 2002-2007 ($ million)

	Acquisition Year	First Year After Acquisition	Second Year After Acquisition	Third Year After Acquisition
Total Sales				
All Firms in the Subset	$44,698	$46,383	$52,678	$56,416
Manufacturing	$19,319	$19,695	$21,878	$22,900
Non-Manufacturing	$25,379	$26,688	$30,800	$33,516
Sales Increases				
All Firms in the Subset		$1,685	$6,295	$3,738
Manufacturing		$376	$2,183	$1,022
Non-Manufacturing		$1,309	$4,112	$2,716
Annual Increases in Sales				
All Firms in the Subset		3.8%	13.6%	7.1%
Manufacturing		1.9%	11.1%	4.7%
Non-Manufacturing		5.2%	15.4%	8.8%

The strong performance of companies once acquired by large private equity firms in this period is also evident by data on increases in their sales-per-employee, which provide a general measure of productivity and efficiency.[20] Twenty-seven companies could provide data on both total sales and number of employees for the year of their acquisitions and subsequent years, representing about 39 percent of the purchases and 50 percent of the total investment by the eight private equity firms in recent years. Sales-per-employee for all 27 companies averaged $509,948 in their acquisition years, including sales per-employee of $338,840 for the 5 manufacturing firms in the group and sales of $548,836 per-employee for 22 non-manufacturing companies. In subsequent years, sales-per-employee by all 27 companies rose by an average of $122,780 or 24.5 percent, with the companies in the group able to provide an average of two years of sales and employee data. Thus, sales-per-employee by the 27 private equity-backed companies increased an average of 12.3 percent per-year following their acquisitions, a rate of increase which was consistent across manufacturing and non-manufacturing companies in the subset (see Table 8, below).

The gains in sales-per-employee by private equity-backed companies substantially outpaced those by all U.S.

20 While this is a widely-accepted gauge of efficiency and productivity, a more precise measure would track sales-per-employee-hour. However, data on hours worked in these firms are not available.

firms. Over the years 2002 to 2006, the sales-per-employee by all private U.S. firms increased by an average of 5.5 percent per-year, or less than half as much as this subgroup of companies acquired by large private equity firms (Table 8, below). The gap is wider for non-manufacturing than for manufacturing companies: Over this period, sales-per-employee increased at an annual average rate of 7.8 percent for all U.S. manufacturing firms and 5.4 percent for all U.S. non-manufacturing companies, compared to 12.3 percent each for both the large manufacturing and large non-manufacturing companies acquired by private equity firms. Stated another way, this group of private equity-backed companies increased their efficiency and productivity, as measured by gains in sales per-employee, 120 percent faster than all U.S. firms, including some 58 percent faster for manufacturing companies and nearly 128 percent faster for non-manufacturing concerns.

Table 8. Sales-Per-Employee and Increases in Sales-per-Employee by 27 Companies Acquired by Private Equity Firms and by All U.S. Companies, 2002-2006[21]

	Total	Manufacturing	Non-manufacturing
Private Equity-Backed Companies			
Number of companies	27	5	22
Sales-Per-Employee in Years of Acquisitions	$509,948	$338,840	$548,836
Average Increase in Sales-Per-Employee	$122,780	$108,311	$126,069
Average Percentage Increase	24.5%	32.0%	23.0%
Average Number of Years Covered	2.0	2.6	1.9
Average Annual Increase in Sales Per-Employee	12.3%	12.3%	12.3%
All U.S. Companies			
Average Sales-Per-Employee, 2002	$135,903	$252,059	$119,341
Average Annual Increase, 2002-2006	5.5%	7.8%	5.4%
How Much Faster Private Equity-Backed Firms Increased Their Sales-Per-Employee than All Firms	**123.6%**	**57.7%**	**127.8%**

V. PRIVATE EQUITY ACQUISITIONS AND EMPLOYMENT [22]

When a company's capital spending and sales both rise strongly, its workforce usually grows as well. Therefore, the rising capital expenditures and sales by the large companies acquired by major private equity firms in recent years should be associated with job creation by those same companies. The data show this connection: In the years following their acquisitions, the large companies acquired by major private equity firms created new jobs, and at a rate five to seven times greater than the average for all U.S. companies, both in manufacturing and non-manufacturing.

21 U.S. Bureau of Labor Statistics and data collected by McKinsey and Company for the Private Equity Council.

22 For a more detailed analysis, see Shapiro, Robert and Pham, Nam, "American Jobs and the Impact of Private Equity Transactions," Private Equity Council, 2008.

Among the 70 large companies purchased by eight major U.S. private equity firms in the years 2002 to 2005, 42 companies could provide employment data for their years of acquisition and at least one subsequent year (see Table 9, below). These 42 companies, including 12 manufacturing firms and 30 non-manufacturing companies, represent 60 percent of all the purchases and 67 percent of the total investment by these private equity firms in large companies. Their total employment in their acquisition years was 310,420, an average of 7,391 employees per-firm, including 70,931 jobs at the 12 manufacturing companies and 239,489 jobs at the 30 non-manufacturing firms. Among this group, 14 firms operate solely in the United States and 28 companies operate globally. In their acquisition years, the 14 domestic-only companies had 65,940 employees, an average of 4,710 employees per-company; and the 28 U.S. and global companies had 244,480 employees, an average of 8,731 employees per company.

Table 9. Employment at 42 Large Private Equity-Backed Companies In the Years of Their Acquisitions, 2002-2005[23]

	Companies	Jobs at Acquisition	Average Jobs per Company at Acquisition
Total	42	310,420	7,391
Manufacturing	12	70,931	5,911
Non-manufacturing	30	239,489	7,983
Location of Operations			
U.S. Only	14	65,940	4,710
U.S. and Global	28	244,480	8,731

Our tracking of employment at these 42 companies found that 32 of them or 76.2 percent expanded their worldwide workforces in the years following their acquisitions, with total employment by all 42 companies rising by 26,214 net new jobs or 8.4 percent. These job gains were distributed roughly evenly across the manufacturing and non-manufacturing firms: The 12 manufacturing companies in this group added 6,094 jobs, an employment increase of 8.6 percent, while the 30 non-manufacturing companies added 20,120 jobs, an increase of 8.4 percent.

Table 10. Job Creation by 42 Private Equity-Backed Companies, 2002-2007[24]

	All	Manufacturing	Non-Manufacturing
Companies	42	12	30
Employment at Acquisitions	310,420	70,931	239,489
Net Job Increases	26,214	6,094	20,120
Percentage Increases	8.4%	8.6%	8.4%

To refine this analysis, we identified a subset of 26 companies which provided specific data on their U.S. employment, including 14 firms operating solely in the United States and 12 global companies that provided

23 Data collected by McKinsey and Company for the Private Equity Council.
24 Data collected by McKinsey and Company for the Private Equity Council.

data on their U.S. employment. In their acquisition years, this group of 26 companies, including seven manufacturing and 19 non-manufacturing companies, employed 104,221 workers. Over subsequent years, these companies added 13,861 jobs, an increase of 13.3 percent. The employment data covered an average of 2.3 years per-company, so the reported job growth of 12.3 percent reflects average annual job growth of 5.7 percent (see Table 11, below). Nearly all of the job growth by these companies occurred in the non-manufacturing firms: Of 13,861 net new jobs, 13,746 were created by the 19 non-manufacturing companies, while the seven manufacturers in the group added just 115 net new jobs. Since the data on these jobs covered an average of 2.2 years for the non-manufacturing firms and 2.7 years for the manufacturing firms, the private equity-backed non-manufacturing companies created new jobs at an average rate of 6.5 percent per-year, while the manufacturing companies acquired by private equity firms created new jobs at an average rate of 0.5 percent per-year (Table 11).

In both cases, the domestic job creation rates for private equity-backed companies substantially outpaced the average for all U.S. companies and separately for all U.S. manufacturing and all U.S. non-manufacturing enterprises. Over this period, domestic employment by all private companies grew by an average of 1.1 percent per-year, with average job gains of 1.5 percent per-year in non-manufacturing companies and average job *losses* of 1.5 percent per-year in manufacturing firms. Therefore, the large companies acquired by eight major private equity firms in this period expanded their U.S. workforces at an annual rate more than five times greater than all U.S. companies (gains of 5.7 percent per-year, versus 1.1 percent per-year). The private equity-backed non-manufacturing companies in this group created net new U.S. jobs at a rate 4.3 times greater than all U.S, non-manufacturing companies (gains of 6.5 percent per-year, versus 1.5 percent per-year), while this group of manufacturing companies acquired by private equity firms created net new U.S. jobs and all U.S. manufacturers were shedding U.S. jobs (gains of 0.5 percent per-year, versus losses of 1.5 percent per-year). Put another way, the manufacturers acquired by major private equity firms in this period achieved net U.S. job gains, adjusted for U.S. job losses among all manufacturers, of 2.0 percent per-year.

Table 11. Domestic Job Creation by 26 Private Equity-Backed Companies And by All U.S. Companies, 2002-2007[25]

	Total	Manufacturing	Non-manufacturing
Private Equity-Backed Companies			
Number of companies	26	7	19
Employment in Years of Acquisition	104,221	8,067	96,154
Employment Increases	13,861	115	13,746
Total Percentage Increase in Jobs	13.3%	1.4%	14.3%
Number of years	2.3	2.7	2.2
Average Annual Job Gains	5.7%	0.5%	6.5%
All U.S. Companies			
Employment in 2002	122,388,000	15,273,000	107,115,000
Job Gains, 2002-2007	6,699,000	-1,183,000	7,882,000
Total Percentage Gains or Losses in Jobs	5.5%	-7.7%	7.4%
Average Annual Job Gains or Losses	1.1%	-1.5%	1.5%
Large U.S. Companies			
Average Annual Job Gains	0.5%		
How Much Faster Private Equity-Backed Companies Created Jobs than All Companies	**418.2%**	**--**	**333.3%**
How Much Faster Private Equity-Backed Companies Created New Jobs than All Large Companies	**1,040.0%**		

Moreover, all of the acquired companies are large enterprises; and domestic employment by U.S. companies with 500 or more employees grew just 2.7 percent over this period, or barely one-fifth of the 13.3 percent gains achieved by our sample of private equity-backed companies. On an average annual basis, employment at all large U.S. companies grew at an average rate of 0.5 percent per-year from 2002 to 2007, compared to 5.7 percent per-year for the group of 26 companies purchased owned and operated by major private equity firms in the same period (Table 11, above).

There is also modest evidence of a modified "J-curve pattern" in job creation by private equity-backed manufacturing companies, in which employment initially declines as investment and other changes are carried out and then expands strongly as these shifts affect sales in subsequent years. The group of 42 private equity-backed companies that could provide jobs data for the year of their acquisition and subsequent years includes 20 companies with employment data for at least three years following their acquisitions. These 20 companies represent 28.6 percent of the large purchases and 23.9 percent of the total investment by the eight major private equity firms in this period. The 20 companies include nine manufacturing and 11 non-manufacturing enterprises. Both sub-groups show significant job gains three years after their acquisitions. Among this group

25 U.S. Bureau of Labor Statistics and data collected by McKinsey and Company for the Private Equity Council.

of private equity-backed manufacturers, jobs grew 4.3 percent from acquisition to year three or an average of 1.4 percent per-year, compared to average job *losses* of 1.5 percent per-year by all U.S. manufacturing (Table 12). Similarly, jobs at this sub-group of private equity-backed non-manufacturing firms grew 4.7 percent from acquisition to year three or an average of 1.6 percent per-year, compared to about 1.5 percent per-year for all U.S. non-manufacturing companies. A modest J-curve pattern in job losses and gains is evident only in the private equity-backed manufacturers: These nine companies reported cutting their workforces 1.2 percent in the first year following their acquisitions and by another 3.8 percent in year two, followed by job growth of 9.8 percent in year three (Table 12, below). This pattern suggests an initial adjustment phase that involves job cuts followed by greater gains reflecting the increases in capital spending, production and sales which we noted earlier. However, the 11 non-manufacturing companies in this sub-group reported modest job gains in the first year after their acquisitions, larger gains in year two, and then job cuts in the third year.

Table 12. Patterns of Jobs Creation and Job Cuts in 20 Private Equity-Backed Companies, 2002-2007[26]

	Acquisition Year	Year One	Year Two	Year Three
Total Employment	**162,090**	**163,215**	**165,830**	**169,497**
Manufacturing	65,443	64,688	62,209	68,278
Non-Manufacturing	96,647	98,572	103,621	101,219
Employment Changes		**1,125**	**2,612**	**3,667**
Manufacturing		-755	-2,479	6,069
Non-Manufacturing		1,880	5,094	-2,402
Percentage Gains or Losses		**0.7%**	**1.6%**	**2.2%**
Manufacturing		-1.2%	-3.8%	9.8%
Non-Manufacturing		1.9%	5.2%	-2.3%

VI. CONCLUSION

While researchers have reached a range of conclusions about the economic performance and impact of private equity-backed companies, this analysis finds clear and convincing evidence that the acquisition and subsequent operation of large companies by major private equity firms since 2002 has resulted in increases in capital spending, sales, efficiency and productivity and jobs. Moreover, after two or three years of operation as private equity-backed companies, the changes initiated following their acquisition produced increases in capital spending, sales and job creation that outpaced the national averages.

Our analysis of the data finds that among large companies purchased by major private equity firms since 2002, the process of acquisition and the changes that follow acquisition involve substantial increases in capital spending. Among 53 private equity-backed companies purchased between 2002 and 2005, which account for nearly three-fourths of all investment in large companies by eight major private-equity firms over this period, capital spending increased at an average rate of 14.6 percent per-year or more than four times the rate for all U.S. companies. Among manufacturing companies, the private equity-backed companies increased their capital spending at an average rate of 9.1 percent per-year or more than 18 times the rate of all U.S. manufac-

26 Data collected by McKinsey and Company for the Private Equity Council.

turers. The non-manufacturing companies in this group increased their capital expenditures by an average of 17.3 percent per-year, again more than four times the rate for all U.S. non-manufacturing concerns.

Our analysis of the data further finds that among these large companies purchased by major private equity firms since 2002, these rising capital expenditures are accompanied by increases in their sales. Among 62 private equity-backed companies purchased between 2002 and 2005, which cover 94 percent of the total investments by the eight major private-equity firms over this period, their combined sales increased at an average annual rate of 10.8 percent or some 77 percent faster than the rate for all U.S. companies. Among manufacturing companies, the private equity-backed companies expanded their sales at an average rate of 13.9 percent per-year or nearly three times the rate for all U.S. manufacturers. The non-manufacturing firms in this group expanded their sales by an average of 9.5 percent per-year or nearly 50 percent faster than the rate for all U.S. non-manufacturing companies.

Our analysis further finds that among a sub-group of large companies purchased by major private equity firms that could provide the necessary data, their sales-per-employee, which provides a general measure of their efficiency and productivity, increased much faster than all U.S. companies. Among 27 private equity-backed companies which accounted for half of all investment by the eight major private equity funds in this period, sales-per-employee grew at an average annual rate of 12.3 percent or more than twice as fast as all U.S. companies. Across manufacturing, the private equity-backed firms in this group increased their sales-per-employee at an average rate of 12.3 percent per-year, or nearly 60 percent faster than all U.S. manufacturers. The non-manufacturing concerns in this group also expanded their sales-per-employee by an average of 12.3 percent per-year or more than twice as fast as all U.S. non-manufacturing companies.

Finally, our analysis finds that large companies purchased by major private equity firms since 2002 expanded their worldwide workforces at substantial rates; and a subgroup of these companies that could provide four years of data on their U.S. workforces created U.S. jobs at much higher rates than all U.S. companies. Among 42 private equity-backed companies purchased between 2002 and 2005, which cover two-thirds of all investment by the eight major private equity firms in this period, total employment grew by 8.4 percent. Moreover, a subset of 26 companies that could provide several years of data on their U.S. workforces produced new jobs at an average annual rate of 5.7 percent, or five times the rate for all U.S. companies and 11 times the rate for all large U.S. concerns. Across the manufacturing companies in this group, the private equity-backed companies expanded their domestic employment at an average rate of 0.5 percent per-year, compared to average job losses of 1.5 percent per-year for all U.S. manufacturers. And the non-manufacturing companies in this group created new domestic jobs at an average rate of 6.5 percent per-year or more than three times the rate for all U.S. non-manufacturing companies.

These findings establish clearly that large purchases by major private equity firms in this period and their subsequent operations have entailed significant growth in capital spending, sales, productivity and jobs; and those increases have generally far outpaced the averages for all U.S. companies and for all U.S. manufacturing and non-manufacturing concerns. On this basis, we conclude that large, private equity buyouts and operations in this period have produced clear, net economic benefits for the acquired companies as well the overall U.S. economy.

REFERENCES

Brown, Charles and Medoff, James, "The Impact of Firm Acquisitions on Labor," Corporate Takeovers, 1988.

Davis, Steven, Haltiwanger, John, Jarmin, Ron, Lerner, Josh and Miranda, Javier, "Private Equity and Employment," The Global Economic Impact of Private Equity Report 2008, 2008.

Ernst & Young, "How Do Private Equity Investors Create Value? A Study of 2006 Exits in the U.S. and Western Europe," Ernst & Young, 2007.

Fox, Isaac and Marcus, Alfred, "The Causes and Consequences of Leveraged Management Buyouts," Academy of Management Review, 1992.

Fruhan, William, "The Role of Private Equity Firms in Merger and Acquisition Transaction," Harvard Business School, 2007.

Garibaldi, Pietro, and Mauro, Paolo, "Job Creation: Why Some Countries Do Better," *Economic Issues*, No. 20, International Monetary Fund, 2000.

Kaplan, Steven, "Management Buyouts, Efficiency Gains or Value Transfers," Working Paper 244, University of Chicago, 1988.

________ , "The Effects of Management Buyouts on Operating Performance and Value," Journal of Financial Economics, 1989.

Long, William and Ravenscraft, David, "The Record of LBO Performance," Paper prepared for the Conference on Corporate Governance, Restructuring and the Market for Corporate Control, 1989.

Muscarella, Chris and Vetsuypens, Michael, "Efficiency and Organizational Structure: A Study of Reverse LBOs," The Journal of Finance, 1990.

Opler, Tim C., "Operating Performance in Leveraged Buyouts: Evidence from 1985-1989 – Leveraged Buyouts Special Issue," Financial Management, Financial Management Association, 1992.

Private Equity Council, data on large acquisitions by large private equity funds, provided by eight PEC members.

Singh, Harbir, "Management Buyouts: Distinguishing Characteristics and Operating Changes Prior to Public Offering," Strategic Management Journal, 1990.

Shapiro, Robert and Pham, Nam, "American Jobs and the Impact of Private Equity Transactions," the Council of Private Equity, 2008.

Smith, A. J., "Capital Ownership Structure and Performance: The Case of Management Buyouts," Journal of Financial Economics, 1990.

"The Top 10 Buyouts," *New York Times*, February 26, 2007.

Thomson Financial, VentureXpert database.

U.S. Bureau of Economic Analysis, Annual Industry Accounts.

U.S. Bureau of Labor Statistics, "Employment, Hours, and Earnings," from the *Current Employment Statistics Survey*.

U.S. Census Bureau, Annual Capital Expenditures Survey.

ABOUT THE AUTHORS

Robert J. Shapiro is the chairman of Sonecon, LLC, a private firm that advises senior officials and executives of U.S. and foreign businesses, governments, and non-profit organizations. Dr. Shapiro has advised, among others, U.S. President Bill Clinton, British Prime Minister Tony Blair, and Senators Barack Obama, Hillary Rodham Clinton and Evan Bayh; private firms including Amgen, AT&T, Gilead Sciences, Google, MCI, Inc., SLM Corporation, Nordstjernan of Sweden, and Fujitsu of Japan; and non-profit organizations including the American Public Transportation Association, the Education Finance Council, and the U.S. Chamber of Commerce. He is also a Senior Fellow of the Georgetown School of Business and the Progressive Policy Institute (PPI), director of the NDN Center on Globalization, co-chair of Argentina Task Force America, chair of the Climate Task Force, and a director of the Axson-Johnson Foundation in Sweden. From 1997 to 2001, he was Under Secretary of Commerce for Economic Affairs. Prior to that, he was co-founder and Vice President of PPI. Dr. Shapiro also served as the principal economic advisor to Bill Clinton in his 1991-1992 presidential campaign, senior economic advisor to Albert Gore, Jr. and John Kerry in their presidential campaigns, Legislative Director for Senator Daniel P. Moynihan, and Associate Editor of *U.S. News & World Report*. He has been a Fellow of Harvard University, the Brookings Institution, and the National Bureau of Economic Research. He holds a Ph.D. and M.A. from Harvard University, a M.Sc. from the London School of Economics, and an A.B. degree from the University of Chicago. He is widely published in professional and popular journals, and his most recent book is *Futurecast: How Superpowers, Populations and Globalization Will Change the Way You Live and Work* (St Martins' Press, 2008).

Nam D. Pham is the founder and president of NDP Group, LLC, an economics consulting firm that specializes in assessing complex issues in finance, international trade, and economic development. Clients of NDP Group include U.S. and foreign corporations, financial institutions, federal and local governments, trade associations, and multi-national organizations. Prior to founding NDP Group in 2000, Dr. Pham was Vice President at Scudder Kemper Investments in Boston, where he was responsible for research, asset allocations and currency hedges for global and international bond funds. Before that, he was Chief Economist of the Asia Region for Standard & Poor's DRI in Boston. Dr. Pham's also has extensive experience in multinational organizations and government agencies, including service as an economist at the World Bank and consultant to the Department of Commerce and the Federal Trade Commission. Dr. Pham also has been an adjunct professor at the George Washington University, where he has taught monetary economics, international trade and finance, macroeconomics and microeconomics. Dr. Pham earned a Ph.D. in economics from the George Washington University with concentrations in international trade and finance, economic development and applied microeconomics, a M.A. from Georgetown University, and a B.A. from the University of Maryland.