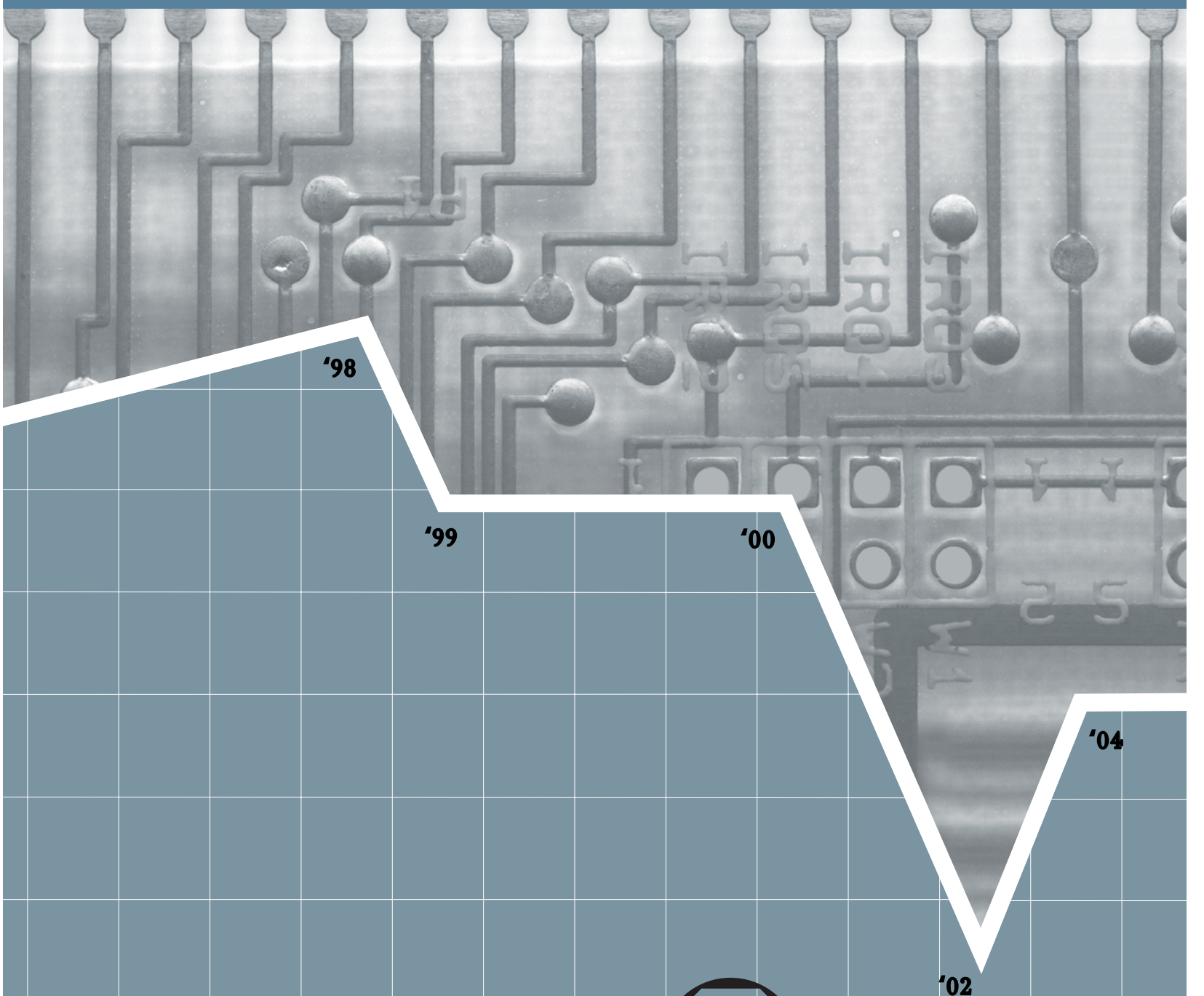
The Profit Squeeze for U.S. Manufacturers

A Close Look at Five Major Industries

October 2005



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A Close Look at Five Major Industries

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FOREWORD

by Jerry Jasinowski and Tom Duesterberg

For anyone who cares about the future of manufacturing in the United States, this concise report is essential reading. The recession that hammered so much of manufacturing from 2000 until 2003 and which saw the disappearance of three million industrial jobs has ended, although the jobs have not returned. However, some of the root causes of that recession remain and are continuing to have an adverse impact on America's industrial base, particularly the durable goods sector.

The Profit Squeeze for U.S. Manufacturers paints a quite different picture of our industry than of the rest of domestic business. Just as the recession hit manufacturing while relative prosperity continued for the rest of the economy, so too have profits languished for much of manufacturing while they have steadily climbed at double-digit rates for the rest of American business.

This report reveals an unprecedented fall in profits in over half of manufacturing between 2000 and 2003. This 67 percent plunge from historical trends, as shown in Chart 2 of this report, has only partially been erased. Profit growth is so sluggish that manufacturing profits have risen only to what was the previous ***low point*** for profits in the past 40 years (in the first quarter of 1986). This is not a positive trend for either industry or for the nation's overall economic health.

There is no question that strong profit performance is the hallmark of successful business and a strong economy. While shareholders, including many retirees and 401(k) pension plans, are the beneficiaries of roughly half of corporate profits in the form of dividends, the other half of profits are used for investment in new plant and equipment, research and development of new products and processes, and in the hiring and training of new employees. In the absence of healthy profits, companies that wish to expand must turn to issuing new stock or borrowing and incurring debt.

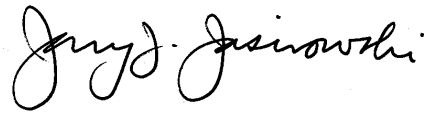
Our key findings in this report are that:

- Manufacturing profits from 2000 to 2003 in over half of the industry were 67 percent lower than they would have been were it not for adverse trends in health care and pension costs, commodity and energy costs, and import price competition in large measure resulting from imbalanced exchange rates;
- The five sectors most affected are industrial machinery, computer and electronic equipment, electrical equipment, motor vehicles, and chemicals.
- Fierce international competition and the resulting lack of pricing power have prevented companies in these sectors from passing on cost increases to their customers.
- The other half of manufacturing has been affected as well, albeit not as significantly.

Our report does not provide a prescription for these trends. Rather, it shows that the rising costs affecting U.S. manufacturing are taking their toll. Our earlier joint report, *How Structural Costs Imposed on U.S. Manufacturers Harm Workers and Threaten Competitiveness,* provides a wider discussion of some of the steps that federal and state governments should take to bolster American manufacturing. *The Profit Squeeze* is a sequel that shows that these costs are continuing to undermine the health of U.S. manufacturing.

Elected officials who seek a better future for 14 million manufacturing employees and the 6 million Americans who work in related, support industries—such as wholesaling, finance, and construction—should redouble their efforts to hold the line and reduce costs for health care, regulatory compliance, taxation, energy, and litigation.

We would like especially to thank the report's author, Jeremy Leonard, for the same high standards he brought to our earlier study. Mr. Leonard understands the underpinnings of today's manufacturing and knows where to locate credible sources of information. We are indebted to his fine research and analytical skills.



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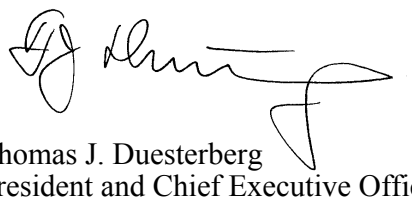

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Introduction and Summary

Profits are the lifeblood of all corporations. Lee Iaccoca summarized it succinctly by quipping, "In the end, all business operations can be reduced to three words: people, product and profits." Economists spanning the spectrum from John Maynard Keynes to Milton Friedman are in unanimous agreement that, without profit incentives, a strong, vibrant, and growing economy would be impossible. Although a majority of corporate profits are returned to shareholders in the form of dividends, a significant portion is retained to provide resources for increased investment, research and development (R&D), hiring, and worker training without having to resort to issuing new debt or equity.[1] Manufacturing profits and investment tracked each other closely from 1987 until 2000 (Chart 1 on page 2); but since then, profits have dropped much more rapidly than investment, meaning that companies increasingly are turning to debt and equity financing, neither of which can sustain investment growth over long periods. Since 2000, U.S. business debt outstanding has increased by 22 percent.

Investment in capital equipment and R&D is the primary driver of economic growth—even more important than the contribution of labor input—and its importance has been increasing over time. During the 1980s, capital accumulation accounted for 45 percent of U.S. economic growth, but that percentage increased to 56 percent by the latter half of the 1990s.[2] Clearly the ability to maintain high investment levels is a key to the long-term strength of U.S. manufacturers.

Contrary to popular perception, there also is a strong positive correlation (with a lag of approximately 12 months) between manufacturing profits and employment.[3] After the mild 1990-1991 recession, a robust rebound in manufacturing profits not only powered investment, it also helped create nearly 1 million manufacturing jobs during the decade. This provides additional evidence that profits, far from being "at the expense" of rank-and-file employees, are in fact essential to the maintenance and expansion of the labor force. Concern about manufacturing profitability should thus stretch from the boardroom to the factory floor.

To provide a framework for the study, Chart 2 on page 2 illustrates the long-term perspective on profits in manufacturing industries since 1970 (with transparent rectangles marking recessions). It shows a secular decline of about 2 cents per dollar. The 1990s proved that U.S. manufacturers were able to buck this trend, thanks to productivity advances that kept unit labor costs in check and strong demand that boosted pricing power. But the recent collapse in profits during the 2000-2001 recession is historically unprecedented, as profit rates dived even more than during the much deeper 1982-1983 recession. More troubling is the fact that the ensuing manufacturing profit recovery has been painfully slow by historical standards in the chemicals, fabricated metal products; electrical equipment, appliances and components; and machinery; motor vehicles, bodies and trailers, and parts industries covered in this report. This is in sharp contrast to profits for the economy as a whole, which have grown at double-digit rates for the past three years, and by 27.4 percent since 1999.

The goal of this paper is to explain the forces behind the trends illustrated in Chart 2, particularly since the late 1990s. Which industries have been most affected and why? It is plain that factors other

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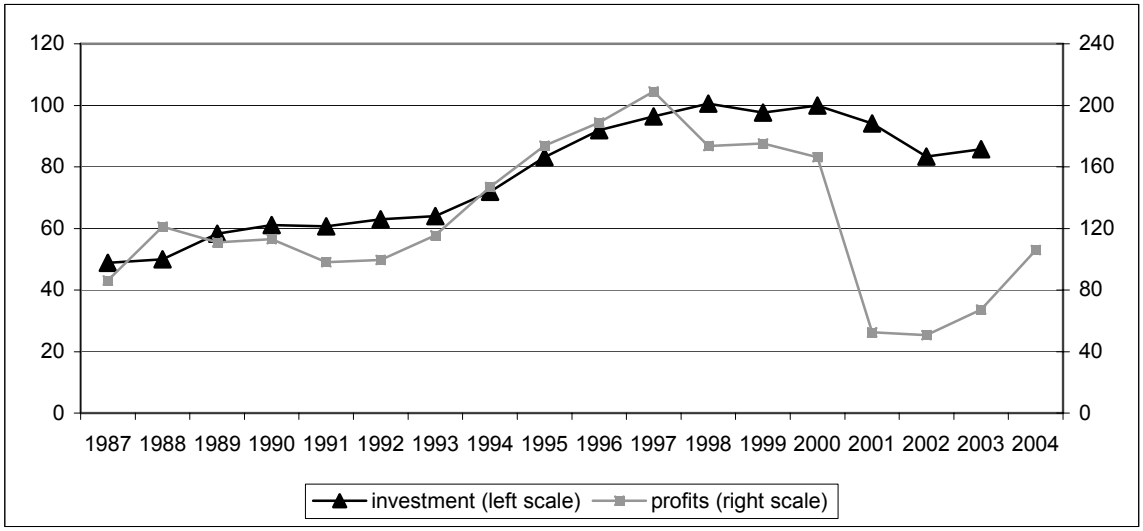
[1] A widespread misunderstanding is that profits are used primarily to inflate executive compensation, and many observers cite trends in CEO pay relative to hourly workers in an attempt to support this view. But CEO compensation, while highly variable, is a tiny proportion of corporate profits. The *BusinessWeek* 50, a compilation of the 50 best-performing companies in the S&P 500, reported total earnings before interest taxes, depreciation, and amortization (EBITDA) of $229 billion in 2004, while CEO compensation—which one might expect to be relatively high given their companies' superior performance—amounted to just over $400 million, a mere 0.2 percent of reported EBITDA.

[2] Dale W. Jorgenson, "Accounting for Growth in the Information Age," in Philippe Aghion and Steven Durlauf, *Handbook of Economic Growth* (Amsterdam: North-Holland, 2005).

[3] From 1987 to 2004, the correlation coefficient between manufacturing employment and the preceding year's profits was 0.59.

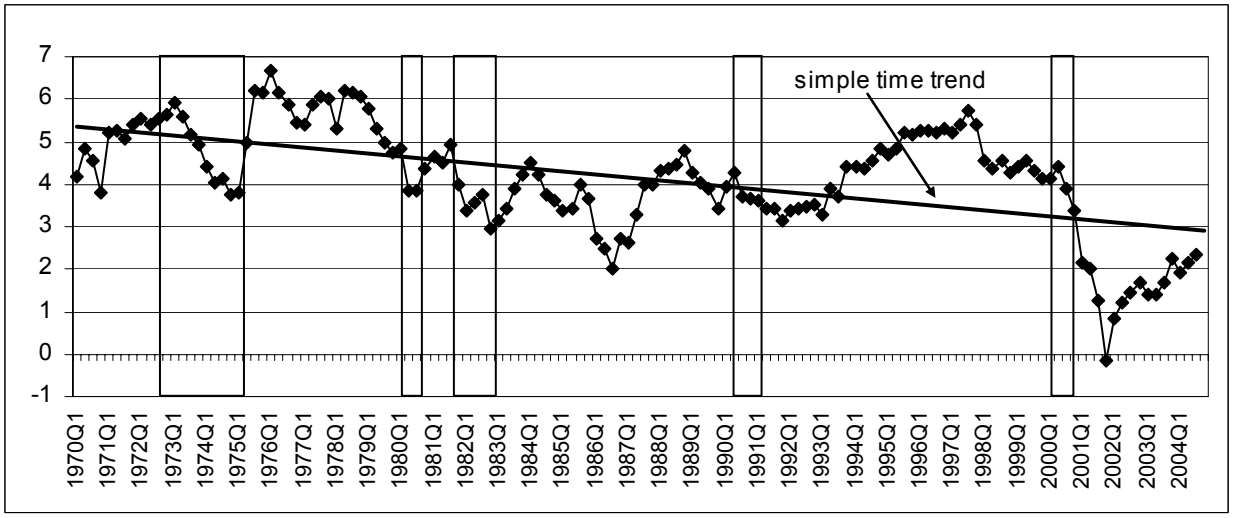
Chart 1
Profits and Investment in Manufacturing Industries, 1987–2004
(billions of dollars)



Source: U.S. Bureau of Economic Analysis

Note: Manufacturing investment data for 2004 not available.

Chart 2
Manufacturing Profit Rate, 1970–2004
(cents per dollar of sales)



Source: U.S. Bureau of Economic Analysis (profits) and U.S. Bureau of the Census (sales)

than the business cycle are at play: despite two years of manufacturing recovery and strong productivity growth, profit rates still are below trend, which itself has been declining over time.

This paper first identifies the six manufacturing industries that account for 50 percent of total manufacturing output and that have been hardest hit by the profit squeeze. One of these industries

(computer and electronic products) has insufficient data to examine these factors. The analysis then turns to the many factors that affect profit rates—including labor compensation costs, materials and energy costs, import competition and exchange rates, and business cycle conditions. Nonproduction factors that affect profits, such as taxes, regulatory compliance, and tort litigation also impose considerable costs on U.S. manufacturers relative to their major international competitors,[4] but lack of suitable data precludes inclusion of such costs in this paper.

The main conclusions of this analysis can be summarized quite succinctly:

- Manufacturing profits from 2000 to 2003 in the five industries shown in Table 1 were 67.1 percent lower than they would have been were it not for adverse trends in benefits costs, materials and energy costs, and import prices/ exchange rates since 1999.
- The manufacturing groups hardest hit by the profit squeeze are those for which import competition is fiercest—industrial machinery, computer and electronic equipment, electrical equipment, motor vehicles, and chemicals.
- In quantitative terms, the most important factor behind weak profits in recent years is the cyclical downturn (Table 1, page 4), which contributed 38.2 percent of the recent decline in manufacturing profits.
- Declining import prices, brought on by both increasing penetration of low-wage countries such as China and Mexico and an appreciation of the U.S. dollar, account for about one-quarter of profit weakness, with considerable variation across industries.
- Soaring health care and pension costs also account for nearly one-quarter of the profit squeeze. Chemical and motor vehicle manufacturers face the most daunting challenges.
- Soft pricing power has been exacerbated by increases in the price of intermediate inputs and energy (which together account for 13.2 percent of the profit decline). U.S. manufacturers have generally been unable to pass these increases on to their customers. Because these pressures have worsened in 2004 and 2005, the results shown in the table are in all likelihood understated relative to the current situation.
- Hefty increases in petroleum and natural gas prices have taken a heavy toll on the chemical industry in particular, accounting for nearly 10 percent of its recent profit weakness, which is concentrated in the basic chemicals group.

Manufacturing profits from 2000 to 2003 were 67.1 percent lower than they would have been were it not for adverse trends in benefits costs, materials and energy costs, and import prices/exchange rates since 1999.

While the focus of this study is on those industries whose profitability has declined the most, several other industries have also seen such declines, albeit smaller in magnitude. Profit rates in nondurable industries have held up much better than in durable industries through the recent recession and recovery, but are nevertheless on average at their lowest levels in three decades. Because some nondurable industries face the same challenges of international competition, rising production costs, and soft pricing as do durable manufacturers, the dynamics described in this paper are applicable to nondurable industries, albeit to a lesser degree.

Statistical Presentation of Trends in Profits

Business profits might seem to be one of the easiest economic data series to measure, since profit is "simply" total revenues less the costs involved in creating those revenues. In fact, differences in accounting practices concerning the costs of production (as well as the valuation of inventories) can lead to starkly divergent estimates. Two measures are published quarterly by the U.S. government—one by the Bureau of Economic Analysis (BEA) and another by the Census Bureau. A third can be obtained by analyzing statistics on corporate income published by the Internal Revenue Service (IRS). *BusinessWeek* and other private sources publish profits data for large publicly held companies.

This paper focuses on the measure of profits published by the Bureau of Economic Analysis, for two main methodological reasons:

[4] Jeremy A. Leonard, *How Structural Costs Imposed on U.S. Manufacturers Harm Workers and Threaten Competitiveness*, Manufacturers Alliance/MAPI and National Association of Manufacturers, December 2003.

Table 1
Impact of Employee Benefits Costs, Materials Costs, Energy Costs, Import Competition and Business Cycle on 2002-2003 Profit Performance in Five Key Manufacturing Industries
(percent of profit decline from hypothetical 1999 baseline)

	Benefits adjustment	Materials cost adjustment	Energy cost adjustment	Import price/exchange rate adjustment	Business cycle adjustment
Fabricated Metal Products	9.9	12.5	5.5	35.9	36.3
Machinery	23.2	10.8	3.6	51.0	11.3
Electrical Equipment, Appliances and Components	18.7	12.3	2.0	19.7	47.3
Motor Vehicles, Bodies and Trailers, and Parts	25.0	4.7	1.4	16.3	52.6
Chemicals	26.1	14.4	10.4	31.3	17.8
WEIGHTED AVERAGE OF ABOVE INDUSTRIES	**22.8**	**9.2**	**4.3**	**25.5**	**38.2**

Source: Bureau of Economic Analysis, Bureau of Labor Statistics, Bureau of the Census, and author's calculations

Note: Unavailability of certain data does not permit inclusion of 2004 in the analysis.

- BEA data are based on a representative sample of all corporations regardless of size and type of ownership. It thus includes smaller manufacturers and privately held companies that are missed by private-sector estimates.
- BEA data are based on IRS income tax statistics, which then are adjusted in various ways to measure income earned on the basis of current production rather than total income. In contrast, Census data are based on financial rather than tax accounting principles, which are not uniform across corporations. For instance, the BEA treats exercised stock options as a current expense, whereas financial accounting typically does not. In addition, inventory withdrawals are valued at current cost by the BEA, while corporate accounting typically values them at their acquisition cost. This removes capital gains or losses associated with inventory withdrawals from profit measures, bringing them closer to true operating profits.

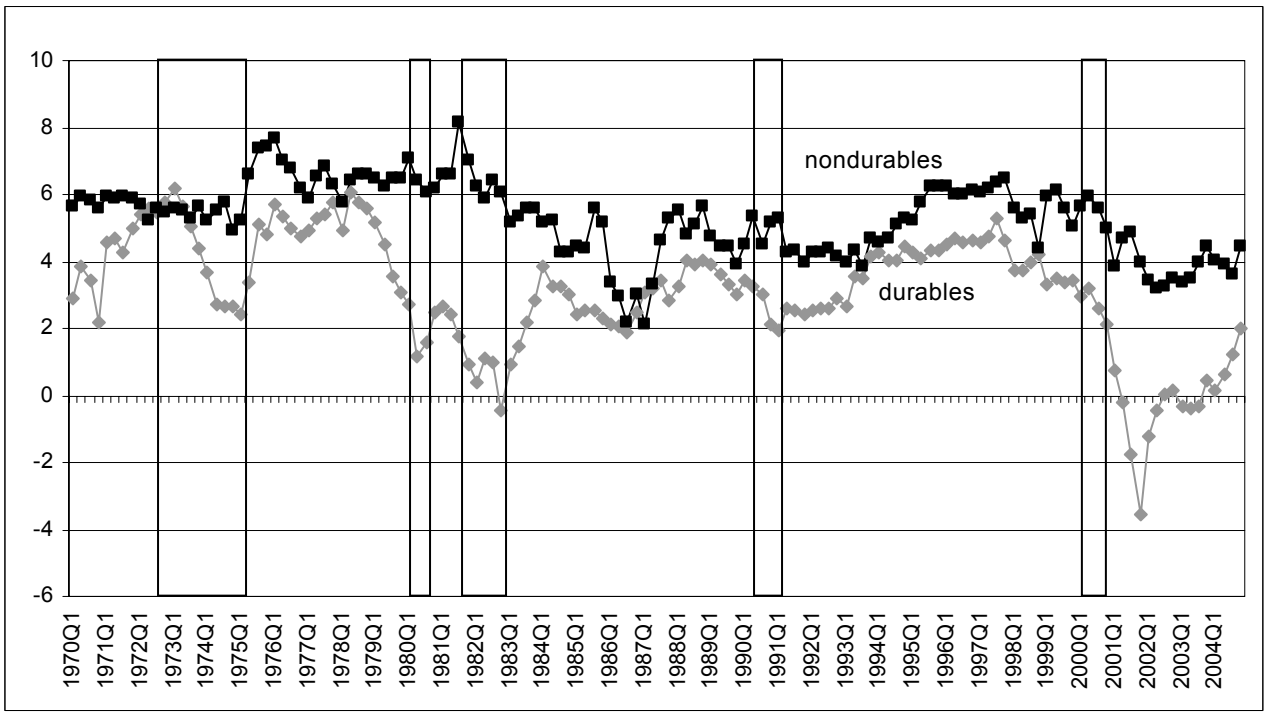
The Appendix discusses the difference between profit measures based on tax accounting and financial accounting in more detail.

Chart 3 on page 5 illustrates the long-term perspective on profits in durable and nondurable goods manufacturing industries since 1970 (with transparent rectangles marking recessions), and shows that the beginning of the 21st Century is a sharp departure from past trends, particularly for durable goods manufacturers. Profitability in durable goods industries always has been more cyclically volatile than nondurable goods, but the dive in profits during the 2000-2001 recession was larger than during the much deeper 1982-1983 recession. More troubling is the fact that profit rates did not turn positive until 2004. This recovery has been painfully slow by historical standards.

Despite two years of manufacturing recovery and strong productivity growth, durable goods profit rates still are as low as, if not lower than, they typically would be in the midst of a recession. To highlight the structural weakness in durable goods manufacturing profits, Table 2 distills the data presented in Chart 3 into averages over the business cycle. During the economic cycles of the 1970s, 1980s, and 1990s, there was some variability in profit rates, but no downward trend. In the current cycle, average durable manufacturing profits are still negative (notwithstanding a small recovery since the first quarter of 2004), in sharp contrast to nondurable profits. As a result, the average gap between nondurable and durable profits per dollar of sales over the business cycle widened to over 4 cents, significantly greater than its long-term average of less than 2 cents.

While this report will focus its attention primarily on durable goods industries, it is nonetheless important to underline that nondurable manufacturers also have seen a slight secular decline in profit rates over the past 35 years. Table 2 reveals that profit rates in the current cycle have averaged 3.9 cents, down from over 6 cents in the 1973-1981 business cycle. The primary reason is that many of the pressures on profits discussed in this report—notably import competition—are less pronounced in the nondurable goods sector than they are in the durable goods sector.

Chart 3
Durable and Nondurable Manufacturing Profit Rate, 1970-2004
(cents per dollar of sales)



Source: U.S. Bureau of Economic Analysis (profits) and U.S. Bureau of the Census (sales)

Table 2
Peak-to-Peak Average Durable and Nondurable Manufacturing Profit Rates Over the Business Cycle, 1973-2004
(cents per dollar of sales)

Business cycle	Durable goods	Nondurable goods	Gap
1973Q4-1981Q3	4.0	6.4	2.4
1981Q3-1990Q3	2.6	4.9	2.3
1990Q3-2001Q1	3.5	5.2	1.7
2001Q1-2004Q4	-0.2	3.9	4.3

Source: U.S. Bureau of Economic Analysis (profits) and U.S. Bureau of the Census (sales)

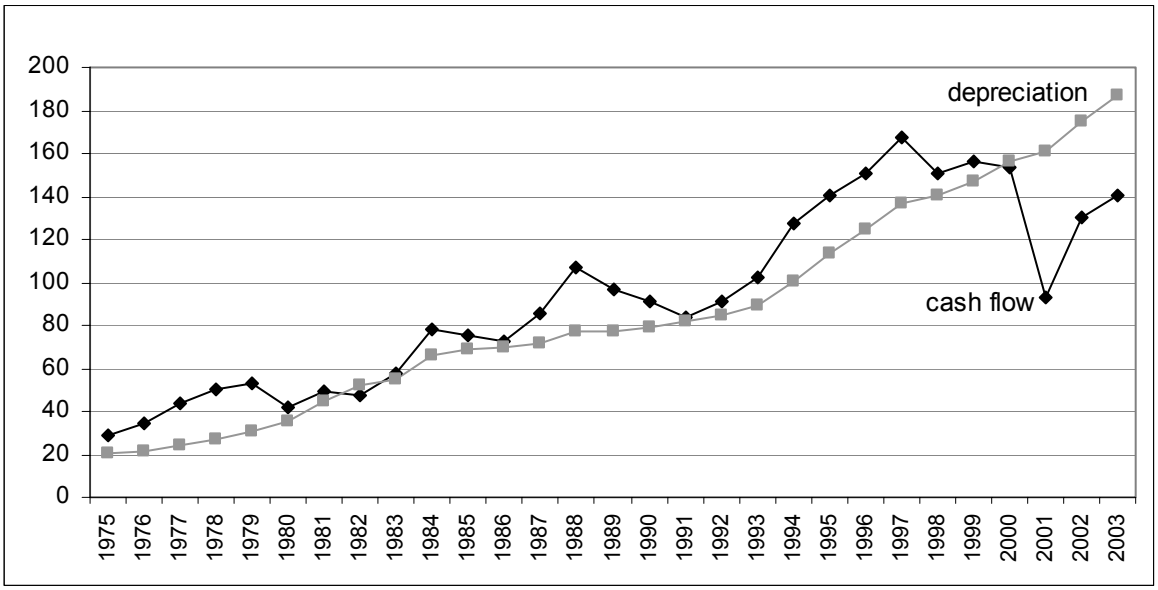
Note: Data from 2001Q1-2004Q4 do not reflect a full business cycle.

This sharp decline in profits has inevitable consequences for cash flow and investment financing. Charts 4 and 5 (page 6) compare trends in cash flow (defined as the difference between net dividends paid and the sum of profits and depreciation) with depreciation of capital stocks in durable and nondurable manufacturing industries, respectively. When cash flow outpaces depreciation, companies have sufficient internal funds to replenish their net capital stock as well as to devote resources to further investment and R&D activities. Because depreciation directly affects cash flow, the difference between the two is due to changes in profits and dividend payouts.

Several interesting trends emerge from the charts. Cash flow in durable goods industries equaled or exceeded depreciation almost continuously from 1975 to 2001—even in the depths of the 1982 recession, cash flow was only $4 billion less than capital depreciation. Large durable goods losses in 2001 opened a wide gap between the two, which was accentuated by the fact that net dividend payments declined only modestly despite poor profitability.

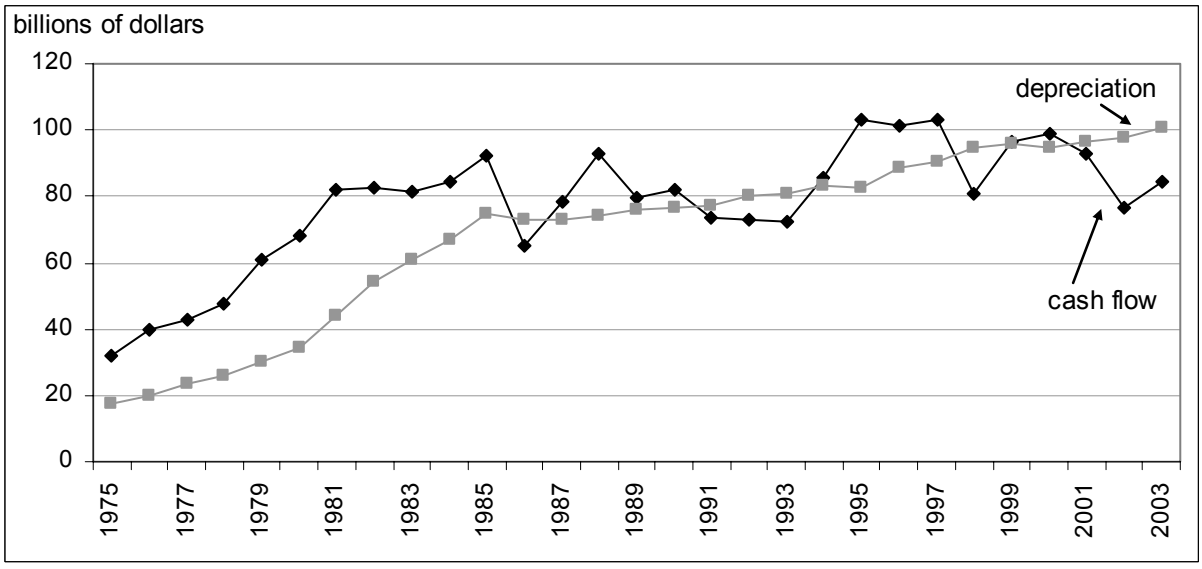
In nondurable manufacturing, cash flow also exceeded depreciation in most years prior to 2001, although there were more exceptions to this rule than in durable manufacturing. In addition, the gap between the two that opened up in 2001 is much smaller than for durable goods producers.

Chart 4
Cash Flow and Capital Depreciation in Durable Goods Manufacturing, 1970–2004
(billions of dollars)



Source: U.S. Bureau of Economic Analysis

Chart 5
Cash Flow and Capital Depreciation in Nondurable Goods Manufacturing, 1970–2004
(billions of dollars)



Source: U.S. Bureau of Economic Analysis

A final interesting point revealed in the charts is that growth in depreciation has accelerated in durable goods industries since the early 1990s, both relative to the past and to nondurable goods industries. This illustrates in part the increasing impact of information technology (IT) (both standalone IT equipment and IT embedded in other machinery and other capital goods), which becomes obsolete more rapidly that the analog and mechanical technologies it has replaced.

Profit Rates by Major Industry

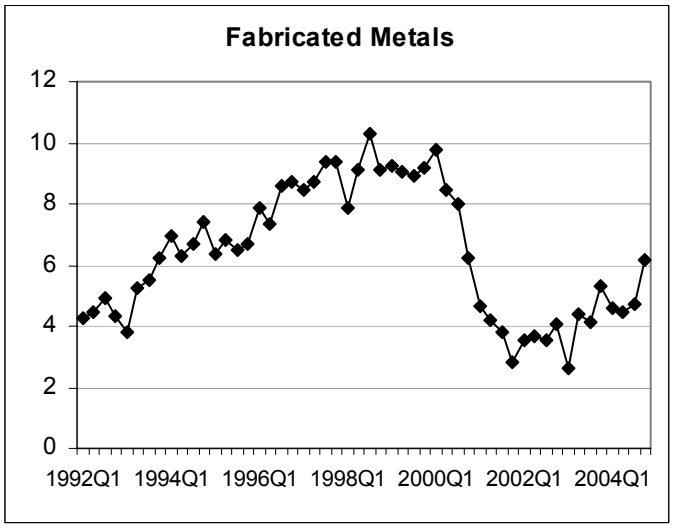
It is clear from the prior discussion that the crux of the profit squeeze is in durable manufacturing. Charts 6 though 11 dig more deeply into the data to identify which industries have been most affected. They show quarterly profits data since 1992 for the "big 5" durable goods manufacturing industries (fabricated metal products, machinery, computer and electronic products, electrical equipment, and motor vehicles) compiled by the Bureau of Economic Analysis.[5] Together they account for 65.8 percent of total gross domestic product (GDP) in durable goods.

While the chemical products industry is a nondurable manufacturing group, it is included in this analysis for several reasons. Most importantly, it has seen a pronounced decline in profit rates in recent years, unlike many other nondurable industries. In addition, it is the second largest nondurable industry group (accounting for one-quarter of nondurable gross output) and has a fairly high import penetration rate.

The largest declines in profit rates occurred in the electrical equipment and machinery industries. In electrical equipment, profit rates generally remained above 15 cents per dollar of shipments until 1997, but since then have plummeted dramatically. Even the recent uptick leaves profits under 5 cents. A similar trend is evident in machinery industries, where profit rates of 10 cents or more per dollar of shipments essentially evaporated in 2001 and have hovered around zero ever since.

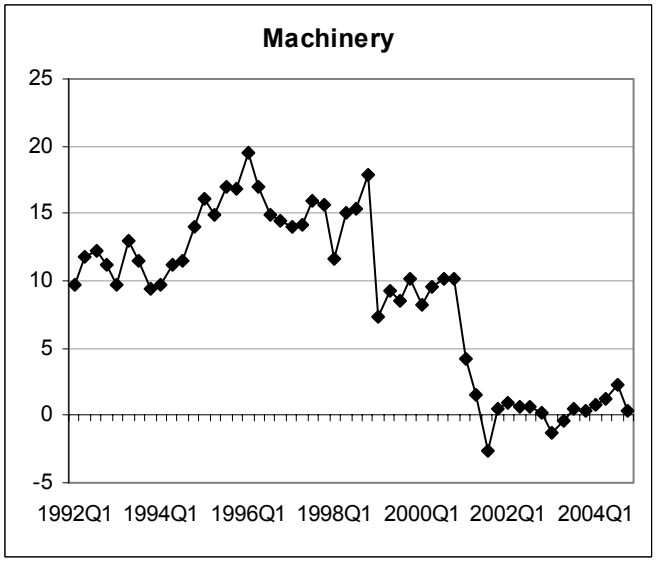
Fabricated metals industries also saw a sharp decline in profit rates in 2000. But because it followed steady growth in the 1990s, the recent recovery has brought profitability back to early 1990s levels. Furthermore, these manufacturers managed to remain profitable even during the 2000-2002 manufacturing recession, unlike other large industries. Similar trends are evident in chemical products.

Chart 6
Profit Rates by Major Durable Goods Industry—Fabricated Metals, 1992-2004
(cents per dollar of sales)



Source: U.S. Bureau of Economic Analysis (profits) and U.S. Bureau of the Census (sales)

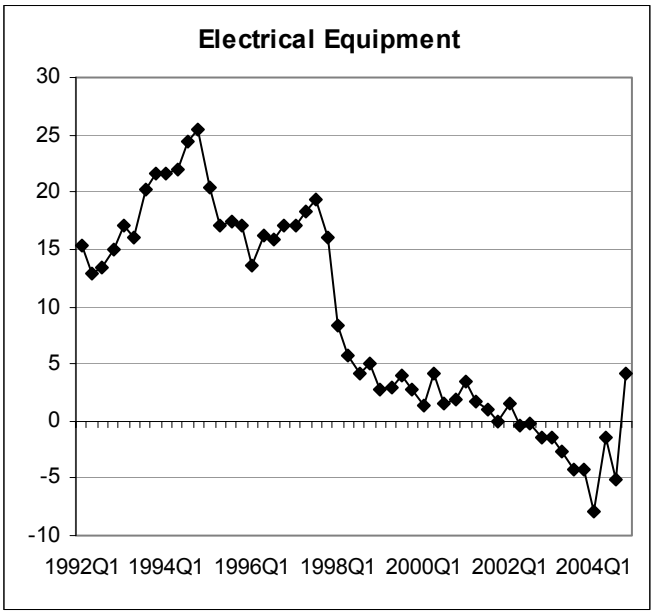
Chart 7
Profit Rates by Major Durable Goods Industry—Machinery, 1992-2004
(cents per dollar of sales)



Source: U.S. Bureau of Economic Analysis (profits) and U.S. Bureau of the Census (sales)

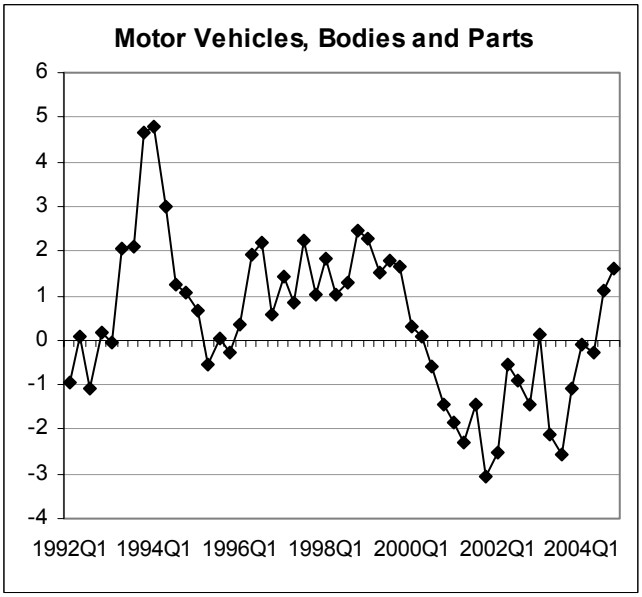
[5] The U.S. Department of Commerce's Bureau of Economic Analysis publishes annual profits data for all 21 manufacturing industry groups as well, but with a significant delay. The most recent published data reflect the 2002 tax year, and 2003 data will not be available until mid-2006.

Chart 8
Profit Rates by Major Durable Goods Industry—Electrical Equipment, 1992–2004
(cents per dollar of sales)



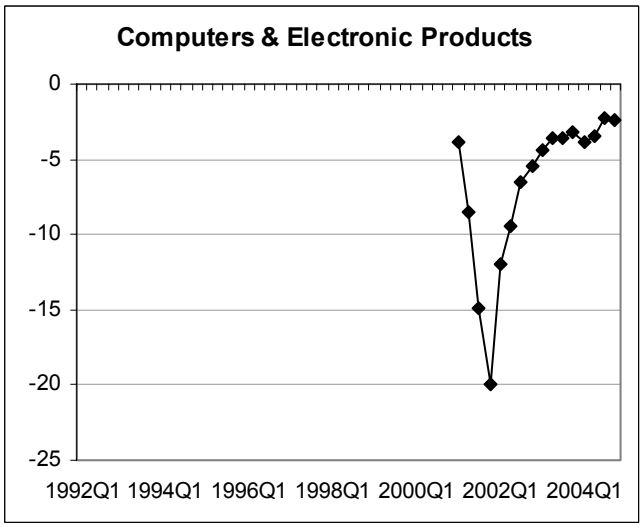
Source: U.S. Bureau of Economic Analysis (profits) and U.S. Bureau of the Census (sales)

Chart 9
Profit Rates by Major Durable Goods Industry—Motor Vehicles, 1992–2004
(cents per dollar of sales)



Source: U.S. Bureau of Economic Analysis (profits) and U.S. Bureau of the Census (sales)

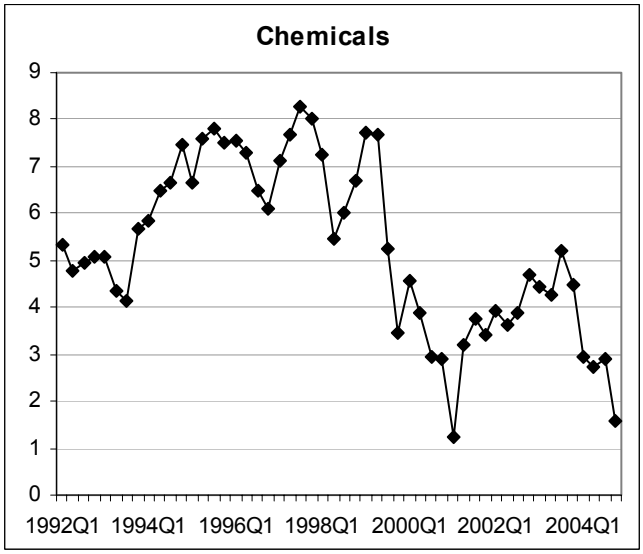
Chart 10
Profit Rates by Major Durable Goods Industry—Computers and Electronics, 1992–2004
(cents per dollar of sales)



Source: U.S. Bureau of Economic Analysis (profits) and U.S. Bureau of the Census (sales)

Note: "Computers and electronic products" was created as a distinct industry group in the 1997 North American Industry Classification System (NAICS), but the Bureau of Economic Analysis has recalculated industry profits on a NAICS basis since first-quarter 2001.

Chart 11
Profit Rates by Major Durable Goods Industry—Chemicals, 1992–2004
(cents per dollar of sales)



Source: U.S. Bureau of Economic Analysis (profits) and U.S. Bureau of the Census (sales)

Automotive manufacturers saw volatility in profits per dollar of shipments in the first half of the 1990s before leveling off at between 1 and 2 cents. The 2000-2002 manufacturing recession took its toll (largely due to extensive use of rebates and financing incentives to prop up motor vehicle demand), but the strong recovery in 2004 helped bring profit rates back to pre-recession levels. Recently released industry-level data for the first quarter of 2005, as well as longer-term problems with regard to funding pension and health care obligations (discussed later), suggest that the recovery will be short-lived.

Computer and electronic products merits special attention for the simple reason that it was not established as a distinct industry group until the adoption of the North American Industry Classification System (NAICS), a harmonized industrial classification created in 1997 by the United States, Canada, and Mexico to better reflect the organization of industrial production than its predecessor, the Standard Industrial Classification (SIC). Prior to the NAICS, computer and electronic products industries were included in the SIC categories of industrial machinery (such as computers and peripherals and electronic office equipment) or electrical and electronic equipment (such as communications equipment, semiconductors, and other electronic components). The Bureau of Economic Analysis has recalculated quarterly industry profits on a NAICS basis starting with the first quarter of 2001; prior to that, computer and electronic products are subsumed in the two SIC industries just mentioned.

Taken as a whole, the computers and electronic products industry suffered sharp operating losses in the wake of the telecom meltdown. And even after a sharp rebound, the industry continues to generate losses of about 3 cents per dollar, notwithstanding some pockets of strength in large companies.

Qualitative Discussion of Factors Affecting Profits

It is clear that at least two large industries—machinery and electrical equipment—have not succeeded in boosting profits since the manufacturing recovery began in 2003, suggesting that structural rather than cyclical problems are to blame. These structural problems can be grouped into five main categories:

- **Employee benefit costs.** Labor compensation accounts for about one-quarter of the value of sales in manufacturing. Recently, the costs of nonwage benefits (especially those related to health care) have been increasing much more rapidly than in the past. Because these increases do not reflect increased worker productivity, they cut into profits.
- **Materials and energy costs.** In manufacturing industries, purchases of intermediate inputs (such as raw materials and energy) average 64 percent of the value of sales. As a result, even small changes in the cost of raw materials and energy, if they cannot be passed on to consumers, can have a marked effect on profits.
- **Foreign competition and exchange rates.** Import penetration has increased markedly in the late 1990s, particularly from countries with lower labor costs. Combined with a strong appreciation of the dollar over the same period, falling import prices put downward pressure on the overall pricing environment in many industries.
- **Business cycle effects.** The 2000-2002 manufacturing recession saw total manufacturing production decline by over 7 percent (one of the most severe in the post-World War II era) which also took its toll on pricing power and profits.
- **Taxes.** Although statutory corporate tax rates have not increased in the United States, rates in most other countries have declined by varying degrees since the late 1980s. The recent profit squeeze thus cannot be blamed directly on rising corporate taxes; but reducing them would be a potent way to improve after-tax profitability.
- **Regulatory compliance, litigation, and other "hidden" costs.** Earlier research documented the excess burden U.S. manufacturers bear relative to their counterparts in major trading partners with regard to these externally imposed costs.[6] These costs have an adverse impact on profitability, but are more difficult to quantify in the context of profit rates because of their indirect relationship to production and sales.

The divergence between BEA-reported profits and financial profits has raised questions about how financial accounting practices affect profitability. Some observers cite the accounting treatment of stock options as a factor in the recent profit

[6] Jeremy A. Leonard, *op. cit.*, 2003.

Table 3
Impact of Rising Benefit Costs on Profits in Five Key Manufacturing Industries, 2001-2003
(billions of dollars, relative to 1999 baseline)

	Fabricated metal products	Machinery	Electrical equipment	Motor vehicles	Chemicals
2000	–	–	–	–	–
2001	–	–	-1.0	–	–
2002	-0.8	-1.3	-1.6	-4.5	-6.7
2003	-1.9	-3.2	-2.2	-22.0	-7.8

Source: Bureau of Economic Analysis and author's calculations

decline.[7] Exercising of stock options is classified as an employee compensation expense by the BEA, and hence reduces BEA-published profits. In contrast, companies typically do not treat these transactions as expenses when they report their financial profits. Others go even further, arguing that overly aggressive accounting has inflated financial profits far above what true economic profits were.

A recent study by the Federal Reserve Bank of New York examined these claims by analyzing corporate profits from 1998 to 2000 by major sectors of the economy.[8] It found that the value of exercised stock options did indeed rise significantly from 1997 to 2000—from $14 billion to $56 billion in durable manufacturing and from $13 billion to $22 billion in nondurable manufacturing—and probably accounted for a large part of the decline in profits over that period.

The study also concludes that aggressive accounting practices exemplified by high-profile cases of earnings overstatement at, for example, Enron, WorldCom, and Qwest had a much smaller impact on overall profits than one might expect given widespread media coverage. Focusing on the telecommunication services industry, they find that earnings restatements totalled only $5 billion in 1999 and 2000, and at most accounted for one-sixth of the difference in financial and BEA profits.

Sources of the Current Profit Squeeze

Many of the qualitative factors affecting profitability discussed above lend themselves readily to quantitative analysis, and allow us to understand more fully the sources of the profit squeeze. This section examines recent trends in compensation costs, materials and energy costs, and pricing power; compares them to corresponding periods in previous business cycles; and uses this information to quantify the causes of the recent profit squeeze in the five hardest-hit industries—fabricated metals, machinery, electrical equipment, motor vehicles, and chemical products.

Labor Compensation Costs

The Bureau of Economic Analysis produces industry-level data on total employee compensation and the wage and salary component, allowing one to extract the dollar value of benefit costs. In all five industries examined, benefits' share of total compensation fluctuated in a narrow band from 1992 to 2000, and then began climbing rapidly. While the data do not provide sufficient detail to verify that health and pension costs are behind this rise, examinations of other comprehensive data sources, as well as anecdotal experience, strongly suggest that this is the case.

Table 3 shows how profits would have evolved since 2000 if benefits' share of compensation had remained at its 1992-2000 average rather than rising. The impact is most pronounced in motor vehicle industries, reflecting the growing burden of financing health and pension benefits for both current employees and retirees, particularly for the Big Three domestic automakers. All have large

[7] See, for instance, Eugene P. Seskin, and Stephanie H. McCulla, "Annual Revision of the National Income and Product Accounts," *Survey of Current Business*, August 2002, and Gil B. Manzon, Jr. and George A. Plesko, "The Relation Between Financial and Tax Reporting Measures of Income," *Tax Law Review*, volume 55, number 2, April 2002.

[8] Charles P. Himmelberg, James M. Mahoney, April Bang, and Brian Chernoff, "Recent Revisions to Corporate Profits: What We Knew and When We Knew It," *Current Issues in Economics and Finance*, Federal Reserve Bank of New York, volume 10, number 4, March 2004.

legacy costs associated with pensions and health care for their considerable population of retirees. In 2003, for example, General Motors floated an extraordinary $17.6 billion bond issue to cover shortfalls in its pension program, which partly explains the large profit effect of benefits in 2003 shown in Table 3. Foreign nameplates that produce in the United States typically do not have such large retiree populations, so such legacy costs are smaller—although they face the same challenges of controlling health care benefit costs for their current employees.

Cost of Materials and Energy

The cost of many raw materials has risen rapidly in recent years. Producer prices for crude nonagricultural raw materials excluding energy have risen about 45 percent since late 2001. Much of the run-up can be traced to iron and steel (70 percent increase), copper (nearly 100 percent), nonferrous metals (30 percent), and lumber (20 percent). Strong global growth in the late 1990s, combined with a housing boom in North America and rapid industrialization in China, has driven up the prices of many commodities that are central to U.S. manufacturers. The producer price index (PPI) for intermediate materials and components purchased by manufacturers has risen 15 percent over the same period, meaning that manufacturers have had to absorb about one-third of the increase in raw materials prices since 2001.

To assess the industry-specific impact of these dynamics on input prices broadly measured, this analysis examines price indexes for purchased intermediate goods in manufacturing industries compiled by the Bureau of Economic Analysis. In the latter half of the 1990s, input prices for manufacturers declined by over 5 percent, a surprising development given the strength of the economy. But input prices actually rose somewhat during the 2000-2001 recession and have continued to creep up. As noted earlier, since purchases of intermediate inputs account for such a large proportion of final sales, even small changes in aggregate price indexes can lead to large swings in profits.

Table 4 on page 12 shows the impact of changing input prices on profits for the five industries hardest hit by the profit squeeze. Not surprisingly, the largest effects are in fabricated metal products and motor vehicles, which are intensive users of steel.

Energy prices also have risen sharply in recent years. Crude oil is the most widely reported in the media, with the refiner acquisition cost more than doubling since 2000. However, the price of natural gas—which has become an important energy source for manufacturers—has increased by 50 percent since 2000.

In most broad industry groups, energy costs are a relatively small proportion of total intermediate purchases, so even wide fluctuations in prices have a relatively small effect on a company's bottom line. But there are significant exceptions. In the chemical products industry broadly defined, for example, energy accounts for almost 10 percent of total intermediate purchases, and a large proportion of that energy is natural gas. In many subgroups, including basic chemicals such as fertilizers, the energy input exceeds 50 percent of materials costs.

The importance of energy costs in the chemical industry is evident in Table 5 (page 12), which shows the energy price impact (as measured by the PPI for intermediate energy goods) on profits for the five key industries examined in this report.

Weak Pricing Power and Exposure to Foreign Competition

A factor influencing profits (and closely related to trends in input prices) is the price at which manufacturers can sell their finished goods. If the pricing environment is firm, companies may be able to pass on all or part of any increase in energy and input costs to customers. But in a weak pricing environment, companies may have no choice but to absorb those price increases, in which case the bottom line suffers accordingly.

If the pricing environment is firm, companies may be able to pass on all or part of any increase in energy and input costs to customers. But in a weak pricing environment, companies may have no choice but to absorb those price increases, in which case the bottom line suffers accordingly.

The pricing environment (as measured by the producer price index for finished manufactured goods) varies over the business cycle, but has generally trended downward since the mid-1980s. Cyclical variation is typically more sensitive to the extent to which spare capacity exists in a given industry: recessions result in excess capacity, which drives down prices, while strong expansions tend to reduce spare capacity, so that customers are willing (or forced) to accept higher prices.

Table 4
Impact of Rising Materials Prices on Profits in Five Key Manufacturing Industries, 2000-2003
(billions of dollars, relative to 1999 baseline)

	Fabricated metal products	Machinery	Electrical equipment	Motor vehicles	Chemicals
2000	-3.4	-2.0	-1.7	-2.6	-6.9
2001	-1.1	-0.6	-1.0	-1.3	-0.1
2002	-0.8	-0.4	-0.8	-1.6	-
2003	-2.6	-1.7	-1.7	-3.4	-8.0

Source: Bureau of Economic Analysis and author's calculations

Table 5
Impact of Rising Energy Prices on Profits in Five Key Manufacturing Industries, 2000-2003
(billions of dollars, relative to 1999 baseline)

	Fabricated metal products	Machinery	Electrical equipment	Motor vehicles	Chemicals
2000	-0.7	-0.4	-0.2	-0.7	-2.6
2001	-0.8	-0.4	-0.2	-0.8	-3.1
2002	-0.5	-0.2	-0.1	-0.5	-1.7
2003	-1.0	-0.5	-0.3	-1.0	-4.1

Source: Bureau of Economic Analysis and author's calculations

But the late 1990s were an exception to this trend. Average price growth for manufactured goods decelerated (and even declined in some years), even as economic growth was the fastest in a generation.

This anomaly (as well as the slight secular decline observed over the past 20 years) is due primarily to increasing import penetration in U.S. manufacturing markets. Imports as a share of total domestic consumption of manufactured goods rose steadily from 14.6 percent in 1987 to 25 percent in 2004, and much of this increase came from China. As Table 6 shows, import penetration rates vary widely across manufacturing industries.

. . . the highest import penetration rates are concentrated precisely in the industries that have seen their profits fall most dramatically in recent years . . .

Table 6 provides prima facie evidence of the effect of import penetration on prices and profits. Nondurable goods industries—which we saw earlier have largely escaped the profit squeeze—have an import penetration rate of only 16 percent, significantly lower than the 29.5 percent rate for durable goods manufacturers. Furthermore, the highest import penetration rates are concentrated precisely in the industries that have seen their profits fall most dramatically in recent years: machinery, computer and electronic products, electrical equipment, and motor vehicles. Chemical products has the second highest import penetration rate in the nondurables group, behind apparel and leather goods.

Data on import prices confirm that foreign competition is the primary culprit behind the soft pricing environment. For six of the ten industries shown in Table 6, changes in import prices were smaller than changes in producer prices, in effect meaning that imports have "dragged down" overall prices. The result was most pronounced in machinery and primary metals industries.

Table 6
Import Penetration Rates and Growth in Producer Prices and Import Prices by Selected Manufacturing Industries, 2003
(percent of domestic consumption)

	Import penetration rate	Change in PPI 2000-2003	Change in import prices 2000-2003
Durable goods	**29.5**	**-3.7**	**-6.7**
Wood products	15.8	1.4	19.0
Nonmetallic mineral products	15.3	2.4	-1.4
Primary metals	23.7	-1.2	-4.8
Fabricated metal products	12.1	2.0	0.1
Machinery	31.6	-1.3	-7.6
Computer and electronic products	45.2	-20.8	-10.8
Electrical equipment, appliances, and components	36.4	-4.8	-4.1
Motor vehicles, bodies and trailers, and parts	35.3	-2.0	1.5
Furniture and related products	22.4	2.9	0.4
Nondurable goods	**16.0**	**5.1**	**4.5**
Chemical products	21.6	5.0	0.3

Source: Bureau of Economic Analysis and International Trade Administration (import penetration rate) and Bureau of Labor Statistics (PPI and import price indexes)

Note: "Import penetration" is calculated as imports divided by gross domestic manufacturing output less manufacturing exports plus manufacturing imports. Since published data do not allow us to subtract intermediate products that are sold from one manufacturer to another from the denominator, the true level of import penetration is understated in this table.

A closer look at import prices and exchange rates.—Trends in import prices are in large part determined by exchange rates and the cost structures of foreign producers. In recent years, import from countries with lower wage costs (including China, Mexico, and the newly industrializing countries of Southeast Asia) have become a larger share of total U.S. imports. Taken together, China's and Mexico's shares increased from 9.1 percent in 1990 to 23.7 percent in 2002. The concomitant price competition restricts the ability of domestic manufacturers to raise their prices.

Exchange rate movements also affect the price of imports, as an appreciation (depreciation) of the dollar lowers (raises) the dollar-denominated cost of U.S. imports. A recent study concluded that foreign exporters pass through about 25 percent of a currency change to U.S. import prices within three months, and 40 percent within three years, one of the lowest rates among industrialized nations.[9] This finding is confirmed by recent trends: from early 1997 to early 2002, the dollar appreciated by 25 percent as measured by the Federal Reserve Board trade-weighted index of currencies. Over the same period, import prices dropped by about 10 percent—exactly 40 percent of the appreciation.

But a 10 percent decrease in import prices does not necessarily translate into a 10 percent decrease in prices for finished products, because a significant share of imported goods is purchased by manufacturers as inputs (in which case declining prices help the bottom line) as well as competing in end-user markets. Simple regression analysis of the determinants of the producer price index for finished manufactured goods over the period 1982-2004 shows that a one percentage point decrease (increase) in the growth rate of import prices growth is associated with a 0.3 percentage point decrease (increase) in finished-good producer price growth.

Using the statistical relationships between exchange rates, import prices, and producer prices, we can answer the question of how producer prices—and by extension sales and profits—would have behaved by industry if the dollar had not appreciated as it did from 1997 to 2002 (Table 7, page 14).

The impact of the business cycle.—Another factor that strongly influences the pricing environment is general business conditions. U.S. manufacturers endured a deep recession from 2000 to 2002, after a robust and lengthy expansion. It is thus no surprise that the drop in demand was a factor in declining profits. Table 8 on page 14 illustrates the

[9] Jose Campa and Linda Goldberg, "Exchange Rate Pass-Through Into Import Price," Federal Reserve Bank of New York working paper, December 2002.

impact industry by industry, by showing how profits would have behaved if prices had continued to follow their late 1990s trends.

All five industries hard hit by the profit squeeze (with the exception of machinery) were hurt by the 2000-2002 recession. The effect on motor vehicle industries is remarkable, and reflects an abrupt structural turnaround in pricing power in the late 1990s. Prior to 1997, U.S. automakers could virtually count on price increases of 2 percent to 3 percent per year, irrespective of the business cycle. Since then, three interrelated factors have conspired to turn those secular increases into consistent flat or slightly declining prices. First, successful entry of Hyundai and other lower-cost Korean nameplates into the U.S. market initially put downward price pressure on the economy car market, pressure that is gradually making its way into the more lucrative SUV and luxury markets. Second, this influx has accompanied a generalized increase in capacity that is more than enough to meet actual demand. Third, underlying demand has slowed in recent years, propped up only by generous incentives.

On the other end of the spectrum, machinery manufacturers became accustomed to flat or declining prices in the 1990s, due primarily to a sharp increase in competition from foreign suppliers. Thus, the price weakness brought on by the recession had no impact on profitability.

The Big Picture

Table 9 synthesizes the results of the above analysis with published profits data to show the relative importance of each factor in the deterioration of profits by industry. The first column shows actual profits as published by the Bureau of Economic Analysis. The middle five columns show how much more profits would have been had each cost driver followed paths more typical of historical patterns. The last column adds all of the previous columns together to arrive at adjusted profits: that is, how much profits would have been had trends in benefits costs, materials costs, and the pricing environment followed their historical patterns.

Table 7
Impact of Exchange Rates and Import Prices on Profits in Five Key Manufacturing Industries, 2000-2003
(billions of dollars, relative to 1999 baseline)

	Fabricated metal products	Machinery	Electrical equipment	Motor vehicles	Chemicals
2000	-3.3	-3.6	-1.5	-5.9	-5.5
2001	-3.2	-3.2	-1.4	-5.4	-5.4
2002	-4.1	-4.1	-1.7	-7.2	-6.8
2003	-5.7	-5.8	-2.3	-10.0	-10.6

Source: Bureau of Economic Analysis and author's calculations

Table 8
Impact of Business Cycle-Related Producer Price Weakness on Profits in Five Key Manufacturing Industries, 2000-2003
(billions of dollars, relative to 1999 baseline)

	Fabricated metal products	Machinery	Electrical equipment	Motor vehicles	Chemicals
2000	–	–	0.5	–	–
2001	2.3	–	2.4	10.7	–
2002	4.7	–	3.6	25.0	8.2
2003	5.2	2.2	6.0	30.6	1.7

Source: Bureau of Economic Analysis and author's calculations

For three of the five industries, the effect of foreign competition and exchange rates on pricing power is the single largest contributor to the profit squeeze. In the automotive and electrical equipment industries, by contrast, business-cycle-related pricing problems are the main culprit, due to excess capacity and sluggish domestic demand. Employee benefits have an effect of roughly the same magnitude as aggregate input prices, except for motor vehicle industries. As noted earlier, long-term commitments on the part of U.S. automakers to provide generous health benefits to both current employees and retirees have a significant effect on profitability.

If we compare adjusted profits with actual profits, we see that profitability in these industries would have weathered the 2000-2001 recession and in fact eliminated the profit gap with respect to historical performance. In electrical equipment industries, for example, actual profits turned to losses during the recession and stayed negative through 2003. But if we remove the effect of excessive growth in benefit costs, materials and energy costs, and poor pricing power, profits would have bounced back to 2000 levels.

Table 9
Impact of Employee Benefits, Materials Costs, Energy Costs, Import Competition, and Pricing Environment on Profits in Five Key Manufacturing Industries, 2000-2003
(billions of dollars)

	Actual profits	Benefits adjustment	Materials cost adjustment	Energy cost adjustment	Import price/ exchange rate adjustment	Price adjustment	Adjusted profits
Fabricated Metal Products							
2000	15.5	–	3.4	0.7	3.3	–	22.9
2001	9.9	–	1.1	0.8	3.2	2.3	17.3
2002	9.3	0.8	0.8	0.5	4.1	4.7	20.2
2003	10.1	1.9	2.6	1.0	5.7	5.2	26.5
Machinery							
2000	8.2	–	2.0	0.4	3.6	–	14.2
2001	2.7	–	0.6	0.4	3.2	–	6.9
2002	1.6	1.3	0.4	0.2	4.1	–	7.6
2003	-0.5	3.2	1.7	0.5	5.8	2.2	12.9
Electrical Equipment, Appliances and Components							
2000	5.6	–	1.7	0.2	1.5	0.5	9.5
2001	1.9	1.0	1.0	0.2	1.4	2.4	7.9
2002	-0.2	1.6	0.8	0.1	1.7	3.6	7.6
2003	-3.2	2.2	1.7	0.3	2.3	6.0	9.3
Motor Vehicles, Bodies and Trailers, and Parts							
2000	-1.0	–	2.6	0.7	5.9	0.0	8.2
2001	-9.2	–	1.3	0.8	5.4	10.7	9.0
2002	-6.0	4.5	1.6	0.5	7.2	25.0	32.8
2003	-6.2	22.0	3.4	1.0	10.0	30.6	60.8
Chemicals							
2000	14.2	–	6.9	2.6	5.5	0.0	29.2
2001	12.6	–	0.1	3.1	5.4	0.0	21.2
2002	17.2	6.7	–	1.7	6.8	8.2	40.6
2003	21.2	7.8	8.0	4.1	10.6	1.7	53.4

Source: Bureau of Economic Analysis, Bureau of Labor Statistics, and author's calculations

Conclusion

Contrary to popular belief, profits do not end up in the pockets of senior management—executive compensation accounts for no more than 4 percent of total profits on average. Rather, profits are returned to shareholders in the form of dividends, labor in the form of new jobs and training opportunities, and assets in the form of increased investment in equipment and R&D. For these reasons, strong profit growth is everyone's concern, whether it be the CEO or the assembler.

It is widely recognized that U.S. manufacturers face an increasingly competitive environment. This analysis has clearly shown that such competition is the primary culprit behind the soft pricing environment, which explains 70 percent of the recent decline in durable goods manufacturing profitability. The scope and quality of this competition will only continue to grow. Penetration of the "Asian Tigers" into U.S. markets was followed by Mexico and Brazil and, more recently, the emerging economic superpowers of China and India. This means that efforts to shore up profitability must focus on the cost side of the equation.

U.S. manufacturers have been doing just that for more than a decade. They have tirelessly improved productivity such that they are alone among major economies to have held unit labor costs in check since 1990. They have continued to invest in R&D and capital equipment, increasing their use of debt recently to do so.

But, productivity improvements and investment can go only so far. As this analysis shows, the cost of providing employee benefits—especially health insurance—has accelerated in recent years, and is responsible for over one-fifth of the recent decline in manufacturing profitability.

In addition to direct production costs, U.S. manufacturers (both durable and nondurable) are saddled with regulatory compliance costs, corporate tax rates, and litigation costs that are generally more burdensome (often significantly so) than manufacturers in our major trading partners. These also urgently need to be addressed in order to improve profit performance.

APPENDIX
Key Differences Between Tax-Accounting, Financial-Accounting, and BEA-Published Profits

	Financial accounting	Tax accounting	BEA methodology
Depreciation	Expenses are calculated with straight-line depreciation.	Expenses are calculated with accelerated formulas and with shorter service lives than those used in financial accounting.	Expenses are calculated with a geometric depreciation, service lives similar to those used in financial accounting, and current-replacement-cost valuation.
Inventory withdrawals	Withdrawals are valued at various costs, including acquisition cost and current-replacement cost.	Withdrawals are valued at various costs, including acquisition cost and current-replacement cost.	Withdrawals are valued at current-replacement cost.
Future expenditures	Expenditures are recognized as current expense when the decision is made.	Expenditures are recognized as current expense when the money is spent.	Same as tax accounting.
Nonstatutory stock options	Options are not treated as an expense.	Options are deducted from profits when exercised.	Same as tax accounting.
Bad debts	Bad debts are treated as expenses when additions are made to bad debt reserves.	Bad debts are treated as expenses when written off.	Expenses are not recognized.

Source: Adapted from Kenneth A. Petrick, "Corporate Profits: Profits Before Tax, Profits Tax Liability and Dividends," BEA Methodology Paper, September 2002

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