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Valuing Design: Enhancing Corporate Performance through Design Effectiveness

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Valuing design:

Enhancing corporate performance through design effectiveness

by Julie H. Hertenstein and Marjorie B. Platt with David R. Brown

It's an initial study, but the analysis indicates that good design is, indeed, good business. Julie H. Hertenstein, Marjorie B. Platt, and David R. Brown have devised a method for relating an organization's focus on design with bottom-line outcomes. They use 12 measures of financial performance and investigate 51 companies in four industries over a five-year time frame. Confirming a long-held belief—design-conscious firms generally do better.



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What is the value of design? Leaving aside for the moment that anything and everything made by people had to be designed before it could be made, the question of what design is worth in the modern economy has been addressed in a hundred ways and in voices ranging from the coolly measured and metaphysical to the sputteringly impassioned. It has inspired philosophers, ethnographers, market researchers, museum curators, writers, critics, academics, thoughtful designers and design managers, and at times even CEOs—advocates all for greater sensitivity to, and understanding of, the potency of design's role in contemporary economies, the business enterprises that drive them, and the material-consumer culture that now pervades the globe.

When observers look at, analyze,

and talk about design—the design of products, objects, vehicles, built environments, communications—they seem to us to do so from two basic stances. We'll call one *curatorial* and the other *commercial*.

The curatorial encompasses evaluation of and comment on design in many forms and forums: published notice, criticism, competitions, professional conferences and societies, awards and other honors, exemplification, selection for museum display and collection, and so on. This domain is well populated and growing, especially where publications are concerned. There is clearly a growing public understanding of design as culture and design as a shaper of both desire and behavior.

Design's performance within business enterprises and consumer culture—that is, design examined from

a commercial stance—has historically been confronted by paradox. In a business world that is largely governed by the precise, measurable, quantifiable, and numerical, the contribution of design to a business's financial performance has stubbornly resisted quantification. While there are well-understood ways to calculate a firm's return on investment (ROI), there is not yet a way to calculate a firm's return on design (ROD), or even to determine what proportion of the *I* is really *D*. Instead, evaluation of design's effectiveness in the commercial world has

typically fallen back on the curatorial (design awards and *Time* magazine covers), the anecdotal (conference presentations and business-school cases) and the purely assertive. "Good design is good business," said IBM's Tom Watson Jr., in a lecture at Harvard in 1974. Watson's comment quickly became a mantra and clad those in the design world with the shining armor needed to carry the holy war for "good" design onto the richly carpeted but still enemy grounds of the executive suite.

But is it true that good design is good

Methodology

Selection of companies for the study

Publicly traded companies were identified by their primary SIC code in Dun and Bradstreet's *Million Dollar Directory* for each industry selected. Companies within SIC codes were cross referenced with SIC code designations in Standard & Poor's COMPUSTAT® database. Where there were discrepancies, the Dun & Bradstreet SIC code was used. Since COMPUSTAT was the source of financial data for the study, a company's inclusion in the COMPUSTAT database for the prior five years was a prerequisite for its inclusion in the set of companies listed by industry.

Responses from the expert panel

Nine members of the advisory council of the Design Management Institute responded to our questionnaires requesting them to select companies in each industry with which they were familiar, and then to rank companies in each industry from those that were most effective at demonstrating good design to those that were least effective. Their rank orders were recorded and then average ranks were calculated for those companies that received at least two rankings. Fifty-one firms received at least two rankings, and they comprised the sample for the analysis. The average number of ratings per ranked firm ranged from three for the furniture industry to five for the automotive industry. Companies were ordered within industries by their average rank orders. The top half of ranked companies in an industry was placed in the more effective design group (26 firms in total); the lower half was placed in the less effective design group (25 firms in total).

The financial data

Financial data were obtained for all companies from COMPUSTAT for the five most recent and complete fiscal years available: 1995 to 1999. The financial data in COMPUSTAT comes from the firm's 10-K (annual report) data submitted to the Securities and Exchange Commission.

Several financial ratios were calculated with these data. In the ratios relative to sales and assets, ratios were calculated using two different measures of cash flows: cash flow from operations, which is taken directly from the cash flow statement; and net cash flows, which is earnings plus depreciation and amortization. We also calculated ratios relative to sales and assets using two measures of income: net income, which is taken directly from the income

statement; and earnings before interest, taxes, depreciation, and amortization. The latter eliminates factors for which operating managers are often not responsible, such as the interest on debt financing, from the measure of earnings (income). Growth rates measure the percentage change in sales, net income or net cash flow from 1995 to 1999. Finally, the five-year total company stock return relative to the market, defined as the S&P 500, was obtained for 1995 to 1999 for each company. Total stock return includes price appreciation and dividends that would be paid, assuming all dividends were reinvested.

Industry-relative calculation

To minimize the effects of industry-specific factors of production and structure, we adopted the industry-relative approach advocated by Platt and Platt,¹ which normalizes a company's financial ratio with respect to the industry average. Thus, all financial ratios were converted to industry-relative financial ratios by dividing the company financial ratio by its industry average financial ratio.² The resulting ratios can be interpreted as indications of the extent to which the company exceeds (ratio > 1) or falls short of (ratio < 1) its industry average.

Statistical analysis

To determine whether there is a difference between the more effective design group and the less effective design group, we test the null hypothesis that assumes there is no difference between the two design effectiveness groups. T-statistics (based on unequal group variances) were calculated by comparing the difference between the mean performance of the more effective design group and the mean performance of the less effective design group to chance alone. We conducted a one-tailed t-test to test the directional alternative hypothesis that the more effective design group would exhibit better performance than the less effective design group.

1. H.D. Platt and M.B. Platt, "Development of a Class of Stable Predictive Variables: The Case of Bankruptcy Prediction," *Journal of Business Finance & Accounting*, vol. 17, no. 1, pp. 31-51; "A Note on the Use of Industry-Relative Ratios in Bankruptcy Prediction," *Journal of Banking and Finance*, vol. 15, no. 4 (1991), pp. 1183-1194.

2. When the industry average was negative, the absolute value of the industry average was the denominator. The sign of the resulting ratio was adjusted, if needed, to reflect the appropriate relationship between the company financial ratio and the industry average financial ratio.

business? Can it be shown, not with the theorems, vocabulary, and judgments of the curatorial, but with the more mathematically rigorous language of business and commerce? And if so—if it can be demonstrated empirically that good design contributes to good performance by the business enterprise that engages with it—then what?

There is evidence that companies that invest in design tend to launch more profitable products and boast higher returns at the firm level

The idea for this preliminary study came from several sources. First, through discussions with design managers and individual designers, we have found a long-standing interest in the general issue of the value/cost of design to the firm. Anomalies that have struck many designers, including one of the authors, include: Why do some poorly designed products sell so well? Why do some well-designed products strike out in the marketplace? Why have so many things from Germany and Italy, and later Japan and even England, looked and felt so much better designed than US products? Why doesn't American business *get it*?

Definitive research that would reveal the financial contribution good design makes to business performance has particular appeal for the design community. In 1996, Hertenstein and Platt developed a set of research priorities for the Design Management Institute (DMI). These research priorities, which highlighted the value of design as a primary research focus, were presented to the European Academy of Design Annual Meeting, in Helsinki. Based on the priorities and on data obtained from design managers working in firms that positioned design as a key strategic advantage, Hertenstein and Platt¹ set forth a conceptual framework to guide continuing research on the value of design to the business enterprise.

Further, at a strategic visioning retreat two years ago, in Santa Fe, the Association of Independent Colleges of Art and Design—a group of 35 or so presidents of the nation's leading private art and design schools—commissioned this pilot study to answer the

question of whether it could be demonstrated empirically and convincingly that, over a substantial period of time, companies that achieve a better performance in design earn a competitive advantage in their markets. To paraphrase Mr. Watson: "Is good design *really* good business?"

Well, there is some reason to believe that "good" design may be related to better financial performance. Hertenstein and Platt,² in their continuing work with DMI, have shown that there is increasing use of direct measurement of design performance. The most frequently used financial measure of design performance is product cost, a key component for the determination of product profitability and, ultimately, firm profitability. Moreover, managers report an increasing desire to better integrate new product development and corporate strategy. That is, some firms are placing greater importance on new product development and the effective use of design as a way to achieve the strategic goals that represent the means to achieve improved financial performance. Further, there is evidence that companies that invest in design tend to launch more profitable products³ and boast higher returns at the firm level.⁴

Roy and his colleagues⁵ conducted a study of companies in the UK and Europe. They categorized companies based on three criteria: design awards received, inclusion in the Design Council's Design Index, and peer recognition. They found that return on capital, averaged over

1. J.H. Hertenstein and M.B. Platt, "Developing a Strategic Design Culture," *Design Management Journal*, vol. 8, no. 2 (1997), pp. 10-19.

2. J.H. Hertenstein and M.B. Platt, "Performance Measures and Management Control in New Product Development," *Accounting Horizons*, vol. 14, no. 3 (2000), pp. 303-323.

3. B. Borja de Mozota, "Design as a Strategic Management Tool," in Oakley, M. (ed.), *Design Management: A Handbook of Issues and Methods* (Oxford and New York: Basil Blackwell, 1990).

4. R. Roy, "Can the Benefits of Good Design Be Quantified?" *Design Management Journal*, Spring 1994, pp. 9-18.

5. V. Walsh, R. Roy, M. Bruce, and S. Potter, *Winning by Design: Technology Product Design and International Competitiveness* (Oxford, England, and Cambridge, MA: Basil Blackwell, 1992).

seven years, was significantly higher for firms that were “design-conscious.” Unfortunately, their study included few “design-conscious” firms (only 14), and these were split between two industry groupings. Thus, while other indicators showed strength for the “design-conscious” firms, the differences were not statistically significant. We believe this could be due, in part, to differences in financial structure of the two industries studied.

Thus, as described below, our study sought to extend these earlier findings by examining industry-relative financial performance and by including more firms and industries to clarify the effect of design on the financial performance of firms. In total, we examined 51 firms in four industries, using 12 different measures of financial performance across five years. Our analysis revealed that firms rated as having good design were stronger on virtually all measures. The results were significant from a practical and managerial perspective, as well as from a statistical perspective. These results provide strong evidence that good design boosts firms’ operating performance and growth, which is rewarded by stock market premiums.

Valuing design: The study

To examine the relationship between effective design and financial performance, we needed measures of effective design and measures of financial performance. We approached the former by deciding that a panel of experts in design would rank the design effectiveness of the chosen firms, as described in more detail below. Our approach to evaluating financial performance was to use traditional financial ratios, such as return on assets and net cash flows to sales for the sample period, 1995 to 1999.

We were, however, keenly aware that the financial performance of a firm is greatly influenced by its factors of production (for example, aluminum production is very capital-intensive; strategic consulting is not) and the structure of its industry (for example, financial returns are lower in industries with strong competitors, customers, and suppliers than those with weaker ones).⁶ To highlight the effect of design on firm performance, we sought to minimize the effects of industry-specific factors of production and structure by measuring the relative performance of each firm to the average

for its industry, then use the resultant industry-relative performance measures for the final analysis, as described in the methodology sidebar on page 11.

These two choices (having experts rank the design effectiveness of the chosen firms, and measuring firm financial performance relative to its industry) necessitated the following approach to selecting firms. First, we selected industries, as

defined by the four-digit Standard Industry Category (SIC) codes, that made products well

known to the general public so that the design experts would recognize the names of the firms and have insight about their design quality. The four industries selected for this preliminary study were furniture, automotive, consumer electronic appliances, and computers. Second, we selected only those publicly traded companies within these industries whose financial data for the prior five years were available in Standard and Poor’s COMPUSTAT® database to ensure that we had access to the necessary financial data in a form that facilitated analysis. We prepared lists of the companies, by industry, for the experts to rank on the basis of their design effectiveness.

Next, we requested the members of the advisory council of the Design Management Institute to be our expert panel and sent them the lists of companies to rank. Advisory council members were asked to select those companies listed in each industry with which they were familiar and to rank them, from those that were most effective at demonstrating good design to those that were least effective. Members were encouraged to use their own definition of good design while considering such factors as:

- Quality of the firm’s design program (for example, number of design awards, peer recognition)
- Quality/excellence of design evidenced in the firm’s products, services, collateral, and so forth (for example, their opinion of the firm’s design of products and materials)

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6. M. Porter, *Competitive Strategy* (New York: Free Press, 1980).

- Importance placed on the firm’s design program (for example, large investment in design)

Average ranks were calculated for companies that received at least two rankings. The top half of ranked companies within an industry were placed in the more effective design group; the lower half were placed in the less effective design group. The two groups were then aggregated across the four industries. Financial performance measures were averaged for companies in each group and compared between the two groups.

After the expert panel ranked the companies, there were 51 companies in four industries in the study (Table 1). This list may not include some firms you might expect in these industries, and some industries may contain firms that will surprise you. This is because of the four constraints listed earlier, which limited the firms in the study. Specifically:

1. The company had to be a publicly traded company; privately held firms were not eligible.
2. The company had to specify one of the four four-digit SIC codes selected for the study as its primary SIC code.
3. The COMPUSTAT database had to include the company’s data for the prior five years.
4. Finally, the company had to be ranked by at least two expert panelists.

Results and discussion

Company financial performance was computed using industry-relative financial ratios as described in the sidebar (see page 11). Four areas of financial performance were examined using 12 measures: growth rates (3 measures), returns related to sales (4), returns related to assets (4), and total stock market returns (1), as shown in Table 2. For each of the three growth-rate measures, a single comparison was made over the five-year period between the group of firms with more-effective design and the group with less-effective design. For each of the remaining measures, five comparisons were made, one for each year of the study. Thus, in total, 48 comparisons were made.

As shown in Table 3, of these 48 comparisons, the results in 45 instances were in the direction we expected—that is, the group of firms with more-effective design outperformed the group with less-effective design. In 25 comparisons, the results were statistically significant. In the three instances in which results did not go in the direction we expected, the results were not statistically significant. Taken as a whole, these results provide strong evidence that effective design is associated with better financial performance.

We will discuss each financial performance area in turn. These results are shown in the four panels of Table 4.

Growth

The growth in sales, net income, and cash flows over the five-year period was higher for the group of firms with more-effective design than for those firms with less-effective design, and the differences were statistically significant for all three measures.

Because the performance of each firm is first calculated as a ratio to the average for its industry, the results in Table 4, Panel A can be interpreted

Table 1. Fifty-one selected companies, organized within four industries.

Furniture Industry	Computer Industry
Bassett Furniture Industry	Apple Computer Inc.
Chromcraft Revington Inc.	Compaq Computer Corp.
Cramer Inc.	Dell Computer Corp.
Ethan Allen Interiors Inc.	Dynatam Inc.
Hon Industries	Gateway Inc.
Kimball Industries	Hewlett-Packard Co.
Knoll Inc.	IBM Corp.
Ladd Furniture Inc.	Maxwell Technologies Inc.
La-Z-Boy Inc.	Micron Electronics Inc.
O’Sullivan Industries Holdings Inc.	Neoware Systems Inc.
Room Plus Inc.	Silicon Graphics Inc.
Rowe Companies	Sun Microsystems Inc.
Stanley Furniture Company Inc.	Vitech America Inc.
Steelcase Inc.	
Electronic Appliance Industry	Automotive Industry
Black & Decker Corp.	Blue Bird Corp.
Maytag Corp.	Daimler Chrysler
National Presto Industries Inc.	Federal Signal Corp.
Remington Products Co. LLC	Fiat Spa
Royal Appliance Mfg Co.	Ford Motor Co.
Salton Inc.	General Motors Corp.
Smith (A O) Corp.	Honda Motor Ltd.
Sunbeam Corp.	Navistar International
Whirlpool Corp.	Nissan Motor Co. Ltd.
	Oshkosh Truck Corp.
	Paccar Inc.
	Toyota Motor Corp.
	Volvo Ab Swe

Table 2. Twelve measures of financial performance grouped into four areas of financial performance.

1 Growth Rates:
Percentage change in net sales 1995 to 1999 is (net sales1999 minus net sales1995) divided by net sales1995
Percentage change in net income 1995 to 1999 is (net income1999 minus net income1995) divided by net income1995
Percentage change in net cash flow 1995 to 1999 is (net cash flow1999 minus net cash flow1995) divided by net cash flow1995
2 Ratios related to sales (the following items were divided by net sales):
Earnings before interest, taxes, depreciation, and amortization
Cash flow from operating activities
Net cash flow (net income plus depreciation and amortization)
Net Income
3 Ratios related to assets (the following items were divided by total assets):
Earnings before interest, taxes, depreciation, and amortization
Cash flow from operating activities
Net cash flow (net income plus depreciation and amortization)
Net income
4 Stock market return:
Total return relative to the S&P 500 is the company's total return divided by the total return for the S&P 500 expressed as a percentage

Table 3. Overall results for all performance measures, 1995-1999.

	1995	1996	1997	1998	1999
Growth					
Percentage change in net sales	●				
Percentage change in net cash flow	●				
Percentage change in net income	●				
Results Relative to Sales					
Earnings before interest, taxes, depreciation, and amortization	●	●	●	●	●
Cash flow from operating activities	●	●	●	●	●
Net cash flow	●	●	●	●	●
Net income	●	●	○	○	●
Results Relative to Assets					
Earnings before interest, taxes, depreciation, and amortization	●	●	●	●	●
Cash flow from operating activities	●	●	●	●	●
Net cash flow	●	●	●	●	●
Net income	●	○	●	●	●
Stock Market Return					
Total stock return relative to the S&P 500	●	●	●	●	●

● Indicates statistical significance in the right direction at least at the .10 level, one-tailed t-test
 ● Indicates an observed difference in the right direction
 ○ Indicates an observed difference in the wrong direction

Our study sought to extend these earlier findings by examining industry-relative financial performance and by including more firms and industries to clarify the effect of design on the financial performance of firms

as performance relative to industry averages. For example, Panel A indicates that for percentage change in sales, the mean rating for the more effective design group was 1.23 and for the less effective design group it was .64. Thus, the sales growth for the firms in the more effective design group averaged 1.23 times the industry averages (or growth was 23 percent higher than the industry averages). Sales growth for the firms in the less effective design group averaged only .64 times the industry averages (or growth averaged 36 percent lower than the industry averages).

Results relative to sales

From a financial perspective, return ratios relative to sales indicate how profitable the firms' sales are. From a design perspective, return ratios relative to sales are relevant because effective product design is intended to enhance the volume of product sold, or the prices at which products can be sold. The four measures in Panel B all provide strong evidence that effective design is associated with better financial performance, with strong statistical significance shown across all measures.

Two of the measures were related to income (earnings before interest, taxes, depreciation and amortization, and net income), and two measures were related to cash flows (cash flow from operating activities, and net cash flows). While these measures overlap to some degree, we would expect that earnings before interest, taxes, depreciation, and amortization would be most closely aligned with design. This measure eliminates the effects of areas in which designers likely have little influence, such as the choices related to financing or choices having tax-related consequences. In fact, this measure is statistically significant in each of the five years. Over these five years, the more effective design group averaged 32 percent higher than the industry averages on the ratio of earnings before interest, taxes,

depreciation, and amortization to sales, and the less effective design group averaged 13 percent lower than the industry averages on this measure.

Ratios relative to assets

Return ratios relative to assets are a way of measuring how much the firm is earning on the investment made in assets. We use the same set of four income and cash flow measures relative to assets that we used relative to sales. Because design has little or no influence on some assets, such as the level of accounts receivable, or whether capital equipment is utilized effectively in the factory, we expect less association between these ratios and effective design than for the ratios related to sales. In fact, that is the case, as this set of measures has fewer statistically significant comparisons, though nearly all the comparisons are in the expected direction, as shown in Panel C.

The ratio using earnings before interest, taxes, depreciation, and amortization is again the one that most often shows a statistically significant association with effective design. Over the five years studied, the more effective design group averaged 21 percent higher than the industry averages on this ratio, and the less effective design group averaged 14 percent lower than the industry averages.

Stock market returns

In conducting financial analyses, an important practical question is not simply whether we can determine statistical significance among the groups on particular financial ratios, but whether the differences we observe have enough practical significance to be valued by shareholders and the stock market. The results in Panel D of Table 4 indicate that the total stock returns of the firms in the more effective design group significantly outperformed those of the firms in the less effective design group in four of the five years.

A word of caution in interpreting these figures. The 1.63 for the more effective design firms in 1995 does not mean that these firms performed 63 percent better than the market; it means that they performed 63 percent better than their industry's average relative to the market. Thus, if the industry outperformed the market by 2 percent, a firm that outperformed the industry by 63 percent would perform 3.26 percent better than the market (2% X 1.63).

Table 4. Financial performance based on mean industry-relative ratios by group.

<i>Variable</i>	<i>More-effective design</i>	<i>Less-effective design</i>
Panel A: Growth rates		
Percentage change net sales, 1995-1999	1.23	0.64
Percentage change net cash flow, 1995-1999	1.42	0.46
Percentage change net income, 1995-1999	0.98	0.23
Panel B: Results relative to sales		
Earnings before interest, taxes, depreciation, and amortization '95	1.22	0.86
Earnings before interest, taxes, depreciation, and amortization '96	1.22	0.92
Earnings before interest, taxes, depreciation, and amortization '97	1.34	0.90
Earnings before interest, taxes, depreciation, and amortization '98	1.60	0.83
Earnings before interest, taxes, depreciation, and amortization '99	1.20	0.84
Cash flow from operating activities '95	2.68	1.43
Cash flow from operating activities '96	1.88	0.95
Cash flow from operating activities '97	1.72	0.61
Cash flow from operating activities '98	1.59	1.27
Cash flow from operating activities '99	2.97	1.16
Net cash flow '95	3.34	1.91
Net cash flow '96	1.34	1.16
Net cash flow '97	1.78	1.29
Net cash flow '98	2.25	0.24
Net cash flow '99	1.53	0.67
Net income '95	1.16	1.00
Net income '96	7.84	6.82
Net income '97	2.83	2.97
Net income '98	0.38	1.00
Net income '99	1.73	0.33
Panel C: Results Relative to Assets		
Earnings before interest, taxes, depreciation, and amortization '95	1.09	0.86
Earnings before interest, taxes, depreciation, and amortization '96	1.08	0.97
Earnings before interest, taxes, depreciation, and amortization '97	1.19	0.89
Earnings before interest, taxes, depreciation, and amortization '98	1.58	0.77
Earnings before interest, taxes, depreciation, and amortization '99	1.13	0.81
Cash flow from operating activities '95	1.39	0.84
Cash flow from operating activities '96	1.32	0.97
Cash flow from operating activities '97	1.09	0.85
Cash flow from operating activities '98	1.64	1.52
Cash flow from operating activities '99	1.29	0.89
Net cash flow '95	1.14	0.79
Net cash flow '96	1.17	1.14
Net cash flow '97	1.32	1.03
Net cash flow '98	2.04	1.23
Net cash flow '99	1.31	0.77
Net income '95	1.59	0.69
Net income '96	1.62	3.42
Net income '97	6.35	3.35
Net income '98	1.09	0.53
Net income '99	1.27	0.87
Panel D: Market Return		
Total return relative to S&P 500 '95	1.63	0.60
Total return relative to S&P 500 '96	1.75	0.43
Total return relative to S&P 500 '97	1.30	0.88
Total return relative to S&P 500 '98	1.73	0.76
Total return relative to S&P 500 '99	1.63	1.02

Note: Numbers in black indicate a statistical significance beyond the .10 level, one-tail.

Table 5. Average industry-relative research and development expense relative to net sales ratios by group, 1995-1999.

Year	More-effective design	Less-effective design
1995	1.34	0.70
1996	1.27	0.82
1997	1.29	0.6
1998	1.19	0.86
1999	1.21	0.89

Note: Differences between groups for all years are statistically significant beyond the .10 level.

Relevant trends

As designers are aware, financial statements reveal little, if anything, about the investments firms make in design. The available figure that comes closest to design is the research and development (R&D) expense. Because much of designers' work in product-oriented firms is directed at product development, much of the expense related to design is incorporated in the research and development expense. Thus, we chose to examine this figure even though we recognized that it was a crude surrogate for a firm's investment in design.

As Table 5 shows, average research and development expenditures relative to net sales for the firms in the more effective design group were well above their industry averages, ranging from 19 percent to 34 percent above, for each of the five years studied. By contrast, the average ratio for the less effective design group ranged from 11 percent to 30 percent less than their industry averages for each of the five years studied. The differences between these two groups were statistically significant in each of the five years.

We can also examine the trends in this measure over the five-year period for both design groups, as shown in Figure 1. What we observe is that the trend in R&D to sales is decreasing for the more effective design group, while the trend is increasing for the less effective design group. Although it makes sense that the less effective group might want to spend more in this area to become more effective, one could be concerned about the more effective group cutting their spending.

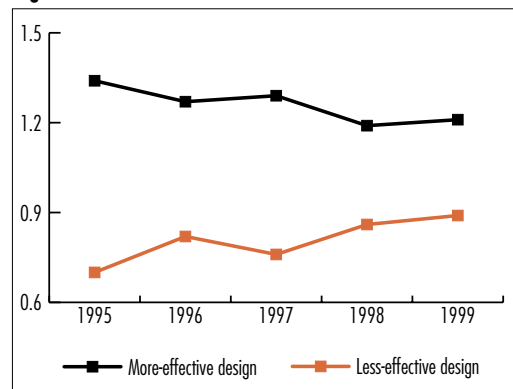
When we look at the trends in total stock market returns relative to the S&P 500, shown

in Figure 2, we are less concerned, however. The stock market return trend for the more effective design firms is steady, remaining consistently above their industry average relative market return, despite their reductions in R&D expenditures relative to sales. It appears that they may have become more efficient in these expenditures, thus able to reduce them without negatively affecting performance. We also see that the additional investments in R&D by the less effective design firms are correlated with improvements in their total stock market returns, bringing them closer to the average relative stock market return for their industry.

Conclusion, caveats, and comments on future directions

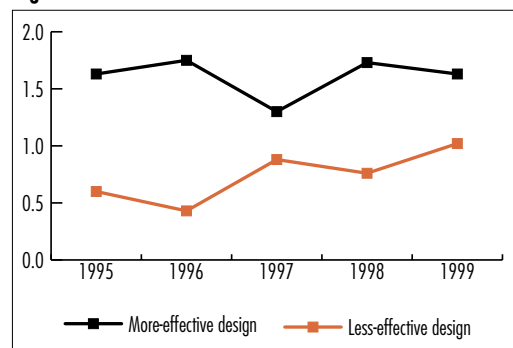
These findings provide strong support for the fact that firms with good design have better financial performance. The consistency of the findings across a variety of measures confirms the robustness of this conclusion. There are, however, a few important caveats about these findings.

Figure 1



R&D to net sales trend line by group, 1995-1999.

Figure 2



Stock market return trend line by group, 1995-1999.

First, the findings apply to a *group* of firms considered more effective in design compared to a *group* of firms considered less effective in design. The findings do not suggest that every firm with effective design will have superior financial performance. Effective design alone cannot overcome the effects of, for example, inefficient production or weak sales and marketing.

Second, the fact that a firm is effective in design may result in part from decisions astute senior managers made about funding and staffing design. It is possible, if not likely, that these same senior managers made other discerning decisions affecting manufacturing, marketing, engineering, and so forth. The better financial performance we observe for the group of firms more effective in design may result not only from effective design but also from many decisions made by judicious senior managers.

Finally, this preliminary study examined only 51 firms in four industries. The relatively small number of firms limited our ability to find statistical significance. With more firms, some of the “directionally correct” findings might also have been shown to be statistically significant. Further, whether these preliminary results apply to other firms and other industries remains to be seen. Finally, the statistical tests in this study can only tell us *what* the outcome was; they cannot illuminate *how* it was achieved. But understanding how good design generates good financial performance is key to improving the day-to-day work of designers.

Thus, this study must be viewed as a beginning. In the future, we expect to extend the study to more industries and more firms. In addition, we are undertaking a study of individual new product development projects to better understand how decisions and other factors influencing these projects result in better new product performance, and better firm performance. We are currently seeking firms to partner with us in this investigation. By continuing this stream of research, we hope to provide further evidence on the relationship between good design and financial performance, as well as to provide guidance to design managers on how best to enhance financial performance through effective design. ■

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