

# Measuring Performance After Meeting Award Criteria

*Study compares perceived success to financial data of award winners and applicants*

by

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**A** QUESTION OFTEN ASKED AMONG QUALITY practitioners is whether companies that receive quality awards actually perform better than others. This issue has been of major concern since the Malcolm Baldrige National Quality Award (MBNQA) was first presented in 1988. After the General Accounting Office (GAO) published the results of its 1991 study on quality management practices of companies that had received MBNQA site visits, several other studies tried to assess issues related to quality awards.

A 1993 report by the Conference Board summarized 20 studies that had been conducted regarding quality management practices, but only three of those studies—one of which was the GAO study—focused on quality awards.<sup>1</sup>

No other study used the same GAO measures to assess performance until 1996. This article presents the results of that 1996 research study, which used the same 20 performance measures as the GAO to investigate the effects quality

award criteria have on U.S. companies.<sup>2</sup> The study, *An Assessment of the Operational and Financial Impact on Companies of Quality Awards in the United States*, is the first to reexamine the GAO's original 20 measures and investigate MBNQA and state-level quality award winners and applicants. It is also the first to extend such measures to organizations that never applied for a quality award. The results of this study can be used to better understand the links between performance and quality award criteria.

## Understanding the GAO study

The GAO study was conducted to determine the importance of total quality management (TQM) practices on the performance of U.S. companies. The GAO developed a general TQM model for companies exhibiting the direction and interrelationships of the total quality processes to improve performance and the direction of improvement for each measure.<sup>3</sup> Six common features that contributed to improved company

performance were defined: customer focus, management and leadership, employee involvement, open corporate culture, fact-based decision-making and partnership with suppliers.

Investigators from the GAO interviewed 20 of the 22 companies that experienced a site visit from the MBNQA in either 1988 or 1989. The impact of TQM practices on company performance was examined in four areas—employee relations, operating procedures, customer satisfaction and financial performance—using 20 performance measures.<sup>4</sup> An expected direction of improvement (up or down) was assigned to each measure.

Based on interviews and data provided by the companies in the study, the GAO determined the average annual percentage change for every measure and the direction of each measure's change: positive, negative or unchanged.

These 20 measures demonstrated overwhelmingly positive improvement in a company's performance when employing TQM practices. However, the study indicated that implementing TQM endeavors took time to yield significant results. On average, the companies studied took 2.5 years to yield results.<sup>5, 6, 7, 8</sup>

### MBNQA and state-level quality awards

One of the largest problems with the GAO study was that it did not consider any quality award other than the MBNQA. This may be due to the fact that such programs were not as typical at the time of the GAO study as they are today.

Established by an Act of Congress and designated as Public Law 100-107, the MBNQA

**TABLE 1** Status of State Quality Awards as of February 1999

MBNQA-like Award	U.S. Senate Productivity Award	Other Quality Award	No Award	Award in development
Arizona—'93	Alabama—'86	California—'94	Alaska	Indiana
Arkansas—'95	California—'94	Delaware—'92	Colorado	Iowa
California—'94	Louisiana—'84	Louisiana—'88	Montana	
Connecticut(2)—'88, '93	Maryland—'83	Maryland—'86	North Dakota	
Florida—'93	Nevada—'89	Nebraska—'93	Vermont	
Georgia—'99	Virginia—'83	Rhode Island—'93	West Virginia	
Hawaii—'95		South Dakota—'85	Wisconsin	
Idaho—'96		Wyoming—'86 (ended—'92, restarted—'97)		
Illinois—'95				
Kansas—'96				
Kentucky—'97				
Louisiana—'95				
Maine—'91				
Massachusetts—'92				
Michigan—'94				
Minnesota—'91				
Mississippi—'95				
Missouri—'93				
New Hampshire—'95				
New Jersey—'93				
New Mexico—'93 (SPA—'84)				
New York—'92				
North Carolina—'91				
Ohio—'99				
Oklahoma—'94				
Oregon—'94				
Pennsylvania—'94				
Rhode Island—'95 (Other—'94)				
South Carolina—'95				
Tennessee—'93				
Texas—'93				
Utah—'95				
Washington—'94				

Improvement Act was signed on August 20, 1987. The MBNQA recognizes outstanding quality management and customer satisfaction of U.S. companies in three categories: manufacturing,

service and small business. In 1999, health care and education categories were added. The examination items and areas to address have continued to evolve and are updated every two years to ensure relevance.

A major outcome of the MBNQA was the development of quality award programs at the state level. These state-level quality awards generally take one of three forms: (1) patterned almost identically after the MBNQA, (2) developed under the U.S. Senate Productivity Award (SPA) program or (3) a local award, independent of existing criteria. The categories and rigor of applying for them vary from state to state.<sup>9,10</sup>

The number of award programs changes yearly as more states develop awards or modify existing ones. Currently, 33 states have developed MBNQA-like awards, six states utilize the SPA program and eight states have other types of quality awards. Table 1 describes the status of all state quality award programs as of February 1999, including the first year each award was presented.

The increase in these awards and the weight of importance they have grown to hold made it necessary to include their existence in the 1996 study.

**Performance measures of the study**

Due to the increased number of quality award programs, the 1996 study needed additional measures of performance to include the value of using local award criteria. A careful review of past studies on quality awards, literature on world-class companies and case studies dealing with strong quality management practices, led to the development of such measures.

*An Assessment of the Operational and Financial Impact on Companies of Quality Awards in the United States* expanded the GAO’s 20 measures to a total of 40 measures. These measures were grouped into three general areas:

- Operational impacts pertain to the ability of a company to meet customer needs. These 22 measures can be categorized into three subareas: employee related, operations related and customer related.

The employee related impacts concern changes in such areas as overall employee satisfaction, attendance and turnover, safety and health, and the use of work teams. The operations related impacts include changes in such factors as reliability, on-time delivery, errors or defects, costs of quality and production costs. The customer related impacts concern changes in issues involving customer satisfaction, complaints and retention. The GAO study had 16 operating measures.

- Financial impacts relate to the company’s bottom-line monetary and competitive issues. These 13

**TABLE 2** Performance Measures

Twenty Operational Measures Taken From the GAO Study	
<b>Employee Related</b>	
1.	Employee satisfaction.
2.	Attendance.
3.	Turnover.
4.	Safety/health.
5.	Suggestions received.
<b>Operations Related</b>	
9.	Reliability.
10.	Timeliness of delivery.
11.	Order-processing time.
12.	Errors or defects.
13.	Product lead time.
14.	Inventory turnover.*
15.	Costs of quality.
16.	Cost savings.
<b>Customer Related</b>	
20.	Overall customer satisfaction.
21.	Customer complaints.
22.	Customer retention.
<b>Financial Measures</b>	
23.	Market share.
24.	Sales per employee.*
25.	Return on assets.*
26.	Return on sales.*
<b>NOTES:</b>	
Measures 6-8, 17-19, and 27-40 were another part of the project.	
* indicates available in Compustat.	

measures include changes in items such as market share, sales per employee, return on assets and sales, share price per earnings, net profit, operating expenses and inventory. The GAO study only examined four financial related measures. Many have expressed concern that quality awards should indicate profitable companies, yet the awards do not directly measure financial performance. By implementing a quality improvement process, the results should, in the long run, show up on the bottom line.

- The award related impacts addressed five specific issues regarding quality awards: the internal use of the award criteria, the use of award feedback infor-

mation, the extent of benchmarking, the use of quality management practices, and the time and expense involved in applying for the award. The GAO study did not address any award related measures.

### The research study

While the GAO study evaluated companies that received MBNQA site visits between 1988 and 1989, this research study looked at winners and applicants of both the MBNQA and state-level award programs between the years 1990 and 1995. Nonapplicants were included to provide a basis for comparison. The categories of companies—common to almost all the awards—were manufacturing, service and small business. Organizations in health care, education and government were not included.

Two data sources were used in this study: a large-scale, nationwide mail survey and Compustat, a financial database of public companies. Compustat contains financial measures on more than 8,000 stock-issuing companies, primarily taken from financial

statements and annual reports that are in the public realm, as determined by the Securities and Exchange Commission.

Even though the mail survey examined 40 measures and the Compustat data covered 13 measures, this article is only concerned with the results of the 20 measures taken from the GAO study. Due to this focus, only four Compustat measures can be considered, as they are the only measures to overlap the GAO’s original 20 (see Table 2).

### The respondents

The mail survey was sent to 1,122 companies, which consisted of 343 quality award winners, 393 quality award applicants and 386 non-applicants. A total of 193 companies (17%) responded to the mail survey. Public companies made up 564 or about half of the total number of companies that received the survey. Of these 564 public companies, 418 had the data for all 13 Compustat measures; therefore, only these public companies could be analyzed where Compustat data was concerned. Thirty-eight of these 418 companies

**TABLE 3** Mail Survey Results—Change in Measures

Measure #	Measure Name	GAO Direction of Improvement	Winners		Applicants		Nonapplicants	
			Mean	Sample Size	Mean	Sample Size	Mean	Sample Size
	Maximum sample size			103		64		26
<b>Employee Related Measures</b>								
1	Employee satisfaction	up	5.431	102	5.333	63	5.238	21
2	Attendance	up	4.919	86	4.825	57	4.905	21
3	Turnover	down	3.580	100	4.164	61	3.800	20
4	Safety/health	up	3.280	93	3.696	56	3.316	19
5	Suggestions received	up	5.368	87	5.091	55	5.412	17
<b>Operations Related Measures</b>								
9	Reliability	up	5.940	100	5.590	61	5.696	23
10	Timeliness of delivery	up	5.598	102	5.548	62	5.696	23
11	Order-processing time	down	4.178	90	4.586	58	4.500	22
12	Errors or defects	down	3.000	101	3.217	60	2.714	21
13	Product lead time	down	3.093	86	3.421	57	3.526	19
14	Inventory turnover	up	5.260	77	4.813	48	5.250	16
15	Costs of quality	down	2.914	93	3.429	56	2.444	18
16	Cost savings	up	5.522	92	5.078	51	5.350	20
<b>Customer Related Measures</b>								
20	Overall customer satisfaction	up	5.961	103	5.381	63	5.680	25
21	Customer complaints	down	2.653	101	2.967	60	2.958	24
22	Customer retention	up	5.477	86	4.833	60	5.273	22
<b>Financial Measures</b>								
23	Market share	up	5.643	84	4.944	54	5.478	23
24	Sales per employee	up	5.805	82	5.389	54	5.760	25
25	Return on assets	up	5.726	84	5.259	54	5.542	24
26	Return on sales	up	5.671	85	5.039	51	5.524	21

**TABLE 4** Survey Results—Primary Reason (Mode) for Change

Measure #	Measure Name	Direction of Improvement	Winners			Applicants			Nonapplicants		
			Mode	Sample Size	Percent	Sample Mode	Size	Percent	Sample Mode	Size	Percent
	Maximum Sample Size			103			64			26	
<b>Employee Related Measures</b>											
1	Employee satisfaction	up	7	92	54.35%	7	58	37.93%	7	18	83.33%
2	Attendance	up	7	63	53.97%	7	42	52.38%	7	13	61.54%
3	Turnover	down	7	73	49.32%	7	43	30.23%	7	14	42.86%
4	Safety/health	up	7	74	55.41%	7	34	50.00%	7	11	72.73%
5	Suggestions received	up	7	78	70.51%	7	44	52.27%	7	13	76.92%
<b>Operations Related Measures</b>											
9	Reliability	up	7	91	49.45%	7	49	55.10%	7	18	55.56%
10	Timeliness of delivery	up	7	94	54.26%	7	50	58.00%	7	16	68.75%
11	Order-processing time	down	7	80	53.75%	7	48	47.92%	7	17	52.94%
12	Errors or defects	down	7	91	69.23%	7	47	59.57%	7	17	64.71%
13	Product lead time	down	7	72	51.39%	7	43	53.49%	7	14	42.86%
14	Inventory turnover	up	7	64	54.69%	7	38	52.63%	7,8	13	23.08%
15	Costs of quality	down	7	80	72.50%	7	44	61.36%	7	14	71.43%
16	Cost savings	up	7	76	68.42%	7	42	64.29%	7	15	93.33%
<b>Customer Related Measures</b>											
20	Overall customer satisfaction	up	7	92	63.04%	7	52	59.62%	7	20	90.00%
21	Customer complaints	down	7	88	67.05%	7	45	66.67%	7	17	82.35%
22	Customer retention	up	7	72	62.50%	7	45	62.22%	7	17	88.24%
<b>Financial Measures</b>											
23	Market share	up	7	72	37.50%	7	44	38.64%	7	19	42.11%
24	Sales per employee	up	7	75	41.33%	7	46	34.78%	7	20	40.00%
25	Return on assets	up	7	75	42.67%	7	44	40.91%	7	19	36.84%
26	Return on sales	up	7	74	40.54%	7	45	40.00%	7	16	43.75%

also completed the mail survey—including five winners, 13 applicants and 20 nonapplicants.

Demographic data was compiled from both the survey and Compustat database. Of the companies, 62% were manufacturing, and 38% were service. About 98% of the survey respondents indicated they were implementing quality management practices. Half of the survey respondents were quality managers or directors, one-quarter were presidents or vice presidents, and the remaining quarter were project or factory managers.

Survey respondents also indicated that the average time between implementing TQM practices and winning a quality award was 5.5 years—over twice as long as indicated by the GAO study.

**The mail survey**

The mail survey was organized into five sections: (I) company background information, (II) award information, (III) change in performance of measure, (IV) reasons for change in performance and (V)

additional information.

Section III asked respondents to estimate the average annual percentage change for each measure between 1990 and 1995. The following seven point Likert scale was used, including a percentage for each category:

- 1—Decreased greatly, 11%+
- 2—Decreased moderately, 6 to 10%
- 3—Decreased slightly, 1 to 5%
- 4—No change, 0%
- 5—Increased slightly, 1 to 5%
- 6—Increased moderately, 6 to 10%
- 7—Increased greatly, 11%+

In addition, an N/A option was provided and coded as a 0 for analysis purposes.

Section IV of the survey requested the reason for the change in the measure. Twelve options were provided, including an *other* option.

The results from the mail survey are shown in Table 3. The number, name and expected direction of improvement are given for each measure. The mean

**TABLE 5** Compustat Results

Measure #	Measure Name	Direction of Improvement	Winners		Applicants		Nonapplicants	
			Mean	Sample Size	Mean	Sample Size	Mean	Sample Size
	Maximum sample size			17		20		379
<b>Operational Measure</b>								
14	Inventory turnover	up	4.84%	15	3.00%	18	3.06%	304
<b>Financial Measures</b>								
24	Sales per employee	up	-5.11%	16	1.77%	20	0.61%	339
25	Return on assets	up	-0.28%	13	35.51%	17	-4.27%	360
26	Return on sales	up	-11.81%	17	-4.52%	20	-5.32%	363

**TABLE 6** Common Company Analysis

Measure #	Measure Name	Direction of Improvement	Correlation Coefficient	Survey Data		COMPUSTAT Data	
				Mean	Sample Size	Mean	Sample Size
	Maximum sample size				38		3
<b>Operational Measure</b>							
14	Inventory turnover	up	0.432	5.069	29	4.727	33
<b>Financial Measures</b>							
24	Sales per employee	up	-0.017	5.789	38	4.086	35
25	Return on assets	up	0.097	5.703	37	4.684	38
26	Return on sales	up	-0.311	5.576	33	2.842	38

and sample size are also reported for the three groups of companies who responded to the mail survey—award winners, award applicants and nonapplicants. Mean values less than four indicate the percent change decreased, while values greater than four indicate the percent change increased. All N/A responses were excluded from the survey analysis.

Generally, the mail survey results for all three types of organizations followed in the same expected direction of improvement as found in the GAO study. However, for safety/health (measure 4) and order processing time (measure 11), the survey results indicated an opposite direction than might be expected for all three groups.

The mail survey requested respondents to identify the reason for the positive change in the measure for their company. Table 4 presents the results of their responses. The most common reason given by all three groups was *implemented quality management practices*. More than half of the respondents gave this reason for several measures. Clearly, respondents believed that the changes in these measures were directly related to

the implementation of quality management.

The last section of the survey asked if respondents thought the award criteria had a positive impact on their company's performance. About 89% of winners, 77% of applicants and 42% of nonapplicants said it had. A linkage appears to exist between award criteria and perceived company performance.

#### Financial results

Table 5 shows the Compustat results for the same three groups of companies. Note the sample size difference. This is primarily due to the fact that most quality award winning companies are not public companies. The percentage change was actually calculated from the data and is reported as a percentage.

The three financial Compustat measures offered disturbing results. The mean values were negative (opposite from the expected direction of improvement) for the winners in all three measures. The same can be said for one measure regarding applicants and two measures where nonapplicants are concerned. There does not appear to be any consistency.

### Perceived performance vs. actual financials

A comparison was made between the mail survey and Compustat results for the four measures that both sources had in common. Table 6 compares the results of the four measures among the 38 public companies that both responded to the survey and had data in Compustat. To accomplish this comparison, the Compustat results were converted to the 1 to 7 Likert scale used in the survey. The analysis was performed by combining the data from the survey and Compustat for the 38 companies.

In all four measures, the mail survey respondents thought they were doing better (by expected direction of improvement) than was indicated by the Compustat data. The mean values for the survey data are greater than for the Compustat data—sometimes by a large margin.

This is corroboration that, in general, respondents to surveys think they are doing better than they actually are. A review of these 38 company surveys showed that the respondents were primarily quality managers, not financial managers. A correlation analysis for all 38 companies identified two correlations—measures 24 and 26—as negative (see Table 6). In other words, these respondents thought almost the opposite of what their company was actually doing.

### Analyzing the results

Based on the results from this research study, we cannot conclusively determine whether quality award winning companies perform better than others. However, since 89% of the winners and 77% of the applicants who responded to the mail survey believed that using award criteria did have a positive impact on company performance, a link appears to exist between award criteria and perceived company performance. Even though there is no clear proof that award criteria yields positive results, implementing quality management practices does seem to have an impact on how positively employees judge the organization's operations and overall performance.

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