

THE EFFECT ON CORPORATE PERFORMANCE OF FIRMS THAT WON THE  
MALCOLM BALDRIGE NATIONAL QUALITY AWARD

By  
John Richard Horne

A DISSERTATION

Submitted to  
H. Wayne Huizenga School of Business and Entrepreneurship  
Nova Southeastern University

in partial fulfillment of the requirements  
for the degree of

DOCTOR OF BUSINESS ADMINISTRATION

2009

UMI Number: 3355828

Copyright 2009 by  
Horne, John Richard

All rights reserved

#### INFORMATION TO USERS

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleed-through, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

**UMI**<sup>®</sup>

---

UMI Microform 3355828  
Copyright 2009 by ProQuest LLC  
All rights reserved. This microform edition is protected against  
unauthorized copying under Title 17, United States Code.

---

ProQuest LLC  
789 East Eisenhower Parkway  
P.O. Box 1346  
Ann Arbor, MI 48106-1346

A Dissertation  
Entitled

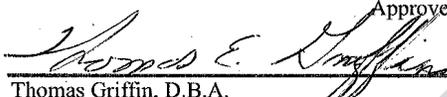
THE EFFECT ON CORPORATE PERFORMANCE OF FIRMS THAT WON  
THE MALCOLM BALDRIGE NATIONAL QUALITY AWARD

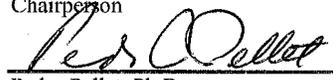
By

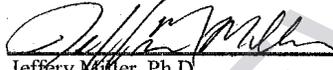
John Richard Horne

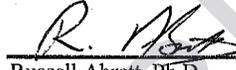
We hereby certify that this Dissertation submitted by John Richard Horne conforms to acceptable standards, and as such is fully adequate in scope and quality. It is therefore approved as the fulfillment of the Dissertation requirements for the Degree of Doctor of Business Administration.

Approved:

 5/21/09  
\_\_\_\_\_  
Thomas Griffin, D.B.A. Date  
Chairperson

 5/14/09  
\_\_\_\_\_  
Pedro Pellet, Ph.D. Date  
Committee Member

 5/10/09  
\_\_\_\_\_  
Jeffery Miller, Ph.D. Date  
Committee member

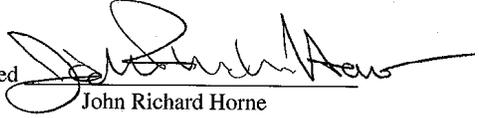
 5/26/09  
\_\_\_\_\_  
Russell Abratt, Ph.D. Date  
Chair of the Doctoral Program

 26 May 2009  
\_\_\_\_\_  
J. Preston Jones, D.B.A. Date  
Executive Associate Dean, H. Wayne Huizenga School of  
Business and Entrepreneurship

Nova Southeastern University  
2009

CERTIFICATION STATEMENT

I hereby certify that this paper constitutes my own product, that where the language of other is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions or writings of another.

Signed   
John Richard Horne

PREVIEW

## ABSTRACT

### THE EFFECT ON CORPORATE PERFORMANCE OF FIRMS THAT WON THE MALCOLM BALDRIGE NATIONAL QUALITY AWARD

by

John Richard Horne

This study examined the business results of companies that won the Malcolm Baldrige National Quality Award (NQA). It used performance data before and after the award to determine if there were significant differences in three key performance indices after adoption of those business techniques that enabled these companies to win their NQA. The three key indicators were return on assets (ROA), earnings per share (EPS) and the current ratio. The study examined the data in two ways; first tests were made by comparing company performance before and after winning an NQA. The second way of testing was by comparing the NQA-winning company's performance with its key competitors within their market segment.

Using both parametric and nonparametric hypothesis testing techniques, the preponderance of evidence suggests there was no significant difference in performance after winning the NQA than before, using the three performance indicators used in this study. Likewise, there was no evidence to suggest that the NQA-winning firms outperformed their key competitors within their market segment, for the three performance indicators used.

## ACKNOWLEDGMENTS

I wish to acknowledge the patience and professionalism displayed by my committee members Drs. Tom Griffin, Pedro Pellet and Jeff Miller, during the preparation of this dissertation. They each contributed something special in their own way that challenged and at times, frustrated me but all their actions contributed to my having a better product than when I started.

I realized that I continued my learning process throughout the preparation of this dissertation and feel that I have just begun my academic journey instead of completing it. Most importantly, I want to thank my wife Ruby who displayed an incredible amount of patience over the last several years of my life as I spent countless hours in my study, often seven days a week, conducting my research. Without her steady support and words of encouragement, this journey would have been unimaginably more difficult. She has truly been my sole research partner, my cheerleader, and my confidant in this effort.

PREVIEW

## Table of Contents

	Page
List of Tables .....	ix
List of Figures .....	x
Chapter	
I. Introduction .....	1
Background of the Study .....	4
Purpose and Rationale for the Study .....	4
A Description of the Malcolm Baldrige NQA Program .....	13
Statement of the Problem .....	16
Research Design and Research Questions .....	18
Definition of Terms .....	22
Assumptions .....	26
Theoretical Framework and Conceptual Model .....	29
Scope .....	30
Summary .....	30
II. Review of Literature .....	32
Introduction to Literature Review .....	32
A Survey of Current Quality Management Systems Literature .....	34
Review of Shareholder Theory and Quality-driven Performance Literature .....	47
Shareholder Theory Literature Review .....	47
Quality-driven Performance Literature .....	63
Financial Analysis Methodologies Literature Review .....	84
Review of General Research and Statistical Techniques Literature .....	88
General Research Literature .....	89
Statistical Research Techniques Literature .....	94
A Critique of MBNQA Process Literature .....	95
Literature from the Malcolm Baldrige National Quality Program Site ....	95
Literature about the MBNQA Evaluation Process .....	101
Conclusion for Literature Review .....	107
III. Methodology .....	112
Research Questions and Hypotheses .....	113
Research Questions .....	113
Research Method and Design Appropriateness .....	115
Theoretical Model .....	115
Definition of Variables .....	117

Chapter	Page
Data Collection .....	120
Sample and Population .....	120
Sample.....	120
Population .....	121
Data Collection Process for NQA Winners .....	121
Key Competitors of NQA Winners.....	122
Sources of Data.....	123
Data Analysis .....	124
Statistical Approach .....	124
Testing for Normality .....	127
Parametric Testing .....	129
Nonparametric Testing.....	130
Validity and Reliability.....	132
Summary.....	134
 IV. Analysis and Presentation of Findings .....	 136
Introduction.....	136
Data Review.....	136
Variables .....	137
Selection of MBNQA-winning Firms.....	137
Data Sources .....	138
Performance Data and Descriptive Statistics .....	140
Summary Data Tables.....	140
Descriptive Statistics.....	140
Review of the Statistical Techniques .....	149
Normality Tests.....	149
Summary of Results of the Normality Tests.....	153
Results of Hypothesis Testing .....	155
Test of Hypothesis 1 .....	161
Test of Hypothesis 2 .....	162
Test of Hypothesis 3 .....	163
Statistical Techniques Applied to the Key Competitor Firms .....	164
Summary of Results of the Normality Tests for SICs .....	177
Results of Hypothesis Testing .....	179
Test of Hypothesis 4 .....	190
Test of Hypothesis 5 .....	191
Test of Hypothesis 6 .....	191
Summary.....	192
Summary of Data for Research Question 1 .....	194
Interpretation of the Data for Research Question 1 .....	196
Summary of Data for Research Question 2 .....	196
Interpretation of the Data for Research Question 2 .....	197

Chapter	Page
V. Summary and Conclusions.....	198
Overview of Study .....	198
Summary of Study Results.....	200
Conclusions Based on Study Results .....	201
Implication of Findings.....	201
Study Limitations and Recommendations for Future Research .....	202
Limitations .....	202
Future Research .....	205
Methodology .....	205
Interviews of Participants .....	206
Appendix	
A. Company Performance Data from COMPUSTAT.....	209
B. Performance Data from Key Competitors.....	216
References Cited.....	229

## List of Tables

Table	Page
1. U.S. Share of World Trade .....	2
2. 1994-2003 Publicly Traded Award Recipients.....	6
3. Global Excellence Model Council Members.....	15
4. Baldrige Evaluation Criteria .....	96
5. Scoring System for Baldrige Criteria.....	99
6. Organizational Profile Questions.....	101
7. Elements of Data Queries in COMPUSTAT .....	124
8. List of Manufacturing and Service Firms That Won the MBNQA .....	138
9. Summary of Normality Tests For Research Question 1 .....	154
10. Statistical Test Decision Results for Research Question 1 .....	155
11. Results of Test of Hypothesis 1 .....	162
12. Results of Hypothesis Test 2.....	163
13. Results of Hypothesis Test 3.....	164
14. Results of Normality Tests for Research Question 2.....	178
15. Statistical Test Decision Results for Research Question 2 .....	178
16. Results of Hypothesis Test 4.....	190
17. Results of Hypothesis Test 5.....	191
18. Results of Hypothesis Test 6.....	192
19. Summary Results for HSBA Tests for Research Question 1.....	195
20. Summary Results for HSBA Tests for Research Question 2.....	197
21. Summary of Significant Results from Research Question 1 .....	200
22. Summary of Significant Results from Research Question 2 .....	201

## List of Figures

Figure	Page
1. Annual Comparison of Stock Performance between S&P 500 and NQA Winners. ....	5
2. Value Line 30 EPS – Share Price Comparison.....	11
3. Regression Analysis for Value Line 30 Share Price and EPS.....	12
4. Pretest and Posttest Experimental Group Design.....	18
5. Pretest and Posttest Experimental and Control Group Design.....	19
6. Mill's Method of Difference.....	19
7. Conceptual Framework for Study.....	29
8. Model of the Study Variables Logic.....	117
9. Data Testing Sequence.....	132

## Chapter I

### Introduction

*“Too many accountants, lawyers and marketing people. What we need are some manufacturers and engineers calling the shots if America is to compete effectively in world markets.”*

*Malcolm Baldrige  
26th Secretary of Commerce, on December 11, 1980  
by President Ronald Reagan*

In this increasingly competitive environment, quality management is an indispensable component to a firm's overall business strategy. "If your company doesn't produce high-quality, you must either sell to low-income groups or go out of business" (Kotler, 2000, p. 6). With this in mind, this study attempts to add to understanding of the linkage between quality improvement initiatives and company performance. After understanding the interrelatedness of the many facets of quality, management can lead change toward performance excellence in order to attain and maintain a competitive position in the market.

The current global economy has also introduced a formidable level of competition to American companies. This started after the end of World War II and in fact, the level of competition has increased with the current presence of China, and to an increasing degree, India as premier world exporters. According to the World Trade Organization, China's increase in merchandise exports to the world increased 80% between 2000 and 2007 while India's increased 71% during this period. The United States (U.S.), on the other hand, increased its trade to the world by only 33% during the same period (WTO

Trade Data, 2008).

One affect of this change in the U.S. world market share has been that the trade deficit for merchandise for the U.S. went from \$261.9 billion in 1998 to \$828 billion in 2005 (WTO World Merchandise Trade, 2005).

International Trade Statistics, a document published by the World Trade Organization indicate a decrease in the share of world trade produced by the U.S. in recent years as shown in Table 1.

Table 1

*U.S. Share of World Trade*

Year	U.S. Share by Percent
1997	12.6%
2000	12.3%
2004	8.9%
2005	8.7%

*Note.* From WTO World Merchandise Trade, 2005.

While there are many possible explanations for this trend, research has been done which provides an association between poor quality and negative trade outcomes (Hudson & Jones, 2003; Kandogan, 2006). This association can supply at least a partial explanation for the situation. Linder (1961) first noted that richer countries spend a higher proportion of their income on high-quality goods. Hallack (2004) went on to illustrate a sector-level confirmation of the Linder hypothesis.

Product and service quality are important for maintaining a competitive position in the marketplace. At the core of this proposition is the necessity to minimize production costs and to focus on customer satisfaction. After almost a century of modern quality management development, quality management has wide acceptance and application in all business environments. To foster the development of quality in a firm, a structured and discipline approach can help. The Malcolm Baldrige National Quality Award (NQA) program is an annual competition of American firms using a disciplined approach. Although this program has received much publicity, research has not been consistent in substantiating benefits to firms that have won a NQA. To that end, the purpose of this study is to examine the effect on shareholder valuation of firms that won a Malcolm Baldrige National Quality Award (NQA) over a set period, in relation to their key competitors.

Many of the earlier attempts to answer the question of shareholder valuation have been centered on the price of the winning firm's stock. This is rational and extends the use of the Efficient Market Hypothesis (EMH) into the evaluation process. Nevertheless, as detailed in Chapter II of this study, there are inconsistent findings in previous research leading to the lack of conclusive evidence that quality initiatives will provide benefits to a firm. This study departed from previous studies by focusing on the relative efficiency of the firm in relation to its competition. Efficiency in this context is the manner in which a firm uses its resources to generate profit and sales. This conforms to the approach by Healy, Palepu, and Ruback (1992) who indicated that accounting methods were a better way to measure firm performance than stock prices.

## *Background of the Study*

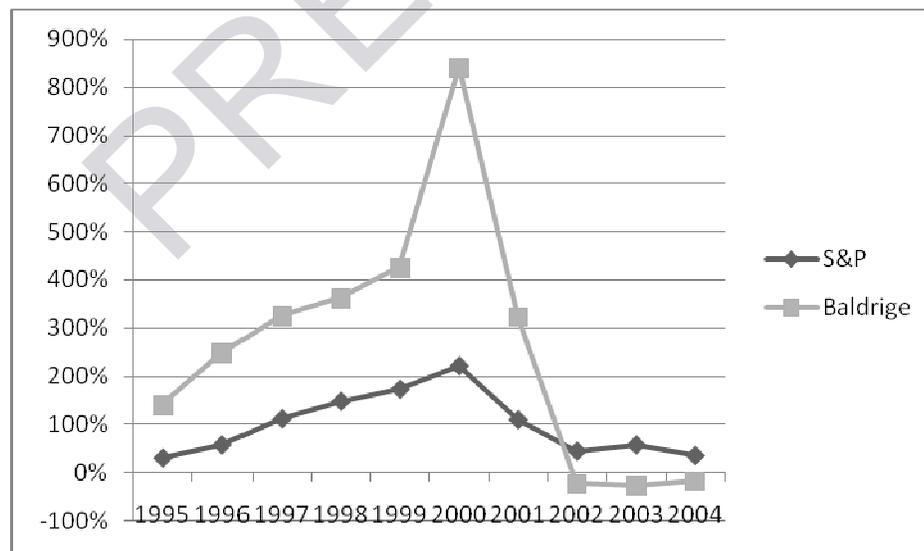
### *Purpose and Rationale for the Study*

To meet increasing competition in the marketplace, many firms have relied on quality and process improvement initiatives to keep competitive. Wilson, Walsh, and Needy (2003) stated, "Internationally, there are nearly 60 programs and awards that reward companies for improving quality" (p. 3). Among the most prestigious quality management programs used is the NQA program. This program, and the value it brings to a company, was the focus of this study. Extending the influence of NQA, thirty-seven state governments in the U.S., have emulated the NQA program and its evaluative structure (The Alliance for Performance Excellence, 2008). The Alliance for Performance Excellence serves as a clearinghouse of information about NQA. It is "a nonprofit network of international, national, state, and local Baldrige-based award programs. Members of The Alliance contribute over \$30 million annually to economic competitiveness by assisting organizations in all industries on their journey to excellence" (The Alliance for Performance Excellence, 2008).

The National Institute of Standards and Technology (NIST) manage the NQA program. The NIST is part of the U.S. Department of Commerce. Under the program, annual quality excellence competitions have been held since 1988, with the competition winners being presented their trophies by either the President, or the Vice President of the U.S. The competition has several discrete categories of competition that use one of three separate evaluation criterion; education, health care and all others. These three criteria produce winners in the separate categories of manufacturing, service, small business, health services, and education. Under current development is a separate category for

nonprofit entities (2007 Nonprofit Category).

There is benefit in following up on the value-adding capability of winning a NQA. Between 1995 and 2004, the NQA Program released annual comparisons of publically traded NQA recipients compared to the S&P 500. This comparison is known as the "Baldrige Index". The practice of annually computing the Baldrige Index however, was discontinued in 2004. Among the reasons for the discontinuation of the annual comparisons was that an increasing number of applicants who were not publicly traded companies. The NQA Program is "currently researching alternatives to the stock study and hopes to replace it with an index that better reflects the performance of all recent Award recipients" (NQA Stock Studies, 2008). Below is a summary of the results of these annual comparisons of stock performance of the S&P 500 companies and NQA recipients:



*Figure 1. Annual comparison of stock performance between S&P 500 and NQA winners.*  
From Baldrige Stock Results, 2008.

Table 2

*1994-2003 Publicly Traded Award Recipients*

	\$ Investment	\$ Value - 12/1/04	Change
1994-2003 Award Recipients	\$2,131.30	\$1,744.53	18.15%
S&P 500	\$2,131.30	\$2,889.54	35.58%

*Note.* From Baldrige Stock Results, 2008.

The results of the stock performance studies as noted previously, presents a dilemma that should be addressed. That is, in the early years of the Baldrige index, firms showed increases in stock price after winning a NQA while in the last years of the study, firms did not out-perform the S&P 500 as one would expect if the markets followed the EMH. Does this mean that firms did not increase their business performance after adapting? Is it possible that firms did increase their own internal performance but this increase was not reflected in the stock price for extraneous reasons related to the market as suggested by EMH? As Koop (2000) noted, "The simple random walk model is a little unreasonable as a description of stock price behavior since most stocks do appreciate in value over time" (p. 168). According to Higgins (2007), there are three weaknesses in using share price to gauge company performance. First is "the difficulty of specifying precisely how operating decisions affect stock price" (p. 56). That is, since there is no certainty in how the market will react to a manager's strategic decisions, then the stock price should not guide the decision in the first place. Secondly is "that managers typically

know more about their company than do outside investors" (p. 56). This should seem fairly obvious that an inside practitioner would have better knowledge than a person outside the company who is relying on only those elements of information that are required to be disclosed for financial reporting reasons. Lastly, the value of a stock price "depends on a whole array of factors outside the company's control. One can never be certain whether an increase in stock price reflects improving company performance or an improving external economic environment" (p. 56).

This study adds new information on value may have been added to firms that have won an NQA by way of business efficiency in using their assets to create sales and profit. As is illustrated below, previous studies present conflicting results whether or not winning the NQA added value to the firm. This study used other metrics that focus on determining if an improvement in internal process efficiencies is in evidence independent of the stock price.

Part of the disparity in the results of the previous studies may lay in that each study measured different parameters. This could be a simple and profound reason why the results of the previous studies providing conflicting evidence. Some of the studies indicated that firms did receive additional value to the value of the winning firms while other studies failed to show added value to the winning firms. The inconsistent outcomes of these studies provide a further rationale for performing this study. To provide a deeper contextual understanding of performance improvement initiatives, the results of firms that implemented Total Quality Management (TQM) programs are also considered. The reason for the examination of both types of quality initiatives is that TQM and the NQA evaluative criteria share many similarities. TQM as an identified quality improvement

strategy started in the mid-1980s while the first year of NQA competition was in 1988. Therefore, the results of implementing one of these quality management initiatives can give insight in implementing the other form of quality management initiative. These similarities are illustrated in Chapter III of this study.

Starting with an early examination of the results of TQM, Singhal and Hendricks (2001) studied the stock price of firm that implemented TQM. They stated that the stock performance of firms that implemented TQM out-performed a control group from 38% to 46%. Interestingly, the authors point out the "the significant positive abnormal returns during the post-implementation period conflict with market efficiency" (Singhal & Hendricks, p. 366). That is, that the market underestimated gains in efficiency after implementing TQM, in contradiction to the EMH. That there is contradictory evidence against the accuracy of the EMH is a significant and recurring theme in this study. Singhal and Hendricks go on to state, "Our interpretation is that the market remain slow to respond to TQM benefits" (p. 367). The evidence of Singhal and Hendricks appears to be contradictory and does little to resolve the dilemma at hand. This study furthers Singhal and Hendrick's work noted previously into testing the value-creating potential to firms that have won a NQA.

Easton and Jarrell (1998) studied 108 firms that implemented some kind of quality program to include TQM or the Baldrige NQA. The study period was from 1981 to 1991. They too measured the TQM firms against a control group of firms that did not declare the implementation of any kind of large-scale quality initiative. The measurement criteria was to look for excess stock performance of the TQM firms over what the expected stock performance was as declared by Value Line analysts.

Morin and Jarrell (2001) generalized this idea of quality initiatives adding value to shareholders by stating, "This is the idea, for example, behind many of the supplier initiatives undertaken within total quality management (TQM) systems. Such linkages can reduce costs and increase differentiation" (p. 17).

Another aspect of the question of valuing participation in quality improvement initiatives is that most firms have been evaluated with a primary focus on stock price performance. The ability of a firm's stock price to reflect accurately the value of the firm is the basis of the EMH ("Efficient Market Hypothesis," 2008). The fact that the stock market acts in a manner prescribed by the EMH is not universally accepted Nagorniak (2005). Koop (2000) for example, suggested a variant to the supposed efficiency of the market he called the "random walk with drift" (p. 168). This drift accounts for the " 'drift' upwards over time" (p. 168). Without the assurance that stock prices reflect the value of a firm, other more direct measures of performance are needed.

On the one hand, Malkiel (2005) subscribes to the efficient market hypothesis. By subscribing to the EMH, he asserts that the price of a stock does reflect the value of a company, that rational, informed customers drive the stock market. That is, "stock market price movements approximate those of a random walk. If new information develops randomly, market prices will too, making the stock market unpredictable apart from its long-run uptrend" (p. 1). Malkiel in summary, bases his contention for the most part on that, "the strongest evidence suggesting that markets are generally quite efficient is that professional investors do not beat the market" (p. 2). On the other hand, Nagorniak (2005) looks at this situation in a different light than Malkiel. He does not view the lack of performance of some managed funds as a validation of the EMH at all. He instead,

proposes that the stock prices do not necessarily reflect a company's true value and that inferior or inappropriate investment models account for the lack of managed fund performance.

As further credence to the previous assertion by Nagorniak, an examination of the current share price for major U.S. firms raises serious question about the efficiency of the market price being an indicator of firm performance. Figure 2 represents data from a grouping of stock on the Value Line Inc. web site called the Value Line 30. An examination for evidence pointing to a relationship between the share price and the earnings ability was made. A correlation and regression was performed on the Value Line 30 and the results follow. The horizontal axis represents the independent variable of earnings per share. This is a viable measure of how much money the firm made per share of outstanding common stock. The vertical axis represent the dependent variable of the share price as of November 23, 2008. There is moderate evidence to indicate that as the earning ability of the firm increases by way of its share price that the price it garners for its stock goes up as well.

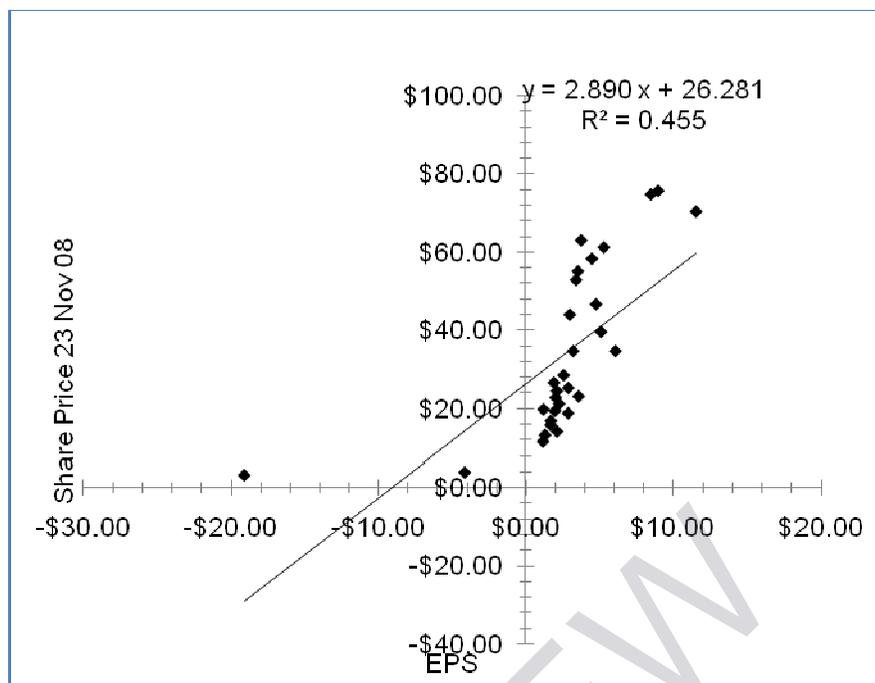


Figure 2. Value line 30 EPS – Share price comparison.

Figure 3 provides more information of the relationship. With the low  $p$ -value indicated below, the null hypothesis of random variation accounting for the variation can be rejected. Although not conclusive alone, this short example indicates that about two thirds of the change in share price may be related to the EPS, the data also suggests that one third of the share price is driven by factors other than the EPS.

Regression Analysis						
	$r^2$	0.455		$n$	30	
	$r$	0.675		$k$	1	
	Std. Error	3.742		Dep. Var.	<b>EPS</b>	
ANOVA table						
Source	SS	df	MS	F	p-value	
Regression	327.4932	1	327.4932	23.39	4.34E-05	
Residual	392.0677	28	14.0024			
Total	719.5609	29				

Figure 3. Regression analysis for value line 30 share price and EPS.

By way of comparison, Tuck (2005) also looked at stock performance in light of market efficiencies for firms winning the Malaysian Prime Ministers Quality Award (MPMQA). He found an interesting dichotomy in that service firms responded better to the quality award announcement than did production firms. This phenomenon however, could have several explanations. One explanation is that the market pricing mechanism is inefficient and therefore should not be expected to respond to the announcement adequately. Another explanation is simply that the market did not think winning of the MPMQA would positively influence the future earnings potential of the winning firms. (Tuck, 2005)

While the researchers previously mentioned focused on the immediate change in stock price after winning a quality award, other researchers examined the long-term impact to a winning firm's stock price. Cheah's (2007) approach was to determine if the stock market had "long-term memory" for NQA-winning firms. He examined the stock prices of NQA-winning firms 150 and 200 days after winning. He found no significant differences in the stock performance between the NQA recipients and comparable firms.

To summarize the findings of the previously mentioned studies, there is no clear, consistent, and compelling evidence on the value of winning an NQA with respect to a firm's stock price. The purpose of this study therefore, is to (a) test the performance of firms before and after winning a NQA to determine if there has been a statistically significant improvement in performance, and to (b) test the change in performance compared to like firms in the market segment of the winning firm. This study uses performance-based metrics and show the quantitative relationships between winning the NQA and those internal performance-based metrics. Published company performance metrics are used to identify changes in performance from before to after winning of a NQA.

#### *A Description of the Malcolm Baldrige NQA Program*

The history of the NQA traces itself back to U.S. Public Law 100-107 that was signed by President Ronald Reagan in 1987 (The Malcolm Baldrige National Quality Improvement Act of 1987 - Public Law 100-107, 09/25/2001). The Act was named the Malcolm Baldrige National Quality Improvement Act of 1987 in honor of a deceased former U.S. Secretary of Commerce, Malcolm Baldrige, who had championed global completion for U.S. firms. Among the key provisions of this Law are the following: