

ISO 9000 in the Iberian Peninsula and America

Dr. Gregory K. Arbuckle, Dr. Stanley L. Lightner

Western Kentucky University
greg.arbuckle@wku.edu

University of Nebraska at Kearney
lightnersl@unk.edu

Abstract

As the globalization of the world continues to grow many organizations are turning to quality systems to help their organization to stay competitive. In the course of their careers, many engineering and industrial technology graduates will be faced with economic decisions, including those which will impact the financial performance of their employers. Some large corporations, such as those in the automotive industry, are requiring ISO 9000 certification, or others quite similar in nature. This begs the question, what, if any, economic benefits are derived from the investment in time, money and other resources required in acquiring these certifications? The industrial technology student can use the knowledge gained from this historical study to assist in the decision making process when faced with these type of questions. The goal of this study was to determine if any research has found statistical proof that quality systems do affect the bottom line of the organization in a positive manner.

Introduction

Over the past two decades there has been a worldwide push for companies to improve their management systems. Many organizations have turned to a quality standard to achieve these improvements. In the spring of 1987, “as markets became global, companies found themselves having to meet many standards for different countries that were sometimes conflicting and usually confusing. In an effort to eliminate some of the confusion, the International Organization for Standardization (ISO), headquartered in Geneva, Switzerland, convened to develop, among other standards, an international quality system standard” [1]. ISO 9000 was developed and has become the benchmark to which all other quality standards set their goals. With over 500,000 certified organizations worldwide, an attempt to determine if ISO 9000 certification does indeed increase a company’s performance should be paramount for stakeholders in industry. This study reviewed both empirical research and objective studies of European and American organizations to determine what if any effect ISO 9000 certification has on an organization’s performance, and to determine if there is a difference between the two regions. Even though the review of literature of empirical studies is limited, both geographical regions are represented well. Along with the performance measures a review of the social and governmental roles in ISO 9000 was conducted.

Purpose of Study

The purpose of the study was to determine if the ISO 9000 can be used as a benchmark for organizational financial gain. This study will compare previous research completed in the United States, and investigations conducted in Portugal and Spain. The results could prove useful for organizations considering application for certification under ISO 9000. This study was completed to discover any statistical proof of financial gain in organizations bottom line.

Review of Qualitative Research

There have been many documents published on the perceived internal and external benefits that an organization gains upon achieving ISO 9000 quality standard certification. Several of these studies have focused on why companies seek certification, what gains the organizations hoped to gain from certification, and what the organization feels it has gained upon receiving certification. Although there are many reasons organizations list wanting a quality system certification, one item always mentioned is the support of top management is essential in order to ensure the success of the program.

There are several reasons why organizations choose to seek ISO 9000 certification. While most organizations look at the internal gains the organization can accrue from certification, the external benefits, in the end, outweigh the cost of certification. Typical reasons for trying to achieve ISO 9000 certification include: to improve the quality system through documentation, increase productivity, stay competitive with other competitors, and gain new customers [2,3,4]. Reasons companies give for seeking certification and the benefits achieved after receiving certification are very closely related. A survey completed by Gupta & Pongetti [2] shows “the variation between certified and noncertified participant responses was at most 12% and was less than 8% for the majority of the questions, a conclusion may be drawn that the beliefs and perceptions persons who have not gone through ISO/QS – 9000 implementation are fairly consistent with those of persons having gone through it.” There is little doubt of the internal gains an organization realizes upon receiving ISO 9000 certification. Thus the question remains, does ISO 9000 certification help the organization’s bottom line through external benefits? Skrabec et. al. [3] asked organizations to agree or disagree on “Measures of Competitive Advantage” using eight different measures with a general response time of just six to eight months after receiving certification. The measures and their percentage of agreement were: Improvement in Profitability (34.2%), Competitive Bids (36.3%), Improvement in Product Delivery (34.9%), Improvement in Production Efficiency (34.9%), Reduction in Cost of Production (36.0%), Reduction in Warranty Claims (19.6%), Reduction in Customer Rejections (39.7%) and Reduction in Internal Scrap (31.7%). Roughly one-third of all the organizations involved in this study agreed that just six to eight months after receiving ISO 9000 or QS 9000 certification, the organization had noticed improvement in seven of the eight “measures of competitive advantage”. Other studies have documented external benefits once certification is achieved. One such benefit was by Xerox. “Xerox bases its supplier qualification process on the ISO 9000 international quality standard” [5]. Much like the automotive industry and QS 9000, organizations are developing supplier certification guidelines based off the ISO 9000 system.

One of the benefits of requiring suppliers to achieve international certification is the understanding of the process in both organizations; thus the two systems can communicate and work together. “Based on recent data, the defect level of certified suppliers is less than one third that of non-certified suppliers” [5]. With so many benefits one might wonder why every company does not seek certification. The biggest barrier to overcome appears to be the resources necessary for an organization to receive certification. With certification taking up to two years to achieve and a price ranging from \$30,000 to well over \$1,000,000, the proof of the return on investment has not been fully demonstrated. Furthermore, “In the early 1990s, about 35 percent of companies failed to achieve certification on the first attempt, but more recently the failure rate has dropped below 30 percent” [6]. With no guarantee of achieving certification, organizations are waiting until more definitive proof that the certification pays for itself to pursue this option.

Review of Quantitative Research

The review of literature indicates a very limited amount of quantitative research has been completed analyzing quality certifications and organizational performance. Geographical regions that were covered in the studies reviewed consist of Spain, Portugal, and the United States. These studies can then be categorized into two techniques of investigating organizational performance. The first method looks at the stock market reactions to organizations receiving certification for abnormal returns. The second approach compares measures of performance of certified organizations to a control group of non-certified organizations.

Two papers reviewed using the abnormal return method, one published in the summer of 1999 by Docking and Downen using two hundred fifty-two U.S. firms, “Market Interpretation of ISO 9000 Registration” studied “whether the firms’ stockholders benefit from this registration process” [7]. Beirao and Cabral published another manuscript concerning the reaction of the stock market to ISO 9000 in 2002 using twelve Portuguese companies. “The fundamental question addressed in this paper is whether the benefits of the ISO 9000 certification are enough to overcome the losses” [8]. The research by Docking and Downen from January 1, 1990, through September 30, 1994 indicated that the market reaction for smaller companies (less than \$3.1 million) to be significant while no significant reaction was observed in the largest companies (above \$64 million). Beirao and Cabral’s study did not find any significant abnormal returns on the official day of certification; however, there were significant positive returns four days prior to the official certification date. This suggests that information concerning the upcoming certification was leaked prior to the actual certification date. Unlike Docking and Downen, 1999, Beirao and Cabral’s 2002 studies did not find a difference in reaction based on company size. However, Beirao and Cabral did find the order in which the certifications were received seemed to affect the results.

In 2002 a study was published using 400 certified and 400 uncertified companies from the Basque region of Spain to compare certification in ISO 9000 and improved financial performance. The data were collected from the Mercantile Register, which collects over 500 items, including outcome and balance sheets, for each of the companies listed with the Register. The organizations were a sample of the more than 100,000 companies listed in the Mercantile Register database. Calculating the Return on Assets (ROA) for each of the 800 companies determined that the 400 certified companies outperformed the uncertified companies in four of

the five years tested. Even though the average of the fifth year, 1994, was larger for certified companies, it was not significantly different at the 0.05 levels when a t-test was performed to ensure statistical validity [9].

Studies from the United States were used to determine if there is a positive relationship between ISO 9000 certification and organizational financial performance. The first, completed in 1998 by Puderbach and Brown [10], tested eleven companies that were registered before the second quarter of 1993. This study used data for twelve quarters before certification and twenty-one quarters of data after certification to perform the test to measure growth in revenue and net income to determine financial performance. Puderbach and Brown's study did not, however, use any means to control normal growth or fluctuations in the organizations financial data. Using data collected from 10-Q and 10-K reports, the Puderbach and Brown study employed a Spearman Rho to test trends in pre- and post-certification, and found a significant difference for both average revenue growth and net income $p < 0.001$ & $p < 0.05$ respectfully.

In a study by Wayhan, Kirche, and Khumawala; organizations in the United States with ISO 9000 certifications was completed. The sample consisted of ninety-six organizations, forty-eight certified and forty-eight non-certified used to test for significant differences in ISO 9000 certification and financial performance. The non-certified organizations were randomly selected by using matched pairs of organizations based on the organizations SIC code and the total assets of the organizations based on the 1993 financial data. The study used four different dependent variables: revenue growth, stockholder equity, gross profit and ROA to measure financial growth by means of a MANOVA with repeated measures to determine if there was a significant difference over time (1990-1998) between the two groups. "The omnibus test indicates that the main effect of ISO certification (ISO93) was insignificant over the entire nine time periods ($F=0.62865$, $p=0.643$)" [10]. This study went on with a post hoc analysis to determine if increasing the size of the study would have an effect on the results. "Finally, when the original sample size is increased by a factor of four ($n=384$), the main effect of (ISO93) becomes significant ($F=2.618$, $p < 0.01$)" [11].

Implications

This study shows that that ISO 9000 certification can affect an organizations bottom line. These studies show that certification has a positive affect on an organizations stock market value (especially for smaller organizations), and that certified organizations outperform non-certified organizations in financial data during the same time frame. With the completion of this study organizations thinking about gaining certification should notice that obtaining a quality system certification can benefit. The certification can allow them to meet their customer's expectations and could all the organization to see a financial gain.

In order to truly determine if organizations are getting a good return on investment for ISO 9000 certification, there needs to be a better way of calculating the real cost of certification. Until that time organizations will have to determine if the perceived benefits out weigh the high cost of certification and the gamble of how ISO 9000 will affect the bottom line.

Conclusion

The perceived benefits of ISO 9000 certification both in the Iberian Peninsula and the United States are essentially the same. The organizations list several internal and external benefits that they wish to gain from the certification. However, in the quantitative research the authors discuss the difficulty in measuring true benefits from ISO 9000 certification. Another issue is the number of companies studied in some of the research completed. It is very difficult to make judgment about how ISO 9000 will affect every organization when the research only looked at a few companies. With the lack of strong data supporting that ISO 9000 quality system improves an organizations financial standing, organizations should be consider what they hope to gain from obtaining certification in a quality system. While there are many benefits that can be gained by obtaining these certifications organizations must understand that ISO 9000 certification does not guarantee financial success. These studies continue to show the need for more research in this field. Especially, since the findings of these studies are in conflict. Further research needs to be completed calculating the true cost and gains of ISO 9000 certification in order to finally determine if ISO 9000 certification should be used as a benchmark for organizations.

References

- [1] Joubert, B. (1998). ISO 9000: International quality standards. [Electronic version]. *Production and Inventory Management Journal*, 39(2), 60-65.
- [2] Gupta, P. & Pongetti, D. (1998). Are ISO/QS-9000 certifications worth the time and money. [Electronic version]. *Quality Progress*, 31 (10), 19-24.
- [3] Simpson, G. L. (1994). ISO 9000: Is it for real? [Electronic version]. *The Canadian Manager*, 19 (4), 21.
- [4] Skrabec, Q. R. Jr., Ragu-Nathan, T. S., Rao, S.S. & Bhatt, B.T. (1997). ISO 9000: Do the benefits outweigh the costs? [Electronic version]. *Industrial Management*, 39 (6), 26-32.
- [5] Avery, S. (1995). Xerox winners exceed ISO 9000. [Electronic version]. *Purchasing*, 118 (1), 111-113.
- [6] Stevenson, T.H. & Barnes, F.C. (2001). Fourteen years of ISO 9000: Impact, criticisms, costs, and benefits. [Electronic version]. *Business Horizons*, 44 (3), 45-51.
- [7] Docking, D.S., & Downen, R. J. (1999). Market interpretation of ISO 9000 registration. [Electronic version]. *Journal of Financial Research*, 22 (2), 147-160.
- [8] Beirao, G., & Sarsfield Cabral, J.A. (2002). The reaction of the Portuguese stock market to ISO 9000 certification. [Electronic version]. *Total Quality Management*, 13 (4), 465-474.
- [9] Heras, I., Casadesus, M., & Dick, G. P. M. (2002). ISO 9000 certification and the bottom line: A comparative study of the profitability of Basque region companies. [Electronic version]. *Managerial Auditing Journal*, 17 (1/2), 72-78.
- [10] Puderbach, L. D., & Brown, K. L. (1998). *Financial Effects of ISO-9000 certification in American Corporations*. Paper presented at the meeting of the Decision Sciences Institute, Las Vegas, NV.

- [11] Wayhan, V. B., Kirche, E. T., & Khumawala, B. M. (2002). ISO 9000 certification: The financial performance implications. [Electronic version]. *Total Quality Management*, 13 (2), 217-231.

Biography

GREGORY ARBUCKLE is currently an Assistant Professor in Technology Management at Western Kentucky University. He earned his B.S. (Mechanical Technology, 1996) from Indiana State University, M.S. (Industrial Technology, 1999) from Eastern Illinois University, and Ph.D. (Technology Management, 2004) from Indiana State University. Dr. Arbuckle has over 10 years of experience as a quality control engineer, quality manager, and educator. He is a Certified Industrial Technologist by the National Association for Industrial Technology.

STANLEY L. LIGHTNER is Associate Professor of Industrial Technology at the University of Nebraska at Kearney. He earned his B.S. (Industrial Technology, 1986), M.Ed. (Secondary Education, 1990) from Northeastern Oklahoma State University and Ed.D. (Occupational and Adult Education, 1997) degree from Oklahoma State University. He worked in industry for a number of years and joined the UNK faculty in 2000. He teaches professional and manufacturing courses within the Industrial Distribution program.