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The stock market's reaction to quality certification: Empirical evidence from Spain

Abstract:

The objective of this paper is to analyze the stock market's reaction to a company that is granted a quality certification (ISO 9000), particularly when such an award is publicly announced. To do so, we carried out an event study, estimating the mean "abnormal" change in the stock prices of all the firms that obtained quality certification, based on the ISO 9000 norms, while they were trading on the Spanish stock market between 1993 and 1999. The results show that the stock market reacts positively to such certification. This implies that quality certification can be considered a useful tool for reducing the asymmetry in the information that circulates among buyers and sellers. useful remedy to reduce information asymmetries between buyers and sellers.

Keywords: Quality, ISO 9000 certification, information asymmetries.

1. Introduction

Over the last few years, differentiation based on quality has become a strategy of increasing importance to Spanish companies. The explanation for this lies in the potential benefits that such a strategy affords. As Deming (1986) points out, keeping their present clients and increasing their market share depend, to a great extent, on the quality of the products they offer. This is most likely because the consumers themselves are becoming more discerning and tend to patronize the companies that offer quality goods. Furthermore, the manufacturers of such products can reduce the costs associated with the lack of quality, which has led Crosby (1979) to state that "quality is free." These hypotheses, together with the possible scale economies that could be achieved with a larger market share, could mean that the companies that offer higher quality products enjoy greater profits than those that ignore this competitive strategy.

Together with this new-found interest in quality, a related interest has also arisen, among managerial circles, in designing methods for ensuring Such quality. There is often great asymmetry between the information that circulates among companies and that held by the consumers, with regard to the quality of the products that are offered on the market. According to Akerlof (1970), when there is asymmetry in information about quality, products of both high and low quality could coexist in the market, which induces consumers to make a sort of ad hoc evaluation of the quality of the products that they wish to purchase, resulting in a difficult and sometimes costly task (Nayyar, 1990). Furthermore, considering that the consumers' behavior depends, to a great extent, on the information that is made available to them both before and after their purchase, such asymmetry is one of the more important factors that determine the transaction costs in an exchange relationship (Nayyar, 1990), since it negatively affects the consumers' evaluation of the quality of the products that are offered.

In view of the above-mentioned situation, companies who consider the quality of their products a marketing priority should try to reduce the asymmetry of information aimed at the consumer. Quality certification and the designing of systems that ensure such quality, therefore, should not only help to reduce the asymmetry commonly seen in information, but also to secure an advantage over competitors who disregard the value of quality. Furthermore, if the granting is done by an independent organization, the consumers will be able to recognize quality products more readily, thus reducing the cost of their search for quality when buying new products. Considering the existing empirical evidence that indicates a positive relationship between quality and performance (Deming, 1986; Capon et al., 1990, 1996), as well as the potential benefits that the certification of the systems of quality affords, the objective of this work is to analyze the impact that quality certification, based on the ISO 9000 norms, has on the returns of firms' shares. The measure employed to evaluate the results was the price of the shares of the companies that obtained such certificates. To achieve this objective, the event study methodology was used. This method allows us to distinguish the results from the news of the quality certification, from those that can be considered "normal". This comparison, which uses the market model as a base, allows us to calculate the variation in the price of a given share on any given day.

The details of our study and its results are organized as follows: we first present a brief review of the concept of quality, as defined in the literature, and the results of previous studies done on quality. We then outline, in Section 3, the different systems available by various companies to reduce the asymmetry that appears in the information that consumers receive, with a special emphasis on quality certification. In Section 4 we describe the empirical study carried out and present the results obtained, and finally, in Section 5, the main conclusions are explained, highlighting the implications that these results have for company management and their limitations. We then close with a few suggestions for future research.

2. Quality and its influence on a firm's performance.

In the existing literature, the concept of quality is now being approached from a twin perspective, as a transformation gradually takes place, from an objective to a more subjective concept, in which the client is becoming the final judge of quality. At first, quality was considered a purely tangible feature and was identified with certain previously established characteristics to which the product offered for sale had to conform. Such specifications were entirely technical (weight, size, etc.), and were assumed to be the pre-conceived preferences and expectations of the consumer. Such a definition of quality is largely objective, and, as Crosby (1979) defines it, is a "conformity to requirements".

More recently, however, the literature has begun to consider quality from a more subjective point of view. As such, product is considered to be "of quality" if it fulfills the client's expectations and needs. According to Juran and Gryna (1980), quality simply consists of "adapting to use" which could be summed up in a group of characteristics that the consumers expect of the product, and about which they will express their level of satisfaction with it. On this point, however, Deming (1986) goes even further and summarizes quality as "the obligation of the company to satisfy the needs of its customers".

Regardless of its definition, however, the quest for quality has become one of the most important competitive strategies undertaken by corporate management in recent years.

According to Deming (1986), a “quality revolution” is being promoted not only by manufacturers but by service companies as well. The decision-makers seem to have begun to realize that in order to increase their market share, indeed, to merely keep their current clientele, the quality of the products and services they offer is of growing importance. This has prompted Feigenbaum (1982) to define quality as the most important factor in company growth on the international level.

In general, there is abundant empirical evidence that indicates a positive relationship between quality and the different measurements done on companies’ performance (Capon et al., 1990, 1996). Due to the different methods employed, however, the literature on the relationship between quality and performance has, in certain cases, offered conflicting results with regard to just how the relationship functions. According to Reeves and Bednar (1994), it can be due to the different approaches to the concept of quality (either due to internal measures on the part of the company’s management or external ones on the part of its customers) and the different means of measuring the results (returns on investment (ROI), market share, profits, etc.). In general terms, we can classify these studies according to the impact that quality has on revenue and on costs. Regarding the influence of quality on revenue, there are several different theories that attempt to explain this relationship. On one hand, Buzzell et al. (1975), and Thompson et al. (1985), suggest that companies that sell quality products can afford to charge higher prices for their products, which allows them to obtain greater revenue. Other authors, however, suggest that an improvement in quality increases the loyalty of their customers and increases their chances of gaining new ones (Deming, 1986), which subsequently is translated into a larger market share. This latter relationship is supported by numerous other studies (Cowling and Cubbin, 1971; Buzzell et al., 1975; Buzzell and Wiersema, 1981a,b; Craig and Douglas, 1982; Phillips et al., 1983; Jacobson and Aaker, 1987; Jacobson, 1988; Szymanski et al., 1993 and Kroll et al., 1999).

Two different theories exist regarding the way quality affects costs. On one hand, there is a belief that to attain a certain level of quality, some investments in resources and formation is required, which can only result in an increase in costs (Juran and Gryna, 1980). On the other hand, the theory originally proposed by Crosby (1979) is that costs associated with quality are always lower than those associated with the lack of quality. Along these lines, Craig and Douglas (1982), and Gale and Branch (1982), defend the idea that companies who offer quality products eventually reduce their costs, which is supported to a certain degree by Phillips et al. (1983), who find an indirect and negative relationship between quality and costs, as manifested through market share. With a rather more compromising sort of view, Rust et al. (1995), suggest that in companies who produce tangible goods or offer very standardized services it is more likely that a reduction in costs occurs, while in purely service firms this is more unlikely, due to the difficulty in standardizing the way they provide the clients with the services. A third line of research attempts to consider revenue and costs simultaneously. It supposes that an improvement in quality has a positive influence on revenue, though it is also associated with some initial costs. Along these lines, Rust et al. (1995), defend the idea that the costs associated with quality should be considered an investment, so that revenues and costs should be analyzed simultaneously, and, therefore, profits would be a good indicator. The relationship between quality and profitability (measured by ROI) is supported by several studies, such as Buzzell and Wiersema (1981b), Craig and Douglas (1982), Gale and Branch (1982), Phillips et al., 1983, Jacobson and Aaker (1987), Jacobson (1988), Szymanski et al. (1993) and Caruana and Pitt (1997). Furthermore, there is empirical evidence that supports the hypothesis that an

improvement in quality increases the company's market value (Thompson et al., 1985; Aaker and Jacobson, 1994; Easton and Jarrell, 1998). The advantage of using market values to measure the impact of quality is that it allows us to carry out a more global financial analysis, considering not only revenue but costs as well.

It is important to stress that the term quality should not be used as if it were a variable in itself, but rather as the result of a process in which a great number of resources and activities are involved (Grönroos, 1984). The strategic role of quality should be evaluated through the implementing of programs to improve on quality. One of the pioneer studies in this field is that of Haim (1993), which analyzes the results of 20 other studies on the relationship between TQM (Total Quality Management) and firms' performance. Only three of those studies, however, attempt to measure the impact of this quality system on profits, and conclude that, in general terms, a positive relationship exists between both of them. In spite of this, however, there is still no conclusive evidence. Easton and Jarrell (1998), point out that, though companies that have implemented quality systems do obtain somewhat better results, which, furthermore, are seen from the moment of such implementation, this does not necessarily imply that companies who do not have such systems will improve their results with such implementation, as there may well be certain factors that make TQM effective in certain companies and not in others. Furthermore, Powell (1995), Spitzer (1993), and Samson and Terziovski (1999) show that only certain practices of TQM have positive effect on the firm's results. The causes that may explain the failure of TQM are many and include such factors as the reticence of the firm's staff with regard to the implementation of the system, the high cost implied in the initial investment, the indispensable commitment required of the firm's management team, and the fact that the results of such a system is hardly observable on a short-term basis, all of which may lead the company to abandon the system.

We can conclude this section by pointing out that, though there is a certain amount of consensus about considering quality a strategic factor that contributes to the improving of a firm's results, the exact specification of the relationship is still far from being clearly seen. Furthermore, though the implementation of a quality system can contribute to the improvement of some firms' performance, this does not necessarily guarantee that it will happen in every company. On this account, it does not seem to be pointless to think that the publication of news related to a firm's quality system, may well be interpreted by the stock market as an investment in quality on the part of the company, which could affect the investors' expectations and, therefore, the price of rate of the shares. If the stock market reacts efficiently and the investors behave rationally, the share prices should reflect all the information affecting the results of the company (Aaker and Jacobson, 1994) and particularly information related to the quality of its products or services.

3. Asymmetry in information and quality certification

Asymmetry in information is understood as the contrast among the different bits of knowledge that consumers and companies have about the products that are offered on the market. When such asymmetry in information concerns the quality of the products offered, the correct evaluation by the consumer becomes extremely difficult. According to Akerlof (1970), this situation can facilitate the coexistence of higher and lower quality goods and services on the market, which the consumers cannot accurately discern. On the other hand, if we accept the hypothesis that consumers will try to reduce

the cost of gathering such information, and that this cost affects their future purchasing intentions (Hoque and Lohse, 1999), companies could exploit this fact by developing a competitive strategy that allows them to reduce the asymmetry in information. Holmstrom (1985) highlights the possibility of establishing guarantees or contracts of responsibility to cover unforeseen drawbacks. This is one of the more commonly used strategies in the realm of management, since it is difficult to find products, especially of durable use, on which the maker does not include the guarantee that he will be responsible for any possible faults that may arise during a given period of time. However, the legal obligation that underlies many of these guarantees means that they cannot be considered by the consumer as a sign of quality. Another way of reducing such asymmetry in information is by investing in training, equipment, and advertising (Nelson, 1970, 1974). If the company's employees are well-trained and serve consumers correctly by taking a special interest in their needs, and if their equipment is modern and visually attractive, and if, furthermore, the company makes a concerted effort to inform its customers about the quality of its products, the market would be better able to discern between quality products and those that are inferior. This is particularly important for service companies. Bharadwaj and Menon (1994) point out that the image that the market has of a service company and its perception of the service it offers affect the company's performance even more than the very quality of the service it offers. Another possible strategy is that of pricing, since the higher the price of a product in relation to its competitors' prices, the higher its quality is considered to be (Klein and Leffler, 1981; Shapiro, 1983).

Finally, another possibility is to obtain certification for the quality systems that a company uses. Certification is the act of formally guaranteeing that the product or service a firm offers has been analyzed and certified to satisfy the minimum requirements stipulated in some form of guidelines on technical specifications or norms of service. At the same time, such norms would be established by the very companies, their customers, and the government, so that the regulations would be a voluntary agreement expressed in a theoretical document in which the characteristics that a product, service, or system should have in order to guarantee its safety, its aptness for use, or its compatibility with other products, services, or systems would be clearly defined. This is why quality certification could represent a useful tool that allows companies to reduce the asymmetry in information, as the consumer will be able to trust such certificates and therefore reduce the cost of searching and choosing to discern among the companies that offer products of higher and lower quality.

In this sense, a quality certificate based on the ISO norms and issued by an independent organization would be an instrument of the type described previously. This, together with the empirical evidence that supports a relationship between quality and share prices, leads us to state that if stock markets are efficient they should reflect the effect that quality certification has on a company. The existing literature on the topic, however, does not offer any conclusive results. On one hand, Hendricks and Singhal (1996) analyze how obtaining a quality award causes an increase in the market value of a company, especially in the case of small firms and particularly when the prize is awarded by an independent organization. This is supported by Soteriou and Zenios (2000), who analyze the effect that a quality award has on the share price of finance companies and conclude that the market reacts positively to such awards. Terziovski et al. (1997), however, find no significant relationship between product quality certification and the firm's performance, though they do find such a relationship for quality systems (TQM), which might be explained by the fact that certification of

quality systems improves but does not ensure the quality of the products. On the other hand, Easton and Jarrell (1998) find that the impact that implementing a quality system has on a firm's results is not affected by whether the company is granted a prize for quality or not.

Considering all of the above-mentioned facts, the objective of this study is to analyze the effects that the granting of a quality certificate has on the market value of the company concerned. Assuming that the award allows the company to reduce the asymmetry in the information available in the market, consumers will then be able to trust such certification and differentiate between companies that offer products of higher or lower quality, which should be reflected positively by the market. If the market reacts positively to the award, such certificates will be a good tool for reducing the asymmetry in information, and there should be a positive relationship between quality and a firm's results.

4. Empirical application.

4.1. Methodology.

In order to analyse the relationship between quality and performance, the event-study methodology is employed. This will allow us to observe the impact of granting a quality certificate on a firm's value by using stock exchange data. That is, given that share prices are deemed to reflect the present value of future cash flows, and assuming investors to follow a rational behaviour, it is expected that share prices must subsume all new information affecting the company.

So, the crux of the matter is to be able to isolate the results derived from such a new information from those considered to be "normal". Hence, the core aspect turns out to be the comparison of real returns observed on the "announcement day", which is supposed to incorporate the effect of the quality certificate, to those which are expected on a "normal day".

To undertake this comparison we rely on the market model, which permit the calculation of the returns for any day. Using it this way, we can estimate the normal returns being expected when there exist no outside influences by means of the expression:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

where R_{it} is the rate of returns on the share price of firm i on day t , and R_{mt} is the rate of returns on a market portfolio of stocks on day t . The parameters α_i and β_i are the constant and the systematic risk of stock i , respectively, and ε_{it} is the error term.

So, this model is calculated over an estimation period, in such a way that the parameters will be used to gauge the expected returns on the event day, or in a wider interval, over an event window around the day of the announcement.

The estimation of the abnormal returns in the event window is, thus, computed as:

$$AR_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{mt})$$

where $\hat{\alpha}_i$ and $\hat{\beta}_i$ are the ordinary least squares estimates, obtained from the regression of R_{it} on R_{mt} over such an estimation period.

Most importantly, however, it is to see whether these abnormal returns are significantly distinct from zero for each day within the event window. Among all the existing tests, we appeal to the parametric test proposed by Jaffe ()

$$t_1 = \frac{\sum_{i=1}^N AR_i}{\sqrt{\sum_{i=1}^N \sigma_{\varepsilon_i}^2 + \sum_{i=1}^N \sum_{\substack{j=1 \\ i \neq j}}^N \sigma_{\varepsilon_i \varepsilon_j}}}$$

where N is the number of news items issued, AR_{i0} is the abnormal return on day 0 or the event day, and $\sigma_{\varepsilon_i}^2$ and $\sigma_{\varepsilon_i \varepsilon_j}$ represent, respectively, the variance and covariance of asset i and j estimated from the estimation period.

The selection of this test is aptly justified by the potential presence of contemporaneous correlation problems potentially appearing in the chosen sample, which are derived, on the one hand from existing overlapped windows in some of the news items for different assets, and on the other, from the fact that several of the firms being analysed belong to the same industry. These problems can result in biased inference as has been so shown by Collins and Dent (1984) and Bernard (1987).

Additionally, we also rely on the the non parametric test due to Corrado (1989).

$$t_2 = \frac{\frac{1}{N} \sum_{i=1}^N \left[K_{i0} - \frac{1}{2}(T+1) \right]}{\sqrt{\frac{1}{T} \sum_{t=1}^T \left[\frac{1}{N} \sum_{i=1}^N \left[K_{it} - \frac{1}{2}(T+1) \right] \right]^2}}$$

where K_{it} is the rank of the abnormal returns in the time series estimated for the security i , and T is the total number of days being observed.

4.2. Sample

To carry out the empirical application, a sample of news releases on quality certificates granted to Spanish firms trading in the Madrid Stock Exchange was collected. Particularly, as the most extended norms are the International Quality Standards (ISO) 9000 we only used quality certifications based on these norms. Specifically, we considered any company that traded in the stock exchange at (and for) any time during the period from 1993 to 1999.

We have only considered certificates based on the norms of the International Quality Standards as they are certainly the most universally accepted of all the existing norms. The sampling consisted of a three-stage process:

1. During the first stage, all of the companies that were trading on the Spanish Stock Exchange at some time during the period from 1993 to 1999 were

identified. This information was obtained from the Servicio de Información Bursátil (SIB). This involved the analysis of 187 companies.

2. The objective of the second stage was to identify the quality awards that were granted to any of the companies previously identified.
3. Stage three involved the identification of the precise day on which the prize was awarded. To do so, we used the database Baratz, which contains information on news published in all the most important Spanish newspapers.

In the search, 40 quality certificates were detected. Some of them, however, had to be excluded from the analysis because, at the time of their publication, the companies concerned were not trading on the market. Once the exact day of publication was determined, the dates included in the window around the event day were also examined to ensure that there were no other news items published about the companies concerned that could have affected its returns during that period. To be more precise, any news items within whose windows a public offer of stock acquisition, a take-over, or any large purchases of shares were announced were eliminated to avoid any outside interference in the analysis (the so-called confounding effects). After applying such filters, 27 sound news items were selected. It is important to stress that, in accordance with the procedure we followed for the collection of the data, we certainly identified all of the news releases for the period under consideration.

Table 1 details the relevant characteristics of the firms included in the sample, showing the first two digits of the SIC code of the industry to which they belong and the year in which the quality award was granted.

To carry out the event study, an estimation period of 147 days was considered. The impact of the news item was analyzed within a window of (-3, +3) days around the event date.

Table 1. Sample Characteristics

Industry	Number of awards	1993	1994	1995	1996	1997	1998	1999
Bulding	1			1				
Electr	3			2	1			
Banking	12		1		1	6	3	1
Mach	3	1		1	1			
Comm	3				2		1	
Motor	1				1			
Food	2			2				
Services	2				1		1	

4.3. Results

By means of the analysis proposed, it was observed that within the window considered, the highest returns appeared on the event day, with a level of significance of 10%. Both the parametric and non-parametric tests provide the same results, so that the potential effect of a non-normal distribution is not manifested in the average abnormal returns.

Furthermore, the event day is the only day within the windows considered on which the percentage of positive abnormal returns is significantly higher than the 45.09% of

positive residuals found during the estimation period. This latter analysis was carried out with the binomial test, which gives a level of significance of 5% (Table 2).

Also, following the recommendations proposed by McWilliams and Siegel (1997), we attempted to isolate the possible impact of any existing outliers. As a result, we detected two of them, though, on repeating the entire analysis, we arrived at the same conclusions.

Table 2. Abnormal Returns Derived from Quality Certifications

Event day	Average Abnormal Returns	Jaffe's test t_1	Corrado's test t_2	% of Positive Abnormal Returns
-3	-0.0007	-0.2223	-0.3666	33.3
-2	0.0041	1.2972	1.5076	55.5
-1	-0.0013	-0.4025	0.5271	55.5
0	0.0054	1.7022*	1.8633*	62.9**
+1	0.0023	0.7295	0.3970	55.5
+2	-0.0001	-0.0159	0.4534	55.5
+3	-0.0005	-0.1614	0.2668	51.8

*= $p < 0.10$; **= $p < 0.05$

5. Conclusions.

This study has attempted to analyse, empirically, the effect that the granting of a quality certificate has on the market value of the company concerned. The abnormal returns seen in the share prices of the firms involved, on the announcement dates of such awards, have been analysed. To do so, all companies that were granted such awards while trading on the Spanish stock market from 1993 to 1999 were examined.

The results obtained indicate that the market reacts positively to the awarding of such certificates. These results support the theory that certification of the quality systems employed by the companies reduces the asymmetry that exists in the information available to firms and consumers. Such certification could be useful to consumers as a sign of the good quality of the products offered by the companies, and the capital market is certainly aware of this.

These results have important implications for corporate management. If the main objective of the managers is to increase the market value of the firm, their efforts should be aimed towards the certification of their quality systems. When a company has a certified quality system, its customers are able to evaluate the quality of its products before buying them, which, undoubtedly, gives the firm a certain competitive advantage, since it diminishes the asymmetry that exists between the information held by the company and its consumers. Not only do companies have to offer quality, but they must also demonstrate that they do, and the certification of their quality systems and the subsequent publication of such certification can be an excellent way of achieving this goal.

Finally, we should point out that, though the analysis carried out has demonstrated that the market responds positively to the awarding of quality certificates, such certification is merely one step in the strategy that companies could implement to improve the quality of the products and services that they offer on the market. Considering that the ISO 9000 is merely a partial vision of the total quality offered by manufacturers and service companies, further empirical evidence on the influence of other quality awards

on the share prices of the firms involved, and analyses in other markets is strongly recommended so that the results obtained here may be further validated.

In fact, Hendricks and Singhal (1996) suggest that the market may well be aware of the existence of a plan for the improvement of quality and might have already carried out an evaluation of the profitability that such an investment affords. However, the obtaining of a quality certification leads to a new evaluation. As such, future research should be aimed at a long-term analysis, to measure the impact of quality on the firms' results. Additionally, other measures of performance could be used, in addition to the one applied here (i.e., ROI), and a comparison between the results obtained by companies that have certified systems of quality and those that do not have any form of quality systems, or have not had them certified. Finally, it would also be interesting to discover if such quality certificates not only have an impact on the company's returns but on the volatility of its share prices.

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