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NEW RESEARCH

Strategic orientation and financial performance of firms implementing ISO 9000

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Abstract *The ISO 9000 scheme has been reproved for being a paper driven process with little if no impact on firm performance. As international scientific literature indicates a wide range of factors leading to the adoption of the ISO 9000 schemes, the impact of this adoption should be viewed and examined in a framework of the firms' strategic orientation. A sample of Greek businesses that adopted the ISO 9000 scheme in the early 1990s is classified into three categories of strategic orientation, namely cost leadership, market differentiation and focus strategy. If all the firms are pooled together, there is no significant difference in their financial performance indicators after a period of six years following the adoption of ISO 9000. However, if the firms are examined separately and according to their strategic orientation, those firms pursuing a cost leadership strategy present statistically significant growth of financial profitability indicators, while those firms pursuing a market differentiation strategy present statistically significant growth of their turnover and market share. Thus, strategic orientation is a moderating factor influencing the relationship between registration to a quality scheme such as the ISO 9000 scheme, and the firm's financial performance.*

Introduction

The ISO 9000 series or, more formally, "quality management and quality assurance standards" outlines the requirements to be met by a producer illustrating his competence to design, produce and deliver products or services with a consistent and coherent level of quality. Since the establishment of the ISO 9000 series, many other quality assurance standards have been set forth at a national or international level, such as the QS 9000, SSM, EFQM, the criteria of the Baldridge Award in the USA and the Deming Prize in Japan. However, the most widely known follower of the ISO 9000 series is the QS 9000 series of the Automotive Industry Action Group in the USA. This set of standards encapsulated almost the whole range of the ISO 9000 series requirements plus

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standards concerning timely delivery, higher productivity, lower unit costs, and continuous improvement programmes. In 2000, a wide range of modifications were introduced to the ISO 9000 series producing the ISO 9000:2000 series orientated towards the achievement of higher levels of customer satisfaction.

A wide range of disciplines in management, business and economics have attempted to provide plausible explanations concerning the underlying reasons driving an enterprise to adopt the ISO 9000 series or, more generally, quality assurance schemes and quality management. Jones *et al.* (1997) categorize the reasons behind the decision to adopt an ISO 9000 registration as developmental, non-developmental and mixed. Developmental reasons refer to the desire to improve the company's internal processes and enhance the overall competitive performance of the company (Yahya and Goh, 2001). Non-developmental refer to the requirement of major customers and the firm's desire to avoid being locked out of future tendering processes or markets. Mixed reasons refer to a combination of developmental and non-developmental reasons. Despite the principle expressed by the early contributors of quality management that this is not externally mandated or controlled (Deming, 1986; Juran, 1982; Ishikawa, 1986), the first reason for the adoption of the ISO 9000 certification nowadays may lie searched in a reactive approach to doing business, lacking any strategic consideration and planning, usually on request by customers, although the firms may gain little benefit from it (Leung *et al.*, 1999). Evidence from Hong Kong shows that this is especially true for small and medium enterprises in the service and construction sectors (Lee, 1998). Marketing provides the second major explanation for the adoption of ISO 9000 quality schemes and Juran (1995) has posited that the major reason for seeking certification is maintenance or expansion of markets. Evidence shows that anticipated marketing advantage and specifically increasing market share and access to new markets, have been critical factors that encourage the pursuit of the ISO 9000 certificate (Buttle, 1997; Capmany *et al.*, 2000). The ability to sustain a market share is ranked fourth among the top ten anticipated benefits of ISO certification and the ability to increase it is ranked sixth (Skrabec *et al.*, 1997). Strong warnings that ISO 9000 registration can result in non-value added costs if it is adopted solely on the basis of its marketing appeal, have shown that ISO 9000 registration can be leveraged into a competitive advantage when it is made consistent with a firm's strategic direction (Curkovic and Pagell, 1999).

The willingness to pursue ISO 9000 registration may be related to expectations about its contribution to improved quality and especially to those factors perceived by the firm's management as important to competitive success and competitive advantage (Escanciano *et al.*, 2001; Withers and Ebrahimpour, 2000). Furthermore, the operation of an ISO 9000 scheme may contribute towards reduction of development times for new products, reduction

of start-up problems and reduction of costs in general. Recent work has provided evidence that the benefits attained by companies adopting ISO certification are linked to an improvement in internal efficiency (Gotzamani and Tsiotras, 2002; Santos and Escanciano, 2002). Thus, despite criticisms of the ISO 9000 being a paper driven process, the formalization unravels the costs and implications of scrap, rework or jammed machinery, calls to attention the need and opportunity for improvement projects and proves that "quality is the most profitable way to run a business" (Reincheld and Sasser, 1990). Finally, it is argued that ISO 9000 has the potential to reduce transaction costs by serving as the seller's guarantee of quality. In particular, transaction costs involved in an exchange between a customer and a supplier may include supplier identification, contract negotiation and contract verification and enforcement. It is argued that some or all of these types of transaction costs may be potentially reduced, thereby increasing firm and/or sector competitiveness (Holleran *et al.*, 1999).

Despite the aforementioned reasons supporting the argument in favour of ISO 9000 adoption, evidence that quality management influences firm performance is contradictory. Empirical evidence shows that firm performance is positively affected after the introduction of ISO 9000 standards, while a growing number of researchers argue that adoption of an ISO 9000 scheme does not really affect firm performance. Recent research work undertaken by the Spanish academic fraternity on ISO 9000 shows that there is no evidence of improved performance after registration (Heras *et al.*, 2002a, b). A sample of 400 certified industries shows superior financial performance in comparison to a control sample of 400 non-certified firms, a result attributed to the fact that firms with superior performance have a greater propensity to pursue ISO 9000 registration. In another study, Heras *et al.* (2002b) show that the returns on assets employed are consistently better in certified than non-certified firms. Forker *et al.* (1996) examined a sample of strategic business units and individual firms in the furniture industry and found that high quality leads to improved business performance. Furthermore, Brah *et al.* (2002) provide support to the proposition that TQM implementation correlates with quality performance. However, in a world survey with data collected from 977 business firms located in the major industrialized regions of the world, Adam *et al.* (1997) found that although the quality improvement approach successfully influenced quality, the impact on financial performance was somewhat weak. In a recent study of Greek firms, Tsekouras *et al.* (2002) has found significant differences in a range of financial performance variables between firms that implemented ISO 9000 standards and a control group of firms that did not implement ISO 9000. Häversjő (2000) obtained the same results in a study of the financial consequences of ISO 9000 registration among Danish companies. Furthermore, a growing number of researchers argue that the ISO 9000 series, being a paper-driven process of limited value, does not really have an impact on firm

performance and the ISO 9000 certification is just another marketing cue (Curkovic and Pagell, 1999; Uzumeri, 1997; Terziovski *et al.*, 1997; Curkovic and Handfield, 1996). Certain studies also provide empirical support to such a view (Lima *et al.*, 2000; Stashevsky and Elizur, 2000; Adams, 1999; Terziovski *et al.*, 1997).

The conflicting results obtained in the international literature has lead certain researchers to hypothesize that the reason underlying the adoption of ISO 9000 and more specifically the firm's strategic orientation is the moderating variable influencing the relationship between quality certification and business performance (Jones *et al.*, 1997; Heras *et al.*, 2002a; Terziovski *et al.*, 1997). In this paper, we argue that the effects of adopting an ISO 9000 registration, and especially its effects on financial performance, should be viewed and judged within a framework identifying the firm's strategic orientation. Case studies, which identify no effects on firm performance in spite of the adoption of an ISO 9000 registration usually, pool together firms with widely varying strategies. For example, in a firm pursuing a cost leadership strategy, an ISO 9000 registration may assist cost reduction and this should be reflected in the relevant financial indicators. But why should the same financial indicators be affected in a firm adopting ISO 9000 with a view to increase its market share? In this paper, we try to identify the effects of adopting ISO 9000 on a wide range of financial performance by using a sample of firms classified into three categories of strategic orientation. It is shown that, the adoption of ISO 9000 may be reflected in various financial performance indicators according to the firm's strategic orientation while, when firms are pooled together, there is no evidence that ISO 9000 has any significant effect on the same financial performance indicators.

Strategic orientation and firm performance

As shown above, there is little agreement among researchers on the main goals served when firms adopt ISO 9000 or on the effects of ISO 9000 registration on the firms' financial performance. Especially when firms in many sectors are considered, the adoption of 9000 may affect not strictly their economic but also their organizational or operational performance. Moreover, the time span of business strategies may be so long as to be hardly revealed by short term financial or other measures of performance and growth. Business strategies may vary from extremely innovative or marketing aggressive tactics to simple survival plans especially in depressed areas. Porter (1980, 1985) argues that well conducted strategic orientations enable a firm to earn above-average returns, perform better than its competitors and survive in highly competitive markets. Porter (1980, 1985) distinguishes three generic types of strategic orientations. First, a cost leadership strategy, which allows firms to compete through reduced costs of production, preserve higher margins than their competitors, gain market share due to lower priced products and improve their

cost structure; second, a differentiation strategy, which allows firms to develop a competitive advantage by gaining customer royalty due to innovative products, innovative delivery methods and after sales support, or by offering a valued unique image via marketing; third, a focus strategy, which is either a cost leadership or a differentiation strategy but is applied to a narrowly defined set of customers thus, targeting the market. Miller (1986, 1988) has suggested that the differentiation strategy should disentangle strategies of innovative differentiation from marketing differentiation, an argument that has been re-confirmed by later research (Robinson and Pearce, 1988, Conant *et al.*, 1990, Miller *et al.*, 1989, Durand and Coeurderoy, 2001).

In this work, we adopt Porter's generic typology of strategic orientation with three categories. First, a cost leadership strategy, when firms invest in order to reduce production or delivery costs. Adopting ISO 9000 within such a business strategic orientation contributes to reduced production and delivery costs (Heras *et al.*, 2002a). It is widely documented in the economics and finance literature that cost leadership is reflected in the financial performance of firms (Borenstein, 1992; Borger, 1995; Demsetz, 1982; Economides, 1993).

Second, an innovative differentiation strategy, when firms develop new products, adopt or adapt existing products, adopt products new to the region or introduce and adapt new technologies of production and distribution (Mole and Worrall, 2001). In the framework of this strategy, adopting ISO 9000 may be itself an innovative activity for a product that was until that time produced without quality assurance certification. In the framework of this strategy we also consider a marketing differentiation strategy when firms aim to differentiate existing products, introduce quality improvements or assign valued unique image via marketing. Adopting ISO 9000 or establishing branding schemes for products accompanied by an ISO 9000 certification specifically serves the aims of this strategy.

The relationship between increased market share and the financial performance of the firm is not clear in the international literature. Two main arguments have been expressed and tested with contradictory results. First, that the relationship between market share and profitability is spurious (Jacobson and Aaker, 1985; Jacobson, 1988). Second, that there is a direct and important market share-profitability relationship which, although contingent on the sector's environment, is subject to significant spurious effects (Phillips *et al.*, 1983; Prescott *et al.*, 1986; Venkatraman and Prescott, 1990). More recent research results provide support for a strong positive relationship between market orientation and growth in overall revenue, return on capital, success of new products and services, ability to retain customers, and success in controlling operating expenses (Subramanian and Gopalakrishna, 2001). Furthermore, market orientation has been found to be positively related to three dimensions of export performance, namely, change in export sales, export profits and change in export profits (Rose and Shoham, 2002). More recently,

Laverty (2001) has provided the clearest test to date showing that there is no direct association between market share and profitability. Thus, one would expect that firms following a marketing differentiation strategy would increase their market share if they were successful but the effects of following such a strategy on firm profitability may not be a priori hypothesized.

The third category according to Porter's generic typology of strategic orientation, that we adopt in this work, is a focus strategy when business tactics aim to access new market segments that are narrowly defined at a geographic level or target customers of specific characteristics. In this framework, certain firms in the tourism or the food and drinks sector adopted ISO 9000 and undertook investments that allowed them to access, for example, the market of people with special needs, or markets located far away from their local market area. The effects of this third strategy on firm performance may be reflected either on strict financial performance indicators if the strategy inclines more to a cost reduction strategy or on market share indicators if the strategy inclines more to the market differentiation strategy.

The definition of successful business performance is a controversial issue in management, business economics, and quality management, largely due to the multidimensional meanings and goals that have been assigned to entrepreneurship (Murphy *et al.*, 1996). Strategic management research integrates research on organizational performance measurement in terms of multiple hierarchical constructs (Venkatraman and Ramanujam, 1986). Financial performance is at the core of the organizational effectiveness domain (Chakravarthy, 1986) while operational performance measures, such as product quality and market share, define a broader conceptualization of organizational performance by focusing on factors that ultimately lead to financial performance (Hofer and Sandberg, 1987; Kaplan, 1983). Within a framework of total quality management, Singels *et al.* (2001) operationalize performance through five indicators including production process, company result, customer satisfaction, personnel motivation and investment on means. Sun (2000) defines performance on criteria that are grouped in three categories, namely product quality and customer satisfaction, productivity and profitability and market position and competitiveness. Venkatraman and Ramanujam (1986) argue that the financial aspects of performance should be considered first so as to improve it by examining its multiple dimensions, an issue that has been highly stressed by several authors (Kaplan, 1983; Gupta, 1987, Steers, 1975; Randolph *et al.*, 1991).

In this work we approach the concept of a firm's financial performance in order to identify financial indices concerning profitability, firm growth, and the firm's capital structure. The most common indices of profitability include the Return on Investment (ROI), the Return on Equity (ROCE) and the evolution of profit margins, all being accounting measures widely regarded as the "bottom line" tests of business performance. In that sense, it is expected that firms

adopting an ISO 9000 registration and pursuing a cost leadership strategy should present evidence of improving financial indices associated with profitability over time. The same indices may also present an improvement over time for those firms pursuing a focus strategy.

Performance, in the sense of firm growth is usually defined in terms of the growth of sales or the growth of equity. Glancey (1998) argues that a higher growth rate may lead to higher profitability through efficiency enhancing learning, an issue highly linked to the adoption of quality assurance schemes (Hill and Hazlett, 2001). Moreover, Havnes and Senneseth (2001) argue that the value of total sales, and thus the growth of total sales, is a good proxy of a firm's utilized capacity and of the limits to capacity utilization. At the same time, the growth of total sales may be regarded as a good proxy of a firm's market expansion. Accordingly, firms adopting an ISO 9000 registration within the framework of a market differentiation strategy should present evidence of improving the financial indices of firm growth over time. The same indices may also present an improvement over time for those firms pursuing a focus strategy.

Finally, capital structure ratios provide insight to the extent to which non-equity capital is used to finance the assets of the firm and may be used as another facet of firm performance. In general, there is no obvious good or bad interpretation for capital structure. The more fixed interest capital the firm has, the higher the risk of its capital is, both equity and debt. However, the return on capital is also expected to be higher. Given these trade-offs, it is not usually possible to say whether a firm's capital structure is good or bad. However, as its was stated above, if the gearing of the firm becomes unusually high, the risk of financial failure increases and the cost of failure will affect the value of the firm. Thus, excessive gearing should be avoided.

Hypotheses, data and methods

Hypotheses

It is evident from the aforementioned discussion that a firm's motivation in adopting ISO 9000 is multifaceted and the implementation of ISO 9000 may have multidimensional effects on firm performance. Moreover, we may argue that the main reasons for the decision to adopt ISO 9000 must be part of the firm's overall business strategy and thus, all adoption-drivers are encapsulated in a firm's dominant strategic orientation. In other words, even if we are not able to state the exact reasons leading a firm to acquire an ISO 9000 registration, we may deduce that these reasons are part of the firm's business strategy and should serve the firm's strategic orientation goals. On the other hand, a firm's strategic orientation points out those dimensions of financial performance targeted by each firm. In this framework, a firm's strategic orientation acts as a filtering mechanism connecting and relating the causes and effects of ISO 9000 registration. Thus, our central hypothesis is as follows:

Strategic orientation filters the causes leading to the adoption of ISO 9000 and points to the expected financial effects of ISO 9000 registration. Thus, we expect that the financial effects of ISO 9000 will vary according to the business strategy followed by firms that have adopted it.

In that sense we hypothesize that:

H1. Firms pursuing a cost leadership strategy will adopt ISO 9000 due to latent (unobserved) cost reduction reasons and the effect of adoption will be reflected on financial performance indicators marking increased profitability. Whether such increased profitability is also reflected on other financial indicators of performance is inconclusive.

H2. Firms pursuing a market differentiation strategy will adopt ISO 9000 due to latent (unobserved) marketing reasons and the effect of adoption will be reflected on financial performance indicators marking increased growth of sales. Whether such increase of the firm's market is also reflected on other financial indicators of performance such as profitability is inconclusive.

H3. Firms pursuing a focus strategy will adopt ISO 9000 due to latent (unobserved) focused marketing reasons and the effects of adoption will be reflected on financial performance indicators marking increased growth of sales. If the focus strategy has a strong element of cost leadership, the firm may also show improvement in profitability or other indices of financial performance.

Data

The implementation of ISO 9000 certification process has rapidly increased in Greece since the early 1990s (Lipovatz *et al.*, 1999; Tsiotras and Gotzamani, 1996). Three certification organizations offer ISO 9000 registration in Greece. From the records of these organizations we obtained the names of all companies that adopted ISO 9000 or carried out the initial registration for the scheme in the period from 1989 to 1993. This is the period immediately after the introduction of the ISO 9000 series in Greece. It was deliberately selected to allow a reasonable time interval between the time of adoption and 1999, the year of the most recently reported financial statements, so that short run effects of ISO adoption on the firms' financial performance could be revealed. Those firms that adopted ISO 9000 from 1989 to 1993 were active in almost all manufacturing and service sectors of the Greek economy and of a variable size in terms of employment, assets and sales. Financial data on individual firm characteristics were derived from the business database maintained by the private financial and business information service company called ICAP, in Greece. The annual ICAP directories provide key elements from the published balance sheets of almost all Plc and Ltd firms operating in all sectors of economic activity in Greece.

In 2000, members of the Department of Mechanical Engineering of the University of Patras carried out a business survey, and a questionnaire was administered to all the managers of the companies that had been identified as ISO 9000 adopters in the period from 1989 to 1993. The questionnaire aimed at collecting information concerning the adoption of quality assurance schemes and more specifically information concerning the underlying motivation to adopt ISO 9000 and the perceived effects of ISO 9000 adoption on organizational and financial performance. In the same questionnaire, managers were asked to identify the firm's major strategic orientation in one of the three categories presented in the previous section as cost leadership, market differentiation and focus strategy. A series of follow-up questions were issued, intended to cross-validate and check whether the claimed strategic orientation was indeed followed by the firm. An English version of the specific part of the questionnaire is available by the authors on request.

Due to missing data from the financial account database (24 records) and questionnaire dropouts (18 records), our working database contains 94 firms that adopted ISO 9000 in the period from 1989 to 1993, a figure accounting for almost 70 per cent of all early adopters of the ISO 9000 quality assurance scheme in Greece (an initial list of 136 firms). A wide range of financial variables was recorded for all firms for the periods 1989-1993 and 1996-1999. The financial variables used in the present work include total sales, total assets, net fixed assets, equity, net profits, and the size of external funding. In order to avoid the well-recorded fluctuations of financial data due to business cycles, the mean of each financial variable for the period from 1989 to 1993 was constructed. The same was done for the financial variables for the period from 1996 to 1999. So the variables used are constructed from the average of the four-year financial data for each period.

Financial indices and methods

A total of six measures of firm performance were constructed of which three reflect firm profitability, two reflect firm growth and one the growth of its capital structure. The three profitability measures concern returns on capital (ROCE) and are defined as net profits to total assets, returns on invested capital (ROI) and defined as net profits to net fixed assets and finally returns to equity (PROF) defined as net profits to equity. The two firm growth measures were calculated as growth of sales (GSALES) and growth of equity (GEQUITY). The capital structure index (LIAB) was constructed as the ratio of external funds to equity. The growth of all the above mentioned financial performance indices in the 1989-1993 and the 1996-1999 periods (GROCE, GROI, GPROF, GLIAB, GSALES, GEQUITY), was estimated as the value of the variable at the end period minus the value at the start period divided by the value in the start period and showing how many times larger or smaller the end value is from the start value of the variable. Table I presents sample descriptive statistics for the

Variable name	Descriptive statistics: median (mean, standard deviation) Strategic orientation category Cost leadership	Market differentiation	Focus	All firms
ROCE 89-93	0.36 (0.53, 0.55)	0.80 (1.48, 1.69)	0.25 (0.39, 0.50)	0.45 (0.75, 1.08)
ROCE 96-99	0.40 (0.78, 1.53)	0.68 (1.70, 3.33)	0.11 (0.20, 0.56)	0.33 (0.85, 2.08)
GROCE	0.04 (1.27, 3.40)	−0.31 (−0.22, 3.18)	−0.59 (−0.09, 3.48)	−0.23 (0.42, 3.41)
ROI 89-93	0.21 (0.30, 0.30)	0.24 (0.67, 0.74)	0.17 (0.18, 0.25)	0.20 (0.36, 0.49)
ROI 96-99	0.20 (0.34, 0.39)	0.23 (0.53, 0.81)	0.11 (0.13, 0.42)	0.18 (0.32, 0.56)
GROI	−0.18 (0.69, 2.79)	−0.23 (0.55, 3.90)	−0.45 (−0.07, 3.62)	−0.23 (0.41, 3.37)
PROF 89-93	0.14 (0.21, 0.36)	0.33 (0.39, 0.34)	0.16 (0.19, 0.18)	0.21 (0.25, 0.32)
PROF 96-99	0.18 (0.32, 0.58)	0.20 (0.53, 1.99)	0.08 (0.12, 0.30)	0.16 (0.31, 1.12)
GPROF	0.02 (0.77, 2.49)	−0.55 (−0.71, 9.96)	−0.41 (−0.37, 3.03)	−0.25 (−0.01, 5.69)
LIAB 89-93	3.58 (5.29, 4.13)	4.46 (6.40, 7.10)	2.73 (3.04, 2.48)	3.43 (4.88, 4.91)
LIAB 96-99	2.88 (3.94, 3.48)	3.24 (6.27, 11.34)	2.20 (3.07, 2.76)	2.84 (4.31, 6.59)
GLIAB	−0.30 (−0.22, 0.53)	−0.11 (0.74, 2.70)	−0.03 (0.36, 1.37)	−0.18 (0.23, 1.68)
SALES 89-93	7,373 (54,387, 139,891)	3,746 (36,769, 744,93)	7,380 (132,962, 352,366)	7,373 (74,591, 222,846)
SALES 96-99	10,932 (61,980, 141,320)	15,403 (75,174, 139,586)	10,932 (190,032, 546,864)	11,928 (106,497, 331,321)
GSALES	0.07 (0.38, 0.92)	1.12 (12.75, 44.08)	0.06 (0.47, 1.28)	0.22 (3.83, 23.54)
EQUITY 89-93	3,499 (8,671, 13,021)	1,285 (14,463, 28,167)	3,499 (67,358, 305,848)	2,306 (29,003, 173,645)
EQUITY 96-99	4,642 (13,866, 22,650)	8,000 (48,621, 130,194)	4,642 (108,574, 515,520)	4,935 (53,705, 298,763)
GEQUITY	0.47 (0.82, 1.08)	3.84 (7.11, 12.04)	0.15 (0.16, 0.79)	0.61 (2.35, 6.96)
Sample size	38	26	30	94

Table I.
Median, mean and standard deviation of key financial indicators

indices for profitability (ROCE, ROI, PROF), capital structure (LIAB) and sales (SALES) for the periods 1989-1993 and 1996-1999, as well as for all respective growth rates (GROCE, GROI, GPROF, GLIAB, GSALES and GEQUITY).

As is often the case with financial data, certain extreme values in the sample distort its descriptive statistics and sometimes, the mean values lead to totally misleading conclusions. The case of ROCE and ROCE's growth (GROCE) for all firms is illuminating (see Table I). In the periods 1989-1993 and 1996-1999, the median ROCE decreased while the mean ROCE increased due to the influence of an extreme positive value in the sample. As a result, the median growth of ROCE (GROCE) shows a negative sign while the corresponding mean growth of ROCE shows a positive sign. In another example we see that although the mean ROCE for the market differentiation group in the period 1989-1993 is lower than the mean ROCE in the period 1996-1999, the mean growth of ROCE (GROCE) has a negative sign instead of the expected positive, due to the influence of two extremely negative growth values (GROCE) in the sample. To avoid this, we base our presentation of descriptive statistics and the data analysis that follows, on median values, which consistently capture the real situation better than the corresponding mean values.

Results

A close inspection of Table I reveals that financial indices differ significantly among firms in the various strategic orientation groups. Firms in the cost leadership group have lower mean and median ROCE than firms in the market differentiation group. However, the mean and median growth of the ROCE index (GROCE) are significantly higher for firms in the cost leadership group than for firms in the other two strategic orientation groups. We get the same picture for the other two indices of profitability. The median growth of ROI and of profit margins (PROF) is negative for all firms, but the lowest values, i.e. lowest losses, are observed for firms in the cost leadership category. The mean ROI and PROF indices are positive and higher for firms in the cost leadership group than for firms in the other two groups. When we consider the growth of sales and equity capital indices (GSALES, GEQUITY), firms in the market differentiation group present extremely higher values than firms in any other group. Thus, a simple analysis of the descriptive statistics presented in Table I reveals that indeed, firms classified in the cost leadership group present good growth rates in all profitability indices, while firms in the market differentiation group present very good growth of their sales, indicating market expansion, and of equity capital. Firms in the focus group seem to attain lower levels of financial performance than firms in the other two groups.

A conventional approach, ignoring the differences in the strategic orientation of firms, would compare the financial performance indices of all firms pooled together in the two time periods. A comparison of the means or medians would thus reveal whether there was any change in the

profitability (ROCE, ROI, PROF), growth (SALES, EQUITY) or leverage (LIAB) of firms that adopted ISO 9000 in the period under consideration. Table II shows the results of such an analysis. The non-parametric Mann-Whitney test is used to examine the difference in the means, while the non-parametric two-sample median test is used to examine the difference in the medians of the financial performance indices for all firms pooled together.

It is shown in Table II that the mean and median of ROCE, ROI, LIAB and SALES and the median for PROF for all firms pooled together do not statistically differ between the two time periods. The only difference is found in the means of the PROF and EQUITY indices and the median of the EQUITY index. Thus, a conventional approach of examination of the differences in financial performance for firms that adopted ISO 9000 would conclude that there are no dramatic differences in the financial performance of firms in the two time periods. As a result, one could argue that the adoption of ISO 9000 did not assist firms in attaining higher levels of financial performance.

In this work, we argue that an examination of the financial performance of firms adopting ISO 9000 should take into account the strategic orientation of the firms under consideration, and should not pool the firms together in an aggregate analysis that masks out differences of financial performance. In that respect, one should attempt to formally examine whether the observed differences of financial performance among firms in the three strategic orientation groups shown in Table I, are statistically significant or not. The first column of Table III presents the results of a Kruskal-Wallis test, the non-parametric analogous of a three way t-test, testing the significance of the joint difference in the means of the financial indices for the three groups of strategic orientation. The second column of Table III presents the results of a three sample median test, testing the significance of the joint difference in the medians of the financial indices for the three groups of strategic orientation.

The difference between the growth of ROCE (GROCE), and the growth of profit margins (GPROF) is statistically significant for the three groups of firms. The same happens for the growth of leverage (GLIAB), the growth of sales (GSALES) and the growth of equity capital (GEQUITY). Thus, it is evident that

Variables	Mann-Whitney test (z value)	Two sample median test (chi-square)
ROCE 89-93 vs ROCE 96-99	0.73	0.19
ROI 89-93 vs ROI 96-99	0.81	0.19
PROF 89-93 vs PROF 96-99	1.73*	1.72
LIAB 89-93 vs LIAB 96-99	1.36	2.57
SALES 89-93 vs SALES 96-99	1.60	2.57
EQUITY 89-93 vs EQUITY 96-99	2.37**	3.60*

Note: * significant at the 5 per cent level; ** significant at the 10 per cent level

Table II.
A conventional view to financial performance

Variable name	Kruskal-Wallis test (chi-square)	Three sample median test (chi-square)
ROCE 89-93	8.99**	3.77
ROCE 96-99	19.17**	13.33**
GROCE	8.54**	4.92*
ROI 89-93	6.51**	3.62
ROI 96-99	13.36**	7.68**
GROI	2.42	2.15
PROF 89-93	10.13**	10.70**
PROF 96-99	13.81**	13.33**
GPROF	7.85**	6.37**
LIAB 89-93	6.24**	1.78
LIAB 96-99	2.00	2.85
GLIAB	5.29*	1.64
SALES 89-93	1.18	1.15
SALES 96-99	1.64	0.29
GSALES	14.50**	14.17**
EQUITY 89-93	1.62	2.02
EQUITY 96-99	2.40	3.77
GEQUITY	34.89**	26.29**

Note: * significant at the 5 per cent level; ** significant at the 10 per cent level

Table III.
Financial performance and the recognition of corporate strategies

if firms are desegregated according to their strategic orientation, there are extreme and statistically significant differences in their financial performance. Those firms pursuing a cost leadership strategy attain higher levels of financial profitability while those firms pursuing a market differentiation strategy attain higher levels of sales and equity growth. Finally, firms pursuing a focus strategy show lower levels of financial performance, a result that may be attributed to the fact that focus strategies need a longer time span to show their results.

If the observed differences in the financial performance of firms in the three strategic orientation categories are attributed, among others, to the adoption of the ISO 9000 quality assurance scheme, one may argue that those firms pursuing a cost leadership strategy reflect this performance on their profitability indices, while firms pursuing a market differentiation strategy reflect this performance on a clear growth of sales. Thus, *H1* and *H2* as stated above are not rejected. *H3* cannot be accepted for those firms pursuing a focus strategy, as their financial performance indicators do not show any clear improvement in relation to the other two categories of strategic orientation.

As it was noted above, a large number of works cited in the international literature have attempted to examine the relationship between ISO 9000 adoption and the firms' financial performance. The results of these works are often contradicting ranging from revealing significant improvement in all financial indicators after the ISO 9000 adoption to showing no effect at all. This

diversity of results has directed researchers to hypothesize that the firms' strategic orientation is a moderating variable influencing the relationship between ISO 9000 registration and financial performance (Jones *et al.*, 1997). Depending on the reason why ISO 9000 was adopted, i.e. under which framework of strategic orientation the adoption of ISO 9000 fits, the expected benefits may vary. Consequently, the adoption of ISO 9000 may not equally affect all the dimensions of a firm's financial performance and it may improve those dimensions of performance the firm itself is interested to improve, depending on its strategic orientation.

All studies reviewed in this work have compared ISO 9000 adopters and non-adopters. In contrast, our study includes only firms that have adopted ISO 9000 and whose performance is moderated (controlled) according to their strategic orientation. Consequently, our results do not prove that ISO 9000 registration improves a firm's financial performance. Our results indicate that, among ISO 9000 adopters, financial performance varies according to the strategic orientation pursued by each firm. In that sense, our results are not directly comparable to results obtained by previous studies but expand previous results by proving that indeed, strategic orientation is a moderating variable that should be taken into account in research examining the financial impact of the ISO 9000 adoption.

Conclusions

ISO 9000 may be adopted in pursuit of a wide range of short or long term business objectives and is usually implemented in the wider framework of a firm's strategic orientation. Thus, the effects from the adoption of ISO 9000 will be more evident on the specific targets set by individual businesses and will not affect equally all dimensions of business performance. Failure to recognize the importance of strategic orientation when the effects of ISO 9000 on business performance are examined will result in serious bias. In this work we have classified businesses that adopted ISO 9000 into three categories of strategic orientation and examined the effects of the adoption on various dimensions of financial performance. It is shown that when firms are pooled together, financial performance before and after the adoption has no statistically significant differences. However, when the strategic orientation is taken into account, the effect of the ISO 9000 adoption on a firm's financial performance is evident. More specifically, firms pursuing a cost leadership strategy significantly improved certain financial indices of profitability, while firms pursuing a market differentiation strategy significantly improved financial indices of turnover growth and, consequently of market growth. Thus, it is clear that the ISO 9000 is not a paper driven process without real effects on financial performance.

The complex relationship between ISO 9000 and strategic orientations should be further addressed in future research. The effects of the adoption of

ISO 9000 on business performance will be better assessed through a deeper understanding of the firms' motivation and inducement into the adoption and the relation of this motivation bears on strategic management. In the present research we have established an individual relationship between strategic orientation, based on Porter's theoretical framework, and performance based on financial indices. In future research, other theoretical frameworks capturing strategic orientation should also be used (Venkatraman and Prescott, 1990), while approaches measuring firm performance other than financial performance should also be incorporated. Such methods should be extended to address issues of business performance beyond strict financial performance. Furthermore, a better understanding of the relation between the adoption of ISO 9000 and business strategies will benefit the forthcoming reforms of the ISO standards and will result in better guidelines for its implementation.

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