The quality journey for Greek SMEs and their financial performance

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ABSTRACT
This paper measures and examines the eagerness of Greek ISO certified SMEs to continue their journey towards quality, whilst facing economic crisis conditions. The level of quality implemented in the Greek ISO certified SMEs was determined by the main quality elements used to characterize TQM namely the quality culture, the quality tools and techniques, the quality processes and the performance appraisal. A set of ten structural interviews were conducted. From the scoring and frequency analysis conducted, it was found that the SMEs in Greece continued their journey towards quality and among those the small sized were those that showed the best performance, followed by the medium and the micro SMEs. Subsequently, the financial performance of those SMEs was tested using as criteria their profitability, efficiency, liquidity and solvency level. The conclusions derived, support the role of the quality level implemented in an SME as a means of sustaining its financial performance at a level capable of reducing the probability of bankruptcy, during severe financial crisis conditions.

1. Introduction

Quality Management is a philosophy. It is a mix of management ideas and a business management approach. Different quality gurus such as Shewhart, Deming, Juran, Ishikawa, Crosby, and Feigenbaum have contributed to that philosophy which aims at satisfying customers’ needs and accomplishing continuous improvement in all the functions of a company (Reid & Sanders, 2005).

The quality journey starts with the ISO certification, as this develops the ‘road map’ for TQM implementation (Dale, 1994). When the operational functions of an SME are certified under ISO standards, improvement in their organizational performance and their competitiveness is achieved. Considering those achievements, customers’ satisfaction and continuous improvement are further supported (Ismyrlis & Moschidis, 2015).

The elements of TQM are defined as the quality tools and techniques, the quality processes, the quality culture and the performance appraisal. These elements are more easily and...
effectively implemented in SMEs. This is because SMEs are more adaptable to changes, and provided that management is committed to quality, they are able to learn faster, than larger sized companies (Sousa & Aspinwall, 2010). But if those elements are implemented in an unmonitored way the positive results derived could be reversed. This comes in contrast to the complex quality models and procedures suitable for larger companies. The development of an individualized model that is supported from its quality practices is what should be implemented and used by an SME (Sousa, Aspinwall, & Sampaio, 2005).

In order to face the economic social and cultural crisis conditions, Greek SMEs have the options, of either trying to survive under the existing conditions or adaption to the new conditions which entails becoming more flexible. Developing new opportunities that are supported from the restructuring of their strategic plan should also be incorporated in the development of a quality plan (Vargo & Seville, 2011). A quality plan acting as a derivative of a company’s strategic plan, would improve the quality of its products and services and consequently its overall performance and competitive position in the market (Rakich, 2000).

2. Quality and TQM review

Quality is introduced to a company through a quality assurance program. This program involves the organization’s quality achievement that is appraised and approved from an independent quality assurance body (Quality Auditors). Experts advocate the importance of total quality management (TQM). This marked the beginning of a movement away from what ‘quality’ was initially viewed as and towards its conceptualization as a philosophy in the field of management.

Quality Management is considered as an eclectic mix of management ideas (Ehrenberg & Stupak, 1994). It is explained from a collective intellectual output of numerous contributors including Shewhart in 1939, Crosby in 1979, Deming in 1986, Ishikawa in 1985, Juran in 1989 and many others (Flynn, Schroeder, & Sakakibara, 1994).

Max Hand and Plowman (1992) defines quality, using the phrase: ‘delighting the customer by consistently meeting and continuously improving his requirements’. Quality can also be defined as the ‘never-ending improvement of a firm’s extended process’ (Gitlow et al., 1989).

Strong criticism against a number of surveys conducted, supports the idea that TQM has no value to a company, when it is based on the perception and the opinion of its managers and its employees. New ways and new methods are used as a means of introducing quality to a company. Methods like the six sigma and the lean management system, were both initially considered as reciprocals of TQM. Now they have been wisely established they are considered as unique components that add value to a company’s operational and financial performance (Hendricks & Singhal, 2000).

Considering that ISO certification is the starting point for introducing quality to a company, Quazi and Padibjo (1998) have studied the impact of ISO standards on SMEs in Singapore and how these contributed to the continuation of their journey towards quality. They have found that companies which have implemented TQM programs prior to the ISO certification, have presented a higher commitment to the broader concepts of quality than the certification per se. This supports the conclusion that the way and the sequence with which an SME approaches TQM, has an impact on the management practices adopted and the outcomes derived from it. This positive impact on their practices and performance cannot be undermined, because of the lack of a statistically significant ISO certification.
Therefore it would not be conflicting for a quality company to search for an ISO certification if it is needed to do so.

ISO certification is considered by SMEs as an investment that would initially improve their operational performance. The opportunities SMEs have to raise the required new funds for such an investment, are comparable with the expected return of that investment that will be realized from the SMEs overall score of profitability and growth. The expected return on such an investment would also support the option of accepting and further implementing quality in their operations (Tsekouras et al., 2002).

Using Earnings before Interest Taxes and Amortization (EBITA) over Total Assets as a criterion in measuring the ISO certified SMEs financial performance, Aba, Badar, and Hayden (2016) proved that the ISO certified companies performed much better compared to the non ISO certified companies. A possible explanation for that could be their ability to establish a more thorough management system (Pantouvakis & Dimas, 2010). Santos, Mendes, and Barbosa (2011) have identified that the SME manufacturing companies have achieved high returns on their investment to ISO certification and this in a period of less than three years. In contrast, the SME servicing companies needed more time to fully implement the ISO standards, receive their certification and start realizing returns. This is an indication that the manufacturing SMEs, for which the ISO certification is a prerequisite in order to operate, are capable of an immediate and more effective implementation of the quality standards and TQM. However it has been recognized that even after the ISO certification is granted, the level of their financial performance remained constant or in some cases deteriorated. This could be due to the fact that the costs incurred in order to keep the system operational, were more that the financial benefits derived from it (Aba et al., 2016).

The current survey’s aim is to elaborate on TQM’s implementation level for SMEs that have already introduced quality through ISO certification. According to Ghobadian and Gallear (1997), it is considered that the intrinsic characteristics of TQM are more easily and effectively implemented in SMEs rather than in large organizations. In addition, the basic elements of TQM are equally applicable to an SME as they are to large organizations. Among those elements are the type of strategy(ies) adopted, the nature and substance of management leadership, the communication methods, the content and the extent of training programs, as well as the nature and the extent of the organizational changes needed. However it has been established that an unmonitored adoption of those TQM elements from an SME may produce adverse results due to the methods and the way they are implemented (Ghobadian & Gallear, 1997). Leadership’s readiness to realize that management style is the key concept for developing an appropriate quality culture and to introduce and implement TQM, is a prerequisite.

It is management’s responsibility to recognize the need for change in an SME’s cultural environment, and support the quality elements. Being supported from top management then it would be easily understood and by all its employees.

Management visibility to support an SME’s cultural change, is an opportunity. This is so because of the close interrelationship with all the blue and white colour workers and their low resistance to possible changes. It is easy for an SME manager to inspire his/her employees with the vision for TQM implementation and set the appropriate and realistic quality performance goals and objectives (Ghobadian, Gallear, & Gallear, 1996).

Quazi and Padibjo (1998) argued that TQM practices have been designed to be applied in large organizations and their application in SMEs presents difficulties. The expected
outcome of their survey was to help SMEs identify the need for consultancy and training with regards to the process of implementing quality and TQM. Their concern was, the inability of TQM as philosophy in an SME due to their limited resources. Their concern was for the conditions that should be accomplished, in order to achieve a competitive advantage. They concluded that changing an SME's corporate culture into a more quality oriented cultural environment, is more valuable than their full commitment to quality standards. It was also recognized that SMEs, compared to large companies, need a simple and specific set of directions for quality changes instead of a general directive for TQM implementation (Sturkenboom, Van Der Wiele, & Brown, 2001).

The SMEs characteristics can be viewed as related to the benefits derived from the implementation of quality and TQM in particular. These benefits are related to the company's capital intensity (low vs. high capital intensity). Capital intensity is measured from the ratio of a company's net property over its number of employees. The company’s size (net property) is measured from the amount of its total assets, the degree of its market diversification and the degree of knowledge transferability among its operational units. All the above, are influenced from the level of quality (TQM) implemented (Hendricks & Singhal, 2000). The benefits are also related to the degree of utilization of the economies of scale concept and the learning synergies among the different units within the company. Those are the factors that will eventually bring positive results and add value to an SME (Hendricks & Singhal, 2000).

One of the core requirements for TQM implementation, is the need to have accurate data that will lead to accurate decisions that will add value to a company. The Hendricks and Singhal (2000) survey was aimed at developing an accurate methodology that would validate the quality of the results derived from the analysis conducted. The purpose of the analysis was to determine the added value of TQM in an SME. The authors selected reliable performance measures from SMEs that had already implemented TQM effectively (Quality award winners). They have chosen a specific time period for their analysis and set benchmarks that were used as a means of comparing their operational and financial performance. Interestingly they divided the research period into two parts. The first was named 'Post-implementation' period and the second 'Implementation period'. The results showed that TQM, should be considered as a long term investment. Anyone could expect to start attaining operational and financial performance benefits in the long run. The companies in the sample started realising an increase in their stock value due to an increase in their long term profitability. This was supported from the increase in their projected sales level in proportion to the number of their employees (size).

The survey conducted by De Knop et al. (2004) has defined two different approaches for implementing TQM. The first is the technical approach that refers to the statistical methods used in developing and controlling the implementation strategies and the design of the procedures needed. The second is the socio-dynamic approach which emphasizes the human factor of the organization and includes the human resource management and the organizational culture elements. Both approaches, examine TQM from:

(a) Its operational level that includes all the primary procedures contributing to the expected experience, and

(b) Its strategic level that includes all other elements and supporting processes that try to optimize the added value created. Table 1, shows the goals which a company's employees need to pursue.
Quality cost and its minimization is one of the issues that a company (25–35% of a process cost) needs to consider in order to further improve its competitiveness. The need to incorporate the cost of quality into a company's cost analysis, is inevitable. The need to identify and measure the size of that cost is also vital, given that it determines the company's production and control costs (Son & Lie-Fern, 1991).

Quality cost is divided into four different categories. These are the prevention cost, the appraisal cost, the internal failure cost and the external failure cost. Different articles have either combined or merged them into two or three categories for simplicity. This is because quality costs cannot be easily recognized within an accounting system and if used need to be measured objectively. Their combination ensures that they are easily recognizable and reliable (Son & Lie-Fern, 1991).

For SMEs the cost of quality is also considered an important component for its strategic plan (Desai, 2008). Its importance is related to the difficulty in measuring it. Crandal and Julien (2010), have generalized that for manufacturing companies the quality cost, represents approximately 15% of their dollar sales and for servicing companies 30% of their dollar sales. Their opinion, is that this amount cannot be ignored and its coverage needs to come from the monetary and/or non-monetary returns derived from the TQM implementation.

The contribution of TQM in a company’s operational and financial performance was accepted from the market and the entrepreneurs as a means of adding value to a company. However its relationship with a company’s overall improved financial performance has not yet been verified. Different researchers such as Hansson & Eriksson, 2002; Kober, Subraamanniam, & Watson, 2012; Watson, Kober, Ng, & Subramaniam, 2003; Bu, Liu, & Peng, 2013; York & Miree, 2004; have tried to work on this issue, using different variables and different models and have tried to identify possible deficiencies in the way financial and quality data were statistically processed and correlated. They have also attempted to identify the influence of TQM implementation on a company’s financial performance (Wayhan & Balderson, 2007). It is generally accepted that the market has mechanisms that try to find ways to improve its quality and the companies view improvement as a means of adding value through the improvement of their financial performance (Hendricks & Singhal, 2000).

From the Herzallah et al. (2014) survey, the indirect relationship between the TQM practices and the SMEs’ financial performance was validated. The factor proven to influence that relationship was the competitive/differentiation strategy developed from the SMEs, which was found to have a direct, significant and positive relationship with the hard elements of TQM. Those are the elements that are highly correlated to the SMEs’ cost leadership strategy and through that to its financial performance. However, the relationship between the

| Table 1. Total quality management (TQM) matrix. |
|-----------------------------------------------|
| **Level/approach**                          | **System-technical approach** | **Social-dynamic approach** |
| Operational level                           | • Inspection                 | • Coordination              |
|                                               | • Statistical techniques     | • Information              |
|                                               | • Procedures and instructions| • Teamwork                 |
|                                               | • Problem-Solving techniques | • Interpersonal skills      |
| Strategic level                             | • Goal formulation           | • Leadership               |
|                                               | • Strategic planning         | • Corporate culture        |
|                                               | • Policy deployment          | • People management        |
|                                               | • Organizational Structure   | • Communication            |

Source: De Knop et al. (2004).
soft and the hard elements of TQM is indirect. This is the reason why the results derived from the analysis of the relationship between the SMEs’ differentiation strategy and their financial performance is characterised as significant but weak (Douglas & Judge, 2001; Hendricks & Singhal, 2001; Herzallah et al., 2014). The special characteristics of the SMEs participating in this survey, come close to the characteristics of the Greek SMEs, meaning that they are mostly family-owned companies which focus more on profits and less on customer satisfaction.

The most traditional, quick and reliable method used for measuring the performance of a company is ratio analysis (Delen, Kuzey, & Uyar, 2013; Voulgaris, Doumpos, & Zopounidis, 2000). Measuring and analysing the financial ratios gives the option to the potential stakeholder to consider and evaluate a company’s operating and financial performance (Hirt, Block, & Danielsen, 2013).

Financial ratios such as the quick ratio, the asset turnover and return on Assets or Equity ratios, are derived from a company’s financial statements and are capable of offering valuable information regarding the manager’s and their department’s performance. They also offer historic data capable of supporting a forecasting process and the valuation of their financial performance, and their financial and competitive position within the market in which they are functioning (Ross, Westerfield, Jaffe, & Jordan, 2007).

Ratio analysis, offers an SME the opportunity to clearly and impartially denote the operational conditions. It is mainly used as a tool for identifying possible abnormalities in a company’s behaviour and is also used as a means of detecting possible future corrective actions (Voulgaris et al., 2000).

In an attempt to examine the impact of quality and process management on a Greek SME’s financial performance, operating in the construction sector, Kampouridis, Giannopoulos, and Tsirkas (2015) used ratio analysis. The authors specifically selected the cash ratio, the current ratio, the inventory and receivable turnover ratios, the gross and net profit margin ratios, the return on capital and equity ratios and the debt to equity ratio. From the analysis they concluded that despite having introduced quality in their operations companies did not manage to prevent the decline in their financial performance. Possible reasons for that could be the severity of the crisis conditions and/or the inability of quality and the ISO standards to support the sustainability of the SME’s financial performance. The authors finally concluded that the TQM elements were not implemented to a degree capable of supporting the financial sustainability or even survival of the SMEs under crisis conditions.

In the survey conducted by Shahin (2011), quality implemented and how this determined a company’s financial performance were examined. This relationship was tested and compared among a company that has adopted quality and TQM in particular and three other companies that they have not. For the financial analysis a set of ratios among which the current ratio, the quick ratio, the return on assets ratio, the return on equity, the debt to total assets and the asset turnover ratio were used. Almost all the financial ratios used except the debt to total assets ratio were found to be positively correlated to TQM. It was found that the performance of the single (TQM adopter) company was significantly improved in relation to all other three companies (non TQM adopters).

The severe economic decline in the European and Greek markets, in recent years, offers the opportunity to the European and Greek SMEs to challenge their financial sustainability. Under such systemic financial crisis conditions the financial ratios can be used as a means of measuring their financial distress rate and project their credit position. The comparison
of the SMEs’ financial ratio, debt to turnover, with their investment strategy and their employment policy was used in a survey conducted by Lawless, O’Connell, and O’Toole (2015). It was found that in recent years, more and more SMEs were in a debt overhang condition, meaning that their debt was so big that it was difficult for them to increase it further. So, in order to continue investing in profitable investments they tried to convince their potential lenders (banks) to supply them with additional financing, thus exceeding their limits. Companies which achieved such a high level of leverage, also realized a negative trend to their investment opportunities. To be debt financed can be considered as productive (MM proposition 1) because it allows a company the possibility of continuing its investment strategy. But when a company exceeds its debt limits, then the results become inversed. The company with an increased level of financial distress would reduce its productivity (Costanzo, Silipo, & Succurro, 2013). This inverse relationship is even stronger when the company is open to fewer investment opportunities, as this was proved from Tobin’s Q Ratio (Q’ Ratio) (Lawless et al., 2015). The use of Altman’s Z-score ratio as the score that identifies the level of a company’s financial distress is accepted and used in the market for many years, however its role in recognizing and influencing a company’s strategic plan has not yet been realized (Calandro, 2007).

3. Research methodology

A qualitative survey was conducted, furthering the quantitative survey conducted by Sainis et al. (2016a) which focuses on the implementation level of TQM in Greek ISO certified SMEs. It should be noted that qualitative data are frequently used as supplementary and supportive to quantitative data collected and analysed (Robson, 2011). The objective is to compare and contrast both sets of results. Qualitative analysis has a supportive role to a quantitative survey, and it enables the deduction of conclusions with just a small amount of data and a simple type of analysis. The methodology used in the qualitative analysis conducted was the thematic coding approach. Under this approach a set of themes (Quality tools and techniques, Quality Processes, Quality Culture and Performance Appraisal) supported by an amount of codes (i.e. for quality tools and techniques, the codes used were related to measurement, communication, development etc.) are used in an attempt to identify the response level of the participants in each different question (Hunt, 1993; Robson, 2011).

The more codes identified in the interviewee responses, the higher the weight assigned to the corresponding theme related to the TQM elements examined.

The score assigned to each theme increased or decreased the value of each response towards quality implementation. The scale and scores used for each theme are shown in Table 2.

The average sum of all the participants and of all the responses per theme, gives the value of quality theme and the element examined. From the sum of the theme and the element values, the value of quality implementation was identified. The maximum score that could
be achieved equals three (3) and the minimum one (1). Scores higher than 1.5, indicate that the companies have improved their quality level beyond the ISO standards and are moving towards full TQM implementation. Companies whose scores were close to the average (1.5–2.5) were named ISO-plus SMEs and those that exceeded the average (>2.5) were named TQM SMEs. On the contrary companies with scores below 1.5, indicated a preference to maintain quality at a level where the ISO standards were partially satisfied. These companies were named ISO SMEs.

From the sample of the ISO certified SMEs that have participated in the quantitative survey, ten (10) SMEs were chosen and the corresponding quality managers were interviewed. Each SME was assigned a code based on its size (A-for Medium, B-for Small and C-for Micro) and a serial number (from 1 to 10) indicating the sequence of the interview conducted. Apart from being ISO certified in order to be selected, the SMEs had to employ a varied number of employees so as to enable the formation of three distinct groups namely micro, small and medium sized SME group. During the interviews, a semi-structured questionnaire was administered. Each question tried to reveal the quality manager’s perception regarding the company’s intention and intended action plan that would support the establishment of the ISO standards. The questions also tried to identify what action the SMEs have been taking to enrich their operations with TQM elements and practices or implement the TQM philosophy and culture in their operations.

To strengthen the survey’s analysis, the conversion of the variables used from ordinal to categorical was made. That is, instead of scoring the quality elements of all the ISO certified SMEs, they were scored after they had been grouped into different categories based on their size.

SMEs were categorized into different groups based on different criteria. For their categorization the criterion used by the European Union’s directives was also used. According to that criterion, based on the number of employees employed SMEs were grouped into Micro, Small and Medium sized SMEs. The Micro SMEs employed less than 10 persons, the Small SMEs employed from 10 to 49 employees and the Medium SMEs employee from 50 to 249 people. Companies that employ more than 250 employees are characterised as large Companies.

In order to identify the effects of further implementing quality, on an ISO certified SME’s financial performance, all the financial data needed to be collected. The financial statements of the interviewed SMEs for the period 2008–2014, were downloaded from the i-Mentor (Hellastat) database and imported to an excel file enabling further processing.

Using a company’s financial ratios, is considered a good source for identifying the impact of managements’ internal decisions taken under different and occasionally difficult environmental conditions, in a quantifiable, unbiased and meaningful way (Voulgaris et al., 2000). Different sets of ratios are used for different purposes. However, all aim at examining SME performance comparatively, in terms of either historic periods or the competition they are faced with. Different ratios are used in order to measure the operational and the financial performance of a company and of an SME in particular (Hirt et al., 2013).

Four different groups of ratios are commonly used to measure a company’s financial performance, (Chaudary, Zafar, & Salman, 2015; Lawless et al., 2015) namely the profitability ratios, the solvency ratios, the efficiency ratios and the liquidity ratios. The four different groups and the selected financial ratios used in this survey are shown in Figure 1.
A number of selected ratios close to the ones used by Delen et al. (2013) in their survey were used in this survey. The selected ratios were considered among the most valuable for measuring a company’s financial performance.

Specifically the ratios selected were the acid-test ratio (Quick Assets/Current Liabilities) for measuring the company’s liquidity, the Altman’s Z-score and the debt to equity ratio for valuing a company’s solvency level, the Inventory (Sales/Average Inventory), the Receivable (Sales/Average Receivables) and the total asset turnover (Sales/Average Total Assets) for measuring an SME’s operational and financial efficiency and the return on Assets (Net Income/Assets) and return on equity ratios (Net Income/Equity) for measuring an SME’s profitability level (Hirt et al., 2013).

4. Results

From the qualitative analysis and the interviews conducted, a number of response forms were compiled. From each of the ten forms completed, the scoring approach was used (methodology) and the results derived are presented below.

From the interviews conducted a score equal to 1.55/3.00 was revealed. That score, being slightly above the average value, reveals that the Greek SMEs are moving towards TQM implementation. Greater emphasis was given to the quality culture element (1.60/3.00) and to the quality performance appraisal element (1.60/3.00). The perception the quality managers have regarding both the quality tools and techniques element and the quality processes element implemented in their SMEs, resulted in a score equal to 1.50/3.00.

From the analysis of the formed groups, it was revealed that the small sized SMEs better implement the TQM elements (1.75/3.00) followed by the medium sized SMEs (1.63/3.00) and the micro sized SMEs (1.25/3.00). It was found that from all the quality elements the medium SMEs, focused more on the performance appraisal element (2.00/3.00), the small SMEs focused more on the quality culture and the quality processes elements (2.00/3.00) and the micro SMEs on the quality tools and techniques element (1.67/3.00). The exact scores for each quality element implemented are shown in Table 3.
Using the codes assigned to each SME, the companies were ranked based on the quality score they received as shown in Table 4.

It is the participant’s belief that the contribution of quality to their SME’s financial performance is equal to 2.5/4.0. Their perception is that the ISO certification contributes to their company’s financial performance at an above average score (2.5/4.0). They also consider that introduction of quality elements would further improve their financial performance (2.8/4.0). Contrarily, they are not as confident that quality elements would enable them to maintain or improve their financial performance, under the economic crisis conditions (2.4/4.0).

From Table 5, it appears that the small sized SMEs scored the highest with regards to the contribution of quality on their financial performance, followed by the micro and the medium SMEs.

The responses of the interview participants regarding the relationship between quality and their SMEs financial performance which are presented below, support the aforementioned scores.

The first SME interviewed is a private company and an organization in its legal form, with seventy full time employees working on its premises. The company specialises in the production of Chemicals and plastic products. From the response of IP-1 (Interview Participant-1), it was found that the implementation of quality was affirmative to the SME’s financial performance, but no specific financial information was given to the interviewer.

The second company interviewed is an energy company and the IP-2 interviewed is its quality manager. The company employs thirty people and has been certified with the ISO-9001:2008 since 2005. The IP-2, is convinced that introducing quality only to its SME production operations and not to its administrative activities, will not lead to the reduction of its operational costs and subsequently will not improve its overall financial performance.
Valuable is the acceptance of IP-2 that the cost reductions achieved from the quality elements introduced, gave the company the opportunity and the ability to cope better with the difficult financial conditions they are up against given the severe economic crisis conditions that Greece is currently facing.

The next company is a private company operating in the food and beverage industry. IP3 is the quality manager of the company which has been ISO certified since 2008 when it was awarded the ISO-9001:2008 certificate. The company was categorized as a micro SME as it employed seven individuals. The IP-3 stated that 'the company became more organized from the moment the ISO standards were adopted, but this has not contributed to reducing its costs or any other financial ratio. Instead it increased overall costs.' In addition to that, the IP-3 expressed her reservations about the bureaucratic procedures required by the ISO-9001:2008 standards, which she claimed reduce the number of available workers and productive time and increase the company's total production cost.

The next interviewed quality manager is of a private company that operates in the trade and delivery economic sector. The company has been certified with the ISO-9001:2008 from TUV Hellas since 2005. It currently employs eleven people and is categorized as a Micro SME. The IP-4 stated that attention is given only to the company's short term plans and, if any, long term development plan is prepared it is recorded only in theory. The financial crisis conditions the company is facing, limit the possibility of developing plans exceeding a one year period. The IP-4 also declared that even though the company and its employees are familiar with the performance appraisal techniques that quality requires, they only keep those that refer to customers’ complaints and customers’ returns and that is because the ISO standards specify it. The IP-4 believes that being an ISO certified SME as opposed to not being ISO certified, offers the company the opportunity to cope with the crisis conditions better.

The IP5, is the quality manager of a private company functioning in the Water bottling sector of the Greek economy. The company employs thirty-three people and is categorized as a small SME. It has been certified with ISO-9001:2008 and ISO-22000 (HACCP) since 2003. The IP-5 admits that quality management improves their sales level and increases their customers' confidence level about the quality of products being received. For their employees she specifically stated that ‘with quality, employees managed to become more conscientious about the way they do things in their work. They also respect the company more.'

The next interview was with IP6, the quality manager of a private company specialized in vehicle technical control. The company is categorized as a micro SME as it employs only seven people and is ISO certified based on the ISO-9001-2008 standards.

The company offers technical inspection to all type and kind of vehicles and as IP6 stated offers them specific service based on the standards specified by law. Regarding the contribution of quality to the company's financial performance, the IP-6 stated that no relationship exists between the two. His perception is that revenues are mainly determined by the company's pricing policy and not from its costs. The only alternative they have in order to better control their costs is simply to impose greater control over their suppliers. He also stated that the company's request to further implement ISO certification is something that at this time is not feasible. He specifically stated that the company 'realizes a break-even point in its operations that is not related to the services offered.' The high fixed cost realised from their high payroll cost, is what has substantially reduced their contribution margin and their overall financial performance.
The next quality manager IP7 is employed at a marble construction company. This private company employees 189 people, so it is categorized as a medium sized SME and has been certified with the ISO-9001:2008 since 2003.

The company has in its organizational chart a quality (internal) audit department that is responsible for all the quality issues related with production and the firm’s operations. It became apparent from the IP-7’s comments regarding introducing quality elements that they have managed to improve and smooth out both the production and the administrative company operations. He strongly believes, though that in the future quality and specifically TQM implementation, are the factors that will contribute more to the improvement of a company’s overall financial improvement.

The next interview conducted is with the quality manager of a private company that produces and bottles mineral water. The company employs thirty-six people and is categorized as a small sized SME. The company has been awarded the ISO-9001:2008, the HACCP, the IFR and the FSSE certificates. Its quality manager (IP-8) admits that introducing quality to their operations has improved its financial performance. That is the reason why the company continues to invest, particularly in technology. Supporting an improvement in the company’s financial performance he stated ‘we are surviving under crisis conditions and the reason for that is that we are a quality company.’

The next interview conducted was with the quality manager of a chemical company developing the ‘base’ needed for the production of perfumes. The company is a private corporation and employs 100 people, so it is categorized as a medium sized SME. The company has been awarded the following quality certificates: ISO-9001:2008, HACCP and the FSSE 22000 from TUV HELLAS. The IP-9 attempting to express her personal opinion has stated that quality and ISO certification in particular, did not manage to improve the company’s financial performance and it did not improve the SME’s return on investment (ROI) ratio. The only thing achieved from its implementation is that the company came closer to its customers and managed to better satisfy their needs. However, no major changes have been realized in the company’s overall sales level.

The last interview conducted, was with the production and quality manager of a pastry production company. The company employs 100 people and is categorized as a medium sized SME. It has been certified with the ISO-9001:2008 certificate since 2000. The comments made by IP-10 for the role of quality in the SME’s financial performance, indicated that quality has improved the company’s image in the market. Quality has increased its sales level, particularly during the period in which severe economic crisis conditions exist. He also stated, that the improved level of sales, is not only a result of the introduction of quality, but can also be attributed to the SME offering low prices due to its reduced costs. Overall the company claimed that it was unable to measure the cost of quality. It is also unable to measure the financial benefits derived from the improved level of quality.

The financial behaviour from the trend analysis conducted on the financial ratios of the participating SMEs, is shown in the following figures.

Figure 2, illustrates the acid test behaviour for all different groups of SMEs (Medium, Small, and Micro) throughout the eight year period (2008–2014). The ability of the medium and the small-sized SMEs to improve their quality level is depicted. From 2010 to 2011 onwards, both groups of the aforementioned SMEs achieved the highest liquidity level.

Regarding the asset turnover ratio that is shown in Figure 3, the medium SMEs were found to have an improved performance. A higher turnover ratio is an indication that the
SMEs managed to increase their sales level and/or by reducing their assets have managed to achieve the optimum level in their highest efficiency. The medium and the small SMEs also scored a high asset turnover ratio.

For the inventory turnover ratio shown in Figure 4, it was found that the companies that show some stability in that ratio are the micro SMEs, though at a very low level and the highest behaviour comes for the medium sized SMEs.

Stability in that ratio is an indication that management has efficiently organized its inventory level in relation to their expected level in sales.

From the receivable turnover ratio values that are depicted in Figure 5, it is established that differences exist among the groups in terms of their behaviour. Once again the medium sized SMEs kept their receivable turnover score at high levels, which is an indication that they are capable of offering better credit terms to their customers and simultaneously reduce the level of their receivable account.

Regarding the profitability ratios, the ROA ratio that is shown in Figure 6 shows those that managed an improvement in their quality level. These are also the companies that showed the highest variability among the other two groups. The relationship between a companies’ earning to the total assets invested shows, in almost all groups, a decline during the year 2010–2011, due to the severity of the crisis conditions. During that time, Greece
got downgraded, the Athens stock exchange general index fell below 500 points, there was political instability caused by the resignation of Prime Minister G. Papandreou and the subsequent election of L. Papadimos as the leader of a coalition government.

Similar to the ROA is the behaviour of the ROE ratio, shown in Figure 7. Higher stability in that ratio is shown from the small sized SMEs that have further improved their financial performance in the year 2012, a period during which the crisis conditions were even more severe.

To examine the solvency of the SMEs that participated in the survey, the debt to equity ratio was valued and the equivalent results are shown in Figure 8. The small sized SMEs are those that managed to score a high ratio level, especially after the year 2011. The medium sized companies, followed by the micro SMEs showed the highest variability and exposure to risk, created from their extended debt financing or from their reduced equity financing. The small sized SMEs are those that have managed to achieve a more stable behaviour in their debt to equity ratio.

The probability of SMEs going bankrupt was examined with the use of the Z-Score, shown in Figure 9. It was found that the small sized SMEs were located in the ‘safe’ zone of bankruptcy, followed by the micro and the medium sized SMEs in the ‘grey’ zone especially during the period of 2010 to 2012, when Greece was downgraded by all three different rating agencies.
However, to identify how quality influences the SMEs financial performance, the financial ratios of different sized SMEs that have implemented different levels of quality were examined. From their analysis, the following results were derived.

The micro SMEs that decided to maintain their quality at a level of the ISO standards (C4) showed an improved performance in their efficiency ratios (inventory turnover, asset and receivable turnovers) and in their $Z$-score.

Similar results were derived from the other two companies, the C3 and the C6, both of which further improved their quality level, reaching the level of the ISO-plus SMEs.

The improvement of the C3 SMEs’ $Z$-score in the last years of the period examined, should be noted.

Continuing with C6, its financial ratios were calculated.
Both companies (C3 & C6) have revealed their competence of controlling their efficiency ratios and their $z$-score better than their liquidity and profitability ratios. Regarding the small SMEs, improvements in their quality level led them to an improved level in liquidity and solvency. Their efficiency has deteriorated and their profitability has remained constant.

B5, an SME that has decided to maintain its quality level at the ISO standards, showed an improved efficiency, especially in its inventory turnover. That improved performance was realized in 2012. From then on, a decline occurred, but an equivalent improvement in its receivable turnover is evident. Its $Z$-score remained at low levels and has decreased over the last years of the period examined.

B8, an SME that has further improved its quality level, showed a tremendous improvement in its $Z$-score and solvency level, and an improved performance in its liquidity. However its efficiency and profitability remain at a very low level.

B2 SME, a company that improved its quality level even further, maintained high scores and high liquidity levels throughout the period examined. Also its efficiency and profitability remained at low levels.
For the medium sized SMEs, differences in the level of quality implemented resulted in the improvement of the SMEs liquidity and solvency as this is seen from the high level of their $Z$-score and their acid test ratio. In addition, it appears that the high efficiency level is a result derived from improving their quality from the ISO level to the TQM level.

A7, an SME that decided to barely satisfy the ISO standards resulted in the improved level of its efficiency (inventory turnover and receivable turnover) and the low probability of being bankrupt ($z$-score).

The A10 and A9 SMEs both improved their quality level introducing more advanced quality tools and techniques and quality processes, achieved a higher $z$-score level, as they were in the safe zone for bankruptcy and a much higher level of liquidity. Substantial is the increase in the efficiency ratios, especially the inventory turnover ratio. In addition, their debt to equity ratio has also increased, an indication that their capital structure has changed together with their willingness to be exposed to higher risks, in their search for higher profitability.
The A1, is an SME that apart from improving its quality tools and processes elements had also improved its quality culture and its performance appraisal elements. The results indicated much higher $z$-score levels, asset and inventory turnover ratios and a higher level in its liquidity. These levels have significantly improved in the last years of the period examined (2013–2014).

5. Discussion

The aim of the study, is to identify if and how the implemented level of a set of quality elements in the Greek, ISO certified SMEs, affected their financial performance, during economic crisis conditions. The economic crisis conditions they have faced in the last eight years, made the threat of bankruptcy evident and the need to cope with unexpected changes in the market’s policies i.e. taxation, regulations etc. These factors subsequently reduced their response time and the possibility of taking corrective actions; thus, making the implementation of quality and TQM an even more challenging process.

The survey is supported by a pilot study conducted by Sainis et al. (2016b) who processed and analysed 179 questionnaires collected from a sample of Greek ISO certified SMEs registered in the i-Mentor (Hellastat) database. It was identified that the quality elements implemented, determined the financial performance of the Greek ISO certified SMEs. The authors, following the triangulation approach, attempted to support and strengthen the quantitative survey results with those of a qualitative one. The quantitative survey results showed that the quality culture and performance appraisal elements, were the most valued elements for the implementation of TQM. The quality tools and techniques and the quality processes also received high scores, but lower than those received by the first two elements. At first, the conclusion derived, supports the belief that the contribution of quality to the improvement of an SME’s operational performance is valid. Those results come close to the results derived from the current survey. In this survey, participants also recognize the positive contribution of quality to their SME’s financial performance and maintain that the
Greek ISO certified SMEs have the intention and the willingness to continue their journey towards quality. The interviewed participants have admitted that being ISO certified, offers them the opportunity to organize their processes better. This resulted in the improvement of their financial performance. However, some interviewees have expressed their doubts regarding the contribution of TQM in strengthening their financial position and performance, because they claim it limits their ability to cope effectively with the crisis conditions that Greece is currently facing. Possible reasons for those doubts, could be the inefficient and partially implemented elements of TQM, caused due to their limited resources and the economic and financial limitations they face given the crisis.

The SME’s financial performance, from the interviewees’ responses denotes that the small SMEs are the ones that have received the highest return on their investments. They strongly believe, that implementing TQM is what would give them the opportunity to overcome the consequences of the economic crisis (Demirbag et al., 2006), because with its implementation they have improved their efficiency and their solvency level. Comparing the different groups of SMEs, it was found that the micro SMEs prefer to stay in the ISO level or at least move to the ISO-plus level. By doing this, they have improved the performance of their liquidity, efficiency and solvency level more than they would with any other alternative. The medium and the large SMEs however prefer to implement quality at the ISO-plus or TQM level, because their liquidity, solvency and efficiency are substantially improved. Irrespective of their quality level all groups admitted that the economic crisis conditions, have led to their poor performance in terms of their profitability but that is the ‘cost’ of minimizing the probability of becoming insolvent.

Different surveys directly or indirectly support the conclusions derived from this survey. Specifically, there is a comparative survey conducted by Mihai Yiannaki (2012) that focuses on different sized SMEs, operating in different industry sectors in Romania and Cyprus. A model was developed using the balance scorecard approach. From the results derived it was concluded that if an SME has a sound company strategy accompanied with a management system capable of better controlling the risks related to its management and human resources, signalling an improved quality level, then it can better control the crisis conditions it is facing or may face in the future.

In another study conducted by El Kalak and Hudson (2016), the size of SMEs was used as a criterion to assess their financial performance and the probability of going bankrupt. A set of financial ratios were used on a sample of US non-financial companies. The authors concluded that the micro and small sized SMEs need to be treated differently in terms of their financial performance and their credit risk in relation to the total number of SMEs. This is not true for the medium sized SMEs and the whole sample of SMEs. So, it was proposed that potential lenders should value the financial performance of micro and small SMEs and their probability for default, differently. That is something that the current survey also supports, given the different role and value of each ratio identified in different sized SMEs under financial distressed conditions.

Contrarily the study conducted by Marimuthu, Arokiasamy, and Woon (2014) who examined the financial performance and insolvency of small, medium and micro Malaysian SMEs, derived results that differ from the results of the author’s survey. Specifically, the results of the earlier study, showed that among the different sized SMEs differences existed only in their profitability but not in terms of their insolvency.
6. Limitations and recommendations

An opportunity for research, that could overcome the survey’s limitations, is to further extend the results of this survey by enriching and enlarging them. This could be achieved by conducting the interviews with the quality managers of companies from different sectors like, agriculture, forestry, processing, manufacturing, construction, retail and wholesale or possibly constructing different case studies. These new elements, would examine the effect of TQM implementation and its quality elements on an SME’s financial performance and its ability to cope with an unstable and uncertain economic environment, in more depth.

An opportunity could also be to follow another path in this research field. That is to develop a comparative study between the Greek ISO certified SMEs and the ISO certified SMEs in other European, American or Asian countries or countries that have faced similar financial crisis conditions and have managed to recover like Italy, Spain, Portugal, Philippines, Malaysia, Venezuela, etc.

Another possibility for further research, could be to additionally expand on the ‘risk’ element and how it determines the improvement of the TQM elements and the SMEs financial performance.

Lastly, an additional opportunity could also be to change the research approach of the study from a self-study type to a longitudinal type. However, the availability of data for that kind of research would pose a considerable challenge.

Note

1. Miller & Modigliani Proposition.

Disclosure statement

No potential conflict of interest was reported by the authors.

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