

Financial and Nonfinancial Performance Improvements through the Extensive Use of Quality Cost Information

Abstract: Often organizations make limited use of the information they produce, and information about quality costs is not an exception. The literature shows how quality cost information has been used by organizations almost exclusively for a total quality control. However, the same information can be used in a more extensive way, from the perspective of total quality learning. In this study we analyse how the extensive use of quality cost information can boost total quality learning, thus leading to an overall improvement in financial and non-financial performance. The conceptual model developed involves these relationships and has been tested using the structural equation modelling technique. To this end, a questionnaire survey was conducted in Portuguese companies with the ISO 9000 certification. The results shed light on the causal links between the variables, and thus validate the conceptual model indicating that the extensive use of quality cost information has a direct positive effect on the development of total quality learning, which leads to the improvement on financial and non-financial performance. This research adds to the knowledge in the field of quality costs and in the use of this information in management processes, thus contributing to the discussion in the domain of the use of quality cost information

Keywords: Quality; Costs of quality; use of information; quality learning; financial and nonfinancial performance.

1. Introduction

The literature focusing on quality costs (QC) has placed great importance on issues related to identifying, measuring and reporting quality cost information (QCI). Less attention has been paid to how this information is used in the management process and how it can enhance internal capabilities and thereby improve company performance. In addition to addressing this question, we analyse how the extensive use of QC can boost organisational learning and innovation in organisations' internal processes, thus leading to an overall improvement in the quality management system (QMS) that is reflected in financial and non-financial performance. The conceptual model developed involves these relationships and has been tested using the structural equation modelling technique. To this end, a questionnaire survey was conducted in Portuguese companies with the ISO 9000 certification. The results shed light on the causal links between the variables, and thus validate the conceptual model indicating that the use of QCI has a positive effect on both the development of QMS and performance. The chapter is structured as follows: the next section begins with a discussion of the relationship between the use of QCI, the development of QMS and the impacts on performance, and then introduces the conceptual model; Section 3 describes the variables and develops research hypotheses; Section 4 presents the methodological issues; Section 5 sets out the main results of the statistical analysis; finally, Section 6 discusses the results and presents the conclusions of the study.

2. QC and the development of a QMS

The importance of QCI to continuous improvement processes is widely acknowledged in the literature. Significant benefits may be obtained from quality costing, because the resulting information converts quality into a measurable concept and thus makes its impact on the organisation more understandable (Crosby 1978). As a result, the literature has become greatly focused on QC, notably on their identification, measurement and reporting. However, as Sansalvador and Brotons (2013) state, despite the importance of implementing a system that provides information about the distinct components of QC, the full benefit can only be derived if the information obtained is analysed in detail. Moreover, the way this information

is applied in the management process may determine the momentum and expected results of that process. The mere existence of information on QC does not necessarily mean that companies are applying it in their management processes, and routines must therefore be created to use the information. Sower et al. (2007) noted that quality costing programs alone do not lead to improved quality. Regardless of the adequacy of the quality costing system implemented, its effectiveness will be intrinsically associated to and dependent upon the way in which the QMS uses the resulting information to improve quality. The extensive and systematic use of QCI is a prerequisite for the development of the QMS. Quality cost should not be seen as solving a problem with a unique definition; there is a whole range of reasonable notions of quality improvements, and that these notions can be seen as actionable guidelines (Jaju et al. 2009). The extensive use of QCI is thus likely to increase both the level of knowledge and awareness of quality, and foster an organisational understanding of quality issues (organisational learning). Quality improvement initiatives should result in higher levels of (financial and non-financial) performance. We therefore propose the conceptual model depicted in Figure 6.1.

Figure 1: Conceptual model



3. Variables and hypotheses

3.1. Use of QCI

For the purposes of this work, a quality costing system is broadly defined as a system conveying useful information to the QMS. The literature has largely ignored the ways in which information provided by the quality costing system is used. However, analysing profiles of the use of information not only allows us to evaluate how the management process relies on that information, but also the effects of this use. This work adopts a structure proposed by Simons that distinguishes between diagnostic and interactive control systems. This structure has been widely used to analyse the profile of use of management accounting and control systems, and the information systems they provide (Cf. e. g. Abernethy and Brownell 1999; Hartmann and Vaassen 2003; Lukka and Granlund 2003; Roberts 2003; Henri 2006; Naranjo-Gil and Hartmann 2006; Kominis and Dudau 2012).

The diagnostic and interactive notions of control proposed by Simons are part of a broader conceptual framework that the author explained extensively in *Levers of Control* (Simons 1995). Diagnostic systems are formal systems that managers use to monitor results and correct deviations from pre-established performance standards (Simons 1995). They are associated to the traditional notion of management control because they are described in terms of the ability to measure the *outputs* of processes and by the existence of standards through which achievements may be compared, so that decisions can be taken to correct deviations verified. Diagnostic systems permit the close control of the critical variables of organisational performance without the constant intervention of managers; attention is focussed on negotiation and goal setting, on periodic reports that inform about ongoing actions, and on sporadic interventions when a critical variable is out of control (Simons 1995). They are systems that limit the search for innovative solutions and the identification of opportunities because they focus on the critical variables of performance. In contrast, interactive systems stimulate the interactive exploration of innovative solutions and learning, allowing new

strategies to grow as participants interact, debate and dialogue in response to perceived opportunities and threats. However, research dedicated specifically to the use of diagnostic information has led to new perspectives. Specifically, it is maintained that the use of this type of information may not constitute an end in itself, but is a necessary means to start and support interactive use of information that favours strategic dialogue and communication among the parties. i.e. diagnostic use constitutes a pre-requisite for interactive use (Haas and Kleingeld 1999).

3.2. Organisational learning

Organisational learning is the process by which new knowledge and ideas are developed by organisations (Slater and Narver 1995); it enables companies to acquire, interpret, disseminate and store information and the results of the organisational experience with a view to making continuous improvements (Giley and Maycunich 2000; Tippins and Sohi 2003; Chenhall 2005). Organisational learning is a personal skill that can generate changes in employees' behaviour; it focuses on routines, processes, practices and organisational standards through the sharing of information and institutionalisation of knowledge between individuals, and it therefore plays a specific role in the development of other skills at the strategic level (Zoolo and Winter 2002).

3.3. Performance

Performance is used herein as a broad concept and is defined as a complex variable with a multiplicity of factors contributing to the overall level of performance at any point of time (Perera et al. 1997). Although the major source of information continues to be a combination of internal-quantitative data expressed in financial and accounting terms (Smith 2005), not all organisational complexities can be expressed within a quantified frame of reference (Bromwich and Bhimani 1996). As a result, performance measurement should take both financial and non-financial perspectives into account.

3.4. Hypotheses

There is widespread acknowledgement of the importance of using QCI as a vehicle for the continuous improvement of quality-related processes. Many companies that develop and implement costing systems make extensive use of QCI; it is used for planning and control purposes and to foster organisational learning and explore innovative solutions. Quality costing must be understood not only as a mechanism for managers to evaluate and monitor the economics, effectiveness and efficiency of quality activities in their organisation but also as a bridge between line and top management (Vaxevanidis et al. 2009). Thus, quality costing systems are used as “answer machines” as well as “learning machines” (See Burchell et al. 1980). According to Simons' (1995) framework, the extensive use of quality costing systems and the resulting information enable companies to focus on the importance of balancing the inevitable tensions between the need for control and achieving pre-established objectives on one hand, and the organisational need for learning and innovation on the other (Kominis and Dudau 2012). QCI fosters communication about the general control of quality within the organisation (Prickett and Rapley 2001). According to Yang (2008), the implementation of quality costing can produce significant benefits. The most important is that organisations are able to focus on the areas that require improvement. This capacity to improve falls between organisational learning and innovation, i.e. it is the ability to learn and the knowledge generated by this that permits the identification of needs and the opportunities for improvement which, in turn, leads to the development of innovation processes. Accordingly, organisational learning is a pre-requisite for innovativeness. Thus, we formulate the following hypothesis:

H1: The extensive use of QCI is positively related with the development of organisational learning, thus contributing to an overall development of the QMS.

Organisations without a quality costing system often develop insular ways of maintaining control over each area of responsibility. This gives rise to uncoordinated information gathering, reporting, and management as well as the need for multiple re-drawing and re-keying of information (Jafari and Rodchua 2014). QC enable organisations to concentrate on low performance areas that need improving whilst also making continuous improvements and planning how to raise quality (Prickett and Rapley 2001). In addition to enabling organisations to focus on areas that require improvement, quality costing increases awareness (within the organisation) of the potential effects of poor quality on overall business results (Prickett and Rapley 2001; Makhopadhyay 2004; Yang 2008). We therefore formulate the following hypothesis:

H2: Organisational learning, which contribute to the development of the QMS, are positively related with financial and nonfinancial performance.

4. Research method

4.1. Sampling procedure

This study uses primary data obtained through a questionnaire survey applied to Portuguese companies with the ISO 9001:2008 certification. Focus is given to certified companies as they are more aware of quality issues and the importance of managing quality variables, including QC, even though they are not required to implement or certify formal quality cost systems. The companies were selected from the last edition of the Quality & Certification Yearbook, published in 2011. A random stratified and systematised sample procedure was adopted to obtain a broad picture of Portuguese certified companies. Given the objectives of the study, only certified companies with a staff of 20 or more were considered because management accounting systems in larger companies tend to be more developed and better structured (Lal and Srivastava 2009).

Every fourth company in the Quality & Certification Yearbook was selected with the aim of surveying 25% of all companies. If a company did not meet the staff size criteria, the next company fulfilling the criteria was selected. Our sample comprised 1272 companies and we obtained a response rate of 25.4%, corresponding to 323 validated questionnaires, which is consistent with the response rate of other similar studies (Cf. e.g. Henri 2006).

A pre-test was performed in 10 companies and led to some small modifications to the original questionnaire. The questionnaire was addressed to the boards of directors who decided who would answer it. Of the 323 validated questionnaires, 200 (61.9%) were answered by the quality manager, 97 (30.0%) by administrators/directors and the remainder by other staff members.

In terms of the representativeness of the final sample, there were no significant differences in the distribution of firms by sector and by size (in accordance with the number of employees). In fact, 50.5% of companies employed 20 to 49 persons, 16.1% employed 50 to 99, 19.2% employed 100 to 249 and 14.2% more than 249. In terms of sales volume, 54.8% of companies reported a volume of up to €5 million, 14.2% reported between €5m and €15m, 4.3% between €15m and €25m, 8.7% between €25m and €40m and 18.0% over €40m.

4.2. Measurement of variables

The literature was used to construct the data collection instrument. The first question was based on a section of a questionnaire developed by Naranjo-Gil and Hartmann (2006); some adaptations were made that allowed us to measure the profile of the use of QCI provided by

the system (see Appendix 1 – Panel 1). The variable was measured on a five-point Likert scale (1- Not used; 5- Used extensively). The second question addresses the extent of organisational learning and innovativeness (see Appendix 1 – Panel 2). Although the structure of this question is supported by the extensive bibliography and some empirical research, it does not reproduce any instruments used in previous studies. The variable was measured on a five-point Likert scale (1- Completely disagree; 5- Completely agree). The third question deals with the degree of compliance with a set of company objectives. We used a slightly modified version of the Scott and Tiessen (1999) instrument for exploring the incidence and importance of measuring the performance of management teams. The original structure of the questionnaire was simplified and respondents were asked questions on three financial categories (cost, sales and profitability) and five non-financial categories (productivity, quality, service, innovation and human resources). Respondents were asked to rate the level of achievement of each target over the previous three years, thus allowing for a dynamic view of performance measurement and simultaneously providing a mechanism to prevent circumstantial effects on the process (see Appendix 1 – Panel 3). The variable was measured on a five-point Likert scale (1 - Much lower than expected; 5 - Greater than expected).

4.3. Preliminary analysis

Companies that collect information on costs of quality do not necessarily use that information extensively in the management process. Thus, the data collected were first analysed to identify significant differences in the way companies used the information on activities described in Question 1 (see Appendix 1 – Panel 1). This procedure also enables us to identify companies with broad-scope costing systems and which make effective and extensive use of their QCI. To that end, we performed a cluster analysis to identify groups of companies with different use profiles for the QCI provided by the system. The cluster analysis is an exploratory multivariate analysis technique that groups subjects based on the existing information; as a result, the subjects belonging to a group are as similar as possible and always more similar to members of their group than to those of the remaining groups (Hair Jr. et al. 2010). The objective is to maximise the homogeneity within each group as well as the heterogeneity among groups. Data was analysed using IBM SPSS Statistics 21 software.

4.4. Estimation and analysis of the proposed model

A structural equation modelling procedure with AMOS (version 21) was used to test the proposed model. The recommended two-step approach (Anderson and Gerbing 1988) was followed. Before estimating the structural model, which describes the causal relationships between constructs and their relative explanatory power, we assessed the relationships between observable indicators in order to evaluate the reliability and validity of the measurement instruments. The advantages of this procedure have been extensively discussed by Anderson and Gerbing (1988), and are associated with the possibility of acquiring a body of knowledge about the variables that comprise the final model. A reliability analysis – Cronbach Alpha – was performed on the set of indicators for each construct to assess the consistency of the measurements of variables (see Appendix 1). The results showed all Cronbach Alpha coefficients exceeded the recommended value of 0.7 (Hair Jr. et al. 2010), indicating good internal consistency and thus assuring the reliability and unidimensionality of measurement scales (Blunch, 2008).

4.5. Confirmatory factor analysis (measurement model)

Two confirmatory factor analysis models were considered (See De Ruyter and Wetzels 1999): one comprised of exogenous constructs (Model A) and another consisted exclusively of endogenous constructs (Model B). The aim is to analyse the set of relations between

observable indicators and latent variables, and evaluate the relationships between them. Model fit was assessed using indices from various categories of fit criteria (see e.g. Blunch, 2008; Byrne 2009), thus overcoming the problem associated with the best index to evaluate the fit of the model (Fan et al. 1999; Byrne 2009).

5. Results

As noted above, the analysis began by identifying companies with broad-scope costing systems that make effective and extensive use of QCI. To this end, we performed a cluster analysis to identify groups of companies with different profiles of the use of the system's QCI. The analysis led to the identification of two heterogeneous groups of companies in terms of profiles of use of QCI. Table 6.1 shows the average scores for the initial sample (n=323) and the mean scores for each group extracted in the cluster analysis. Marked differences were identified between the two groups. Group 1 consists of 112 companies that make more limited use of the information about QC. The mean scores of this group are lower than the mean scores for all companies (n=323) with regard the use of QC for all actions reported in Table 6.1. In contrast, companies in Group 2 seem to make extensive use of information provided by the system. Group 1 is composed of 72.7% of companies with under 100 employees (90.9% have less than 250 employees). The turnover of about 79% of companies does not exceed €15m. Information on QC is essentially prepared in the quality departments (48.8%), the accounting departments (27.4%) or both (19.0%). QCI is mostly prepared annually (53.5%), which explains the less extensive use of this information and also that it is not such an important support in the management process. Only 22.1% and 18.6% of companies prepare monthly and quarterly information on QC, respectively. Group 2 consists of 211 companies. These companies are larger than those of Group 1, both in terms of number of employees and sales volume. About 64 % of companies have less than 100 employees (83.5% have less than 250 employees and 93.4% less than 500 employees). The turnover of 76.8% of the companies is below €40m (69.2 % have a turnover of less than €25m and 65.6% less than €15m). In these companies, the QCI is mainly prepared in the quality departments (61.3%). Information is prepared in the accounting department in 15.7 % and by both departments in 14.2% of the companies. QCI is issued monthly and quarterly in 32.7% and 30.1% of companies respectively. This information is prepared twice a year in 11.7 % and annually in 25.5% of companies. This group of companies therefore makes more extensive and recurrent use of QCI, which suggests it is a useful support for the management process

Table 1: Use of information about QC

Actions:	All companies (n=323)		Groups (mean scores)	
	Mean	SD	Gr.1	Gr.2
Signalling key strategic areas	3.16	1.19	2.35	4.05
Implementing new ideas and ways of doing tasks	3.19	1.16	2.35	4.10
Setting targets and objectives	3.67	1.14	2.45	4.48
Negotiating targets and objectives	3.43	1.14	2.39	4.26
Debating data assumptions and action plans	3.45	1.10	2.40	4.32
Following up significant exceptions and deviations	3.59	1.08	2.41	4.36
Following up pre-set plans and goals	3.64	1.04	2.46	4.37
Aligning performance measures with strategic goals	3.77	1.05	2.58	4.45
Involvement in permanent coordination with others	3.49	1.03	2.53	4.21
Developing, implementing and operating evaluation and control systems	3.50	1.05	2.58	4.20
Learning tool	3.25	1.09	2.56	4.01
Allowing the company to focus on the critical factors for success	3.44	1.05	2.69	4.19

Our next step was to detect significant differences between the two groups of companies in relation to the use of QCI. T-test showed statistically significant differences between the two groups in relation to the use of QCI for all actions presented in Table 6.1. Given the purposes of this study, we then estimated the model using only the companies in Group 2

As mentioned above, two models were initially considered for a confirmatory factor analysis to evaluate and validate the measurement model. Model A is a recursive model, since the variables in this model are not influenced by others. An admissible solution was obtained from the estimation process and allowed for an acceptable fit. The value of χ^2/df was 2.150, below the recommended maximum of 3.00. TLI, NFI and CFI indices range from zero (poor fit) to one (perfect fit), with an acceptable minimum level of 0.90 (Hair Jr. et al. 2010). All indices were above the minimum recommended levels, indicating that the hypothesised model fits the data to a reasonable degree: NFI=0.937; TLI=0.906; CFI=0.944. The RMSEA value was 0.07. Values below 0.05 indicate good fit and values less than 0.08 are acceptable values (Hair Jr. et al. 2010). The associated confidence interval (which ranges from 0.060 to 0.077) indicated the RMSEA value had a good level of accuracy in replicating the model in the population. Model B consists of the endogenous constructs. The estimation process also resulted in an acceptable solution, since the fit quality measures are below the minimum recommended levels: $\chi^2/\text{df} = 1.945$; NFI = 0.920; TLI = 0.945; CFI = 0.954; RMSEA = 0.055.

Once the structure inherent in the measurement model was confirmed and validated, we proceeded to the estimation of the conceptual model to test the research hypotheses. Figure 6.2 shows the results after the estimation process, suggesting that the hypothesised model has a reasonable fit with the data. Factor loadings (standardised regression weights) are also presented and represent statistically significant relationships. Each value refers to the increase in the dependent variable in standard deviation units due to the variation of one unit of standard deviation in the independent variable.

6. Discussion and conclusion

The main objective of this study is to analyse the relationship between the use of QC, improvements in the QMS (through the development of organisational learning and innovativeness) and organisational performance. We claimed that extensive use of QCI is likely to foster organisational learning and the capacity to innovate. This means that it is being used in a diagnostic fashion to motivate and guide organisations towards achieving goals by focussing on and correcting deviations from pre-set performance standards (Henri 2006); it is also used interactively to expand opportunity seeking and learning by focussing attention and fostering dialogue throughout the organisation (Henri 2006).

As noted above, companies that make effective and extensive use of QCI (i.e. that are using this information diagnostically and interactively) were selected. Diagnostic use of information acts as a negative force as it constrains innovation and opportunity-seeking to ensure the achievement of goals set (Simons1995). However, it is also seen as a prerequisite to interactive use (Haas and Kleingeld 1999). Thus, the diagnostic and interactive styles of use are formative elements of the “use of QCI” construct. The estimation process showed that the extensive use of QCI had a positive and statistically significant effect on improving the QMS through the incremental effect on organisational learning and innovativeness; this means that the information provided by the quality costing system is being used by companies to balance tensions between the need for control and the achievement of pre-established objectives – which is the traditional focus of quality costing processes – and the need for learning and innovation (Kominis and Dudau 2012).

Our hypothesis that a positive causal relationship existed between organisational learning and innovativeness was also supported. This is consistent with theoretical assumptions that organisational learning constitutes a major component of innovative ability. Organisational learning fosters knowledge and the associations among past actions, the effectiveness of these actions, and future actions (Fiol and Lyles 1985). The organisation's capacity to use this knowledge for the continuous improvement of quality related processes is an innovative capability.

The causal relationship between organisational learning was also positive and statistically significant. This is relevant in that it shows how the improvements in the QMS impact performance. In light of the positive and statistically significant direct effect of the use of QCI on improving QMS noted above, it is concluded that the extensive use of QCI may have an indirect positive effect on performance, in keeping with previous research.

This chapter highlighted the issue of using QCI to promote the development of QMS through the improvement of organisational learning. Companies have developed and implemented quality costing systems to provide information to support quality management processes. However, many of these companies do not make extensive use of this information, thus limiting the benefits that can be obtained in terms of the development of organisational capabilities, such as organisational learning. More research is needed and additional efforts must be made to highlight this issue and to encourage managers to use QCI to promote participation, dialogue and involvement of all participants and not just to control the accomplishment of predetermined objectives.

Appendix

Questionnaire and results extracted from the statistical analysis

Panel 1: Profile of use of information about costs and other quality indicators provided by the information system

Indicate in which way the information provided by the information system about costs and other quality indicators is used for the following actions. (1- Not used; 5- Used extensively)

Diagnostic use

Setting targets and objectives.
Negotiating targets and objectives.
Following up significant exceptions and deviations.
Following up pre-set plans and goals.
Aligning performance measures with strategic goals.
Involvement in systematic contact with employees.

Interactive use

Signalling key strategic areas.
Implementing new ideas and ways for doing tasks.
Debating data assumptions and action plans.
Developing, implementing and operating evaluation and control systems.
Learning tool.
Allowing the company to focus on the critical factors for success.

Diagnostic profile of use: Cronbach's alpha = 0.957; Interactive profile of use: Cronbach's alpha = 0.939.

Panel 2: Improvement of QMS

Indicate the degree of agreement with the following statements: (1- Completely disagree; 5- Completely agree)

Organisational learning

Learning as a way of taking action to improve is one of the company's core values.
The ability to learn is a key factor for improvement actions in the company.
Learning is understood as a basic capacity that ensures the company's future.
In-company learning is seen as an investment.

Innovativeness: Cronbach's alpha = 0,936; Organisational learning: Cronbach's alpha = 0.866.

Panel 3: Performance

With reference to the last three years, how do you evaluate the degree to which the following organisational goals were attained: (1 - Much lower than expected; 5 - Greater than expected)

Financial performance

Cost (e.g. implementing policies to reduce costs; reaching target costs for the period; etc.).

Sales (e.g. meeting the figures forecast for sales/services or market share).

Profitability (e.g. reaching the expected levels for indicators such as profitability, contribution margin, net income, etc.).

Non-financial performance

Service (e.g. ensuring the performance of products/services, adapting them to customer requirements; assessing the level of consumer satisfaction and meeting deadlines with clients).

Quality (e.g. significantly decrease the percentage of defective products; meet the desired standards of services provided; assessment and the monitoring of QC, etc.).

Productivity (e.g. elimination of waste, productivity of raw materials and human resources).

Human resources (e.g. improvement in indicators such as employee satisfaction, absenteeism, learning, professional and academic training, development of technical capabilities, etc.).

Innovation (e.g. improve levels of sales/services by placing new products/services in the market; expansion into new markets; rate of introduction of new products and/or services; evolution of these indicators in comparison with competitors).

Financial performance: Cronbach's alpha = 0.784; Non-financial performance: Cronbach's alpha = 0.861.

References

- Abernethy, M. & Brownell, P. (1999). The role of budgets in organizations facing strategic change: an exploratory study. *Accounting, Organizations & Society*, 24(3), 189-204.
- Anderson, J. & Gerbing, D. (1988). Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach. *Psychological Bulletin*, 103(3), 411-423.
- Blunch, N. (2008), *Introduction to Structural Equation Modelling Using SPSS and AMOS*. London: SAGE Publications.
- Bromwich, M. & Bhimani, A. (1996). *Management Accounting: Pathways to Progress*. London: Chartered Institute of Management Accountants Publishing.
- Burchell, S., Clubb, C., Hopwood, A., Hughes, J. & Nahapiet, J. (1980). The Roles of Accounting in Organizations and Society. *Accounting, Organizations & Society*, 5(1), 5-27.
- Byrne, B. (2009). *Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming*, 2nd ed., New-York, NY: Taylor & Francis Group.
- Chenhall, R. (2005) Integrative strategic performance measurement systems, strategic alignment of manufacturing, learning and strategic outcomes: an exploratory study. *Accounting, Organizations and Society*. 30(5), 395–422
- Crosby, P. (1979). *Quality Is Free*. New York: Mc-Graw-Hill.
- De Ruyter, K. & Wetzels, M.. (1999). Commitment in auditor-client relationships: antecedents and consequences. *Accounting, Organizations & Society*, 24(1), 57-75.
- Fiol, C. & Lyles, M. (1985). Organizational learning. *Academy of Mng Review*, 10(4), 803-13.
- Fan, X., Thompson, B. & Wang, L. (1999). Effects of Sample Size, Estimation Methods, and Model Specification on Structural Equation Modeling Fit Indexes. *Structural Equation Modeling*, 6(1), 56-83.
- Gilley, J. & Maycunich, A. (2000). *Organizational Learning, Performance and Change*. Cambridge, MA: Perseus Publishing.
- Haas, M. & Kleingeld, A. (1999). Multilevel design of performance measurement systems: enhancing strategic dialogue throughout the organization. *Mng. Acc. Res.*, 10(3), 233-261.
- Hair Jr., J., Black, W., Babin, B. & Anderson, R. (2010). *Multivariate Data Analysis – A Global Perspective*, 7th ed.. Upper Saddle River, NJ: Pearson Prentice Hall.

- Hartmann, F. & Vaassen, E. (2003). The Changing Role of Management Accounting and Control Systems. In A. Bhimani (Ed.), *Management Accounting in the Digital Economy* (pp. 112 - 132). Oxford: Oxford University Press.
- Henri, J.-F. (2006). Management control systems and strategy: A resource-based perspective. *Accounting, Organizations & Society*, 31(6), 529-558.
- Jafari, A. & Rodchua, S. (2014). Survey research on quality costs and problems in the construction environment. *Total Quality Mngt and Business Excellence*, 25(3-4), 222-234.
- Jajua, S., Mohanty, R. & Lakhe, R. (2009). Towards managing quality cost: A case study. *Total Quality Management*, 20(10), 1075-1094.
- Kominis, G. & Dudau, A. (2012). Time for interactive control systems in the public sector? The case of the Every Child Matters policy change in England. *Management Accounting Research*, 23(2), 142-155.
- Lal, J. & Srivastava, S. (2009). *Cost Accounting*, 4th ed., New Delhi: Tata McGraw-Hill.
- Lukka, K. & Granlund, M. (2003). Management and Control in a New Economy Firm. In A. Bhimani (Ed.), *Management Accounting in the Digital Economy* (pp. 239 - 259). Oxford: Oxford University Press.
- Makhopadhyay, A. (2004). Estimation of cost of quality in an Indian textile industry for reducing cost of non-conformance. *Total Quality Management and Business Excellence*, 15(2), 229-234.
- Naranjo-Gil, D. & Hartmann, F. (2006). How top management teams use management accounting systems to implement strategy. *J. of Mng. Accounting Research*, 18(1), 21-53.
- Perera, S., Harrison, G. & Poole, M. (1997). Customer-Focused Manufacturing Strategy and the Use of Operations-Based Non-Financial Performance Measures: A Research Note. *Accounting, Organizations & Society*, 22(6), 557-572.
- Prickett, T. & Rapley, C. (2001). Quality costing: A study of manufacturing organizations. Part 2: Main survey. *Total Quality Management*, 12(2), 211-222.
- Roberts, H. (2003). Management Accounting and the Knowledge Production Process. In A. Bhimani, (Ed.). *Management Accounting in the Digital Economy* (pp. 260 - 283). Oxford: Oxford University Press.
- Sansalvador, M. & Brotons, J. (2013). Quality costing analysis: a case study of a Spanish organisation. *Total Quality Management and Business Excellence*, 24(4), 378-396.
- Scott, T. & Tiessen, P. (1999). Performance measurement and managerial teams. *Accounting, Organizations & Society*. 24(3), 263-285.
- Simons, R. (1995). *Levers of control: how managers use innovative control systems to drive strategic renewal*. Boston: Harvard Business School Press.
- Slater, S. & Narver, J. (1995). Market orientation and the learning organization. *Journal of Marketing*. 59(3), 63-74.
- Smith, M. (2005). *Performance Measurement & Management – A Strategic Approach to Management Accounting*. London: SAGE Publications.
- Sower, V., Quarles, R. & Broussard, E. (2007). Cost of quality usage and its relationship to quality system maturity. *Int. Journal of Quality and Reliability Management*, 24(2), 121-140.
- Tippins, J. & Sohi, R. (2003). IT competency and firm performance: is organizational learning a missing link? *Strategic Management Journal*, 24 (8), 745-761.
- Vaxevanidis, N., Petropoulos, G., Avakumovic, J. & Mourlas, A. (2009). Cost of Quality Models and Their Implementation in Manufacturing Firms. *International Journal for Quality Research*, 3(1), 27-36.
- Yang, C. (2008). Improving the definition and quantification of quality costs. *Total Quality Management*, 19(3), 175-191.
- Zoolo, M. and Winter, S. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Sciences*, 13(3), 339-351.