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Does total quality management still shine? Re-examining the total quality management effect on financial performance

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This paper re-examines the effects of total quality management (TQM) on firms' financial performance by reviewing the findings of the empirical literature. It assesses the appropriateness of different financial measures while evaluating the impact of TQM as reported by various studies. We propose a new conceptual model to empirically test the effect of TQM implementation on financial performance – one that is meaningful for shareholders. There is near consensus that the overriding objective of a firm should be to maximise shareholders' wealth. We conclude by briefly reviewing the methodological limitations inherent in studies in this field and recommend avenues for further empirical research on TQM's impact on financial performance.

Keywords: TQM; shareholder return; financial performance; proxy

1. Introduction

Total quality management (TQM) is crucial to the process of satisfying customers' needs and generating business profits. It can be seen as a journey rather than a destination with management commitment essential to its success in an organisation. There is a need, for example, for all employees to remain committed to TQM and willing to combat waste, shrink costs, and bring about steady improvements. Shareholders' and financial institutions' commitment is also key to long-term business performance (Zairi, Letza, & Oakland, 1994). TQM implementation carries both costs and advantages that can only be justified if they have a significant impact on financial performance (Shahin, 2011). Therefore, it is important to gauge the impact of such costly procedures.

1.1. *The foundations of TQM*

Advocates of TQM suggest that there is a positive relationship between TQM implementation and firms' financial performance, but empirical studies have yielded mixed findings. Most studies focusing on the effect of TQM have investigated soft measures such as managers' perceptions, and only a limited number have reported the effect of TQM on financial performance (York & Miree, 2004).

Improved quality should shrink costs and thus yield a positive outcome for financial performance. Moreover, superior-quality products or services should enhance the retention rate of existing customers and attract new ones, thus strengthening market share and revenues (Rust, Zahorik, & Keiningham, 1994; Slater & Narver, 1995; Sterman, Repenning, & Kofman, 1997). In addition, improved-quality products or services

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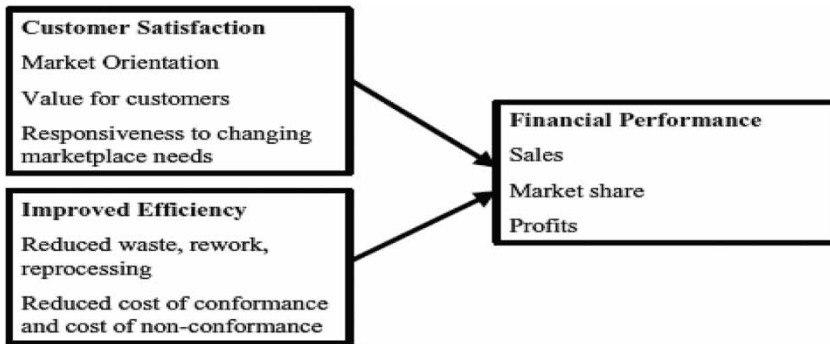


Figure 1. TQM and financial performance model.

Source: York and Miree (2004).

should also increase consumer loyalty, stock prices, and productivity and reduce customer complaints (Hendricks & Singhal, 1996; Rust et al., 1994).

According to York and Miree (2004), the fundamental theoretical foundation for the link between effective TQM practices and financial performance relies on two expected relationships. First, TQM emphasises the generation and retention of customers, which leads to higher revenues by increasing a firm's market share and reducing costs through product design efficiency. Second, TQM results in process improvements both in the manufacturing and services sectors, which lead to higher profits through product reliability and costs cut through process efficiency. The authors' conceptual model of TQM is shown in Figure 1. In sum, doing the right thing and doing it more efficiently should have a positive effect on several financial performance measures.

1.2. *Contribution to the literature*

This study moves beyond the existing research and aims to evaluate the appropriateness of the different initiative proxies used to measure TQM and financial performance. While other studies have used a wide range of financial ratios to measure financial performance with diverse results, we critically evaluate the justifiability of using profitability ratios. Ratios that are used as proxies of financial performance may be meaningful to firms but are they as meaningful to shareholders? Do these proxies measure what they should?

Our aim is to contribute to the existing literature by proposing a new relationship in the form of a conceptual model that gauges the direct effect of TQM implementation – including award winners and world-class TQM practices – on those measures of financial performance that are meaningful to firm shareholders (owners). We argue that a shareholder's realised rate of return is the most appropriate proxy for the firm's financial performance and that all other ratios should be calculated for supplementary purposes.

1.3. *Research questions*

We put forward the following questions:

- RQ1: Is successful TQM implementation reflected in the firm's financial performance in the literature?

- RQ2: What is the best measure (proxy) of financial performance to gauge the impact of TQM on the firm's financial performance?
- RQ3: How have various studies measured TQM relative to financial performance?

2. The theory of TQM

York and Miree (2004) define TQM as a set of instruments employed by the firm's management that aim to provide better value to customers by recognising their observable and hidden needs (which are sensitive to changing markets) and improving the efficiency of the procedures that generate the product or service. All entities engage in quality improvements regardless of their size or financial status (Hodgetts, 1996). Oakland (1989) defines TQM as 'an approach to improve competitiveness, efficiency and the flexibility for the whole organization'. The European Foundation for Quality Management excellence model advocates performance as the achievement of an individual, team, organisation, or process. Magd and Curry (2003) argue that the concept of ISO 9000 and TQM complement each other. The focus on quality has led to the implementation of TQM and the external recognition of quality has led to the development of ISO 9000. Hence, ISO 9000 certification can be used as a proxy for TQM.

Lascelles and Dale (1991) identify six TQM adoption levels: (i) uncommitted, (ii) drifters, (iii) tool purchasers, (iv) improvers, (v) award winners, and (vi) world class (see Figure 2). These levels are not stages of TQM as much as they reflect how a firm responds to TQM. At level five, the organisation has reached quality maturity and adopted the requisite culture, value, capabilities, relationship, trust, and employee involvement. Very few firms reach level six, which fully incorporates quality excellence and the moulding of business strategies to customer satisfaction.

2.1. The positive effect of TQM on financial performance

York and Miree (2004) use a sample of Baldrige Award winners to examine the relationship between TQM and financial performance; they repeat the exercise for State Quality Award winners. Financial performance is gauged by three different measures: operating income, net sales, and the cost of goods sold (COGS). They conclude that both samples – the Baldrige

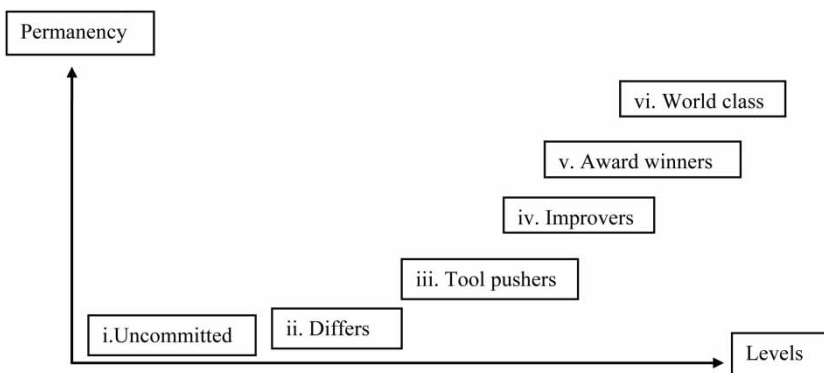


Figure 2. Different levels of TQM adoption.
Source: Lascelles and Dale (1991).

Award winners and State Quality Award winners – reflect healthier financial performance than their peers before and after winning the quality award.

Hendricks and Singhal (2000b) measure financial performance in terms of stock returns, operating income, sales, and costs as TQM maturity varies. They argue that long-run share prices depend on operating income, hence justifying its use as a financial measure. Although the cost measure is not explicitly addressed in their study, they offer a sound rationale for using stock prices as a measure of financial performance; their reasoning is aligned with one of the goals of our study in that stock price performance is commonly stated and can easily be understood and traced. Generally, share price performance is of immense concern to all stakeholders, including shareholders, senior management, employees, suppliers, and fund managers. Theoretically, the goal of a firm should be to maximise its shareholders' wealth, of which share price is a component. Hendricks and Singhal conclude that award-winning firms had been able to beat indices such as the New York stock exchange, American stock exchange, and National Association of Securities Dealers Automated Quotation in terms of shareholder rates of return. The portfolios of indexed firms had experienced a gain of 76% compared to 114% realised by investing in the shares of award-winning companies in the same period. Moreover, award-winning firms also outperformed other firms in the same industry by 26%.

Hendricks and Singhal (2000b) carry out an exhaustive analysis of stock price performance over five years in the post-TQM implementation period. Their results indicate that award-winning firms outperform the index in four of five years. Financial performance thus improves dramatically when TQM is implemented effectively. Boulter, Bendell, and Dahlgaard (2013) use the same methodology (event study) to analyse stock returns and accounting-based performance. They report that, regardless of the dissimilarity in firms' structures and institutional settings between the USA and Europe, quality award-winning firms showed signs of sturdy financial performance.

Radder (1998) studies TQM in terms of 'stakeholders delight' rather than shareholder returns. He defines the stakeholder as anyone whose actions affect or are affected by the actions of the firm. He proposes that complex learning is essential for innovation and creativity and that such learning is likely to result in stakeholders delight. Shahin (2011) investigates the impact of TQM practices on the financial performance of the Boutan Industrial Corporation. Six different ratios – the current ratio, the quick ratio, the return-on-assets (ROA) ratio, return-on-equity ratio, debt-to-total-assets ratio, and total-assets-turnover ratio – are used to quantify financial performance. The findings at a 95% confidence interval reflect the positive impact of TQM. Modi and Mishra (2011) show that resource efficiency is positively linked to the firm's financial performance. However, their results reveal that the financial gains from resource efficiency show diminishing returns. The strength of this study lies in its use of the Carhart four-factor model rather than the capital asset pricing model (single-factor) or Fama and French (three-factor) model to estimate the rate of return.

Hansson and Eriksson (2002) apply different financial performance indicators, including sales, total assets, the number of employees, ROA, and the return on sales (ROS) to a sample of Swedish quality award-winning firms with their branch indices and competitors. They find that the award recipients as a group outperform the branch index and their identified competitors on most of these indicators. The important point they make is that it is only in the post-TQM implementation period that these firms begin to outperform their competitors.

Ahmadi and Helms (1995) have designed an instrument to quantify TQM, but their proposed questionnaire does not cover the relevant financial measures. Similarly, Pham (2010) puts forward a conceptual TQM model for Vietnamese companies that integrate four important constructs for manufacturing firms: (i) TQM, (ii) competitive advantage,

(iii) employee satisfaction, and (iv) firm financial performance. However, the study does not propose measures to quantify these constructs. Kaziliūnas (2010) confirms the financial benefits of ISO 9000 certification but stresses that continuous improvement is a crucial factor during the post-certification period.

Hendricks and Singhal (2001) conduct an event study using stock prices as a proxy for financial performance and award-winning firms as a proxy for successful TQM. They find no difference in stock price performance during the TQM implementation period but show that, post-implementation, award-winning firms are found to have significantly outperformed firms against the control group. Their results imply that effective TQM implementation leads to significant wealth creation for shareholders. This finding is similar to that of Corbett, Montes-Sancho, and Kirsch (2005) who also employ an event-study methodology to calculate abnormal returns. They conclude that significantly better financial performance (as quantified by abnormal returns) arises after three years of ISO 9000 certification. It appears, therefore, that it is never too late to implement TQM.

We attempt to move beyond the existing literature and focus on the appropriateness of various TQM and financial performance measures. Our study weighs the precision of measuring different financial ratios and then asks if these ratios are as meaningful to shareholders. Do these proxies gauge what they should be gauging? We propose a new conceptual model that measures the direct effect of TQM implementation (level six) on financial performance; we then assess if these measures are meaningful to shareholders.

2.2. Do results vary with early or late TQM adoption?

Montes and Jover (2004) carry out a cluster analysis of a sample of Spanish financial firms in order to determine if there is any difference in the performance of those firms that introduced TQM first and those that followed. They conclude that firm performance is uncertain and depends on the period during which the TQM system was initiated. However, the study does not specify which proxy is used to measure financial performance.

Hendricks and Singhal (2000a) study various characteristics (firm size, the degree of capital intensity, the degree of diversification, the timing of TQM implementation, and the maturity of the programme) of a sample of award-winning firms and their financial performance (operating income). They find that small firms tend to fare significantly better than large firms. However, the study provides weak evidence for the financial performance of capital-intensive and diversified firms. Moreover, there is no significant difference between the performance of firms that implemented TQM earlier and those that did so later.

Corredor and Goñi (2011) compare a sample of award-winning Spanish firms with a control group, and find that TQM pioneer firms reported performance gains over the latter. They measure performance in terms of ROA, the cash-flow-by-investment ratio, ROS, added value per employee, sales revenue per total assets, the debt-to-equity ratio, and the working-capital-to-sales ratio. Late implementers did not report similar gains. Benner and Veloso (2008) also find that the financial gains (ROA, ROS, stock market-based measures, Tobin's Q) of ISO 9000-certified firms diminish as numerous competitors in an industry adopt similar certification and late adopters can no longer reap its financial benefits.

2.3. Is the effect of TQM implementation on financial performance direct or indirect?

Ciptono, Ibrahim, Sulaiman, and Kadir (2011) study financial performance (profit, market share enhancement, and cost reduction) as an endogenous variable with six exogenous

variables (quality improvement programme, supervisory leadership, supplier involvement, top management commitment, training to improve products/services, and cross-functional team relationships among strategic business units) and three mediating variables (world-class company practices, excellence practices, and company nonfinancial performance). The results show that all six quality management practices have a significant, positive indirect effect on financial performance – through the mediation of world-class company practices – as well as on nonfinancial performance. World-class company practices, excellence practices, and company nonfinancial performance are found to act as partial mediators between quality management practices and company financial performance. A company's nonfinancial performance is found to have a significant impact on its financial performance.

Duh, Hsu, and Huang (2012) apply structural equation modelling to a sample of 209 firms and find that firm size and the level of competition affect the functioning of TQM. They also report that the functioning of TQM is positively related to firm performance, be it nonfinancial or financial. TQM implementation is found to have a direct effect on nonfinancial performance and an indirect effect on financial performance. Li, Benton, and Leong (2002) investigate whether better quality performance positively affects hospitals' cost performance and if better cost performance contributes to better financial performance. Their findings suggest that hospitals' financial performance is indirectly affected by quality measures and directly affected by cost measures.

Albacete-Sáez, Fuentes-Fuentes, and Bojica (2011) study the role of leadership in the implementation of quality management and its effect on financial performance. They conduct a multi-group analysis for a sample of 256 firms and find that quality management is effectively implemented when supervised by general managers rather than quality managers. When the effect of quality management on financial performance is measured, the relationship is found to be significant only for quality directors. General managers, therefore, do better in implementing quality management practices. However, the authors do not find that quality-related practices have a direct influence over the financial results.

2.4. Weak links between TQM and financial performance

Hafeez, Malak, and Abdelmeguid (2006) find that firms experience difficulty in translating TQM theory into practice. Only a small number of organisations have successfully adopted a holistic approach to TQM and most of them have focused on technology elements rather than soft issues. Bergquist and Ramsing (1999) provide a negative picture of TQM execution and argue that it is difficult to ascertain the relationship between TQM and firm performance. They identify two main reasons for this: unclear description and unsuccessful implementation of TQM.

Bhat and Rajashekhar (2009) point to the lack of customer orientation, planning for quality, total involvement, management commitment, and resources as potential barriers to successful TQM implementation. Han, Chen, and Ebrahimpour (2007) suggest that neither ISO 9000 nor TQM has a significant, positive direct effect on business performance. Using multiple regression, Duarte, Brito, Di Serio, and Martins (2011) survey 1200 Brazilian firms and conclude that TQM (ISO certification) has a weak negative relationship with financial performance (profitability and growth).

Aarts and Vos (2001) explain shareholder returns and the progression of ISO registration based on an event study and find support for a semi-strong market hypothesis. They find no market reaction to ISO registration announcements. ISO-registered firms are found to perform poorly compared to the index and the choice of certifying authority

is reported to influence subsequent firm performance. Firms who pursued ISO registration incurred agency costs and their financial managers were found to be ineffective. Therefore, adopting ISO standards does not maximise shareholder wealth. However, their study ignores dividend yields as a part of shareholder wealth and is also subject to robustness issues.

Demirbag, Tatoglu, Tekinkus, and Zaim (2006) empirically investigate which important factors determine TQM along with its effect on business performance (nonfinancial and financial) in the Turkish textile industry. Employing exploratory factor analysis, confirmatory factor analysis, and structural equation modelling, the study identifies seven dimensions of TQM. The authors report a strong relationship between TQM implementation and nonfinancial performance but a weak relationship between TQM practices and financial performance. They do not, however, account for industry effects as York and Miree (2004) report that the difference between award-winning and other firms depends on the Standard industrial classification (SIC) code. Since the study aggregates firms across SIC codes, this may have hidden industry differences.

Kober, Subraamanniam, and Watson (2012) explore TQM practices in small and medium enterprises (SMEs) and find that TQM improvements do not result in sound financial performance (sales, profit, turnover, return-on-investment/capital ratios) after controlling for size and risk. Therefore, TQM practices for large companies are not the same as for SMEs. The authors suggest that TQM implementation is necessary for the SME sector because it makes up a substantial share of any country's total business population and therefore strongly determines employment.

Williams (1997) argues that the implementation of ISO 9000 standards leads to the TQM journey and eventually results in customer satisfaction and better financial performance. We can therefore conclude in response to our first research question that TQM implementation does not always result in positive financial performance. Is this an implementation problem or a measurement problem? To answer the third research question, Table 1 outlines how TQM and financial measures are quantified by various studies.

3. Discussion and conclusion

We now evaluate TQM and the financial proxies for performance, having reviewed the relevant literature. As Table 1 shows, more than 60% of the studies cited refer either to award winners or ISO-certified firms as successful TQM implementers. There seems to be no issue in using these proxies for two reasons: first, ISO certification is one of the stages of TQM implementation (Lascelles & Dale, 1991); and second, almost all the studies have chosen one type of award.

Magd and Curry (2003) affirm that ISO 9000 certification and TQM implementation complement each other. The focus on quality leads to the implementation of TQM and external recognition of quality leads to the achievement of ISO 9000 certification. Therefore, ISO 9000 certification can be used as a proxy for TQM implementation.

However, a serious issue arises in the choice of proxies for financial performance. Obviously, whatever actions the firm takes should be in favour of maximising shareholders' wealth, which is only possible by providing dividends and capital gains. In finance, stock returns are usually calculated using the natural log of P_0 and P_1 , i.e. $\ln(P_1/P_0)$ instead of $(P_1 - P_0) + D/P_0$, where P_0 is the previous price, P_1 is the current price, and D is the cash dividend. Very few studies have used stock price performance, i.e. $\ln(P_1/P_0)$, and to the best of our knowledge, no study has attempted to test the relationship between TQM and dividend yield (D/P_0), which is a major component of

Table 1. Proxies used for TQM implementation and financial performance.

No.	Author	Financial measure proxy	Journal	TQM proxy	Country
1	Williams (1997)	Sales, profit, turnover, return on investment/capital ratios	The TQM Magazine	ISO 9000	UK
2	Hendricks and Singhal (1999)	Stock returns, operating income, sales, and costs	Quality Progress	Award winners	USA
3	Hendricks and Singhal (2000a)	Operating income	Journal of Operations Management	Award winners	USA
4	Aarts and Vos (2001)	Abnormal returns	The TQM Magazine	ISO 9000	New Zealand
5	Hendricks and Singhal (2001)	Stock prices	Management Sciences	Award winners	USA
6	Li et al. (2002)	Market share, operating profit, and return on assets and investment	Journal of Operations Management	Clinical quality and customer satisfaction	USA
7	Hansson and Eriksson (2002)	Percent change in sales, total assets, and number of employees, ROA, ROS	Measuring Business Excellence	Quality award recipients	Sweden
8	Montes and Jover (2004)	Not reported	The Service Industries Journal	Dillman (1978)	Spain
9	Ketokivi and Schroeder (2004)	Price	Journal of Operations Management	World-class company practices	USA, UK, Germany, Italy, and Japan
10	York and Miree (2004)	Operating income, net sales, COGS	Journal of Operations Management	Baldrige Award and State Award winners	Not reported
11	Corbett et al. (2005)	Abnormal returns, ROS, ROA, sales/assets, and COGS/sales	Management Sciences	ISO 9000	USA
12	Han et al. (2007)	Profit and market share	Journal of Business and Economic Studies	ISO 9000	USA
13	Benner and Veloso (2008)	ROA, ROS, stock market-based measures, and Tobin's Q	Journal of Operations Management	ISO 9000	USA
14	Pham (2010)	Anecdotal	Business Studies Journal	Anecdotal	Vietnam
15	Ciptono et al. (2011)	Profit, market share, and cost reduction	Gadjah Mada International Journal of Business	World-class company practices	Malaysia
16	Modi and Mishra (2011)	Stock returns, Tobin's Q , and ROA	Journal of Operations Management	Efficiency of good operations management	USA
17	Corredor and Goñi (2011)	ROA, CFOI, ROS, AVOE, SOA, DOE, and WOS	Journal of Business Research	Award winners	Spain
18	Duarte et al. (2011)	Profitability and growth	Brazilian Administration Review	ISO certification	Brazil
19	Shahin (2011)	Current ratio, quick ratio, ROA, ROE, D/A, and total-assets-turnover ratio	International Journal of Business and Social Science	Not reported	Boutan
20	Klingenberg et al. (2013)	ROA, ROE, and BEP	International Journal of Production Economics	Not reported	USA
21	Boulter et al. (2013)	Stock returns, sales, cost/sales, capital expenditure, total value of assets, operating income, and number of employees	International Journal of Operations and Production Management	Quality award recipients	EU

Notes: CFOI, Cash flow by investment; AVOE, Added value per employee; SOE, Sales revenue per total assets; DOE, Debt to equity; WOS; Working capital to sales ratio.

the shareholder rate of return. Recent studies have started paying attention to rigorous methodologies: Boulter et al. (2013) rightly calculate shareholder returns but they could also have used other financial ratios, such as net operating profits after taxes (NOPAT) to calculate managerial performance.

The successful implementation of TQM depends on leadership (managers' performance) and, therefore, along with shareholder returns, managers' performance should also be calculated using the NOPAT. This ratio is used because NOPAT is a result of the firm assuming only business risk and zero financial risk. Managers' performance in operating areas should be evaluated by assuming that the firm has taken zero debt (Brigham & Houston, 1998) and, therefore, has zero financial risk. However, no study has quantified financial performance based on this fine distinction.

Klingenberg, Timberlake, Geurts, and Brown (2013) critically evaluate the use of profitability ratios such as ROA, return on equity (ROE), and basic earning power (BEP) to determine the effect of a given operations strategy on the firm's performance. Their findings show that there is no reliable association between ROA, ROE, BEP, and inventory management ratios. Firm profitability is affected by at least two factors: the results of its operations and the way it is financed (cheap debt enhances profitability). They conclude that the firm's operations strategy cannot be isolated from its financial management strategy. For this reason, profitability ratios such as ROA, ROE, and BEP, which sum up all the firm's activities, may not be appropriate for determining the effect of just-in-time (JIT) and lean manufacturing methods on financial performance.

BEP – measured as earnings before interest and taxes/total assets – is the ratio that relates the level of assets and operating income. It is free from the effect of financial leverage and tax and is useful for comparing firms across different tax slabs and financial structures. However, NOPAT, unlike BEP, considers income after tax but excludes the impact of interest expenses. In addition to stock returns (composed of both capital gains yield and dividend yield), researchers should employ BEP and NOPAT as measures of financial performance. This would permit a comparison of firms' pure operating performance through different degrees of financial leverage (Brigham & Erhardt, 2011).

ROA (net income/total assets) shows the profitability of the firm by comparing net income to the assets needed to generate it. Net income is arrived at after deducting interest and tax from operating income; ROA is therefore affected by financial leverage as well as the tax rate on corporate profits (Brigham & Erhardt, 2011). If we assume that the return on operations for a firm is 7%, partly financed by debt at an interest rate of 4%, then for every dollar financed, the firm realises a spread of 3%. The impact increases when more assets are financed by debt. ROA takes in the debt effect and is not a good financial measure of operations (Brigham & Houston, 1998).

ROE shows how well the available equity is used to generate net income. Like ROA, it also includes the effects of financial leverage, which are calculated based on net income after interest and taxes (Brigham & Erhardt, 2011). Klingenberg et al. (2013) argue that decreasing inventory levels per se does not have an immediate effect on ROE as there are no assets in the ratio. Hence, it is a better measure than ROA. However, this can be challenged on the grounds that assets are included if we calculate ROE based on the DuPont principle: (assets/equity, net income/sales, sales/assets).

ROA can also be measured through the DuPont analysis as the product of asset turnover (revenue/assets) and profit margin (net income/revenue). Klingenberg et al. (2013) propose that it may be possible to isolate the effect of financial leverage on ROA by analysing each component independently. Table 2 answers our second research question and gives the best five financial measures along with their justification.

Table 2. Financial proxies to measure financial performance.

Financial proxy	Source	Reason
Stock returns	Boulter et al. (2013) Modi and Mishra (2011) Corbett et al. (2005) Aarts and Vos (2001) Hendricks and Singhal (2001)	Stock returns are the returns to shareholders (true owners of the firm)
Dividend yield	This study	Dividends are the return to shareholders (owners) even when prices are falling
ROE (through DuPont analysis)	Klingenberg et al. (2013)	To check if decreasing inventory levels have an immediate effect on ROE
ROA (through DuPont analysis)	Klingenberg et al. (2013)	To isolate the effect of financial leverage on ROA by analysing each component independently
Tobin's Q	Modi and Mishra (2011) Benner and Veloso (2008)	Helps to identify under- and overvalued stocks
Sales or ROS	Boulter et al. (2013) Corredor and Goñi (2011) Benner and Veloso (2008) Hendricks and Singhal (2000b) Hansson and Eriksson (2002) York and Miree (2004) Corbett et al. (2005) Williams (1997)	Profitability and market share depend on sales
NOPAT	This study	Measures managers' performance by assuming the firm has taken zero debt
BEP	Klingenberg et al. (2013)	Free from financial leverage and tax effect and is useful for comparing firms in different tax and leverage situations

These results may surprise managers looking for one sound method to evaluate the firm's operating performance. Based on the discussion above, we propose that a new conceptual model is needed. This is shown in [Figure 3](#), which is a modified version of York and Miree's (2004) model. It also answers our third research question on the direct effect of TQM implementation (both for award winners and world-class practices) on financial performance, which is meaningful to firm shareholders (owners), along with other justified ratios. We suggest that the proposed model should be tested longitudinally for an emerging economy, using a rigorous and robust statistical methodology. Such empirical testing is likely to add significant value to the literature and theoretical developments.

It is important to point out that the studies reviewed have serious instrument, methodology, and robustness issues although some have made a good attempt to investigate TQM and financial performance in developing countries where quality management remains vital. This study tries to fill the gap by proposing new proxies for TQM and financial performance, thus building on York and Miree's (2004) model. The new proxy for

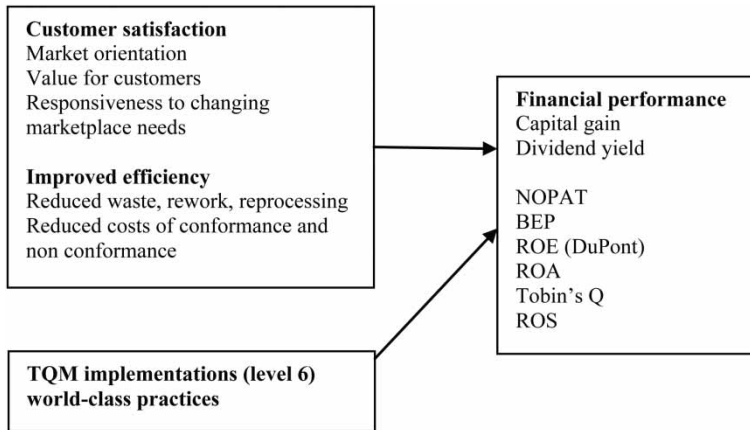


Figure 3. Proposed conceptual model.
Note: Adapted from York and Miree (2004).

TQM implementation is level six of TQM (Lascelles & Dale, 1991); NOPAT and dividend yield are proposed as new proxies for financial performance in addition to the existing ratios.

4. Limitations and future research

The proposed model needs to be tested empirically, leaving solid grounds for future research. To the best of our knowledge, no study on TQM and financial performance has yet successfully addressed the research question we proposed earlier. Therefore, the question of the causal link between TQM and financial performance remains unanswered because of the questionable proxies used to quantify both.

The purpose of this study is not to discourage the use of financial ratios but to emphasise that their use should supplement the proxy for shareholder returns. The important point to remember is that the proxy for financial measures should be absolutely meaningful to shareholders. In addition, we suggest including NOPAT, which reflects managers' performance without financial leverage, and BEP, which reflects financial performance without financial leverage.

There is significant room for future research to explore the impact of TQM on financial performance. First, more rigorous and robust research is needed – most of the existing studies are anecdotal and thus subject to bias. Respondents cannot assess the causal link between quality management and financial performance. Only a rigorous statistical methodology along with robustness testing will yield valid results. For example Wayhan, McCallum, and Golyer (2013) study the relationship between TQM and financial performance using two research methodologies. They carry out a cross-sectional analysis using the *t*-test and Multivariate analysis of variance for repeated measures for 93 US firms that won supplier quality awards. Unfortunately, very few studies have this high level of sophistication and statistical rigor.

Second, future research should focus on a longitudinal research design rather than cross-sectional: longitudinal studies are considered to be real-time studies (Meglio & Risberg, 2010) and are more suitable because TQM implementation is a long process.

Third, researchers should consider replicating their studies for multiple countries in order to generalise their results, especially for emerging economies where brand outsourcing is becoming more common and maintaining quality is crucial.

Fourth, more research is needed on the relationship between world-class practices and financial performance – so far, only a handful of studies have analysed the relationship between level six of TQM (Lascelles & Dale, 1991) and financial performance.

Finally, this study has only looked at the relationship between TQM and firm performance, whereas Wagner, Grosse-Ruyken, and Erhun (2012) argue that supply chain fit also affects financial performance (ROA). Klingenberg et al. (2013) also suggest that, in addition to TQM, other determinants may reflect a firm's performance, e.g. lean manufacturing or JIT production, environmental management systems, and the Lean Green Six Sigma.

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