



THE IMPACT OF TQM ADOPTION ON SME FINANCIAL PERFORMANCE

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Abstract

Many studies have demonstrated the positive impact of total quality management (TQM) practices on the financial performances of large listed companies. However, there have been fewer studies examining the impact of TQM practices on small- and medium-sized enterprises (SMEs) and these have typically relied on managers' self-assessments of performance in reaching their conclusions. This is not surprising given the restricted availability of financial performance data for smaller enterprises. This study accesses the Australian Bureau of Statistics (ABS) Business Growth and Performance Survey, which contains financial data for SMEs, to examine the association between TQM and financial performance. An analysis based on 3,776 firms finds no evidence to suggest that adopting TQM practices improves the financial performances of SMEs.



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Introduction

The effectiveness of total quality management (TQM) as a mechanism for organisational improvement has been widely debated in the literature. Proponents of TQM claim that this philosophy leads to improved firm performance and this outcome has been demonstrated by a number of studies (for example, Flynn, Schroeder and Sakakibara 1995; Powell 1995; Samson and Terziovski 1999; Terziovski and Samson 1999). Proponents of TQM also contend that the philosophy can be applied to any organisation (Powell 1995). Wernick (1991, p.15), for example, suggested that even the “smaller firm with limited resources can apply TQM principles with measurable success and without undue expense”. Many of the studies that have examined the relationship between TQM and performance, however, have focused on large organisations, and the literature recognises that TQM studies on small and medium enterprises (SMEs) is limited (Parkin and Parkin 1996; Walley 2000).

Prior studies that have examined the attitudes of small- and medium-sized enterprises (SMEs) towards TQM have often reported that managers perceive the lack of resources and the cost of implementation as obstacles to its adoption (for example, Spendlove 1997; Walley 2000). Furthermore, SMEs often implement TQM in response to external pressures rather than as the result of internally generated initiatives to improve quality or reduce costs (Spendlove 1997; Guilhon, Martin and Weill 1998; Sun and Cheng 2002). Shea and Gobeli (1995) looked at whether TQM was a worthwhile investment and, based on interviews with ten SME owners, concluded that TQM could be used to improve small business performance.

A major drawback of the research examining the association between TQM and performance has been the availability of financial data. In fact, Agus and Abdullah (2000) acknowledged that the confidentiality associated with financial data meant that their research was constrained to listed companies. This would explain why prior research examining the relationship between TQM adopters and firm performance in SMEs has predominantly relied on managers’ self-assessments of performance.

This study examined the financial performance of TQM adopters in Australian SMEs using data obtained from the Australian Bureau of Statistics (ABS) Business Growth and Performance Survey conducted in 1995/96. SMEs selected for this survey were legally required to participate in the survey and were compelled to report their financial results. Having access to this database facilitated a more objective assessment of the impact of TQM adoption on the financial performance of Australian SMEs. Based on a sample of 3,776 firms, this study found no evidence to suggest that adopting TQM practices improved key financial performance indicators.

In the next section we provide a review of the literature on TQM and SME performance. This leads to the development of the hypothesis to be tested in this study. We then provide further details concerning the data used in this study, including some descriptive information on our sample of Australian SMEs. The fifth section provides a discussion of the results from analysing this data, and is followed by our conclusions and suggestions for future research.

Review of Literature

Moreno-Luzon (1993) examined the effectiveness of TQM in a survey of 44 small manufacturing companies in Valencia, Spain. Effectiveness was measured on the basis of managers’ satisfaction with the achievement of specific objectives and their estimation of the change in several performance variables over a one-year period believed to be a consequence of the quality program. Overall, the managers indicated a high level of achievement of their TQM objectives, and some managers perceived that their TQM programs had resulted in highly positive effects. In particular, the most frequently cited effects were the development of a quality culture (with 77% of firms experiencing this effect) and improved training



(72.7%). Increased profits and increased sales were less frequently cited, with 63.6% and 50% of firms experiencing these effects, respectively.

From their survey of 42 French SMEs regarding ISO 9000 certification, Guilhon et al. (1998) reported that the quality program had improved organisational performance (for example, commitment and process quality), but had not significantly improved financial performance (that is, sales, market share and profit). Guilhon et al. (1998) noted, however, that a large proportion of their sample was in the process of certification and this could have accounted for their findings.

Walley (2000) provided insights to the effect of TQM in SMEs in the UK farming sector. Respondents were asked to rate the impact of TQM on a range of criteria. Based on the responses of 25 farmers who had implemented TQM (15.2% of the sample)¹, Walley (2000) concluded that although some farmers had indicated that TQM had resulted in slight decreases in criteria such as 'cost efficiency' and 'profitability', on average TQM appeared to have a small positive effect on overall performance. Criteria where TQM had a major impact were 'quality awareness' and 'employee morale'.

Anderson and Sohal (1999) sent a questionnaire to 670 small businesses in Australia. The survey contained questions pertaining to six quality variables (leadership; strategy, policy and planning; information and analysis; people; customer focus; and quality of process, product and service). Respondents were asked to rate, using a five-point scale,² the impact of these variables on six measures of business performance (sales; exports; cash flow; employment levels; overall competitiveness; and market share). Sixty-two small businesses returned the completed questionnaire. Anderson and Sohal (1999) reported that quality practices and procedures were perceived to have the highest impact on the overall competitiveness of the business, followed by sales, market share, employment levels and cash flows. The practices and principles were perceived to have the least impact on exports.

Rahman (2001) studied the relationship between TQM practices and three business outcomes in SMEs in Western Australia. A questionnaire was developed which asked respondents to rate themselves on the extent to which they practiced 36 TQM practices. These questions pertained to the same six quality criteria examined in Anderson and Sohal's (1999) study. Business outcomes were defined in terms of revenue, profit, and the number of customers. Again, a self-rating scale was used to measure business outcomes. The questionnaire was sent to 250 SMEs, and 49 usable responses were received. Rahman (2001) reported that 'leadership', 'processes, products and services', 'people', and 'customer focus' were all significantly correlated with business outcomes.

Kaldenberg and Gobeli (1995) examined the link between TQM and performance in a healthcare context. A questionnaire was developed that covered seven categories of quality management practices (leadership, information and analysis, strategic planning, human resource utilisation, quality assurance, quality results, and customer satisfaction). Respondents were required to provide self-assessments for each question to measure the extent to which quality practices were embraced. To measure business outcomes, respondents were asked questions pertaining to total annual revenue, total annual profit and the total number of new patients in a year. Comparative data was also obtained by asking respondents to indicate changes over the past three years. The questionnaire was sent to a sample of dentists in private practice in Oregon, US. A total of 334 dentists participated in the study. Kaldenberg and Gobeli (1995) found a positive relationship between most quality practices and business outcomes (revenue, profit, and new patients) over the three year period.

¹ One hundred and seventy farmers completed this survey, but only 165 provided a response to this particular question.

² Respondents were also asked to rate the impact of the variables on organisational performance measures such as timeliness of delivery and quality of product or service.



Hypothesis Development

The studies reviewed in the previous section suggest that TQM practices positively impact on business performance in SMEs. These studies, however, have mostly depended on managers' self-assessments to measure both the extent of quality practices and performance.

Studies that have examined this relationship in larger organisations using publicly available financial data also provide support for the effectiveness of TQM in improving performance. Lemak and Reed (1997), for example, found that TQM implementation resulted in an increase in stock value and improved profit margins. Similarly, Easton and Jarrell (1998) reported that TQM adoption was associated with profitability and stock returns.

Prior literature would therefore suggest that TQM improves financial performance. As such, the following hypothesis is proposed:

H₁: Firms that have implemented TQM will financially outperform firms that have not implemented TQM.

To test this hypothesis we relied on a large quantitative database developed from surveys conducted on behalf of the Australian Federal Government and specifically aimed at providing a better understanding of the growth and performance of Australian SMEs. As the data set was relatively large, we have used a one percent level of significance throughout the paper.³ The data set is described in the following section.

Data

The data set used in this study was derived from the 1994-95, 1995-96, 1996-97, and 1997-98 Business Growth and Performance Surveys (also known as the Business Longitudinal Survey) undertaken by the Australian Bureau of Statistics (ABS). The surveys were designed to provide information on the growth and performance of Australian employing businesses for the federal government. As well as on-going questions, each annual questionnaire also included once-off questions on particular topics of interest to the federal government. Data collection was through self-administered questionnaires, copies of which can be obtained from the ABS. Because the ABS can legally enforce compliance with its data requests (under the *Census and Statistics Act 1905*) response rates were very high (typically in excess of 90%). As a result, the sample used was highly representative of Australian SMEs; a significant advantage over many previous studies. For confidentiality reasons, information on all large businesses (those employing more than 200 people) was excluded from the data set made available to researchers outside the ABS.

The ABS Business Register was used as the population frame for the surveys. For the second survey (1995-96) a representative sub-sample of the original 1994-95 survey was selected and this sub-sample was then used for the remaining surveys (1996-97 and 1997-98). All employing businesses in the Australian economy were included in the scope of the survey except for businesses in the nature of: government enterprises; libraries; museums; parks and gardens; private households employing staff; agriculture, forestry and fishing; electricity, gas and water supply; communication services; government administration and defense; education; and health and community services.

With respect to the initial survey (for the year ended 30 June 1995), responses were received from 8,375 SMEs. In each subsequent survey only a sub-set of these original firms were included. In addition, some firms failed and these were replaced with similar firms to ensure the data remained representative of Australian SMEs. Of interest to this study is the survey conducted in 1995-96 as this was the only survey to include a question on the use of TQM practices.⁴ The data from this second survey included details on

³ Using a 5% level of significance did not change the results in any material way.

⁴ Question 26 on the survey asked respondents to indicate their level of TQM adoption from the following choices: no/not applicable; informally in place; formal programme developed in-house; and externally assisted



5,027 SMEs. However, on a close inspection of the data it was found that 41 firms had no employees; these firms were excluded as the data set was supposed to be for employing businesses. We also discovered a further 13 firms had no income and were, therefore, excluded on the assumption they were not active businesses. An additional 1,197 firms were excluded because they had negative (or zero) balances for either (or both) total assets or owners equity. We considered it unlikely that these firms would be going concerns. This left a sub-sample of 3,776 SMEs (971 that adopted TQM practices and 2,805 that did not) that could be used to test our hypothesis.

Table 1 provides the following descriptive information (for both the original survey and our sub-sample): industry; age of business; type of legal organization; and size (measured in terms of the number of employees, total assets and total sales). Additionally, for our sub-sample only, descriptive information is also shown for both the TQM adopters and the non-adopters.

programme. Those answering no/not applicable were classified as non-adopters with the rest classified as adopters.



Table 1: Descriptive Information for Initial Survey and Sub-Sample

Variable	Initial Survey N = 8,375		Sub-Sample N = 3,776		TQM N = 971		Non-TQM N = 2,805	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
<i>Industry</i>								
Mining	60	(0.7)	42	(1.1) *	9	(1)	33	(1)
Manufacturing	3,076	(37)	1,465	(39)	474	(49)	991	(35) *
Construction	452	(5)	185	(5)	28	(3)	157	(6) *
Wholesale Trade	1,074	(13)	607	(16) *	176	(18)	431	(15) *
Retail Trade	899	(11)	372	(10)	89	(9)	283	(10)
Accom, Cafes, Restaurants	315	(4)	152	(4)	28	(3)	124	(4) *
Transport & Storage	340	(4)	139	(4)	22	(2)	117	(4) *
Finance & Insurance	350	(4)	153	(4)	29	(3)	124	(4) *
Property & Bus Services	1,397	(17)	499	(13) *	97	(10)	402	(14) *
Cultural & Rec Services	185	(2)	91	(2)	10	(1)	81	(3) *
Personal & Other Services	227	(3)	71	(2) *	9	(1)	62	(2) *
Totals	8,375	(100)	3,776	(100)	971	(100)	2,805	(100)
<i>Age of Business</i>								
Less than 2 years old	1,180	(14)	429	(11) *	105	(11)	324	(12)
2 years to less than 5	1,342	(16)	549	(15)	129	(13)	420	(15) *
5 years to less than 10	2,021	(24)	945	(25)	215	(22)	730	(26) *
10 years to less than 20	2,222	(27)	1,011	(27)	252	(26)	759	(27)
20 or more years old	1,610	(19)	842	(22) *	270	(28)	572	(20) *
Totals	8,375	(100)	3,776	(100)	971	(100)	2,805	(100)
<i>Type of Legal Organization</i>								
Incorporated	5,396	(64)	2,625	(70) *	738	(76)	1,888	(67) *
Unincorporated	2,979	(36)	1,150	(30) *	233	(24)	917	(33) *
Totals	8,375	(100)	3,775	(100)	971	(100)	2,805	(100)
<i>Size Variables</i>								
	Mean	(Median)	Mean	(Median)	Mean	(Median)	Mean	(Median)
Number of Employees	23	(9)	30	(15) *	42	(30)	26	(11) *
Total Assets ('000)	9,213	(416)	10,513	(888) *	14,569	(1,925)	9,109	(661) *
Total Income ('000)	6,063	(909)	9,140	(1,721) *	12,287	(4,076)	8,050	(1,270) *

* Significantly different at 1% level.

Note: The significance tests were based on z scores for industry, age of business and type of legal organization; and on the Mann-Whitney U test for the size variables.

A review of the descriptive information provided in Table 1 suggests that the sub-sample used in this study was reasonably representative of the initial survey and, therefore, of the population of Australian SMEs. However, four notable differences between the businesses in the initial survey and those in our sub-sample should be highlighted. First, the sub-sample appears to be over-represented in terms of mining and wholesale trade businesses; and under-represented in terms of property and business services, and personal and other services. Second, the sub-sample has relatively fewer younger businesses and relatively more older businesses. Third, the sub-sample has a greater proportion of incorporated



businesses and relatively fewer unincorporated businesses. Finally, the businesses in our sub-sample were larger (on average) in terms of the number of employees, total assets, and total sales.

It should also be noted from Table 1 that, compared to the TQM adopters, the non-TQM adopters were under-represented in manufacturing and wholesale trade; and relatively over-represented in most of the other industry groupings. It would also appear that the TQM adopters were relatively over-represented in the oldest age group and under-represented in the younger age groups. The TQM adopting firms were also more likely to be incorporated relative to the non-adopters. Finally, the TQM adopting SMEs were significantly larger than the non-adopting SMEs. Given these systematic differences between the TQM adopting and non-adopting SMES in our data set, it is important to control for these factors in any comparison of performance.

Results

As noted earlier, one of the major strengths of this study is its use of a large representative database developed from surveys conducted on behalf of the Australian Federal Government and specifically aimed at providing a better understanding of the growth and performance of Australian SMEs. To provide some comparisons between TQM adopting and non-adopting SMEs, and to test our hypothesis, we now turn to an examination of this data.

Table 2: Performance Results

Performance Measure	Median Result		
	TQM	N-TQM	Sig.
Total Income ('000)	4,076	1,270	.00
Profit ('000)	95	40	.00
EBIT ('000)	151	63	.00
EBITDA ('000)	229	88	.00
Profit/Total Income (PTTI) (%)	4.21	4.75	.06
EBIT/Total Income (EBITTI) (%)	5.69	6.61	.02
EBITDA/Total Income (EBITDATI) (%)	7.92	8.80	.04
Total Income/Total Assets (TITTA)	1.93	2.08	.02
Profit/Total Equity (ROE)	0.22	0.26	.01
EBIT/Total Assets (ROA)	0.11	0.12	.01
EBITDA/Total Assets (EBITDATA)	0.15	0.16	.01
Total Income/Employee (TIPE) ('000)	134	104	.00
Profit/Employee (PPE) ('000)	5.67	5.00	.08
EBIT/Employee (EBITPE) ('000)	8.38	7.00	.03
EBITDA/Employee (EBITDPE) ('000)	11.00	9.33	.00

Note: Significance test was based on the Mann-Whitney Test (two tail)

To measure performance we selected four groups of performance indicators. The first group represented gross (output) measures and included: total income; profit; earnings before interest and tax (EBIT); and earnings before interest, tax, depreciation and amortisation (EBITDA). The second group of performance indicators examined profit margins by dividing profit, EBIT and EBITDA by total income. Our third group of performance indicators related our four gross (output) measures to one of two input measures



(total assets or total shareholders' equity). Our final group of performance indicators looks at staff productivity by relating our four gross (output) measures to the number of employees in the business (another input measure).

As the performance measures were not normally distributed, Table 2 reports the median (rather than mean) results for each of our four groups of performance indicators. In terms of the four gross (output) performance indicators, TQM adopting firms appear to significantly outperform the non-adopters. However, where these output measures are related to inputs (total assets, total shareholders' equity and employees) the results seem to indicate that, in general, the TQM adopting firms do not have any advantage over the non-adopters (with the possible exception of total income per employee and EBITDA per employee).

In our analysis so far we have not attempted to control for industry effects, the age of the business, type of legal organisation, or the size of the business. The results of the descriptive analysis in Table 1 suggest that these may be important variables to control for in any analysis of firm performance.

To check the robustness of our results, we performed separate ANOVA tests for each of the performance measures listed in Table 2 controlling for: industry; age; type of legal organisation; and size. Because our dependent variables (performance indicators) were not normally distributed we transformed them by taking logs. For the first three control variables, the categories used in the ANOVA are those reported in Table 1. For the size variable, we used the number of employees in the business as our control. Table 3 reports the ANOVA results for total income. As can be seen from Table 3, TQM adoption does not appear to have any significant explanatory power over firm performance; after controlling for industry, age, type of legal organisation, and size. This finding was repeated for each of the remaining performance indicators, and as such, we have not reported these findings in separate tables. Hence, the adoption of TQM practices did not appear to have any significant impact on the financial performance of our sample of firms and, therefore, we are forced to reject our hypothesis.

Table 3: ANOVA of Log of Total Income to Various Business Demographics and TQM

Source of Variation	Sum of Squares	DF	Mean Square	F	Sig of F
Industry	624.971	10	62.497	69.759	.00
Age of business	21.273	4	5.318	5.936	.00
Type of Legal Organisation	67.572	1	67.572	75.423	.00
No of Employees	7483.05	178	42.04	46.924	.00
TQM	1.654	1	1.654	1.847	.17

Conclusions

Although proponents of TQM argue that it can successfully be applied to organisations of all sizes (Powell 1995) the results of this paper, based on an analysis of 3,776 firms drawn from the ABS Business Growth and Performance Survey, finds no evidence to support the assertion that the adoption of TQM practices is of financial benefit to Australian SMEs, after controlling for demographic differences in the sample. Prior to controlling for demographic differences, there does appear to be some evidence to suggest an improvement in gross (output) performance measures and returns per employee for firms adopting TQM. However, this improvement does not hold where firm profitability is related to the level of capital investment (in terms of either total assets or shareholders' equity). Our finding of some improvement in financial performance per employee could be considered consistent with prior survey



research (for example, Flynn et al. 1995; Powell 1995; Samson and Terziovski 1999; Terziovski and Samson 1999). Much of this prior research has sought managers' opinions on the merit of TQM adoption and given that an improvement in performance per employee would be readily visible to managers this could favourably impact their perceptions of firm performance.

It would be interesting to conduct further research to explain our finding that TQM adoption does not appear to have a positive financial impact on Australian SMEs. One avenue for future research would be to survey SMEs to determine their motivation for adopting TQM. It is possible that our findings could be due to a lack of 'true' commitment by many SMEs to TQM because they implemented TQM not as part of a strategy to improve quality or reduce costs but in response to external pressures (Spendlove 1997; Guilhon et al. 1998; Sun and Cheng 2002). Another alternative explanation could be that the TQM adopting firms were those whose financial performance was lagging that of others in their industry and they implemented TQM in an attempt to improve their financial performances.

Further research could also investigate whether TQM adopting SMEs experienced improvements in financial performances over a longer time period. Due to the costs associated with adopting TQM, it might take several years for the financial benefits of TQM adoption to be realised. Further research could also investigate whether TQM adoption is only beneficial to firms above a certain size. That is, the costs associated with TQM adoption may outweigh the benefits for firms below a certain size.



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