



# Total Quality Management and Organizational Performance: the Role of Performance Measurement System

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## Abstract

Escalation in globalization, information and advancement in manufacturing technologies have constantly contribute to the increase in demand and in the competitive manufacturing business environment. Align with the challenges facing the companies, there is a need for companies to devise relevant strategies to help them cope with the changes and sustain their competitiveness. Total Quality Management (TQM) is a management philosophy and strategy that can help improve the quality of product and production processes. Prior research highlights the importance of implementing performance measurement system (PMS) in assisting the implementation of TQM practices. Incorporating contingency theory and socio-technical system theory, this study aims to examine the relationship between TQM practices and organisational performance and to determine the influence of PMS use in the relationship. Data were collected using self-administered questionnaire survey on a sample of Malaysian manufacturing companies. Our results support the view that more extensive PMS benefits performance as we find that, firms implementing TQM with more advanced PMS especially those that include financial and nonfinancial measures have higher performance. The results revealed that the relationship is more significant for companies using more advanced PMS compared to companies that used traditional PMS.

**Keywords:** Total quality management, performance measurement systems, organisational performance, contingency theory, socio-technical system theory

## 1. Introduction

Over the last two decades, escalation in globalization, information and manufacturing technologies advancements have been contributing to the increase in the challenges facing the manufacturing business environments. In order to cope with the changing needs and to survive in this dynamic business environment, companies have to be alert and responsive to the change in the current market demands to improve their competitive position and performance. The increase in global pressures, market uncertainties and complexities require firms to constantly assess and modify their strategies and plans for continuous improvement in their operations in order to remain competitive, to survive and sustain their market positions to achieve the desired performance (Dean and Snell, 1996, Lee, 1996). Management accounting techniques and practices play important roles in maintaining the relevance and changing needs of managers and other professionals in keeping pace with the business advancement.

Since the 1980s there has been an increasing awareness and implementation of practices associated with the needs to enhance product quality and cost reduction. Total Quality Management (TQM) is one of the main techniques which had received particular attention in both academic and practitioner circles (Cua, Mckone, and Schroeder, 2001; Kannan and Choon, 2005).

In relation to the competitive business environment today, companies including manufacturing sector need to find ways to strategically reduce cost and continue to improve the quality to survive in the industry. In deriving competitive advantage, companies are given two choices of strategies either product

differentiation or low cost production (Chenhall and Langfield-Smith, 1998)<sup>a</sup>. It has been agreed by Kald and Nilsson, (2000) who claimed that the best technique to improve the organisation and management practices is for companies to engage with TQM practices.

TQM philosophy has been developed towards improving the quality of plant production processes and products which is ultimately crucial to ensure customers' satisfaction.

Findings from previous studies detailed that TQM practices are independently applied in manufacturing companies to enhance their performance (Fullerton et al., 2003, and Demirbag, Tatoglu, Tekinkus, and Zaim, 2006). Even though there are mix findings from prior studies that supported and rejected some of TQM elements (Terziovski and Samson, 1999), considerable prior research revealed significant benefit gained from its implementation (Demirbag et al., (2006). According to the discussion by Powell, (1995), the economic benefit that TQM provides are much depends on the imitable characteristics like open beliefs, worker empowerment and management commitment, and not on general characteristics such as training, budgeting and process improvement. The finding is similar with Hansson and Klefsjö, (2003) who found that the management leadership, staff commitment and constant improvement are needed in the implementation of TQM in small organisations.

Also, when a manufacturing organisation carrying out the TQM practices, both organisational and business performances will be enhanced (Terziovski and Samson, 1999). According to the idea of Chenhall and Langfield-Smith, (1998)<sup>b</sup>, in order to stay competitive in the industry, most organisations are making some changes in various aspects of planning, directing and monitoring procedures. In considering the development and improvement of

organisational performance, there is a need for an organisation to implement such a well-established Performance Measurement Systems (PMS). An effective PMS has a good strategy in terms of business developments, resource allocation and employee willingness to support the thrive of an organisation (Sinclair and Zairi, 1995). Considerable prior research discovered limitations of the traditional performance measures which is claimed unable to provide adequate information; due to delay and inaccurate data for decision making (Abdul Rasit and Isa, (2014); AzAzofra et al., (2003); (Kald and Nilsson, 2000).

As a result of the globalization and competition, contemporary or advance PMS have been adopted by firms. Current interest has been employed by organisation to change to advanced PMS such as strategic performance measurement systems (SPMS) (Gimbert, Bisbe, and Mendoza, 2010). The unique characteristics of SPMS that contain both financial and non-financial measures will be used by managers to identify the cause-effect relationship between organisation's strategy and its operations (Chenhall, 2005). Medori and Steeple, (2000) stated that the balanced PMS would assist the organisation to constantly align with the company's objectives and strategies. With the addition of non-financial measures in a PMS can lead to improve in financial performance (Davis and Albright, 2004). In the manufacturing companies, the ultimate focus that managers should give priority is on the effectiveness and efficiency of production process. The cost efficiency and quality improvement seem to be vital concern of the management.

In order to achieve those goals, appropriate management accounting techniques like TQM practices with the implementation of appropriate PMS would be able to help firms in achieving their objectives to improve their performance. This research will provide empirical evidence on the effect of the TQM implementation towards organisational performance. The research will also identify if there is any effect on the organisational performance with the use of either traditional or advance PMS. There is lack of research in this area that has been conducted in developing countries such as Malaysia particularly the implementation of TQM towards organisational performance. Proper performance measurement is believed to support formulation of company strategy, management of business processes and changes, communication, resource allocation, employee motivation and long-term success.

Prior studies stressed the prominence of PMS in assisting the implementation of TQM practices (Upton, 1998; Chenhall, 1997). Several research in the area of performance measurements has identified contradictory findings in the relation between performance measurement and performance. It has been argued that a well-operated standard cost systems which is traditional performance measures provide satisfactory information for productivity measurement and enhancement programs (Banker, Datar, and Kaplan, 1989). On the other hands, prior research also claimed that traditional performance measures have been too aggregated, too late and only focus on the historical costs (McNair, Lynch, and Cross, 1990). According to the literature reviewed by Gomes, Lisboa and Yasin (2004), there are several drawbacks which relate to the traditional performance measures to disregards the continuous improvement and ignores the external needs. In addition, it is also claimed in recent years that traditional accounting measures based on budget variances are unable to provide feedback on the effectiveness of TQM applications (Chenhall, 1997).

The argument stated that traditional financial performance evaluation systems are not sufficiently comprehensive to assess efforts to improve competitiveness through TQM programs (Chenhall, 1997). Apart from that, the reliance on Manufacturing Performance Measures as suggested by (Chenhall, 1997) in evaluation of manager's performance and also enhancement of sustainable profit would provide a positive feedback in an organisation that pursuing TQM. Many researchers and practitioners have identified shortcoming and have expressed a

general dissatisfaction with traditional PMS which were developed from costing and accounting systems (Kumar, Grosbois, Choisine, and Kumar, 2008). It was argued that there is a need for traditional PMS to change and the management accountants must develop accounting systems which support the changing manufacturing environment in order to compete in the fast moving, challenging and dynamic market (Widener, 2006; Johnson and Kaplan 1987).

Apparently, most manufacturing firms in Malaysia still emphasizing on the usage of financial measures compared to non-financial measures (Jusoh, Ibrahim, and Zainuddin, 2008). In addition, this study will incorporate contingency theory and socio-technical systems theory in order to explain the relation between the variables. In order to achieve those goals, appropriate management accounting technique for continuous improvement such as TQM with the appropriate PMS would help firms in achieving their objectives to improve performance. This research will provide empirical evidence on the effect of TQM practices towards organisational performance. The research will also identify the effect on the organisational performance with the use of either traditional or advance PMS. The remainder of this paper is organized as follows: the next section provides discussion on the conceptual framework and hypotheses development. Then followed by research methodology, discussion of results and conclusion section.

## 2. Conceptual Framework and Formulation of Hypotheses

This study will provide empirical evidence in examining the influence of management accounting practices; Total Quality Management (TQM) towards organisational performance. Since the PMS is important in the implementation of the technique (Upton, 1998; Chenhall, 1997), this study would further examine how PMS can influence the implementation TQM towards achieving improved organisational performance. For the purpose of this study, PMS will be divided into two categories which are Traditional PMS (TPMS) and Advanced PMS (APMS) and will be considered as the moderating variable in this study. Contingency theory refers to the idea that there is no commonly appropriate accounting techniques that would be applicable to all organisations in similar circumstances (Emmanuel et al. 1990; Haldma and Lääts, 2002, and Otley, 1980).

Each organisation has its own specific design of accounting system to achieve certain desired goals to enhance the organisational performance (Haldma and Lääts, 2002; Ruckert, Walker, and Roering, 1985). An effective accounting system depends on the capability of the companies to strive in line with the changes in its contingent factors (external and internal aspects) (Haldma and Lääts, 2002). Some of the most common internal factors examined in prior research include technology (Merchant, 1984, and Dunk, 1992), companies strategies (Miles, Snow, Meyer, and Coleman, 1978; Simons, 1987) and production system (Reid and Smith, 2000). TQM and PMS are the contingent aspects of production system being focused in this research which are supported from prior studies to enhance the organisational performance.

On the other hand, socio-technical system theory can be used to appreciate the importance of combining common practices in an organisation that could lead to good performance. The social and technical systems were fundamental factors, in which the earlier is referring to the people and later is the equipment (Trist, 1981). The social and technical aspects must work together as a work system to produce both physical product and social result. Rehder, (1988) created the socio-technical system that covers the traditional organisation and combining its sub-systems including tactical planning, culture, organisation, human resources and methods.

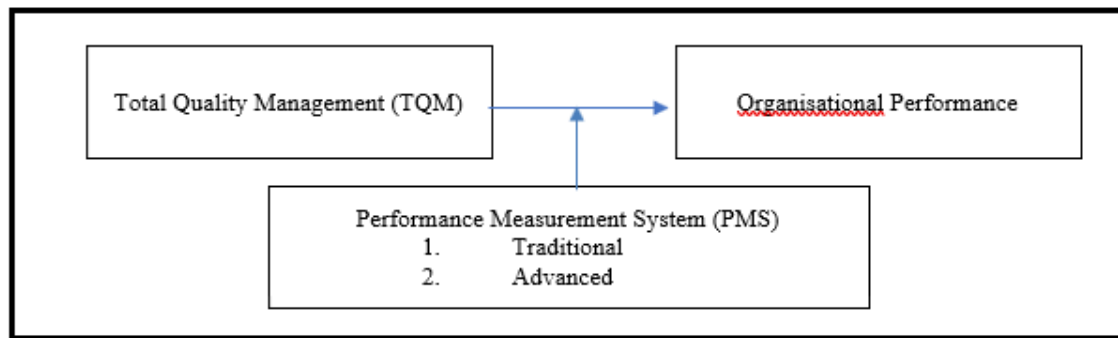


Figure 1: Conceptual Framework

TQM and PMS would be the technical part and considered as important equipment or strategies in manufacturing companies to improve organisational performance. This current study emphasised on the joint optimisation of two (2) management accounting practices namely TQM and PMS that suit the idea of socio-technical system theory that combining both social and technical aspects. Socio-technical theory is a system that “focuses on the interdependencies between and among people, technology and environment” (Appelbaum, 1997; Cua et al., (2001). The organisational performance of manufacturing firm will be superior with the joint optimisation of social and technical systems. Hence, the development of conceptual framework is as shown in Figure 1. Total Quality Management and Organisational Performance

TQM programs have been proven as an effective measure to improve performance (Chenhall, 1997). In considering the success factor of TQM implementation to organisational performance, Montes et al., (2003) suggested that both the contents and elements of TQM must fit with the business strategy and organisational environment. TQM practice has a significant positive effect on organisation performance which focus on both objective and subjective business performance measures (Terziovski and Samson, 1999). Overall, TQM programs as suggested by Agus and Hassan, (2011) can improve and have a positive structural effect on production and customer related performance which are part of organisational focus.

Through a survey on Turkey SMEs textile industry, Demirbag et al., (2006) revealed that there is a strong positive relationship between TQM practices and its performance. Also, a survey on Malaysian SMEs, Mahmud and Hilmi, (2014) found that there is a positive relation between TQM and SMEs performance. Based on prior literatures, this hypothesis is developed;

H1: Total Quality Management has positive relationship with organisational performance.

Total Quality Management, Advanced Performance Measurement System and Organisational Performance

The initial benefits that advanced performance measurement system would provide better improvement for manufacturing and other firm’s performance leads to a changing strategic practice. The study by Demirbag et al., (2006) discloses a strong positive association between TQM practices and non-financial performance of SMEs that will increase the organisation’s performance, and weak impact of TQM practices on SMEs financial performance. In investigating the connections between organisational performance and customer-focused approaches as one of the management philosophies underlined TQM, performance measures and information technology, Hyvonen, (2007) found out that the advanced performance measures failed to maintained and achieved high customer performance in a business. There is also a finding that supports a company with quality-based manufacturing strategy that implementing non-financial measures will perform better (Van der Stede, Chow, and Lin, 2006). Production performances namely, production effectiveness and production efficiency have highest and significant correlations between quality measurement and supplier relations (Agus and Hassan, 2011). Rahman, (2001) studied the

relationship between TQM and companies’ sales in SMEs that certified and non-certified by ISO 9000 and found that there is no significant difference. For that, the second hypothesis is developed:

H1a: There is a significant positive relationship between TQM and organisational performance for companies implementing Advanced PMS

Total Quality Management, Traditional Performance Measurement System and Organisational Performance

Traditional or financial performance measures are relatively being used by most organisations in order to measure the performance. Return on investment, profitability, return on sales and many others are usually used in valuing how good the companies are. In determining the relation between TQM programs and traditional measures, prior literatures find a mixed result. Hyvonen, (2007) provide an argument that showed a positive improvement in terms of customer performance with financial performance measures. In the study by Chenhall, (1997), the association between TQM and company’s profitability was stronger when Manufacturing Performance Measures (MPM) were used as part of managerial evaluation. Hence, the third hypothesis is developed:

H1b: There is a weak positive relationship between TQM and organisational performance for companies implementing Traditional PMS

### 3. Research Methodology

#### 3.1. The Sample and Data Collection

The research was carried out using a survey design to gather data from the Malaysian manufacturing companies listed in the 2016 Federation of Malaysian Manufacturing (FMM) Directory.

Only large manufacturing companies are selected since it is expected that these companies would have implemented the management accounting practices that includes advanced techniques (Chenhall and Langfield-Smith, 1998, and Hyvonen, 2007). The size of company is measured using number of employees (Upton, 1998). This study is using a sample of companies that have more than 150 employees in order to control the large size (El-Khalil and Farah, 2013).

The selection is made by referring to the 2016 FMM Directory based on the number of employees stated. As for the company’s type, manufacturing industry would be the choice since these companies are much more related with the management accounting practices and changes (Sulaiman and Mitchell, 2005). Manufacturing companies would use TQM practices since it is likely to be sophisticated and known practice as to compete in manufacturing industry (Agus, 2001). Additionally, the use of PMS in manufacturing firms are common and this type of company particularly focused on product market, technological development, and cost structure (Jusoh et al., 2008).

The questionnaires were distributed using both methods; postal mail and electronic mail (e-mail) (Isa and Keong, 2008). The surveys were addressed to the managers as they have the

professional knowledge related to management accounting techniques. Managers' views were considered suitable in this study primarily because their view is related to company's interest that will affect judgements in terms of the choice of plan and variations in organisational and management accounting techniques. Managers have knowledge on how to direct the company's activities as it is hard to measure accurately variables for instance the change in the environment, or variation in strategy. Managers also claimed to have sufficient knowledge to make decision and able to give reliable information. The response rate for this current study is 24 percent. As claimed by Smith, (2003), and Tuan Mat et al., (2010), a response rate of less than 25% is common in accounting research and this rate is considered reasonable for statistical analysis and suggestion.

### 3.2. Data Analysis and Measurement of Variables

The data were analyzed using SPSS Statistics software. For the hypotheses testing, data were analysed using simple regression analysis.

#### Total Quality Management

The study examines the effect of TQM on organisational performance. Respondents were asked to indicate to what extent the Total Quality Management (TQM) practices adopted in their organisation. To measure TQM, a 5-point Likert scale was used. The scale is ranged from 1 = least extent to 5 = greatest extent. The items for TQM are using the instruments taken from Carr et al., (1997) with the details of items provided in Table 3.1.

#### Performance Measurement System

The PMS was measured using a 5-point Likert scale ranging from 1 = not used to 5 = widely used. The items used for PMS are derived from Hyvonen (2007) to measure the extent of PMS used. There 8 items used comprises traditional PMS and advanced PMS.

**Organisational Performance**  
To measure the performance of the company, the respondents were asked to indicate the level of their organisational performance compared to industry using a 5-point Likert scale. The scale ranges from 1 = below average and 5 = above average. The items of organisational performance are derived from the study by Hoque and James (2000) and Upton (1998).

## 4. Results and Discussion

### 4.1. Descriptive Analysis

Table 1 shows TQM mean value is 4.12 indicating that TQM is moderately used by the manufacturing companies.

As for PMS the mean value is 3.91 and organisational performance is 4.02.

**Table 1:** Descriptive Statistics of the Main Variables

| Variables | Min  | Max  | Mean | Standard Deviation |
|-----------|------|------|------|--------------------|
| TQM       | 2.00 | 5.00 | 4.12 | 0.64               |
| PMS       | 1.75 | 5.00 | 3.91 | 0.77               |
| OP        | 3.00 | 5.00 | 4.02 | 0.58               |

### 4.2. Validity and Reliability

For the purpose of this study, the reliability test aims to test the internal consistency of the questionnaires used. For this study, the Cronbach's alpha is used as indicator for measurement of the reliability test. According to Sekaran and Bougie (2013, p.293), the closer Cronbach's alpha is to 1, the higher the internal consistency reliability. The test for reliability shows that the Cronbach's alpha value for each variable; TQM (0.894), PMS (0.912) and Organisational Performance (0.886). The Cronbach's Alpha values are all above 0.8 which suggests the measurements used are all consistent (Hair, Money, Samouel, and Page, 2007).

For the test of normality, all the variables are normally distributed with the values of Skewness and Kurtosis within  $\pm 2$  (George and Mallery, 2010). Thus, the assumption of normality is not violated and the study can proceed to use the parametric test.

**Table 2:** Pearson Correlation Analysis (n=48)

|     | TQM   | PMS    | OP     |
|-----|-------|--------|--------|
| TQM | 1.000 | .786** | .595** |
| PMS | -     | 1.000  | .580** |
| OP  |       |        | 1.000  |

*Note: TQM = Total Quality Management, PMS = Performance Measurement Systems, OP = Organisational Performance. \*\*Correlation is significant at the 0.01 level (2-tailed)*

### 4.3. Correlation Analysis

Correlation analysis is performed in order to measure the strength of relationship between two variables. For the purpose of this study, the analysis was conducted to examine the association between TQM, PMS and organisational performance. According to Cohen, 1988 that has been cited by Hemphill, (2003) the interpretation of correlation coefficient values are in the order of .10 are "small," those of .30 are "medium," and those of .50 are "large" in terms of magnitude of effect sizes. Table 2 provides results of the analysis among the variables. The results show that TQM has a significant large positive association with PMS ( $r = .786$ ,  $n = 48$ ,  $p = .000$ ). It can be described that, as TQM increase, PMS will also increase by 0.786.

There is also a significant large positive correlation between TQM and OP with  $r = .595$ ,  $n = 48$ ,  $p = .000$ . The results imply that as the more extensive is the TQM practiced, the better is the organisational performance. The association between PMS and OP is also significant ( $r = .580$ ,  $n = 48$ ,  $p = .000$ ). Again, the result indicates that there is linear relationship between PMS and OP. The more extensive is the PMS implemented the higher is the performance. Overall, the correlations between the variables are all positive and significant at  $< 0.001$ . Overall, the analysis also indicates that there is no multicollinearity as the correlation  $r$  is less than 0.80 (Field, 2014). Thus, analysis of data can proceed with regression analysis for hypotheses testing.

**Table 3:** Regression Analysis

|          | B    | R <sup>2</sup> | Adj. R <sup>2</sup> | t     | Sig. |
|----------|------|----------------|---------------------|-------|------|
| Constant |      | .388           | .374                | 9.629 | .000 |
| TQM      | .592 |                |                     | 5.398 | .000 |

*Significant at \*\*\*p < 0.01*

### 4.4. Test of Hypotheses

**Simple Regression Analysis:** The analysis was conducted to examine the relationship between TQM technique and organisational performance. Based on the Table 3 above, it shows that TQM technique has a strong and significant positive relationship with organisational performance with Adj. R<sup>2</sup> of .374, ( $B = .592$ ,  $t = 5.862$ ,  $p < 0.01$ ). This indicates that, if the company increase the implementation of TQM technique, there will be 37.4% variation in organisational performance. Thus, H1 will be supported. This result will continue to support the results from (Powell, 1995, Terziovski and Samson, 1999, Demirbag et al., 2006, and Agus and Hassan, 2011). All these studies claimed that TQM practices have a strong positive relationship on organisational performance. Also, manufacturing organisation is more likely to achieve better performance in employee affairs, customer satisfaction, operational performance and business performance with TQM. Apart from that, TQM is much more related with product quality that will be resulted in superior product performance and significantly improving customer related performance.

Multigroup Analysis: The implementation of the PMS is classified into traditional and advanced PMS subgroups based on the PMS median scores, as shown in Table 4. The higher scores indicate more advanced PMS and traditional PMS for the lower scores. The classification of the PMS implementation would allow further analysis of the relationship between the TQM practices and organisational performance. With the multigroup analysis at median score of 32, the samples are being divided into 2 (two) types of PMS implementation; advanced PMS and traditional PMS.

**Table 4:** Descriptive Statistics for PMS Variables

|            | B    | R <sup>2</sup> | Adj. R <sup>2</sup> | t     | Sig. |
|------------|------|----------------|---------------------|-------|------|
| (Constant) |      | .262           | .227                | .671  | .509 |
| TQM        | .764 |                |                     | 2.731 | .013 |

*Significant at \*\*p < 0.01*

The first group comprises 25 companies that are implementing traditional PMS (relative to the median of the distributions < 32). The second group is using advanced PMS (23 companies, median > 32).

#### 4.5. TQM, Advanced PMS and Organizational Performance

The linear regression results, as shown in Table 5, indicate a significant and positive relationship exists between TQM practices and organizational performance ( $B = .764$ ,  $t = 2.731$ ,  $p < 0.05$ ). The results as shown by the Adj. R<sup>2</sup> propose that the level of TQM practices accounted for almost 22.7% of the changes in organizational performance. The regression results provide support for predictions in this study that the usage of TQM practices should lead to better performance in a company that used advanced PMS.

This is consistent with prior study's result which suggest that there is strong positive association between TQM practices and non-financial performance of SMEs that will increase the organisation's performance (Demirbag et al., 2006). There is also a conclusion that specifies a company with quality-based manufacturing strategy that implement non-financial measures will improve (Van der Stede et al., 2006).

**Table 5:** Regression Analysis

| Research Constructs | Theoretical Range (Observed Range) | Median (n*) | Mean (Std. Deviation) |
|---------------------|------------------------------------|-------------|-----------------------|
| PMS                 | 0-40<br>(14-40)                    | 32<br>(48)  | 31.31<br>(6.16)       |
| Traditional PMS     | 0-32<br>(14-32)                    | 29<br>(25)  | 27.1<br>(5.57)        |
| Advanced PMS        | 33-40<br>(33-40)                   | 35<br>(23)  | 35.91<br>(2.15)       |

This result again supports the view that advanced PMS may be appropriate for organisation with TQM system. The argument by McNair et al., (1990) proposed that a framework which combine strategic information systems with performance measurement should include together non-financial measures such as customer satisfaction, flexibility and productivity and not only financial or traditional measures. The higher value in Beta of .764 specifies that the positive relationship between TQM and organisational performance is stronger in companies implemented advance performance measurement systems. Thus, this is lending a support to Hypothesis 1(a).

#### 4.6. TQM, Traditional PMS and Organisational Performance

Table 6 reports the result of the regression analysis. The overall regression model for TQM practices explained 21% (adjusted r<sup>2</sup>) of the variance in organisational performance. The data indicate that the ( $B = .374$ ,  $t = 2.716$ ,  $p < 0.05$ ), shows that there is

significant positive relationship between TQM practices and organisational performance that implement traditional PMS. Prior research for example Hyvonen, (2007) provides an argument that showed a positive improvement in terms of customer performance with financial performance measures when applying customer-focus strategy (which includes TQM items). The Beta value for this model is .374, which is lower than Beta value from Table 5 ( $Beta = .764$ ). The difference in beta value shows companies that used advanced have better performance relative to those that use traditional PMS. These results support the hypothesis that the relationship between TQM and organisational performance is less strong for companies implementing traditional PMS. Thus, provide support for Hypothesis 1(b).

**Table 6:** Regression Analysis

|          | B    | R <sup>2</sup> | Adj. R <sup>2</sup> | t     | Sig. |
|----------|------|----------------|---------------------|-------|------|
| Constant |      | .243           | .210                | 4.515 | .000 |
| TQM      | .374 |                |                     | 2.716 | .012 |

*Significant at \*p < 0.01*

**Table 7:** Summary of Research Hypotheses and Findings

|     | Hypothesis  | Findings  |
|-----|---|-----------|
| H1  | TQM has a positive relationship with organisational performance   | Supported |
| H1a | There is a significant positive relationship between TQM practice and OP for companies using Advanced PMS | Supported |
| H1b | There is a weak positive relationship between TQM practice and OP for companies using Traditional PMS     | Supported |

As claimed by Maskell, (1989) and cited by Carr et al. (1997), traditional measures are incapable to support a quality-related manufacturing approach. Demirbag et al.,(2006) also found that TQM practices have a moderate positive impact on financial performance. Therefore, H1(b) is supported. Table 7 presents the summary of the hypotheses testing result.

## 5. Discussion, Limitations and Conclusion

The global intense competition facing the businesses has increased concern among businesses to adopt more advance management accounting techniques (Chenhall and Langfield-Smith, 1998)<sup>c</sup>. It is also being discussed by Azofra, Prieto, and Santidria, (2003) who claimed that the current economic and competitive condition faced by major companies had led to increase in motivation for companies to modify the way they carry out their production practices. In recent years, due to the competitive pressure, there have been emergences of numerous operations paradigms, initiatives, and practices to improve product quality, to increase responsiveness, and to shorten the lead times, but at the same time to minimize the cost. This study has developed an integrated framework that support the use of management accounting techniques particularly, TQM and PMS towards improving organisational performance. This research contributes an important finding for manufacturing industry for successful implementation of TQM, the use of Advanced PMS play a significant role to improve the organisational performance. From the study, the results conclude that firms may need to adopt TQM philosophy and practices as the technique can improve organisational performance which is consistent with Fullerton et al., (2003) and Demirbag et al., (2006).

Additionally, this research also shows that with appropriate PMS, management accounting practices such as TQM practices will be able to help firms to improve the quality of their products and production processes leads to enhance organisational performance. This finding is aligned with (Chenhall, 1997; Davis and Albright, 2004) who found enhanced organisational performance by companies implementing more advanced PMS. There are a few limitations to the study. The major limitation of this study is the use of a questionnaire survey for data collection.

The method may not be able to gather extensive information on the implementation of the techniques. Future studies may extend the research on other industries and countries. Other than that, the small sample size of 48 respondents and low response rate of 24% may lead to some variations while reporting the result. Future research may gather bigger samples for a more meaningful result.

## References

- [1] Abdul Rasit, Z., & Isa, C. R. (2014). The influence of comprehensive performance measurement system ( CPMS ) towards managers ' role ambiguity. *Procedia - Social and Behavioral Sciences*, 164(August), 548–561.
- [2] Agus, A. (2001). A linear structural modelling of Total Quality Management practices in manufacturing companies in Malaysia. *Total Quality Management*, Vol. 12(No. 5), 561–573
- [3] Agus, A., & Hassan, Z. (2011). Enhancing Production Performance and Customer Performance Through Total Quality Management ( TQM ): Strategies For Competitive Advantage. *Procedia - Social and Behavioral Sciences*, 24, 1650–1662.
- [4] Appelbaum, S. H. (1997). Socio-technical systems theory: an intervention strategy for organizational development. *Management Decision*, 35(6), 452–463.
- [5] Azofra, V., Prieto, B., & Santidria, A. (2003). The usefulness of a performance measurement system in the daily life of an organisation: a note on a case study. *The British Accounting Review*, 35, 367–384.
- [6] Banker, R. D., Datar, S. M., & Kaplan, R. S. (1989). Productivity Measurement and Management Accounting. *Journal of Accounting, Auditing & Finance*, Vol. 4(4), pp. 528.
- [7] Carr, S., Mak, Y. T., & Needham, J. E. (1997). Differences in strategy , quality management practices and performance reporting systems between ISO accredited and non-ISO accredited companies. *Management Accounting Research*, 8(January), 383?403.
- [8] Chenhall, R. (2005). Integrative strategic performance measurement systems , strategic alignment of manufacturing , learning and strategic outcomes : an exploratory study. *Accounting, Organizations and Society*, 30, 395–422.
- [9] Chenhall, R. H. (1997). Reliance on manufacturing performance measures , total quality management and organizational performance. *Management Accounting Research*, 8(June 1996), 187–206.
- [10] Chenhall, R. H., & Langfield-Smith, K. (1998). The Relationship between Strategic Priorities, Management Techniques and Management Accounting: An Empirical Investigation Using A Systems Approach. *Accounting, Organizations and Society*, 23(3), pp. 243–264.
- [11] Chenhall, R., & Langfield-Smith, K. (1998). Factors influencing the role of management accounting in the development of performance measures within organizational change programs. *Management Accounting Research*, 9(May), 361–386.
- [12] Chenhall, R. H., & Langfield-smith, K. (1998). Adoption and Benefits of Management Accounting Practices : An Australian Study Adoption and benefits of management accounting practices : an Australian study. *Management Accounting Research* , 9(January 1998), 1–19.
- [13] Cua, K. O., Mckone, K. E., & Schroeder, R. G. (2001). Relationships between implementation of TQM , JIT , and TPM and manufacturing performance. *Journal of Operations Management*, 19, 675–694.
- [14] Davis, S., & Albright, T. (2004). An investigation of the effect of Balanced Scorecard implementation on financial performance. *Management Accounting Research*, 15, 135–153.
- [15] Dean, J. W., & Snell, S. A. (1996). The Strategic Use Of Integrated Manufacturing: An Example Examination. *Strategic Management Journal*, 17(November 1995), 459–480.
- [16] Demirbag, M., Tatoglu, E., Tekinkus, M., & Zaim, S. (2006). An analysis of the relationship between TQM implementation and organizational performance Evidence from Turkish SMEs. *Journal of Manufacturing Technology Management*, Vol. 17(Iss 6), pp. 829 – 847.
- [17] Dunk, A. S. (1992). Reliance On Budgetary Control , Manufacturing Process Automation And Production Subunit Performance : A Research. *Accounting Organizations and Society*, 17(314), 195–203.
- [18] El-Khalil, R., & Farah, M. F. (2013). Lean Management Adoption Level in Middle Eastern Manufacturing Facilities. *The Business Review*, 21(2012), 158–168.
- [19] Fullerton, R. R., Mcwatters, C. S., & Fawson, C. (2003). An examination of the relationships between JIT and financial performance. *Journal of Operations Management*, 21, 383–404.
- [20] George, D., & Mallery, P. (2010). Using SPSS for Windows step by step: a simple guide and reference. Boston: Allyn & Bacon.
- [21] Gimbert, X., Bisbe, J., & Mendoza, X. (2010). The Role of Performance Measurement Systems in Strategy Formulation Processes. *Long Range Planning*.
- [22] Gomes, C. F., Lisboa, J., & M. Yasin, M. (2004). A literature review of manufacturing performance measures and measurement in an organizational context: A framework and direction for future research. *Journal of Manufacturing Technology Management*, Vol. 15(Iss: 6), pp.511 – 530.
- [24] Hair, J. F., Money, A. H., Samouel, P., & Page, M. (2007). *Research Methods for Business* (1st ed.). United Kingdom: John Wiley & Sons Ltd.
- [25] Haldma, T., & Lääts, K. (2002). Influencing Contingencies on Management Accounting Practices in Estonian Manufacturing Companies. *Management Accounting Research*, (13), 379–400.
- [26] Hansson, J., & Klefsjö, B. (2003). A core value model for implementing total quality management in small organisations. *The TQM Magazine*, Vol. 15(Iss 2), pp. 71–81.
- [27] Hemphill, J. F. (2003). Interpreting the Magnitude of Correlation Coefficients. *American Psychologist*, Vol. 58(February 2003), 78–80.
- [28] Hoque, Z., & James, W. (2000). Linking balanced scorecard measures to size and market factors: Impact on or ... *Journal of Management Accounting Research*, 12, pp 1.
- [29] Hyvonen, J. (2007). Strategy , performance measurement techniques and information technology of the firm and their links to organizational performance. *Management Accounting Research*, 18, 343–366.
- [30] Isa, C. R., & Keong, T. Y. (2008). Just-In Time Manufacturing And Purchasing Practices And Business Performance: An Exploratory Study. *Asia Pacific Management Accounting Journal*, Vol 3(Iss 1), 67–86.
- [31] Jusoh, R., Ibrahim, D. N., & Zainuddin, Y. (2008). The performance consequence of multiple performance measures usage Evidence from the Malaysian manufacturers. *International Journal of Productivity and Performance Management*, Vol. 57(Iss 2 6), pp. 119 – 136.
- [32] Kald, M., & Nilsson, F. (2000). Performance Measurement At Nordic Companies. *European Management Journal*, 18(1), 113–127.
- [33] Kannan, V. R., & Choon, K. (2005). Just in time , total quality management , and supply chain management : understanding their linkages and impact on business performance. *The International Journal of Management Science*, 33, 153–162.
- [34] Kumar, V., Grosbois, D. De, Choisine, F., & Kumar, U. (2008). Performance measurement by TQM adopters. *The TQM Journal*, Vol. 20(Iss 3), pp. 209 – 222.
- [35] Mahmud, N., & Hilmi, M. F. (2014). TQM and Malaysian SMEs Performance : The Mediating Roles of Organization Learning. *Procedia - Social and Behavioral Sciences*, 130, 216–225.
- [36] McNair, C. J., Lynch, R. L., & Cross, K. F. (1990). Do Financial and Nonfinancial performances measures have to agree? *Management Accounting Research*, 1, 1–19.
- [37] Medori, D., & Steeple, D. (2000). A framework for auditing and enhancing performance measurement systems. *International Journal of Operations & Production Management*, Vol. 20(No. 5), pp. 520–533.
- [38] Merchant, K. A. (1990). The Effect of Financial Controls on Data Manipulation and Management Myopia. *Accounting, Organizations and Society*, 15(4), pp. 297–313.
- [39] Miles, R. E., Snow, C. C., Meyer, A. D., & Coleman, H. J. (1978). Organizational Strategy, Structure, and Process. *The Academy of Management Review*, 3(3), 546–562.
- [40] Montes, F. J. L., Jover, A. V., & Fernandez, L. M. M. (2003). Factors affecting the relationship between total quality management and organizational performance. *International Journal of Quality & Reliability Management*, Vol. 20(Iss 2), pp. 189 – 209.
- [41] Otley, D. T. (1980). *Accounting, Organizations and Society*, 5(4).
- [42] Powell, T. C. (1995). Total Quality Mangement as Competitive advantage: A review and empirical study. *Strategic Management Journal*, Vol. 16(No. 1), 15–37.
- [43] Rahman, S. (2001). A comparative study of TQM practice and organisational performance of SMEs with and without ISO 9000

- certification. *International Journal of Quality & Reliability Management*, Vol. 18(Iss 1), pp. 35 – 49.
- [44] Reid, G. C., & Smith, J. A. (2000). The impact of contingencies on management accounting system development. *Management Accounting Research*, 11(August), 427–450.
- [45] Ruckert, R. W., Walker, O. C., & Roering, K. J. (1985). The Organization of Marketing Activities: A Contingency Theory of Structure and Performance. *Journal of Marketing*, Vol. 49(January 1985), 13–25. Sekaran, U. (2003). *Research Methods for Business: A Skill-uilding Approach* (Fourth Edi). John Wiley & Sons, Inc.
- [46] Simons, R. (1987). Accounting Control Systems and Business Strategy: An Empirical Analysis. *Accounting Organizations and Society*, 12(4), 357–374.
- [47] Sinclair, D., & Zairi, M. (1995). Effective process management through performance measurement: part I – applications of total quality- based performance measurement. *Business Process Re-Engineering & Management Journal*, Vol. 1(Iss 1), pp. 75 – 88.
- [48] Smith, M. (2003). *Research Methods in Accounting*. London: SAGE Publications.
- [49] Sulaiman, S., & Mitchell, F. (2005). Utilising a typology of management accounting change: An empirical analysis. *Management Accounting Research*, 16, 422–437.
- [50] Trist, E. (1981). The Evolution of Socio-Technical Systems, A Conceptual Framework And An Action Program. Occasional Paper, 2 (June).
- [51] Terziovski, M., & Samson, D. (1999). The link between total quality management practice and organisational performance. *International Journal of Quality & Reliability Management*, Vol. 16(Iss 3), pp. 226 – 237.
- [52] Tuan Mat, T. Z., Smith, M., & Djajadikerta, H. (2010). Determinants of Management Accounting Control System in Malaysian Manufacturing Companies. *Asian Journal of Accounting and Governance*, 1, 79–104.
- [53] Upton, D. (1998). Just-in-time and performance measurement systems. *International Journal of Operations & Production Management*, Vol. 18(Iss 11), pp. 1101 – 1110.
- [54] Van der Stede, W. A., Chow, C. W., & Lin, T. W. (2006). Measures, and Performance. *Behavioral Research in Accounting*, 18(2002), 185–205.
- [55] Widener, S. K. (2006). Associations between strategic resource importance and performance measure use: The impact on firm performance. *Management Accounting Research*, 17, 433–457.