A CONCEPTUAL PAPER ON THE PERFORMANCE MEASURE USAGE ACCORDING TO BSC PERSPECTIVE WITHIN THE MALAYSIAN ELECTRICAL & ELACTRONICS SECTOR

*Amri Mohamad, Yuserrie Zainuddin

Universiti Teknologi MARA (UiTM)
16800 Machang, Kelantan, Malaysia

Universiti Malaysia Pahang
Lebuhraya Tun Razak
26300 Gambang, Kuantan, Pahang

*Corresponding author's email: amri093@kelantan.uitm.edu.my

Abstract

The objective of this study is to investigate on the performance measure usage within the Malaysian E&E manufacturing firms' performance. Basically the theoretical gaps are concentrated on the issue of focusing solely on the financial measurements to measure the firm's performance. And it has been discussed at length in the literature about the insufficiency of relying on the financial indicators only as the sole indicator to gauge firms performance. The main aim of this paper is to investigate on the performance measure usage according to BSC perspectives within the E&E manufacturers that will serve as a basis for future research with regards to this issue within the E&E manufacturing performance in Malaysia.

Keywords: *performance usage, financial indicators, balanced scorecards, nonfinancial indicators, firm performance*

1.0 INTRODUCTION

The inadequacies of relying exclusively on the financial indicators in manufacturing performance measurement are well documented and understood (Medori, Steeple, Pye & Wood, 1995). According to Eccles and Pybum (1992), the drawbacks of looking solely into financial indicators are well known by managers. Among the many limitations cited are the financial measures are at best too summarized to be useful and, at worst, they provide a very limited and often misleading picture of the performance of the organization (Tarr, 1995). It is widely recognized during the 1990's that the exclusive reliance on financial indicators are not appropriate anymore for the purpose of measuring performance in manufacturing (Geanuracos & Meiklejohn, 1993).

According to Banker, Potter and Srinivasan (2000), non-financial measurements show better indicators for future performance and they are important in evaluating and motivating managerial performance. In addition to this, studies by Maiga and Jacobs (2003) and Hoque and James (2000) showed that the usage of multiple performance measure which is inclusive of non-financial indicators will lead to better firms' performance. Because of this theoretical gap that explained clearly that the sole reliance on using

financial measure is not appropriate and suitable anymore, and that the multiple usage of performance measures will lead to better firm performance, thus it is one of the objectives for this research is to look into the multiple performance measures usage in the E&E companies in Malaysia.

A further look at performance indicators for local E&E industry, most of the measures used are financial measures which are represented by productivity and profitability indicators (Productivity Report, 2010/2011). Some of the mostly cited productivity performance indicators as explained in the report were Capital Productivity, Labour Productivity, Labour Competitiveness, Capital Intensity, Process Efficiency and Added Value Content.

To further determine the gaps with regard to the performance measures used in the E&E sector, an interview was conducted with a manager, industry and research division specializing on E&E sector, at National Productivity Centre (NPC). The purpose of this interview was to gauge on the usage of performance indicators in the E&E manufacturers that is to know the usage of financial and non financial indicators in those firms. From the interview, it was revealed that financial indicators are mainly used as the indicators for company's performance, whereas the non-financial indicators are used mainly in the operations division. The non-financial measures as used in operation are cited to be defect rates and process efficiency. This showed the gaps the present practices of E&E manufacturers in the sense that the non-financial indicators were not fully practiced in the firms and this is one of the gaps that was covered in this study.

2.0 BACKGROUND/LITERATURE REVIEW

The term performance measurement has been conceptualized by several authors. Mia and Patiar (2001) conceptualized performance as the quantification of activities which will lead to effectiveness. Otley (1999) stated that performance measurement is related to the efforts to achieve organization's objective in the environment that it is in. The evolution of performance measurement has changed as situation changes. According to Ghalayini and Noble (1996), in the beginning of the 1880s the concerns of the day were of how to minimize cost in the production. This cost accounting approach was of importance since it could help managers to monitor their operating costs although later on some other elements of financial measures such as profit and ROI were also introduced to better measure the performance of the firm.

However, the growth of global activities during the 1980s and changes associated with it has drawn criticism on performance measurements using financial measures as its sole indicators. Previously the mass production with homogeneous products was order of the day but when foreign competitors were able to bring in more quality and variety products, local manufacturers began to suffer losses. Customers now have more variety and quality of products to choose from at competitive prices brought in by foreign competitors and as a result of this, local manufacturers began to lose out (Ghalayini & Noble, 1996).

In order to counter these unfavorable situations, they began to focus more on quality, variety, delivery, flexibility and also introduced technology such as Computer Integrated Manufacturing (CIM) and Flexible Manufacturing System (FMS) (Ghalayini & Noble, 1996). During this period, the disadvantages of focusing on financial measurements only had become apparent where criticisms were made of its inability to measure non-financial indicators. The focus on solely using financial measurement seemed insufficient to include on all factors critical to firms success (Kaplan, 1983; 1984). The implementation of

these changes showed that traditional performance measures as used before had many drawbacks and needed to be updated to cope with changing situations.

In addition, there were also others who criticized the sole usage of financial indicators such as Johnson and Kaplan (1987) whereby they stated that the cost accounting orientation lacked the continuous improvement criteria and relied on the minimization of variance. McNair and Mosconi (1987) has proposed the need for better usage of both financial and non-financial measures according to firm's strategy. Santori and Anderson (1987) stressed the significance of non-financial indicators to monitor employees' progress and to motivate them.

2.1 Criticisms of Using Sole Financial Performance Measures

According to Ghalayini and Noble (1996), the following will present the most commonly cited limitations:

i. Lagging indicators
Financial reports are the output of past transactions which is closed normally at the end of the month. Thus, it has become outdated for day to day operating decisions especially for non-financial employees like the supervisors and operators.

ii. Lacking of non-financial indicators
Not all of the critical success factors can be measured using financial indicators. Other performance indicators especially related to non-financial measurements just cannot be captured using financial performance. With the globalization in world trade and stiff competition from foreign competitors offering more quality products at competitive prices, it is very important for firms to have all round performance measurement systems which have non-financial criteria also such as lead time, quality and efficient delivery.

iii. Lacking of strategy
Traditional performance measurement has focused mainly on minimization of costs rather than continuous improvements. Strategy is not incorporated in the designing of traditional performance measurement system unlike in BSC which incorporates strategy.

Table 1 provides some summaries of the differences between traditional and non-traditional performance measurements.

Table 1 Comparisons between traditional performance measure and non-traditional performance measures

Traditional Performance Measures	**Non-Traditional Performance Measures**
Based on outdated traditional accounting system	Based on company strategy
Mainly financial measures	Mainly non-financial measures
Intended for middle and high managers	Intended for all employees
Lagging metrics (weekly or monthly)	On time metrics (hourly or daily)
Lead to employee frustration	Lead to employee satisfaction
Neglected at shopfloor	Frequently used at shopfloor
Have a fixed format	Have no fixed format (depends on needs)
Do not vary between locations	Vary between locations
Intended mainly for monitoring performance	Intended to improve performance

Adapted from Ghalayini & Noble (1996). p 68.

The sole reliance in using the traditional performance measurement has somewhat become irrelevance in the flexible situations (Kaplan, 1983). If firms still insisting on using sole performance measure, it will lose out to other competitors which had an integrated approach using criteria which cannot be measured using financial indicators such as customer satisfaction, lead time, fast and efficient delivery.

The dynamic business environment which required the all-round multiple criteria success factors in measuring performance should be adopted by firms wishing to compete in global business arena or they will lose out to other competitors emulating the non-financial measures (Kaplan, 1985). Accounting should be able to serve the objective of the firm and although it cannot mobilize organizational change, it should be able to provide impetus for improving organizational performance (Kaplan, 1983; 1986).

2.2 Non-financial Indicators

Due to the wide ranging acceptability of the need to use non-financial indicators alongside financial measurement, some forms of new integrated performance measurement systems were suggested. The purpose for developing integrated performance measurement system was that it will show an overall view of companies' performance and to guard against sub-optimization (Ghalayini & Noble, 1996).

There were many methods introduces to integrate both of the financial and non-financial indicators to measure the firm performance and among them are performance measurement matrix (Keegan, Eiler, & Anania, 1989), balanced scorecard (Kaplan & Norton, 1992), and integrated dynamic Performance Measurement System (Ghalayini, Noble, & Crowe, 1997) and among all of the performance measurement systems, it appears that balanced scorecard (BSC) is the most used and widely generally accepted among practitioners and scholars (Gomes, Mahmoud & Lisboa; 2004).

The advantages of using BSC and the justifications for using BSC as the performance measurement system that integrates both of the financial and non-financial indicators are as explained below:

i. BSC encompasses both financial and non-financial benefits of firm performance, thus it will be better able to capture on the financial and non-financial benefits accrued from the IT investment.
ii. It incorporated together the elements of strategy, financial and non-financial measurements into it. It was a technique that allowed firms to translate their strategic objectives into a coherent set of performance measures (Kaplan & Norton, 1993).
iii. BSC incorporates strategy as an element used by a firm to link with firm performance. The conceptualization of IT as a strategy by a firm to achieve organizational effectiveness has been mooted by author such as Edwards (2001).
iv. BSC has been acknowledged as the most frequently implemented performance measurement system showing its usability and acceptability in the market (Gomes et al., 2004).

2.3 Performance Measurement in Manufacturing

Manufacturers recommended the use of non-financial measures in managing production activities. Non-financial measurements like customer service, quality, flexibility, delivery time, competitive position, and

production process time were mentioned in literature on manufacturing performance measures (Kaplan, 1985). According to Kaplan (1983), non-financial measurements were needed to monitor and control the manufacturing process. McNair, Lynch, and Cross (1990) also stressed the importance of relying on both financial and non-financial measurement. This view were also shared by Grady (1991) and Sellenheim (1991). The point raised for the usage of non-financial indicators alongside financial indicators in manufacturing was that financial measures were not relevance to shop floor operators. Most of the metrics of relevance to shop floor operators were those which were not normally measured using dollars and cents such as lead time reduction, delivery schedule, customer satisfaction and product quality (Ghalayini & Noble, 1996).

McNair and Mosconi (1987) proposed for the usage of integrated performance measurement applying both the financial and non-financial measures according to the business strategy. This explanation fits well with the concept of BSC where it was established earlier that BSC incorporates both financial and non-financial indicators and at the same time stressed on linking the strategy to firm measurement and performance. Furthermore, BSC was the most widely used method to measure performance in manufacturing (Gomes et al, 2004) and this is illustrated by some examples of scholarly articles using BSC in manufacturing as listed in Table 2.

Table 2 BSC in manufacturing

Authors	**Scope**
Kaplan (1993)	Presents some insights on the BSC implementation at FMC Corporation
Kaplan & Norton (1993)	Presents some insights on the BSC implementation at Apple Computer, Advanced Micro Devices and Rockwater Corporation
Kaplan (1994)	Examines the use of the BSC at Rockwater Corporation
Vokurka & Fliedner (1995)	Presents an operations performance measurement system developed by one firm based on the BSC
Davis (1996)	Describes the process of implementing a BSC system developed by General Electric Lighting Business Group (USA)
Roest (1997)	Presents ten 'golden rules' to help the BSC practical implementation
Martinsons, Davison, & Tse (1999)	Develops a BSC for information system (IS) that measures and evaluates information system activities
Brewer & Speh (2000)	Examines how the BSC can be used to develop a framework for assessing supply chain performance
Lipe & Salterion (2000)	Examines how the BSC that includes some measures common to multiple units and other measures that are unique to a particular unit affect superior's evaluations of that unit's performance.

3.0 RESEARCH ISSUE

As highlighted in the earlier sections, there were many practical gaps in the manufacturing performance such as rising costs, lack of innovation and below average statistics. These had indicated the needs to

acknowledge the problems in the manufacturing firm performance and thus, the need to suggest revised and improvised methods to encounter the said symptoms and problems. Thus these manufacturing practical gaps are basically the indicators that manufacturing performance problems do exist in the E&E manufacturing industry and thus need to be addressed by looking at how performance can be further enhanced within this E&E industry.

In terms of theoretical gap, criticisms were made on traditional financial measurements and showed the importance in the introduction of non-financial indicators. The extensive usage of financial indicators and selected non-financial indicators such as in operations division in Malaysian E&E manufacturing firms (Lok Lee & Mazlina Shafie, 2007) indicated that a more comprehensive approach needed to be looked into so that firms would be better able to deal with practical gaps explained previously. Thus in this study, the problems of relying mostly on financial perspectives and less emphasis on non financial performance indicators need to be investigated in terms of usage of both financial and non financial indicators in the E&E industry, and to look at the advantages that firms can obtain if they were to use both financial and non financial indicators in order to increase their firm performance comprehensively.

This study attempts to close the theoretical on E & E performance measurement by suggesting a Balanced Scorecard (BSC) approach to measure performance. BSC is chosen since it is the most widely used multiple measures in manufacturing (Gomes et al., 2004). BSC is multidimensional in nature and has a comprehensive set of performance measure that contains both financial and non-financial indicators (Kaplan & Norton, 1996). This approach included both the financial and non-financial indicators under four perspectives, namely financial, internal business process, innovation & learning and customer perspectives. All of the perspectives are linked by cause and effect or means end relationship whereby improvement in non-financial perspective will in the end lead to improvement in financial performance. The usage of BSC perspectives in the E&E manufacturing firms is one of the key issues investigated in this study.

4.0 CONCLUSION

This study concludes that there exists gaps in terms of relying exclusively on financial indicators to a firm performance. There exists several weaknesses in relying solely on the financial indicators and there also exist benefits that firms will get if they were to use non financial indicators alongside financial indicators. The non financial indicators will complement the performance measurement in the performance measurement. This will lead to a comprehensive performance measurement that will lead to the increase in the firm's performance and these elements will serve as a basis for future research in this area.

Acknowledgements

The authors would like to express appreciation to the Universiti Teknologi MARA for funding the research.

References

Banker, R. D., Potter, G. & Srinivasan, D. (2000). An empirical investigation of an incentive plan that includes non-financial performance measures. *The Accounting Review, 75(1),* 65-92.

Brewer, P. C., & Speh, T. W. (2000). Using balanced scorecard to measure supply chain performance. *Journal of Business Logistics, 21(1),* 75-93.

Davis, T. R. V. (1996). Developing an employee balanced scorecard: linking frontline performance to corporate objectives. *Management Decision, 1(3),* 25-33.

Eccles, R., & Pybum, P. J. (1992). Creating a comprehensive system to measure performance. *Management Accounting (USA), 74(4),* 41-44.

Edwards, J. B. (2001). ERP, balanced scorecard and IT. How do they fit together? *Journal of Corporate Accounting & Finance, 12(5),* 3-12.

Geanuracos, J., & Meiklejohn, I. (1993). *Performance measurement: The new agenda*. London: Business Intelligence.

Ghalayini, A. M., & Noble, J. S. (1996). The changing basis of performance measurement. *International Journal of Operation & Production Management, 16(8),* 63-80.

Ghalayini, A. M., Noble, J. S., & Crowe, T. J. (1997). An integrated dynamic performance measurement system for improving manufacturing competitiveness. *International Journal of Production Economics*, 48(3), 207-225.

Grady, M. W. (1991). Performance measurement: Implementing strategy. *Management Accounting (US), 73(1),* 49-53.

Gomes, C. F., Mahmoud M Yasin, & Joao, V. Lisboa. (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*, 15(6), 511-530.

Hoque, Z., & James, W. (2000). Linking balanced scorecard measures to size and market factors: Impact on organizational performance. *Journal of Management Accounting Research, 12,* 1-17.

Johnson, H. T., & Kaplan, R. S. (1987). *Relevance lost: The rise and fall of management accounting.* Boston: Harvard Business School Press.

Kaplan, R. S. (1983). Measuring manufacturing performance: A new challenge for managerial accounting research. *Accounting Review, LVIII(4),* 686-705.

Kaplan, R. S. (1984). The evolution of management accounting. *The Accounting Review, 59(3),* 390-418.

Kaplan, R. S.(1985). Cost accounting: A revolution in the making. *Corporate Accounting. Spring* : 10-16.

Kaplan, R. S. (1986). Accounting Lag. The obsolescence of cost accounting system. *California Management Review. 28(2),* 174-199.

Kaplan, R. S. (1993). Implementing the balanced scorecard at FMC corporation: An interview with Larry D. Brady. *Harvard Business Review, 71(5),* 143-147.

Kaplan, R. S. (1994). Devising a balanced scorecard matched to business strategy. *Planning Review, 22(5),* 15-48.

Kaplan, R. S., & Norton, D. P. (1992). The Balanced Scorecard – Measures that drive Performance. *Harvard Business Review, 70(1),* 71-79.

Kaplan, R. S., & Norton, D. P. (1993). Putting the balanced scorecard to work. *Harvard Business Review, 71(5),* 134-142.

Keegan, D. O., Eiler, R., & Anania, J. V. (1989). An advanced cost management system for the factory of the future. *Management Accounting, June,* 45-50.

Lipe, M. G., & Salterion, S. E. (2000). The balanced scorecard: Judgemental effects of common and unique performance measures. *The Accounting Review, 75(3),* 283-298.

Lok Lee, & Mazlina Shafii. (2007). Productivity in industry: Electrical & electronics. *P&Q Digest, Vol. 08*. August. ISSN 1675-5111.

Maiga, A. S., & Jacobs, F. A. (2003). Balanced scorecard, activity based costing and company performance: An empirical analysis. *Journal of Managerial Issues, 15(3),* 283-301.

Martinsons, M., Davison, R., & Tse, D. (1999). The balanced scorecard: A foundation for the strategic management of information systems. *Decision Support Systems, 25,* 71-88.

McNair, C. J., & Mosconi, W. (1987). Measuring performance in an advanced manufacturing environment. *Management Accounting, July,* 28-31.

McNair, C. J., Lynch, R. L., & Cross, K. F. (1990). Do financial and nonfinancial performance measures have to agree? *Management Accounting (US), November,* 34-36.

Medori, D., Steeple, D., Pye, T., & Wood, R. (1995). *Performance measures: The way forward.* Proceedings of the Eleventh National Conference on Manufacturing Research, De Montfort University, Leicester, Taylor and Francis, Basingstoke, UK, 589-593.

Mia, L., & Patiar, A. (2001). The use of management accounting systems in hotels: An exploratory study. *International Journal of Hospitality Management, 20 (2)*: 111-28

Otley, D. T. (1999). Performance management: A framework for management control system design. *Management Accounting Research, 10,* 363-382.

Productivity Report. (2010/2011). *Productivity Report*. Retrieved from http://www.mpc.gov.my

Roest, P. (1997). The golden rules for implementing the balanced business scorecard. *Information Management and Computer Security, 5(5),* 163-165.

Santori, P. R. and A. D. Anderson. (1987). Manufacturing performance in the 1990s: Measuring excellence.",*Journal of Accountancy, 164(5):* 141-147

Sellenheim, M. R. (1991). J. I. Case company: Performance measurement. *Management Accounting (US), September,* 50-53.

Tarr, J. D. (1995). Developing performance measurement systems that support continuous improvement. *Hospital Material Management Quarterly, 17(3),* 59-67.

Vokurka, R., & Fliedner, G. (1995). Measuring operating performance: A specific case study. *Production and Inventory Management Journal, 36(1)*, 38-43.