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Firm Technological Change and Its Effects on Management Accounting Change (Case Study of Iranian Manufacturing Firms)

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Firm Technological Change and Its Effects on Management Accounting Change (Case Study of Iranian Manufacturing Firms)

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Abstract - Exact costing of productions and providing suitable and reliable information or reports for economic decision-making process are the main consideration in management accounting, meanwhile firms technological change causes the management accounting to change which we have tested the effects of such technological change on management accounting change (MAC). The research method is descriptive survey and in applied type in which researcher have utilized four hypothesis to obtain the research objectives. The first hypotheses compare the rate of technological changes effect on management accounting change. While the second hypothesis is used to compare the needs of manufacturing firms to another costing system. Also in this research, the author has T test for both hypothesis. The third hypothesis deals with the sameness of technological changes item in which researcher have used Friedman test to examine it. Finally, the fourth hypothesis, to compare the sameness of technological changes effect and the rate of firms need for other costing system by considering the firm size, researcher have applied Kruskal-Wallis test and the research results indicate the firms tendencies to develop the management accounting system.

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I. INTRODUCTION

In 21 century the financial managers can specify only 10-20 percents of their working time to do the affairs of reporting and market price (market cost) definitions.

This point comes from the fact that the common and traditional methods of accounting and financial report have been developed into the automatic process which is common and clear these days. In this situation the financial management can be useful for their firms only when they assist them (firms); decision – making process and defining the strategies.

In this century, the financial managers must specify most part of their working time to access, analyze and interpret the changes and management decision- making process. (Hilton, 2000)

The designing of accounting system in Iran coincided with the arrival of accounting experts from western countries, mean while the performance history of system designing units of some international firms (institutions) such as coopers and others some who

refer to the second half of 20 century. Fundamental changes in economy, manufacturing technology specially it have caused many tremendous changes in management method of the firms. Firms manufacturing managers are under pressure to find ways for balancing costs- cutting and quality improvement by considering profitability. In developed countries, firms not succeeded in defeating these challenges, often stop their performance or being purchased by other firms. As an example, is the case which happened for a firm among 100 large manufacturing firms in austerely between 1982-1993.

Since 1985, all discussions in academics and executives state that in many manufacturing firms the costing systems don't satisfy information needs (requirements) and analysis process during decision making and sometimes they reason that the costing system is an important obstacle to perform new technologies and understand firm's competitive advantages.

New approaches and philosophy in management area, specially total quality management and just in time system in some developed countries and developing countries , also change in it area, economic.

And business have made tremendous effects in manufacture method of productions and costing system performance method of organizations, mean while some new technics such as activity based costing (ABC) , objective costing , life cycle costing, reporting quality costing and strategic management accounting have been created and been utilized.

Therefore, in spite of carrying out new manufacturing methods by the firms to improve their competitive advantage and requirement to make change in manufacturing methods and tools, the costing system are faced with serious exotics in this essay not only we have management accounting literature but we are trying to examine the effects of technological changes including items as 1- automation 2- short production cycle 3- increase in overheads and analysis firms needs for costing system.

In understanding management accounting in a competitive business environment, much research has increasingly focused on the change aspect. When business organizations respond to challenges by embarking on a change management path, they will

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face the choice of which one of the alternative management methods, techniques and systems would be most effective (Waldron, 2005).

Moreover, the introduction of a 'fast information technology' environment, within which firms in manufacturing industries in Malaysia operate, has greatly affected the associated technological environment. Much literature has identified technological advancement, active competitors and demanding customers as potential predictors of organisational and MAC (Baines & Langfield-Smith, 2003; Dibrell & Miller, 2002; Innes & Mitchell, 1990; Kaplan & Norton, 1996; Shields, 1997). This aspect is important because the management accounting system (MAS) requirements can vary significantly depending on how well known are the causes of change in the external environment, and their indicators are to the organisation. This argument is supported by Waweru, Hoque and Uliana (2004), who found that an increase in global competition and changes in technology were the two main contingent factors affecting MAC in South Africa.

As the firm strives to achieve a better fit with its environment, and to be more successful, sustaining, and improving current performance will become critical. However, very limited research has taken place into how changes in technological and competitive business environments have caused management accounting and organisational change in developing countries. Most empirical evidence in this area originates from research in developed countries (Baines & Langfield-Smith, 2003; Burns, Ezzamel, & Scapens, 1999; Chenhall & Euske, 2007; Ling-Yee & Ogunmokun, 2008; J. A. Smith, J. Morris, & M. Ezzamel, 2005).

a) *Management Accounting Change*

MAC is not a uniform phenomenon. Consequently one might expect the causal factors of change to be varied and this has indeed been confirmed by management accounting researchers. It is evident that both the external factors (environmental) and internal factors (relating to the organisation concerned) have influenced the recent development of new management accounting systems and techniques. According to Shields (1997), the potential change drivers are competition, technologies, organizational design and strategies. These drivers of change also indicate the differing roles which causal factors can have in the process of change. Change in environment also implies uncertainty and risk which create a demand for further MAC in the form of 'non-financial' measures (Vaivio, 1999).

Many researchers have shown an interest in understanding MAC (Baines & Langfield-Smith, 2003; Chenhall & Langfield-Smith, 1998b; Innes & Mitchell, 1990; Libby & Waterhouse, 1996). For example Chenhall and Langfield-Smith (1998b) have explored the benefit of management accounting change, but less is known

about the forces that induce this change (Laitinen, 2006). The reasons for MAC are termed "motivational factors" (Laitinen, 2006), and many researchers have suggested a substantial list of motivational factors (Baines & Langfield-Smith, 2003; Laitinen, 2001; Libby & Waterhouse, 1996). For example, Innes and Mitchell (1990) found a different set of circumstances linked with management accounting change, which they termed as follows:

- Motivators (e.g., competitive market, organisational structure, and product technology)
- Catalysts (e.g., poor financial performance, loss of market share, organisational change)
- Facilitators (e.g., accounting staff resources, degree of autonomy, accounting requirements)

The interaction between these variables promotes change not only in management accounting but also other related disciplines² (Innes & Mitchell, 1990; Laitinen, 2006). Laitinen (2001) classified these factors in six groups: information needs; changes in technology and environment; willingness to change; resources for change; objectives for change; and external requirements. Laitinen (2006), on the other hand, used four categories of factors to explain management accounting change: organisational factors; financial factors; motivational factors, and management tools.

While, various factors have been associated with management accounting change, this study considers three factors, i.e., motivational factors, organisational factors and financial factors. Changes in environment and technology are used as motivational factors in explaining MAC and changes in organisational factors (i.e., structure and strategy). Besides that, organisational structure and strategy (organisational factors) are considered as contextual factors inside the firm that may have a connection to changes in management accounting (Moores & Yuen, 2001). Financial factors are used as outcomes of management accounting and organisational change. Grandlund (2001) suggested that low financial performance may put economic pressure on the firm to change its MAS to increase performance. Baines and Langfield-Smith (2003) suggested that if MAC is accompanied by a greater reliance on accounting information, it may result in improved performance. Thus, financial performance may be an antecedent or an outcome factor of management accounting change.

II. LITERATURE REVIEW

The basic purpose of accounting information is to help users make decisions. Management accounting is the branch of accounting that produces information for managers and forms an important integral part of the strategic process within an organisation. It involves the

process of identifying, measuring, accumulating, analysing, preparing, interpreting, and communicating information that helps managers fulfill organizational objectives (Horngren, Sundem, Stratton, Burgstahler, & Schatzberg, 2007). Chartered Institute of Management Accountants (UK) (2000) views management accounting as an integral part of management which requires the identification, generation, presentation, interpretation and use of information relevant to formulating business strategy, planning and controlling activities, decision-making, efficient resource usage, and performance improvement and value enhancement.

III. RESEARCH OBJECTIVES

Research objectives are as follow:

- 1- To examine the effects of technical changes on management accounting of manufacturing firms.
- 2- To identify the rate of firms needs for other costing system.

IV. RESEARCH HYPOTHESES

- 1- Technical changes have no effects to change the management accounting of Iranian manufacturing firms.
- 2- Iranian manufacturing firms need other costing system.
- 3- Technical items occupy the same importance from the view points of their effects to change the management accounting.
- 4- Technical changes have same importance to change the management accounting by considering the firm size.

V. RESEARCH METHODOLOGY

Research method is descriptive- survey and applied one in order to enter research area field method have been used. In order to gather needed research information two series of data (primary and second) have been used in which documents, books, internet search motors and relative sites have been utilized in gathering data.

Also, in this research questionnaire and interview techniques have been used simultaneously to gather research primary data from statistical society.

Sampling method is based on random- class which has been applied to select sample level- in this research firms are classified based on firm size as follow: small (below 10 personals), middle (10-50 personals) , large (50-150 personals) and very large (more them 150 personals). The research statistical society – active manufacturing firms- were provided with 150 questionnaires in which 112 answered questionnaire came to obtain conclusion by researcher. Statistical analysis has performed in two sections, descriptive and deductive in descriptive section, frequency charts have been formed to examine the general features of studied sample (sex , age ,

professional experience , major course , degree and human resource number) and describe them.

In deductive analysis section, T- test has been utilized to compare the observed and theoretical means to decide on hypothesizes rejection or validation. If the observed mean of studied sample described for the first hypothesis is meaningfully more than theoretical mean ($3=1+2+3+4+5/5$) and fore second hypothesis it (observed mean) is meaininfuly more than theoretical mean of specified codes mean in LIKERT scale , we can conclude that the Frequency of much and very much options is meaningfully less than frequency of options little and very little , so the hypothesis is valid, in this assay Friedman test has been used to examine the uniformity of research variables and than kruskal- wallis non- parametric test has been utilized to analyze separately the effect of firm size on research variable.

Table 1: Frequency of Firms Size

| Firm Size | | Frequency | Percent |
|------------|---------------|-----------|---------|
| Small | > 10 | 4 | 3.6 |
| Middle | 10 to 50 | 56 | 50. |
| Large | 50 to 150 | 28 | 25 |
| Very large | more than 150 | 24 | 21.4 |
| Total | | 112 | 100 |

VI. STATISTICAL ANALYSIS

a) First hypothesis testing

Ho: the mean is equal to 3 (technological changes have no effect on MAC of Iranian manufacturing firms.

H1: the mean is opposed to 3 (technological changes have effect on MAC of Iranian manufacturing firms.

Considering the values in table No.2, p-value= 0.000 the assumption of Ho is invalid in the error level of %5. On the other hand, the observed mean is not equal to 3 and since the applied mean (2.08) is less than 3 or theoretical mean then we can conclude that the observations mean is meaningfully less than 3, in other word, the research hypothesis is accepted in the error level of %5 so we can state that the technological changes affect the management accounting to change.

b) Second hypothesis testing

Ho: the mean is equal to 2. (Iranian manufacturing firms need no their costing system)

H1: the mean is opposed to 2. (Iranian manufacturing firms need their costing system)



Table 2 : T Test Statistics

| Description | n | \bar{x} | s | t | d.f | Test Value | P-value | Result |
|-------------------|-----|-----------|-------|--------|-----|------------|---------|--------|
| Hypotheses | | | | | | | | |
| First Hypothesis | 112 | 2.08 | 0.268 | 0.0254 | 11 | 3 | 0.000 | Accept |
| Second Hypothesis | 112 | 2.28 | 0.962 | 0.0909 | 11 | 2 | 0.002 | Accept |

Regarding the values in table No. 2, p-value=0.002, the assumption of Ho is rejected in the error level of %5.

In other word, the mean of the observation is not equal to s and since the applied mean (2.28) is more than 2 or theoretical mean then we conclude that the mean of the observation. Is meaningfully more than 2, in other word research hypothesis is valid in the error level of %5 therefore we can state that the manufacturing firms need no other costing system.

c) Third hypothesis testing

Ho: technological items have uniform importance to affect the management accounting change.

H1: technological items don't have uniform importance to affect the management accounting change.

In order to prioritize the important of each variable we have used Friedman test. This test is used when the statistical data are ordinal or we can classify them reciprocally based on ordinal conception.

Friedman test states that if there is a factor among all to be most important than or not, they have all uniform importance.

As you see in table 3, the statistical value, chi-square with Freedom degree 3 and sig=0.00 less than %5, H1 is rejected and the assumption of Ho is valid wit %95 trust level. And the prioritizations of independent variables are as table No.5.

Therefore we can conclude that the technological items have uniform importance to affect the management accounting change.

Table 3 : Friedman Test Statistics

| N | Chi-Square | df | Sig | Result |
|-----|------------|----|-------|--------|
| 112 | 23.155 | 3 | 0.000 | Accept |

Table 4 : Rank

| Independent Variables | Mean Rank |
|------------------------|-----------|
| Automation | 2.84 |
| Short Production Cycle | 2.65 |
| Quality Requirements | 2.45 |
| Increase in Overheads | 2.27 |

d) Forth hypothesis testing

Ho: Technological changes have uniform effects to change management accounting by considering the firm size

H1: technological changes don't have uniform effects to change management accounting by considering firm size.

Considering the values obtained from sig in table No.6, we can conclude that the firm size affects the variables of technological changes. Therefore, we state that these effects are uniform based on different size of times.

Table 5 : Ranks

| Description | Firm Size | N | Mean Rank |
|-------------------------------------|---------------|-----|-----------|
| The effect of technological changes | >10 | 4 | 12.50 |
| | 10 to 50 | 56 | 64.36 |
| | 50 to 150 | 28 | 50.79 |
| | more than 150 | 24 | 52.17 |
| | Total | 112 | |
| Other costing system requirements | >10 | 4 | 14.50 |
| | 10 to 50 | 56 | 63.64 |
| | 50 to 150 | 28 | 65.93 |
| | more than 150 | 24 | 35.83 |
| | Total | 112 | |

Table 6 : Kruskal-Wallis Test Statistics

| Factor | The effect of technological changes | Other costing system requirements |
|------------|-------------------------------------|-----------------------------------|
| Chi-Square | 13.838 | 23.428 |
| df | 2 | 3 |
| P-Value | 0.003 | 0.000 |
| Result | Difference is meaningfully | Difference is meaningfully |

VII. RESULTS AND FINDINGS

This essay describes the survey results obtained from active manufacturing firms sizes in this research are as follow: small, middle, large and very large.

Results obtained from research hypothesis testing show that the firm technological changes affect MAC and firm need other costing system.

In order to examine the uniformity research independent variables effect. Friedman test has been used which states that the effect of research independent to recognize the effect of research main variables based on firm size Kruskal-Wallis test was used and test results show agreement among studied sample hypothesis.

We can generally conclude that the firm's competition in world markets have been complicated and pressed in comparison with post and customers have many options to select their favorite productions. Now days, technology developments have brought more production and similar service and customers have many options to purchase the favorite items. In this situation firms can survive and continue their activity in production process by providing quality, suitable performance and competitive production with low net cost to increase their share in markets and earn their favorite been fit. The only tool to satisfy these is activity based costing (ABC) and promotion of manufacturing system and store which can be responsible against technological changes.

We can conclude that monopolistic or exclusive markets in Iran is a critical obstacle preventing Iranian firms to apply new costing methods and production and it is possible only in competitive atmosphere in which firms will apply these system to survive.

VIII. ACKNOWLEDGEMENT

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IX. CONCLUSIONS

Considering the topic in importance and regarding the results obtained from research data some recommendations are provided as follow:

1. In Iran firms are inclined to change their management accounting system , but the absence of competitive nature in markets don't allow them to carry the costs of system change on his shoulder. So government must provide some facilitations in boundaries to import goods and productions from foreign countries , then national manufacturer will be encourage to compete with goods imported from foreign countries, so national manufacturers will

- consider key factors of management accounting systems change and costing in their manufacturing process.
2. Firms must replace traditional and individualized method of working in order to increase the quality and reduce cost price.
3. To develop the relation between firm and customers in order to identify their needs.
4. Costing is defined based on activity of a system which reduces costs and leads to the precise computation of cost price, so firms are recommended to replace traditional system of measurement and cost price definition with activity based costing.
5. Considering the Society of Iranian value engineering (SIVE) it is recommended to the firms to benefit from the guidelines of this society, value engineering, to improve their performance by referring to web site of Iranian value engineering Society (www.sive.org)

REFERENCES RÉFÉRENCES REFERENCIAS

1. Adler, R.E, Andre M. & Waldren, M, Advanced Management Accounting Techniques, Accounting Forum, Vol. 24, No.2, June 2000
2. Baines, A., and Langfield-Smith, K. (2003), "Antecedents to management accounting change: a structural equation approach", Accounting, Organizations and Society, 28(7,8): pp. 675-698.
3. Chenhall, R. H., and Euske, K. J. (2007), "The Role Of Management Control Systems in Planned Organizational Change: An Analysis of Two Organizations", Accounting, Organizations and Society, 32(7/8): pp. 601- 637.
4. Chenhall, R. H., and Langfield-Smith, K. (1998b), "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.
5. Dibrell, C. C., and Miller, T. R. (2002), "Organization Design: The Continuing Influence of Information Technology", Management Decision, 40(5/6): pp. 620-627.
6. Ezzamel, M., Robson, K., Stapleton, P., and McLean, C. (2007), "Discourse and Institutional Change: 'Giving Accounts' and Accountability", Management Accounting Research, 18: pp. 150-171.
7. Granlund, M. (2001), "Towards Explaining Stability in and Around Management Accounting Systems", Management Accounting Research, 12: pp. 141-166.
8. Hilton; R.W. Maher; M.W Selto; F.H. (2000). Cost Management: Strategies for Business ecision, New Jersey, Mc-Fraw Hill.

9. Horngren, C., Sundem, G., Stratton, W., Burgstahler, D., and Schatzberg, J. (2007), *Introduction to Management Accounting* (14th ed.), Pearson Prentice Hall, New Jersey.
10. Innes, J., and Mitchell, F. (1990), "The Process of Change in Management Accounting: Some Field Study Evidence", *Management Accounting Research*, 1: pp. 3-19.
11. Innes, J., and Mitchell, F. (1990), "The Process of Change in Management Accounting: Some Field Study Evidence", *Management Accounting Research*, 1: pp. 3-19.
12. Kaplan, R. S., and Norton, D. P. (1996), *The Balance Scorecard: Translating Strategy into Action*, Harvard Business School Publishing, Boston.
13. Laitinen, E. K. (2001), "Management Accounting Change in Small Technology Companies: Towards a Mathematical Model of the Technology Firm", *Management Accounting Research*, 12(4): pp. 507-541.
14. Laitinen, E. K. (2006), "Explaining Management Accounting Change: Evidence from Finland", *International Journal Accounting, Auditing and Performance Evaluation*, 3(2): pp. 252-281.
15. Libby, T., and Waterhouse, J. H. (1996), "Predicting Change in Management Accounting Systems", *Journal of Management Accounting Research*, 8: pp. 137-150.
16. Ling-Yee, L., and Ogunmokun, G. O. (2008), "An Empirical Study of Manufacturing Flexibility of Exporting Firms in China: How do Strategic and Organizational Contexts Matter?", *Industrial Marketing Management*, 37 (6): pp. 27-40.
17. Moores, K., and Yuen, S. (2001), "Management Accounting Systems and Organization Configuration: A Life-Cycle Perspective", *Accounting, Organizations and Society*, 26: pp. 351-389.
18. Shields, M. D. (1997), "Research in Management Accounting by North Americans in the 1990s", *Journal of Management Accounting Research*, 9: pp. 3-61.
19. Shields, M. D. (1997), "Research in Management Accounting by North Americans in the 1990s", *Journal of Management Accounting Research*, 9: pp. 3-61.
20. Smith, J. A., Morris, J., and Ezzamel, M. (2005), "Organisational Change, Outsourcing and the Impact on Management Accounting", *The British Accounting Review*, 37(4): pp. 415-441.
21. Smith, J., Morris, J., and Ezzamel, M. (2005), "Organisational Change, Outsourcing and the Impact on Management Accounting", *The British Accounting Review*, 37(4): pp. 415- 441.
22. Vaivio, J. (1999), "Exploring a 'Non-Financial' Management Change", *Management Accounting Research*, 10: pp. 409-437.
23. Waldron, M. (2005), "Overcoming Barriers to Change in Management Accounting Systems", *Journal of American Academy of Business*, Cambridge (2): pp. 244-249.
24. Waweru, N. M., Hoque, Z., and Uliana, E. (2004), "Management Accounting Change in South Africa", *Accounting, Auditing and Accountability Journal*, 17(5): pp. 675-704.

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