

WHICH MANAGEMENT ACCOUNTING TECHNIQUES INFLUENCE PROFITABILITY IN THE MANUFACTURING SECTOR OF PAKISTAN?

Syed Maqbool-ur-Rehman
Department of Finance and Accounting
College of Business Management, Karachi

Abstract

This paper examines the application of management accounting techniques in the manufacturing sector of Pakistan. It investigates the relationship between several contextual factors and their influence in the usage of management accounting practices. The purpose of this research is to find out whether the profitability of the firm is influenced by the usage of management accounting techniques in Pakistan. Further, the conclusions inferred from data analysis may be useful to policy makers in the manufacturing sector of Pakistan.

Keywords: Management Accounting Technique, Kaizen, Throughput, Process, Full, Traditional, Advanced

JEL Classification: M41

I Introduction:

The basic aim of management accounting is to facilitate managers in performing the following management tasks: planning, organizing, directing, controlling and decision making. A major goal of every organization is to achieve satisfactory financial results. If a business is to be financially successful management must be both efficient and effective. Efficiency means maintaining a satisfactory relationship between a firm's

resource input and its output (the number of labor hours required to produce a product), effectiveness refers to how well a firm attains its goal (e.g. actual sale value against planned sale value).

There is almost no research done in Pakistan by academics on the application of traditional and contemporary management accounting techniques used by practitioners, whereas a strong information base had been created through continuous studies in many other parts of the world. Such research provides an opportunity for academics to study the efficient and effective management tools as successfully employed by firms. This study will examine the level of management accounting practices in the manufacturing sector of Pakistan. It will investigate the relationship between several contextual factors and their influence in the usage of management accounting practices. The purpose of this research is to find out whether the profitability of the firm is influenced by the usage of management accounting techniques in Pakistan. Further, the conclusions inferred from data analysis may lead to useful policy recommendations to the manufacturing sector of Pakistan.

II Literature review:

Abdel-Kader and Luther (2006) studied management accounting practices (MAPs) in the food and drinks industry in the U.K. in order to understand the level of MAP's sophistication and the factors that affect implementation of MAPs in this industry. The research methodology used in this study was a survey questionnaire sent to 650 executives of the industry. In total, 245 usable completed questionnaires were received and analyzed. Respondents were asked to indicate the frequency of use of 38 management accounting practices (MAPs) using a Likert scale (1 indicating never and 5 indicating very often). They were also asked to assess the importance of each technique/practice by rating these as 'not important, moderately important or important'.

Unlike previous contingency theory studies, this study investigated the relationship between the development of management accounting practices and explanatory factors (such

as external, organizational and processing factors). Variables studied were(a) the use and importance of management accounting practices; costing systems, budgeting, performance evaluation, information for decision making, strategic analysis and communication of management accounting information. The respondent firms were classified into management accounting evolution stages in order to explore the sophistication of current practices and to examine whether there are relationships between their sophistication and potential explanatory factors. This was done on the basis of their emphasis on certain practices and then relating those management accounting practices to the stages of management accounting evolution (IFAC, 1998). Finally, the study sought to understand the effect of explanatory factors (e.g. external, organizational and processing) on management accounting practices. The study found that as companies moved into a more uncertain environment, the sophistication level of management accounting practices increased. Likewise, as their power relative to customers' diminished, companies moved up the stages of evolution. Analysis of the management accounting practices used suggested that the management accounting systems employed in many food and drinks companies were not particularly sophisticated. Taking the industry as a whole, there was little evidence of management accounting directly connected with 'value creation'. There were, however, indications that increased use may be expected of techniques relating to cost of quality information, non-financial measures relating to employees, and analysis of competitors' strengths and weaknesses in future.

Anand et al. (2004) in their study of cost management practices in India studied the responses furnished by 53 CFOs in Indian corporations. The objective of their study was to capture the development in cost management practices such as accounting for overheads, applications of budgetary control and standard costing in corporate India. The survey questionnaire also aimed to verify any significant difference in management motivation for the implementation and use of standard costing as a control tool between activity based cost management (ABCM) user firms and firms using traditional costing systems.

This study also sought clarification about whether firms using ABCM were more likely to have a: better insight for benchmarking and budgeting; clearer structure of priorities of budget goal; clarity of reasons for effective implementation of budgeting process in their organization and were less likely to use department-wide budgeting systems, absorption costing systems, and variable costing systems.

The questionnaire was sent to CFOs of 579 private sector companies. Despite two reminders and assurances that only aggregate results will be published, only 53 companies chose to respond. The response rate was about 8.52%. This rate was low in comparison to another longitudinal study of 249 companies conducted by Joshi (2001) which elicited a response rate of 24.4% but much higher as compared to response rate of 1.8% to Rigby's (2001) survey mailed to North American executives. Fifty three responses received constituted the sample which was stratified in two segments; ABCM user firms and Non ABCM user firms. Five point Likert scale was used to gauge success achieved in the application of present costing systems to capture (a) accurate cost information with respect to product pricing, inventory valuation, value chain analysis, supply chain analysis and outsourcing decisions; (b) accurate profit analysis by product, by process, by department and by customer; (c) better insight for benchmarking and budgeting and (d) better insight about manufacturing performance.

The results showed that firms which have adopted ABC were significantly more successful in capturing accurate cost information for value chain analysis and supply chain analysis vis-à-vis the firms which had not adopted ABC. No significant difference was found in the use of standard costing among ABC user firms and non users.

Wijewardena and Zoysa. (1999) in a comparative analysis of management accounting practices in Australia and Japan investigated the differences in the adoption of management accounting techniques through a survey questionnaire which was mailed to 1000 largest manufacturing

companies in each country. The size of the company was based on total assets. A total of 217 Japanese companies and 231 Australian companies responded to the 31 questions asked covering various aspects of managerial accounting techniques. This analysis involved comparisons of techniques in different cultural contexts. Major cultural differences identified in the study were collective decision making, unique company philosophy, usage of small firms as sub contractors, company specific cost accounting training for each employee, and the difference in educational background of management accountants as seen in Japan compared to Australia. Based on responses, the profile (e.g. type, asset size, export ratio, annual sales, number of employees and nature of market competition) of the sample firms was tabulated in percentage terms. Other variables explored were; importance of management accounting tools, uses of cost accounting data, purposes of standard costing, investment appraisal methods, components of budgets, timings of budget, main overhead allocation bases, manufacturing cost structure, inventories as a percentage of total assets, quantitative techniques, performance evaluation measures, product costing methods, major participants in new product cost estimation, costing systems and significant changes to costing systems. Mean and coefficient of variation were computed alongside ranking of studied variables for data analysis methodology. In four questions asked, a five point Likert scale from 'much less important to much more important' was utilized to obtain the respondents views on the importance of various areas of management accounting. The responses to these questions were then ranked in accordance with the coefficient of variations. Statistical significance of differences between Australian and Japanese responses was examined by the Kruskal-Wallis non parametric analysis of variances. Other questions which intended to elicit factual responses were analyzed in terms of percentages. Findings of the comparative survey revealed that management accounting practices of Australian companies placed emphasis on cost control tools (e.g. budgeting, standard costing and variance analysis) at the manufacturing stage while Japanese companies focused attention on cost planning and cost reduction tools such as target costing at the product planning and design

stage. This finding is in agreement with another study of Howell and Sukarai (1992) that “Japanese companies seem to understand better than their western counterparts that cost should be managed and avoided during the product planning and product cycle stages rather than when products have entered full scale production”. Another noteworthy difference that emanated from the survey was that activity-based costing (ABC) appeared to be popular among Australian companies while it was rarely used in Japanese companies. Despite the decreased labor component in the manufacturing cost structure, manufacturing companies in both countries seemed to allocate factory overhead mainly on the basis of direct labor. Inventory levels were significantly lower in Japanese companies for finished goods and raw materials in comparison to Australian companies.

Liaqat (2006) carried out an empirical study to find out the application of contemporary management accounting techniques in Indian industry through a survey of 530 member companies of the National Association of Financial Directors and Cost Controllers. Sixty three companies responded which constituted the sample; a response rate of about 12%. The sample was stratified in two segments; ABCM user firms and Non ABCM user firms. A five point Likert scale was used. The focus of the study was to find evidence on how widely traditional and contemporary management accounting practices were adopted by Indian industry. The investigations revealed that improvement of overall profitability and cost reduction were the motivating factors for using management accounting in Indian companies. The researcher found a positive association between the adoption of ABC and company characteristics (e.g. degree of customization, pressure of competition, business size, and proportion of overhead to total cost). However, none of the differences was found to be significant at 10% level.

Isa & Thye (2006) examined the usage of management accounting practices in manufacturing firms in Malaysia. They also studied the relationship between product variety, complexity of production process, level of competition, company

size, overhead expenses and usage of advanced management accounting practices. Management accountants in 500 manufacturing firms were randomly selected from the 2004/2005 Federation of Malaysian Manufacturers Directory. A total of 75 usable responses were received, that represented a response rate of 15%. Respondents comprised of senior level managers, including Chief Executive Officers, General Managers and Management Accountants. To check for non-response bias, two procedures, similar to those utilized by Williams and Seaman (2001) were used. First, the final sample was dichotomized according to size based on sales turnover. Response bias did not appear to be problematic since the cross-correlation for all variables in the two groups were not significantly different. Second, the final sample was divided into two groups: early and late responses. Response bias did not appear to be problematic since the cross-correlation for all variables in the two groups were not significantly different. The instrument for measuring intensity in competition was a modified version of the composite scale for measuring competitive pressure in Khandwalla (1977), as well as in Libby and Waterhouse (1996) and Mia and Clarke (1999). This measure consisted of eight items for rating the intensity of competition in price, product range, quality, new product introduction, advertising and promotion, technological change, marketing distribution and changes in government regulation or policy on a scale ranging from 1 (very low) to 7 (very high). In this study, the measures for traditional management accounting techniques (TMAT) and advanced management accounting techniques (AMAT) were adopted from Waldron and Everett (2004). The TMAT were represented by four techniques: full costing, standard costing, job order costing and process costing. The AMAT comprised thirteen techniques: Activity-Based Costing, Activity-Based Management, Target Costing, Kaizen Costing, Value Added Accounting, Cost of Quality, Economic Value Added, Life Cycle Costing, Target Cost Planning, Cost Modeling, Strategic Management Accounting, Throughput Accounting and Back Flush Costing.

Past and present usage of management accounting techniques was determined through frequency distribution and

in percentages. To examine whether contextual factors such as product variety, complexity of production process, level of competition, company size and overhead expenses are related to the use of advanced management accounting practices, Spearman correlation coefficient was calculated. Spearman correlation indicated no significant relationship between the contextual factors mentioned earlier and the use of advanced management techniques. Significant positive relationships were indicated between line production process (least complex) and advanced management accounting techniques and also between job shop order (most complex) production process and traditional management accounting techniques. These results, however, contradict the notion that usage of advanced management accounting techniques is related to the more complex production processes. Advanced management accounting techniques usage was found to be significantly and negatively related to perceived competition due to product range, new product introduction, changes in government regulation and advertising and promotion. Traditional management accounting techniques were negatively significantly related to only one factor, changes in government regulation. These results implied that usage of AMAT does not necessarily correlate with higher level of perceived intensity in market competition. In fact, the negative coefficients suggested low usage of AMAT as perceived competition increased.

Adler, Everett, and Waldron (2000) conducted a survey that asked management accountants, in New Zealand manufacturing businesses, to indicate the techniques adopted in their business. While many studies have focused on particular techniques such as ABC or target costing, Adler et al. provided a questionnaire that included a vast array of management accounting techniques to provide a fuller set of response options. Respondents were asked to rank management techniques on a five point scale "from most used to least used". A judgment sampling method was chosen to achieve a response rate of 19% that provided 165 completed questionnaires. Traditional management accounting techniques, such as full

costing, direct costing and standard costing were found to be used more often than advanced management accounting techniques, such as strategic management accounting. The study by Adler et al. (2000) is generally consistent with the lack of adoption of advanced management accounting techniques as stated by the Ainikkal (1993) and Hawkes et al. (2003) studies, but inconsistent with respect to individual techniques. It was found that firms in Australia adopted ABC, and cost of quality techniques and also that big firms were more likely to use modern accounting techniques.

Drury et al. (1993) found that allocation methods such as plant wide rates and labour based rates are being used in U.K manufacturing firms because of their simplicity. ABC was widely considered, but not used extensively. Standard costing, payback analysis, and target profit and return on investment were widely used. Management accountants still appeared concerned with product costing and profitability. The survey by Drury et al. is consistent with a similar study in 1990 that found target costing and ABC was widely used. The high use of performance measures such as return on investment was not evident in other surveys. There also appears to be a changed emphasis towards non-financial indicators, as opposed to financial indicators.

Chenhall and Langfield (1998) selected and surveyed large Australian manufacturing firms. The response rate was high, at 56%, compared with other studies. There were a total of 78 responses after the second mailing. The survey asked accountants whether the business they worked in had adopted the management accounting technique stated in the survey. The results showed relatively high rates of adoption for all of the techniques, with the lowest adoption rate 38%. The highly adopted techniques were used by 90% or more of the firms. Suggested reasons for the unusual high adoption rates were due to the chosen firms being large, and the situational differences of Australia.

Yazdifar (2005) asked respondents to identify the five most important techniques out of 32 in a postal survey of management accountants in the United Kingdom. Survey

responses were disaggregated into parent and subsidiary organizations. The results of the survey showed business performance evaluation, budgets, strategic management accounting, variance analysis, and rolling forecasts were the most important. There was no significant difference between parent and subsidiary organizations.

France (2004) used a novel approach to surveying management accounting practices by recording management techniques that appeared in job advertisements on situation vacant job sites in New Zealand. The survey period ran for four weeks during February 2004. There were a total of 36 techniques that were found as the type of techniques that management accountants use. The various techniques of reporting, forecasting, budgeting, cash flow management, strategic management accounting, and variance analysis found to be emphasized in situations vacant positions corroborated with other mail survey studies.

Ghosh et al. (1994) studied managerial accounting practices in 650 companies of Singapore through a mail questionnaire. 109 firms responded and constituted the sample. The response rate was 16.8%. The study did the ranking of the management technique used based on frequency distribution of the responses received from the firms. Techniques investigated were budgets, long term planning, cash budgeting, periodic income statement, standard costing, activity based costing, total quality management, break even analysis, return on investment, capital budgeting, transfer pricing, quantitative methods.

Manalo (2001) in a telephonic survey inquired about the costing system employed in business operations from 500 corporations taken from the Philippine Yearbook, 2001. The result of the telephone survey conducted revealed that out of the top 500 corporations in the Philippines, only 16 percent (83 companies) were using activity based costing as their costing technique, 55 percent or 275 companies are still using traditional cost accounting techniques, and 28.4 percent or 142 firms

included in the survey could not be contacted. Of these 142 firms, 86 companies were not cooperative and 55 companies did not want to reply to any telephone inquiries regarding their companies' cost accounting system being currently used. Included in the 28.4 percent is one company that attempted to adopt ABC as their costing technique but eventually discarded it when they were overwhelmed by the magnitude of the tasks involved in the start-up of the system.

III Research Methodology:

Based on the foregoing discussion, the following were the objectives of this study:

1. To examine the level of management accounting practices in manufacturing companies operating in Pakistan.
2. To examine the relationships between product varieties, complexity of production process, overhead expenses and usage of management accounting practices.
3. To examine the relationship between level of competition and usage of management accounting practices.
4. To examine the relationship between company size and usage of management accounting practices.
5. To examine the relationship between the usage of management accounting practices and profitability of the firm.
6. To examine the relationship between export sale ratio and the usage of management accounting techniques.
7. To examine the relationship between industrial classification of the firm and the usage of management accounting techniques.

The target group of this study is derived from the list of 657 firms, available on the website of the Karachi Stock Exchange. The present research study intends to take in population only those manufacturing firms listed on the Karachi Stock Exchange

who have their plants/offices in Karachi. Therefore, our population comprised 148 firms fulfilling the above stated criteria (list of the population firms is attached in the appendix). As detailed below, the sample size comprises of 51 manufacturing companies belonging to different sectors of the economy.

Data Collection Method

The sample size of this survey has been calculated on the basis of following formula: $n = N / (\text{constant} \times \log N)$ where;

$N = \text{Population} = 148$

$\text{Constant} = 1.33$

$n = \text{Sample} = 148 / 2.886 = 51.28$

The participants of the survey (senior management accountants in the surveyed firms) were informed that the objective of this study is to analyze aggregate responses. Thus, the sanctity of their data would be preserved. The data from the questionnaire was first entered into Microsoft Excel program and then imported to Statistical Package for Social Sciences Program (SPSS) to facilitate data analysis. The questionnaire generated descriptive statistics as well as inferential statistics as two scales have been used to draw responses; Interval and nominal scales. Cronbach's alpha was used to check the reliability of the measures; i.e. inter item consistency. Mean and standard deviation were used to analyze the descriptive statistics of the sample. Significance of difference between mean scores was done through t test. Chi square test of independence was applied to analyze the inferential statistics and to determine the relationship among the variables for the studied objectives. In most of the studies reviewed ranking of the management accounting technique was done by using frequency distribution. However, two reviewed studies used Pearson's correlation and Kruskal-Wallis one way analysis of variance.

The questionnaire for the survey is divided into two sections. Section 1 seeks demographic information about the respondents (name, position, qualification, length of service,

and contact information). Data is also collected on organizational variables (sector, total sales, total assets, number of products being produced, and export sales ratio to gain valuable insights about the firms characteristics. These details have been asked by every research work reviewed in the literature. Section 11 of the questionnaire investigates the usage of management accounting techniques, systems, methods and their relationship to certain contextual factors; export sales ratio, size, product variety, product price, product range, product quality, new product introduction, technological change, changes in government regulation, advertising and promotion and after sales service. This section contains 14 questions. All the questions in the survey have been designed on the basis of the findings in the literature review discussed earlier. A copy of the questionnaire is annexed in the Appendix. A table is drawn below to show the management accounting area(s) covered in this study and the questions asked by researchers in the literature surveyed on the topics explored further in our questionnaire. Please see Table 1 below:

An attempt has been made to cover all the relevant aspects of the studies reviewed. This can be verified from the table above as no single reviewed study covered all the topics probed in this study. All the questions were framed after analyzing the cultural compatibility of the same with the Pakistani manufacturing environment. Further, similarities and differences are highlighted between this study and those of the reviewed studies in the ensuing discussion of parts of the question asked in this study.

Techniques enquired of the management accountants in Question No. 1 have been used previously in a number of studies conducted around the world by numerous research scholars, Drury et al. (1993), Ghosh et al. (1994), Chenhall and Langfield, (1998) Wijeywardena and Zoysa (1999), Adler et al. (2000), Anand et al. (2004), France (2004), Manalo (2004), Yazdifar (2005), Isa & Thye (2006) and Kader and Luther (2006). No such study has been done in Pakistan. This question is designed to find the techniques used/adopted in the Pakistani manufacturing industry and also explore the extent to which these are rated on a five point scale. The listed measures in this question consist of traditional management techniques as well as contemporary management techniques.

Choice of investment appraisal methods of the respondents as used in organizations and the relative perceived importance of the methods on a five point likert scale is checked in Question No. 2. These methods with minor adjustments were reported in most of the available longitudinal studies on management accounting practices in the literature reviewed. Researchers tried to establish relationship, for example between size and the choice of investment appraisal method. Zubairi(2007) found a significant negative correlation between size and the usage of certain methods in a survey based study on “capital budgeting practices”. This question is expected to furnish further empirical evidence as to the choice of investment appraisal methods and the size of the firm and other variables. Other researchers who included this question in their studies are Drury et al. (1993), Ghosh et al. (1994), Wijeywardena and Zoysa(1999) and Kader and Luther (2006).

Respondents were asked to rate the usefulness of cost accounting data with respect to managerial activities ranging from decision making to performance evaluation in Question No.3 on a five point scale in their organizations. This question has been framed to find out the inclination of the Pakistani manufacturer as to the effectiveness of cost accounting data in performing several managerial tasks. This has been considered previously by Wijeywardena and Zoysa.(1999), Anand et al. (2004) and Kader and Luther (2006).

The usage of standard costing is reported to have declined in the accounting literature. Question No. 4 is designed to find out the possible linkage between managerial functions and standard costing in the Pakistani manufacturing firms. Respondents are asked to rank the importance of managerial function(s) as performed by standard costing on a five point scale to verify the assertions made in the literature. This question has been probed by Wijeywardena and Zoysa(1999), Anand et al. (2004), Isa & Thye (2006) and Kader and Luther (2006) in the past studies.

In recent times greater emphasis has been placed in the accounting curriculum on quantitative tools. These are supposed to be used by business. Question No.5 is intended to find out which quantitative tools are used in Pakistani business environment and whether these findings can be linked to the use of certain management accounting techniques. This has been enquired previously by Drury et al. (1993), Ghosh et al (1994), Wijeywardena and Zoysa(1999) and Kader and Luther (2006).

Question No.6 in this study aims to explore whether accurate cost information is captured for the profitability analysis by the present costing system and which variable is used in this analysis i.e. product, process, department and customer. Information gleaned through this question can be utilized in finding linkage with popular management accounting techniques. This has been examined in the past by Anand et al. (2004) and Kader and Luther (2006).

Questions No.7 and No.8 have been asked to gather information on the methods and the basis being used for overheads cost allocation by the corporate Pakistan while Question No. 9 sought answers in four broad categories about manufacturing overhead as a percentage of total manufacturing cost to find out the relevance of this cost component in the total cost structure of the firm. These questions have been asked in previous studies by Drury et al. (1993), Wijeywardena and Zoysa(1999), Anand et al. (2004), Isa & Thye (2006) and Kader and Luther (2006).

Accounting literature contains negative criticism on return on investment as A performance evaluation measure in view of the short term orientation resulting in low growth of the business in the long run. Question No.10 is framed to collect further empirical evidence of the assertion made in the literature by asking the respondents the preferred measure among the four listed measures. This question has been studied previously by Ghosh et al. (1994), Wijeywardena and Zoysa(1999) and Kader and Luther (2006).

It has been argued in the accounting literature that the choice of management techniques is dependent on the sophistication of the production process adopted by the manufacturing firms. Question No. 11 addressed this concern by asking the respondents of the process being used among the four listed in ascending order from the least sophisticated to the most sophisticated process to find out whether the choice of production process has any impact on the management accounting techniques used in the Pakistani manufacturing environment. Isa & Thye (2006) and Kader and Luther (2006) probed this aspect in their studies.

Many researchers contended that to keep pace with the changing manufacturing environment, accountants are required to introduce timely changes in cost accounting systems. Question No. 12 was planned to look into whether Pakistani firms made changes with respect to their cost accounting system in the last five years. This has been examined

by Wijeywardena and Zoysa(1999), Isa & Thye (2006) and Kader and Luther (2006).

Increased trade liberalization and international/ domestic competition require firms to adopt advanced management techniques. Question No.13 was aimed to draw responses from the participants about the degree of competition being experienced in their respective firms and whether the degree of competition has an impact on the choice of management accounting practice/technique. The four choices given in this question ranged from “slight to severe”. This question has been previously used by Wijeywardena and Zoysa(1999) and Kader and Luther (2006). Question No.14 is designed to capture perceived competition on a five point scale ranging from very low to very high on the basis of the following factors (product price, product range, product quality, new product introduction, technological change, changes in government regulation, advertising and promotion and after sales service) and to examine the relationship between level of competition and usage of management accounting techniques. Perceived competition has been measured by Isa & Thye (2006). The instrument for measuring intensity in competition is a modified version of the composite scale for measuring competitive pressure in Khandwalla (1977), Libby and Waterhouse (1996) and Mia and Clarke (1999).

1V. Data analysis & discussion

1V.1: Reliability analysis

Fifty one Questionnaires have been distributed among CFOs of the manufacturing firms. Forty five questionnaires were filled in and returned making up a response rate of 88.2% which is an excellent response rate. Six firms remained unresponsive and chose not to fill in the questionnaire despite reminders.

Table-2: Results showing Cornbach’s alpha for inter item consistency of the constructs

Studied variables	Reliability coefficient	Standardized Cornbach’s Alpha
Advanced management accounting techniques	15 items	.8701
Traditional management accounting techniques	8 items	.7293
Capital budgeting measures	6 items	.6303
Usefulness of cost accounting data	6 items	.8113
Purposes of standard costing	7 items	.9154
Competition scale	8 items	.8528

Alpha coefficient ranges in value from 0 to 1 and may be used to describe the reliability of factors extracted from scale questions. The higher the score, the more reliable the generated scale. Nunnaly (1978) has indicated 0.7 to be an acceptable reliability coefficient but lower thresholds are sometimes used in the literature. It can be seen from table-2 that all the variables were showing high reliability coefficients except for capital budgeting measures where alpha slipped below 0.7. This was due to the respondent’s interest in only three variables while ignoring the other three measures in this construct. When we removed the least responded variables, alpha improved to 0.726. Reliability test enhanced the predictability of the variables.

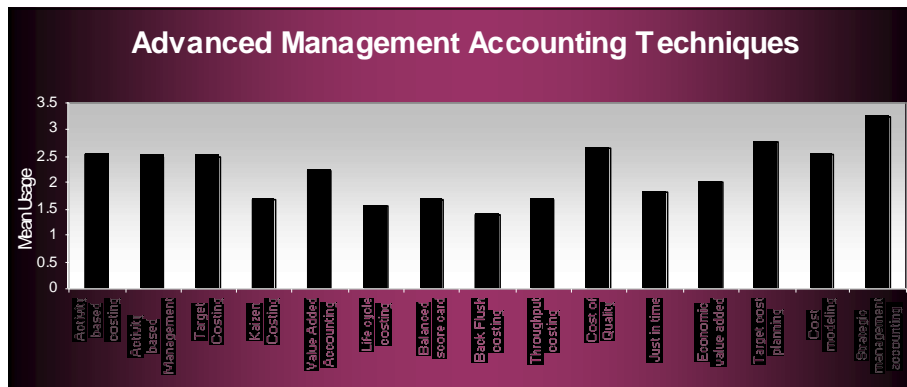
1V.2: Descriptive analysis

Figure- 1(a): Results showing usage of traditional management techniques

The popularity of traditional management accounting techniques as established from the perusal of figure 1(a). Budgeting with a mean score of 4.42 (out of a maximum score value of 5) remained the most used and practiced management accounting technique followed by cost volume profit analysis and material resource planning with a mean of 4.11. Among the traditional management accounting techniques, the usage of job order costing in the sample of Pakistani manufacturing firms was the lowest as reported in the mean value of 2.32. Standard costing in terms of ranking among eight traditional techniques surveyed came at 7th position which is consistent with accounting literature where the usage was reported to have declined, Wijeywardena and Zoysa(1999). Significance of difference between mean scores was also checked through the application of t test. Results are attached in the appendix. Significant differences were found in paired comparison of the mean scores of full costing-job order costing, full costing-variable costing, full costing-budgeting, standard costing-job order costing, standard costing-material resource planning, standard costing-cost volume profit analysis, standard costing-budgeting, job order costing-process costing, job order costing-variable costing, job order costing- material resource planning, job order costing- cost volume profit analysis, job order costing-

budgeting, process costing-variable costing, variable costing-material resource planning, variable costing- cost volume profit analysis and variable costing –budgeting suggesting that the mean usage of the reported observations was not equal. Other paired observations of the variables reported in table-1(a) were insignificant at 5% level of significance.

Figure-1(b): Results showing mean usage of advanced management accounting techniques



Of the fifteen advanced management accounting techniques surveyed, strategic management accounting with a mean score of 3.24 managed to have found greatest acceptability among Pakistani firms whereas other techniques were practiced modestly. Six management accounting techniques were given a mean score ranging 2.49 to 2.78 by the respondents which include target cost planning, cost of quality, cost modeling, activity based costing, activity based management and target costing having mean scores of 2.78, 2.64, 2.53, 2.51, 2.50 & 2.49, respectively with low to medium usage of the contemporary techniques. Eight advanced management techniques had very low mean scores of 2 and below on a composite scale of 5 indicating low usage of these techniques. This signifies that the advanced management accounting techniques were little used in the manufacturing sector of Pakistan. Significance of difference between mean scores was also checked through the application of t test. Of the 15 advanced management accounting techniques, 105 paired observations were checked for the significant difference in mean scores. Significant

differences were found in paired comparison of the mean scores of activity based costing-kaizen costing, activity based costing-life cycle costing, activity based costing-balanced score card, activity based costing-back flush costing, activity based costing-throughput costing, activity based costing-just in time, activity based costing-strategic management, ABM-kaizen costing, ABM-life cycle costing, ABM- balanced score card, ABM- back flush costing, ABM- throughput costing, ABM- just in time, ABM-strategic management accounting, target costing-kaizen costing, life cycle costing, balanced score card, back flush costing, throughput costing, just in time, strategic management accounting, kaizen costing- value added accounting, cost of quality, target costing planning, cost modeling, strategic management accounting, value added accounting- life cycle costing, balanced score card, back flush costing, throughput costing, cost of quality, target costing, strategic management accounting, life cycle costing- cost of quality, target cost planning, cost modeling, strategic management accounting, balanced score card- cost of quality, target cost planning, cost modeling, strategic management accounting, back flush costing- cost of quality, just in time, economic value added, target cost planning, cost modeling, strategic management accounting, throughput costing- cost of quality, target cost planning, cost modeling, strategic management accounting, cost of quality- just in time, economic value added, strategic management accounting, just in time- target cost planning, cost modeling, strategic management accounting, economic value added- target cost planning, cost modeling, strategic management accounting and cost modeling- strategic management accounting suggesting that the mean usage of the reported observations was not equal. Other paired observations of the variables reported in Table-1(b) were insignificant at 5% level of significance.

Table 3: Results showing usage of capital budgeting techniques

Capital budgeting technique	N	Min	Max.	Mean	Std. Deviation
payback period	45	1	5	3.87	1.38
internal rate of return	43	1	5	3.63	1.35
net present value	45	1	5	3.58	1.39
modified internal rate of return	41	1	5	2.17	1.2
accounting rate of return	42	1	5	2.52	1.4
profitability index	42	1	5	2.83	1.59

Choice of investment appraisal methods is shown for the respondent firms in Table 3. It can be seen that of the six capital budgeting techniques, Net present value, Payback period and Internal rate of return were overwhelmingly used in the industry with high mean scores of 3.87, 3.63 and 3.58 respectively, indicating greater applicability for investment appraisal decisions. Payback period found most users in the industry which was consistent with the findings of Zubairi (2007) in an earlier research. Other choices of investment appraisal methods received lukewarm responses. Significance of difference between mean scores was also checked through the application of t test. No significant difference was found in the mean scores of payback period, internal rate of return, net present value, MIRR & ARR and ARR & PI at 5% significance level meaning that the mean usage of these techniques by the firms was same despite minor differences in the mean scores. However, significant differences were found in paired comparison of the mean scores of NPV & MIRR, NPV & ARR, NPV & PI, PP & MIRR, PP & ARR, PP & PI, IRR & MIRR, IRR & PI and MIRR & PI suggesting mean usage of the paired techniques is not the same.

Table-4: Results showing the uses of Cost Accounting data

Uses of cost accounting data	Min	Max	Mean	Std. Deviation
decision making	1	5	4.53	0.87
cost management	1	5	4.20	1.01
budget and budgetary	1	5	4.13	1.14
preparation of financial	1	5	4.04	1.19
performance evaluation	1	5	3.89	1.23
producer pricing	1	5	4.00	1.3
Valid N = 45				

Perceived usefulness of cost accounting data is exhibited in Table-4. It shows that cost accounting data facilitated managerial activities such as decision making, cost management and budget & budgetary control more than other activities used by the Pakistani manufacturing firms. This finding was consistent with the previous studies of Wijeywardena and Zoysa (1999) and Anand et al. (2004). Significance of difference between mean scores for the perceived uses of the cost accounting data was also checked through the application of t test. Significant differences were found in paired comparison of the mean scores of decision making-budget and budgetary control, decision making-cost management, decision making-producer pricing and decision making-performance evaluation which signifies that the mean scores given to these pairs were not equal. Other paired observations of the variables reported in Table-4 were insignificant at 5% level of significance.

Table-5: Results showing the purpose of standard costing

	Min	Max	Mean	Std. Deviation
Budget	1	5	3.84	1.41
Product cost	1	5	3.71	1.46
Cost Control	1	5	3.62	1.42
Management Control	1	5	3.58	1.42
Cost Reduction	1	5	3.29	1.39
Inventory Valuation	1	5	3.09	1.41
Simplification of book keeping	1	5	2.56	1.39
Valid N = 45				

Responses summarized in Table-5 show the purpose of standard costing as perceived by respondents on a 5 point likert scale. Budget, product cost, cost control was ranked highly on the basis of the mean score of 3.62 and above. Other purposes were also given a mean score of 3 above except simplification of book keeping. These results were in agreement with Wijewardena and Zoysa(1999) and Kader and Luther (2006). Significance of difference between mean scores for the perceived uses of the cost accounting data was also checked through the application of t test. Significant differences were found in paired comparison of the mean scores of product cost-inventory valuation, product cost-cost reduction, product cost-simplification of bookkeeping, budget- inventory valuation, budget-cost reduction, budget-simplification of book keeping, inventory valuation-management control, inventory valuation-cost control, inventory valuation-simplification of book keeping, management control- simplification of book keeping, cost control- simplification of book keeping and cost reduction- simplification of book keeping which signifies that the mean scores given to these pairs were not equal. Other

paired observations of the variables reported in table-5 were insignificant at 5% level of significance.

Table-6: Results showing usage of the quantitative tools

quantitative techniques used

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid forecasting technique	19	42.2	50.0	50.0
statistical analysis	6	13.3	15.8	65.8
simulation	3	6.7	7.9	73.7
input-output analysis	7	15.6	18.4	92.1
inventory models	1	2.2	2.6	94.7
spreadsheet analysis	2	4.4	5.3	100.0
Total	38	84.4	100.0	
Missing System	7	15.6		
Total	45	100.0		

Emphasis on quantitative tools was examined in Table-6. Respondents were asked to single out the most used quantitative tool in their firms. Forecasting was found to be popular among 19 respondents out of 38 companies. Seven companies indicated usage of all the techniques which was not incorporated in the figure-2. Seven respondents indicated the usage of input/output analysis and six preferred other statistical tools. Inventory models contrary to expectations were least used. In a comparative study of Japan and Australian firms by Wijewardena and Zoysa(1999), forecasting was found most used whereas in another comparative study of Singapore and U.K by Ghosh et al (1994), Statistical and inventory models were found extensively used.

Table 7: Is the present system for profit analysis helpful?

	Frequency	Percent
by product	26	57.8%
by process	6	13.3%
by department	8	17.8%
by customers	3	6.7%
No response	2	4.4%
Total	45	100.0%

Adequacy of the present system was investigated in connection with profitability analysis. The objective was to find the relevant variable preferred by the users for this purpose. Forty three respondents chose to answer. Profitability was analysed by product (58%), by department (18%), by process(13%) and by customers(7%) in the surveyed firms. A similar pattern of choices was found by Anand et al (2004). However, Kader and Luther (2006) found product profitability analysis and customer profitability analysis to be often or very often calculated in the majority of companies – 69% and 51% respectively. Thus, the results are consistent with the evidences found in the literature.

Table-8: Results showing percentage of total cost allocated to overhead

percentage of total cost allocated to overheads

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid less than 25%	24	53.3	53.3	53.3
25-50%	16	35.6	35.6	88.9
50-75%	4	8.9	8.9	97.8
more than 75%	1	2.2	2.2	100.0
Total	45	100.0	100.0	

Manufacturing overhead; an important element of the product cost was focused on in three questions asked in this study. First, percentage of total cost allocated to overhead was divided into four broad categories. These results are shown in table-8. Twenty four respondents (53%) allocated less than 25% of total cost to overheads, sixteen respondents (36%) allocated 25-50%, and four respondents (9%) allocated 50-75% and one respondent allocated more than 75% of the total cost to overheads. This pattern in frequency and percentage is similar to the findings of Anand et al (2004).

Table-9: Results showing method used for cost allocation

methods used for cost allocation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	reciprocal method	3	6.7	6.8	6.8
	step down method	6	13.3	13.6	20.5
	direct method	35	77.8	79.5	100.0
	Total	44	97.8	100.0	
Missing	System	1	2.2		
Total		45	100.0		

Secondly, methods used for cost allocation were investigated and reported in Table-9. It was found that 78% companies were using direct method, 13.3 % practiced step down method while 6.7% inclined towards reciprocal method. One company did not respond to this question. This finding was consistent with the previous studies available in literature. Interestingly, reciprocal method theoretically more sound did not find user preference.

Table 10: Results showing frequency of basis used for overhead cost allocation

basis used for overhead allocation	Frequency	Percentage
direct labour hours	10	23
machine hours	11	24
units of output	20	44
direct material cost	3	7
no response	1	2
Total	45	100

Finally, the basis used for over head cost allocation was investigated in one of the questions pertaining to manufacturing overhead. Responses were reported in table-10. Twenty companies (44%) used units of output method as basis for overhead cost allocation, 24% applied machine hours, 23% preferred use of direct labour hours as the basis for overhead cost allocation and 7% respondents opted for direct material cost as the basis for overhead cost allocation. Direct labour hours and machine hours were used by 10% and 11% respondents while direct material cost was applied by 7% firms. These findings were not supported by the evidence in the literature where direct labour hours and machine hours were used in that order for cost allocation. Direct labour hours was found in use by 68% firms in Japan and 73% firms in Australia. Units of output method was reportedly used in Japan by 32% respondents in a sample of 212 companies. Machine hour basis was found most used in India by Anand et al. (2004).

Table 11: Results showing usage of performance evaluation measures

Performance evaluation	Frequency	Percentage
Return on Investment	14	32
Residual income	1	2
Return on sales	24	55
Accounting rate of return	5	11
N	44	100

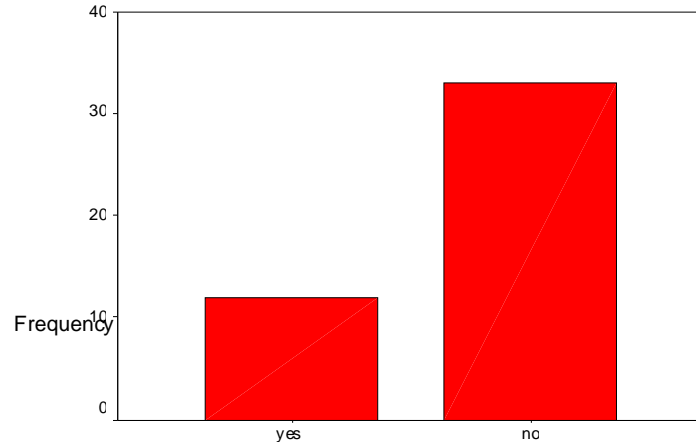
In order to seek empirical evidence, respondents were asked to indicate measures used for evaluating divisional performance as listed in Table-11. Responses showed that 55% of companies use return on sale, 32% reported usage of return on investment, 11% applied accounting rate of return and 2% residual income. Accounting literature contained negative criticism on return on investment as performance evaluation measure in view of the short term orientation resulting in low growth of the business in the long run. ROS is market oriented whereas ROI is stock holder oriented. Usage of ROI as performance evaluation measure may appease stock holder but does not evaluate the market realities that ROS shows. Findings in Table-8 are consistent with the research results on this construct in many countries of the world except U.S.A where ROI was reported more popular among managers than ROS.

Table-12: Results showing the frequency of the production process used

production process used	Frequency	Percentage
batch	6	13
line	9	20
continuous	25	56
job shop order	4	9
no response	1	2
Total	45	100

In the Table-12, results were summarized for the production process used by Pakistani manufacturing firms. Fifty six percent used continuous production process, 20% used line, 13% batch production, 9% job shop order and 2% did not respond. There were arguments in accounting literature that the choice of management techniques was dependent on the sophistication of the production process adopted by the manufacturing firms. Sophistication/ complexity of the production process was defined on a scale from least complex to most complex. Most firms were found using the least complex production process and only 9% reported the use of the most complex production process i.e. job shop order.

Figure 2: Results showing changes in Cost accounting system in 5 years



Twelve companies comprising 27% responded affirmatively to a question relating to change/revision of cost accounting system in the last five years. This compared less favourably with companies in Japan (78%) and in Australia (53%). Thirty three Pakistani companies (73%) made no revision/changes in the cost accounting system in contrast to 36% in Australia and 8% in Japan.

Table-13: Results showing Degree of competition

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid slight	2	4.4	4.4	4.4
moderate	6	13.3	13.3	17.8
strong	27	60.0	60.0	77.8
severe	10	22.2	22.2	100.0
Total	45	100.0	100.0	

Respondents were asked to identify the degree of competition in four categories from slight to severe. These results were summarized in Table-13. Two respondents (4.4%) faced slight, six (13.3%) moderate, 27(60%) strong and 10(22.2%) reported severe competition.

Table 14: Factors affecting sales of the company

Factors	Missing	Mean	Std. Deviation
Over all	2	3.71	1.19
product quality	0	3.91	1.18
product price	0	3.84	1.31
change in govt. regulation	1	3.66	1.16
technological change	0	3.18	1.39
product range	1	3.09	1.07
new product introduction	0	2.93	1.36
advertising and promotion	0	2.78	1.22
after sales service	0	2.78	1.52
valid N = 45			

In order to measure the intensity of the perceived competition, respondents were further asked to rate on a five point Likert scale ranging from very low to very high the factors as listed in Table-14.

These factors have been ranked on the basis of mean score as perceived by the respondents. It can be observed that product quality, product price, change in government regulation was given a mean score of 3.66 to 3.91 showing the moderate intensity of competition on these three factors. Over all level of perceived competition in Pakistani manufacturing firms was moderate to high with a mean score of 3.71 on a 5 point scale as compared to mean score of 3.91 considered moderate on a 7 point scale in a Malaysian study, Ruhana and Kok (2006). It can be inferred that Pakistani firms faced little competition on new product introduction, advertising and promotion and after sale service as the mean scores are less than 3 on a 5 point scale.

1V.3: Chi square results:

This section presents the results of χ^2 test of independence applied on the hypotheses given below to determine the relationship among various variables of interest to this study:

H_{0_1} : Complexity of production process does not influence the usage of Job order costing; a traditional management accounting technique.

H_{1_1} : Complexity of production process influences the usage of Job order costing; a traditional management accounting technique.

Table 15: Complexity of production process and Job order costing

Crosstab

Count		job order costing3		Total
		1.00	2.00	
production process used	batch line continuous job shop order	5 8 19 1	1 1 5 3	6 9 24 4
Total		33	10	43

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.969 ^a	3	.073
Likelihood Ratio	5.894	3	.117
Linear-by-Linear Association	2.825	1	.093
N of Valid Cases	43		

a. 5 cells (62.5%) have expected count less than 5. The minimum expected count is .93.

P value(.073) associated with the $\chi^2(6.969)$ is insignificant at $\alpha = .05$; thus H_0 is not rejected. However, if alpha is increased to 10%, H_0 will be rejected meaning complexity of production process influences the usage of Job order costing; a traditional management accounting technique.

H_{02} : Complexity of production process does not influence the usage of Kaizen costing; an advanced management accounting technique.

H_{12} : Complexity of production process influences the usage of Kaizen costing; an advanced management accounting technique.

Table 16: Complexity of production process and Kaizen costing

Crosstab

Count

		kaizan costing		Total
		1.00	2.00	
production	batch	6		6
process	line	6	3	9
used	continuous	24	1	25
	job shop order	4		4
Total		40	4	44

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.184 ^a	3	.042
Likelihood Ratio	6.954	3	.073
Linear-by-Linear Association	.822	1	.365
N of Valid Cases	44		

a. 5 cells (62.5%) have expected count less than 5. The minimum expected count is .36.

P value(.042) associated with the $\chi^2(8.184)$ is significant at $\alpha= .05$, thus H_0_2 is rejected meaning complexity of production process influences the usage of Kaizen costing; an advanced management accounting technique. A χ^2 test of independence is applied on all the twenty three management accounting techniques to find the relationship of production process used by the organizations and the management accounting techniques used by them. Except for the above two techniques mentioned above, none was found significant even at 10% level of significance.

H_0_3 : Variety of product does not influence the usage of Kaizen costing; an advanced management accounting technique.

H_1_3 : Variety of product influences the usage of Kaizen costing; an advanced management accounting technique.

Table 17: Product variety and use of Kaizen costing

Crosstab

Count		kaizan costing		Total
		1.00	2.00	
number	1	19	1	20
of	2	6		6
products	3	3		3
	4		2	2
	5	3		3
	6	1		1
	9	1		1
	10	1		1
	14	1		1
	25	1		1
	50	2		2
Total		38	3	41

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.184 ^a	3	.042
Likelihood Ratio	6.954	3	.073
Linear-by-Linear Association	.822	1	.365
N of Valid Cases	44		

a. 5 cells (62.5%) have expected count less than 5. The minimum expected count is .36.

P value (.003) associated with the $\chi^2(26.992)$ is significant at $\alpha = .05$, thus H_0_3 is rejected, suggesting variety of product influences the usage of Kaizen costing; an advanced management accounting technique.

H_0_4 : Variety of product does not influence the usage of life cycle costing; an advanced management accounting technique.

H_1_4 : Variety of product influences the usage of life cycle costing; an advanced management accounting technique.

Table 18: Product variety and use of Life cycle costing

Crosstab

Count		kaizan costing		Total
		1.00	2.00	
number	1	19	1	20
of	2	6		6
products	3	3		3
	4		2	2
	5	3		3
	6	1		1
	9	1		1
	10	1		1
	14	1		1
	25	1		1
	50	2		2
Total		38	3	41

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.526 ^a	10	.025
Likelihood Ratio	8.042	10	.625
Linear-by-Linear Association	.072	1	.788
N of Valid Cases	41		

a. 20 cells (90.9%) have expected count less than 5. The minimum expected count is .05.

P value(.025) associated with the $\chi^2(20.526)$ is significant at $\alpha = .05$, thus H_0_4 is rejected, suggesting variety of product influences the usage of life cycle costing; an advanced management accounting technique.

H_0_5 : Overhead expenditure does not influence the usage of economic value added(EVA); an advanced management accounting technique.

H_1_5 : Overhead expenditure influences the usage of economic value added (EVA); an advanced management accounting technique.

Table 19: Overhead expenditure and use of Economic value added (EVA)

Crosstab

Count

		economic value added		Total
		1.00	2.00	
percentage of total cost allocated to overheads	less than 25%	19	5	24
	25-50%	15	1	16
	50-75%	3	1	4
	more than 75%		1	1
Total		37	8	45

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.376 ^a	3	.095
Likelihood Ratio	5.577	3	.134
Linear-by-Linear Association	.388	1	.533
N of Valid Cases	45		

a. 6 cells (75.0%) have expected count less than 5. The minimum expected count is .18.

P value (.095) associated with the $\chi^2(6.376)$ is insignificant at $\alpha=.05$, thus H_0 is not rejected. However, if the level of significance is increased to 10%, H_0 will be rejected which will indicate that overhead expenditure influences the usage of economic value added (EVA); an advanced management accounting technique.

H_0 : Degree of competition does not influence the usage of back flush costing; an advance management accounting technique.

H_1 : Degree of competition influences the usage of back flush costing; an advance management accounting technique.

Crosstab

Count

		back flush costing		Total
		1.00	2.00	
degree of competition	slight	2		2
	moderate	6		6
	strong	27		27
	severe	8	2	10
Total		43	2	45

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.326 ^a	3	.062
Likelihood Ratio	6.356	3	.096
Linear-by-Linear Association	3.837	1	.050
N of Valid Cases	45		

a. 5 cells (62.5%) have expected count less than 5. The minimum expected count is .09.

Null hypothesis is not rejected as p value of .062 is greater than the significance level of 5% and the $\chi^2(7.326)$ falls outside the critical area. However, the p value of .062 is quite significant at 10% significance level.

H₀: Degree of competition does not influence the usage of economic value added (EVA); an advance management accounting technique.

H₁: Degree of competition influences the usage of economic value added (EVA); an advanced management accounting technique.

Table 21: Degree of competition and use of economic value added (EVA)

Crosstab

Count

		economic value added		Total
		1.00	2.00	
degree of competition	slight		2	2
	moderate	6		6
	strong	24	3	27
	severe	7	3	10
Total		37	8	45

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.390 ^a	3	.006
Likelihood Ratio	11.066	3	.011
Linear-by-Linear Association	.279	1	.598
N of Valid Cases	45		

a. 6 cells (75.0%) have expected count less than 5. The minimum expected count is .36.

P value(.006) associated with the $\chi^2(12.390)$ is significant at $\alpha=.05$, thus H_0 is rejected indicating that degree of competition influences the usage of economic value added (EVA); an advanced management accounting technique.

H_0 : The size of the company does not influence the usage of activity based management; an advanced management accounting technique.

H_1 : The size of the company influences the usage of activity based management; an advanced management accounting technique.

Table 22: Size and activity based management

Crosstab

Count		activity based management		Total
		1.00	2.00	
total	1.00	4	3	7
assets	2.00	9		9
	3.00	8	2	10
Total		21	5	26

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.662 ^a	2	.097
Likelihood Ratio	5.888	2	.053
Linear-by-Linear Association	.924	1	.336
N of Valid Cases	26		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is 1.35.

Null hypothesis is not rejected as p value of .097 is greater than the significance level of 5% and the $\chi^2(4.662)$ falls outside the critical area. However, the p value of .097 is significant at 10% level of significance which will indicate that the size of the company influences the usage of activity based management; an advanced management accounting technique.

H₀; Activity based management; an advanced management accounting technique does not influence profitability of the firm.

H₁; Activity based management; an advanced management accounting technique influences profitability of the firm.

Table 23: Activity based management and profitability

Table 23: Activity based management and profitability

Crosstab

Count		Profit			Total
		low	medium	high	
activity based management	low usage	17	5	4	26
	high usage	2	2	4	8
Total		19	7	8	34

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.000 ^a	2	.082
Likelihood Ratio	4.847	2	.089
Linear-by-Linear Association	4.844	1	.028
N of Valid Cases	34		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is 1.65.

We will not reject H_0 , as the p value of .082 exceeds the level of significance (.05) and the value of $\chi^2(5.000)$ falls outside the critical area suggesting that activity based management; an advanced management accounting technique does not influence profitability of the firm.

H_{010} : Target costing; an advanced management accounting technique does not influence profitability of the firm.

H_{110} : Target costing an advanced management accounting technique influences profitability of the firm.

Table 24: Target costing and profitability

Crosstab

Count

		Profit			Total
		low	medium	high	
target costing	low usage	16	7	4	27
	high usage	4		4	8
Total		20	7	8	35

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.509 ^a	2	.064
Likelihood Ratio	6.522	2	.038
Linear-by-Linear Association	1.735	1	.188
N of Valid Cases	35		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is 1.60.

H_{010} will be rejected as the p value is .064 which is quite significant suggesting that target costing an advanced management accounting technique influences profitability of the firm. A χ^2 test of independence is applied on all the twenty three management accounting techniques to find the relationship between usage of the management accounting techniques and the profitability of the firm. Except for the above two techniques mentioned above, none was found significant even at 10% level of significance.

H_{011} : Exports sale ratio does not influence the usage of target costing; an advanced management accounting technique.

H_{111} : Exports sale ratio influences the usage of target costing; an advanced management

Table 25: Export sales and target costing

Crosstab

Count		export ratio				Total
		nil	low	medium	high	
target costing	low usage	12	4	8	7	31
	high usage	1	3	1	6	11
Total		13	7	9	13	42

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.046 ^a	3	.070
Likelihood Ratio	7.468	3	.058
Linear-by-Linear Association	3.145	1	.076
N of Valid Cases	42		

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is 1.83.

Null hypothesis is not rejected as p value of .070 is greater than the significance level of 5% and the $\chi^2(7.046)$ falls outside the critical area. However, the p value of .07 is significant at 10% level of significance which will indicate that exports sale ratio influences the usage of target costing; an advanced management accounting technique.

H0₁₂: Exports sale ratio does not influence the usage of job order costing; a traditional management accounting technique.

H1₁₂: Exports sale ratio influences the usage of job order costing; a traditional management accounting technique.

Table 26: Export sales and ob order costing

Crosstab

Count		export ratio				Total
		nil	low	medium	high	
job order costing3	low usage	11	6	8	7	32
	high usage	1	1	1	6	9
Total		12	7	9	13	41

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.601 ^a	3	.086
Likelihood Ratio	6.306	3	.098
Linear-by-Linear Association	4.578	1	.032
N of Valid Cases	41		

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is 1.54.

Null hypothesis is not rejected as p value of .086 is greater than the significance level of 5% and the $\chi^2(6.601)$ falls outside the critical area. However, the p value of .086 is significant at 10% level of significance which will indicate that exports sale ratio influences the usage of job order costing; a traditional management accounting technique.

H0₁₃: Industrial classification does not influence the usage of variable costing; a traditional management accounting technique.

H1₁₃: Industrial classification influences the usage of variable costing; a traditional management accounting technique.

Table 27: Sectors and variable costing usage

Crosstab

Count		variable costing		Total
		low usage	high usage	
sector	consumer goods	1	2	3
	autos	3	2	5
	sugar	5	2	7
	textile	7	8	15
	chemicals		1	1
	cement		7	7
	others	5		5
	construction material	1		1
Total		22	22	44

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.886 ^a	7	.026
Likelihood Ratio	21.344	7	.003
Linear-by-Linear Association	.053	1	.817
N of Valid Cases	44		

a. 14 cells (87.5%) have expected count less than 5. The minimum expected count is .50.

Null hypothesis will be rejected as the p value is .026 which is quite significant suggesting that industrial classification influences the usage of variable costing; a traditional management accounting technique. It can be readily observed from the cross tab that higher usage of variable costing, a traditional accounting technique is reportedly used by about 50% of the respondent firms. Of those reported high usage of variable costing, textile and cement sector comprised 68%.

H₀₁₄: Industrial classification does not influence the usage of economic value added (EVA); an advanced management accounting technique.

H₀₁₄: Industrial classification influences the usage of economic value added (EVA); an advanced management accounting technique.

Table 28: Sectors and EVA

Crosstab

Count		economic value added		Total
		low usage	high usage	
sector	consumer goods	4		4
	autos	5		5
	sugar	5	2	7
	textile	11	4	15
	chemicals		1	1
	cement	7		7
	others	5		5
	construction material		1	1
Total		37	8	45

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.159 ^a	7	.034
Likelihood Ratio	16.347	7	.022
Linear-by-Linear Association	.294	1	.587
N of Valid Cases	45		

a. 13 cells (81.3%) have expected count less than 5. The minimum expected count is .18.

P value (.034) associated with the $\chi^2(15.159)$ is significant at $\alpha = .05$, thus H_{014} is rejected indicating that industrial classification influences the usage of economic value added (EVA); an advanced management accounting technique. It can be readily observed from the cross tab that out of forty five companies, eight firms (18%) use economic value added (EVA); an advanced management accounting technique. Textile, sugar and chemical industries are likely to use this technique.

V. Conclusion

In this study, data from the sample of forty five manufacturing firms was analyzed through descriptive and statistical techniques to determine the impact of selected independent variables on the choice of management accounting techniques used in Pakistan.

Traditional management accounting techniques were found to be in frequent use by the Pakistani manufacturing firms whereas advanced management accounting techniques did not appear to find many users in Pakistani manufacturing environment. Pakistani companies showed preference for payback period, a capital budgeting technique considered most simple in application. At the other extreme, these companies did not shy away from NPV and IRR methods as the reported usage was significant; a comparatively complex technique. Respondent companies found that the perceived usefulness of accounting data is critical to decision making which strengthens management accounting as a discipline. Return on sales was used to evaluate divisional performance by the majority companies in the manufacturing sector. Over eighty percent of the firms surveyed found the going tough as they indicated strong to severe conditions of competition. Surprisingly, when measured for eight variables ranging from product price, quality, variety, change in regulation, technology, promotion to after sale service, the overall mean score for competitiveness was only 3.71 on a scale containing never (1), rarely (2), sometimes (3), often (4) and always (5) which shows medium to high incidence of competition for Pakistani business contrary to claims of high to very high competition.

Data analysis provides significant empirical evidence to support certain claims but these must be read keeping in view the limitations of the study.

1. Traditional management accounting techniques are popular in Pakistani manufacturing firms.
2. Advanced management accounting techniques are still in an evolving stage and are modestly used by the manufacturing firms.
3. Empirical evidence is found that complexity of production process influences the usage of Job order costing; a traditional management accounting technique and Kaizen costing; an advanced management accounting technique.
4. Variety of product influences the usage of life cycle costing, Kaizen costing; both advanced management accounting techniques.
5. Overhead expenditure influences the usage of economic value added (EVA); an advanced management accounting technique.
6. Degree of competition influences the usage of economic value added (EVA); an advance management accounting technique.
7. Sector location influences the usage of variable costing; a traditional management accounting technique. Higher usage of variable costing, a traditional accounting technique is reportedly used by about 50% of the respondent firms. Of those reported high usage of variable costing, textile and cement sector comprised 68%.
8. We found the relationship between Job order costing and target costing and export sales ratio significant at 10 percent.

9. Size of the firm was considered an important factor influencing the usage of management accounting techniques only in case of activity based management at 10 % level of significance.
10. It was found that the profitable firms using two management accounting techniques; target costing and activity based management had significant impact on profitability at 6.4% and 8.2%, respectively.

VI. Limitations:

This study is subject to the usual limitations associated with survey research. First, the sample size was small and there was no previous research on the subject. Secondly, response bias can not be eliminated due to the unwillingness of the respondents to share the accurate information. Thirdly, the measures studied may not be exhaustive thus, limiting the findings of the study. Fourthly, it is possible that the effect of contextual factors used in this study yield different results for other types of industries i.e service etc. Finally, there can be other variables that may be added to the theoretical framework to enhance its explanatory power.

Acknowledgement:

I would like to thank Allah, family, friends at IoBM and Dr. Ansari, especially, for providing invaluable guidance.

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