

CHAPTER 1

INTRODUCTION

1.1 FOREWORD

The outcome of a cost system is information which should assist decision makers fulfil the goals of the organisation. Writers often include in a discussion of management accounting a need for different costs for different purposes (Horngren et al, 1996, ch.11). This particular theme was proposed in the 1920's by Clark (1923) with a chapter, 'Different Costs for Different Purposes'.

The requirements outlined above for a cost system are not modest. The challenge to accountants involves having systems which continue to be useful to users in economic periods where change is continual but not evenly paced. The literature abounds with criticisms and defences of 'traditional' management accounting. In such dissertations there is often a presumed link between systems and a capacity for more reliable decision making and implicitly, better organisational performance (Kaplan, 1987; Clark and Baxter, 1992).

This study intends to examine two different types of cost systems used in manufacturing, in order to make findings about their relative strengths in an Australian setting. In doing so, the study may contribute some information into cost system use and behaviour.

1.2 RESEARCH QUESTION BACKGROUND

The mass production of the manufacturing age is recent in human development terms. It was not until after the Agrarian Revolution in Britain which allowed a surplus labour force to develop and the rapid population growth after the mid 18th century, that the foundations of a manufacturing age could be laid.

It is generally recognised that the establishment of early modern manufactures was with textiles in the Manchester region by the mid 19th Century. 'Exports, backed by the systematic and aggressive help of government, provided the spark, and - with cotton textiles ... in the genesis of industrialisation' (Hobsbawm, 1969, p.50).

The textile mills required internal administrative means to efficiently coordinate the various production processes to create finished goods. By the end of the century people within the 'scientific management' group which contained advocates like Frederick Taylor and Henry Towne, extended their workstandards to measure and allocate overhead costs to products (Kaplan, 1984, pp.590-1). This school of thought believe in precision measures of production functions and strict control by management of work practices. This technique was demonstrated in the first half of the century by the Ford production method in the automobile industry in the United States of America (USA).

In the early 20th Century vertically integrated manufacturers had emerged. Around the late 19th and early 20th Centuries Britain was overtaken by the USA as the world's largest industrial power. Within the USA, the DuPont and General Motors Companies, influenced by Pierre du Pont and Alfred Sloan undertook innovative management accounting measures. These measures provided for central control techniques combined with decentralised functions.

Virtually all the practices recently employed and outlined in cost accounting textbooks had been developed by 1925 (Kaplan, 1984, p.586). The modern problem, it is claimed by activity-based cost (ABC) advocates, lies in using systems essentially designed before World War 2 (WW2). These systems have failed to develop and accommodate the post war manufacturing increases in the competitive market place; manufacturing process complexity; and the diversity of products (Cooper, 1990, pp.6-7).

Product lines of manufacturers have proliferated, competition both national and international has reportedly intensified (Bromwich and Bhimani, 1994; Drucker, 1990), and increased political attention has focused on micro economic reform. This reform has extended to common vocabulary like 'level playing fields' and ambitions of general tariff reductions and the continued easing of import and capital flow restrictions

(Jennings, 1997, p.11). The major political parties in Australia appear generally committed to this basic trend: only the implementation timetables differ in some respects.

Newer and recent production methods involve complexities using technology like Computer Aided Design\Computer Aided Manufacturing (CAD\CAM). The combinations of such factors make accurate product cost information crucial to competitive success (Cooper and Kaplan, 1988, p.27). Many plants still use cost systems which use simple volume measures (Kaplan, 1988; Howell and Soucy, 1987a). Marketing and distribution costs of products may not be allocated at all.

Central to the Kaplan, Johnson (1987) proposition is the claim that volume-based cost (VBC) systems produce distorted cost information for managers. This led to an increasing irrelevance of management accounting use as production methods and contextual factors changed. It is widely claimed that management accounting became subservient to the macro based needs of functionally orientated accounting and did not serve as an effective management decision making tool. This recognition of a changing production environment was not in isolation.

The need for new management styles was reinforced by the concept of 'flexible specialisation' which is argued by Piore and Sabel (1984, ch.4) to be replacing mass standardised production. While Piore and Sabel (1984) argue that 'Taylorism' is no longer appropriate for changed production methods their solution lay more with the 'human resources' style of management than developing new quantitative methods as Johnson and Kaplan (1987) recommended.

During the post war period, alternative management styles of the more rigid and controlled scientific management type developed. The Mayo management studies adopted a less specific and rigid management control of the workplace. It allowed more focus upon worker involvement. Later developments included participative budgeting studies aimed at factors including personalities and culture. This general period is the one the Kaplan, Johnson proposition relates to. The calculated numbers of the cost

system were said not to be relied upon predominantly for management decisions, but used more for aggregate reporting.

Changing production practices have resulted in arguments for a new strategic response by unions to meet the challenge posed by non union related 'Human Relations Management' methods. In the 'Transformation of American Industrial Relations' (Kochan, Katz and McKersie, 1986 ch.4) the authors outline different models of workplace arrangements to implement necessary changes for the changing production environment. Mathews (1994, chs. -4) gives an Australian analysis of the debate concerning production systems, management styles and of various solutions to it.

Part of the solution of Kaplan and Johnson (1987) to the challenge above lay with the development of an improved quantitative management information system. ABC proposes that the indirect manufacturing costs of products (overheads) should be allocated according to the cost of the activities undertaken to make the product. The main criticism with the more traditional cost systems is that the information generated by VBC systems is '... too late, too aggregated, and too distorted to be relevant to managers' planning and control decisions' (Johnson and Kaplan, 1987, p.1).

Since the advent of cheap electronic means of calculation and storage data collection and information transfer is increasingly responsible for employment sector growth. High growth rates are being experienced by the information consulting and data capture and analysis sector.¹ For manufacturing firms, a strategic analysis of their position in the market place and of policies aimed at the skills and inert potential within the organisation, is advanced as being increasingly important as competitive pressures rise (Cooper, 1996, pp.20-21). Organisational objectives can include strategies like being a low cost producer, product differentiation, and market leadership (Porter, 1985; Miller and Vollmann, 1985). Strategies can be supported by cheaper availability and access to quantitative statistics for guidance.

¹ Andersen Consulting among others has for several years experienced high growth rates. Recent offshore arrivals of data firms including from the USA, are contributing to an expanding market. The SA government has recently outsourced its main data requirement and information processing systems to a USA based firm, EDS (BRW, 1996; Hanks, 1996)

1.3 RESEARCH QUESTION AND METHOD

The evidence supporting the replacement of volume-based cost (VBC) systems which allocate overheads on the basis of a quantity measure, with activity-based cost (ABC) systems, has largely been based upon case and anecdotal studies. A number of cases by advocates like Kaplan and March (1987), Cooper (1988), and Turney (1990), demonstrate the success and benefits which can be gained by using ABC systems. Despite these claims the supporting evidence of ABC has not provided convincing and conclusive argument to persuade the majority to adopt it.

The interest in ABC has encouraged the collection of empirical survey evidence to contribute to resolving the issues between supporters and critics in an attempt to substantiate claims made for and against ABC. Such survey research may allow some valid extrapolation of findings to the wider population. Findings may be of use to both practitioners using cost systems and those interested in the VBC and ABC debate.

The research question addresses whether evidence substantiates that ABC systems have an increased rate of usage than VBC systems when moderated by contextual factors. If the literature supporting ABC is correct, the evidence should demonstrate that ABC users have the advantages of more accurate and reliable information when operating factors are more uncertain. The study will attempt to find if any relationship exists between cost system type and use with changes in some contextual factors.

The challenge that this study specifically undertakes is to produce systematic empirical evidence that will contribute to the existing evidence of the use made of ABC and VBC systems, particularly where some contextual factors vary. This challenge has not been met very successfully in most prior studies in a reliable and significant manner.

The aim of ABC is the reorganisation of the collection of data for more effective decision making. It has potential significance in that the improvement from using ABC is not dependent on extraneous factors but is internally achievable. The study will refer to preceding established models and studies which include: Perrow (1967); Porter (1980); Chenhall and Morris (1986) Foster and Gupta (1990); Banker and Johnson

(1993); Anderson (1995); and Swenson and Flesher (1996). It will differ from many studies in that it will seek to examine a large class of manufacturers rather than a small specific firm type or industry study to produce information representative of a larger population of manufacturers.

1.4 PURPOSE AND AIM

This investigation will consider contextual factors and how they may influence the use of a particular cost system. The type of cost system employed by a manufacturing plant is identifiable as being between volume-based and activity-based in treatment of overhead cost allocation.

At a fundamental level this investigation aims to explore relationships along a continuum between the two types of cost allocation/attribution methods identified as being used. The volume-based (VEC) method of allocating indirect manufacturing costs, uses a small number of variables. The other, activity-based (ABC) utilises less encompassing allocation variables.

The research aims to contribute some understanding and explanation to aid the still unresolved debate between VBC and ABC systems. If the study produces any significant data then this purpose will have been fulfilled.

It is often treated as axiomatic that accountants and managers who use cost systems would benefit from better knowledge of the relationships between cost system type and intervening contextual factors (Bronwich and Bhimani, 1994, ch.1; Cooper, 1996, p.20). This is relevant if those factors influence the actual and potential use of management accounting data and information.

It is possible that the debate concerning the increasing adoption of ABC harbours a more philosophical approach in method of management style. If this is correct, then the lack of widespread adoption and inability to obtain conclusive results using techniques like correlation or regression analysis is because they provide mis-specified tests of ABC theory (Kaplan, 1993, p.3). ABC may reflect differing underlying constructs than

the ones usually examined. If the debate continues to be unresolved then further consideration may be given later to the possibility and acceptance of the view that the search for correlation with complexity and variety factors is misplaced (Kaplan, 1993, p.3).

Contextual factors have been posited as having an impact upon the use or benefit of cost systems (Perrow, 1967; Khandwalla, 1973; Hayes and Wheelwright, 1984; Chenhall and Morris, 1986; Johnson and Kaplan, 1987; Cooper and Kaplan, 1988; Foster and Gupta, 1990; Spicer, 1992; Anderson, 1995. Swenson, and Flesher, 1996) in an attempt to produce some understanding about cost system use and effectiveness.

1.5 MANAGEMENT ACCOUNTING SCOPE

This study will refer to management accounting in widely accepted terms. The following outlines generally considered purposes of cost systems.

Horngren et al (1994, p.4) in his seminal text on 'Cost Accounting' states that management accounting is concerned with most purposes of an accounting system. It is not uncommon to find that there are generally agreed purposes for cost systems (Kaplan, 1983; Scapens, 1990):

- Purpose 1: Internal routine reporting for control purposes including
 - a) cost planning and control of operations;
 - b) performance evaluation;
- Purpose 2 Internal routine reporting for pricing and resource allocation purposes. Examples include profitability of products, analysis and brand categories;
- Purpose 3 Internal non routine reporting for strategic and tactical decisions, including policies for long range plans, new product development, equipment and special orders/situations.

1.6 ORGANISATION OF DISSERTATION

The dissertation is organised as follows:

- Chapter 2 examines the debate in the literature regarding the use of cost systems. ABC has largely been supported by case studies and a challenge exists whether survey evidence supports the propositions developed by those supporting the more widespread adoption of ABC;
- Chapter 3 explains the specific support for the actual hypotheses which are developed and subjected to testing;
- Chapter 4 describes the research methods used in the empirical study from which a self administered questionnaire is randomly distributed and includes the selection of the sample and the data analysis tools employed;
- Chapter 5 will present the data analysis and results of the survey;
- Chapter 6 concludes the dissertation with a summary and discussion of results. Limitations of the study and future research potential are identified.

1.7 CONCLUSION

Cost systems were largely developed by pre WW2 and resulted from the mass production organisational changes brought about by the Industrial Revolution. Clark (1923) recognised the possibility of systems to match the particular circumstances. Volume-based systems are being challenged by activity-based cost proponents who claim VBC methods are often irrelevant and produce distorted cost information for management decisions. These systems are incompatible with the view of managing manufacturing organisations held by ABC advocates.

The evidence in support of ABC is not conclusive as there has not been widespread adoption of ABC systems. This study aims to assist in the search for evidence which may explain more about ABC in real settings, and may have benefit to those interested in actual cost systems. If ABC offers clear operational advantages to users and is compatible with various management methods and philosophies, then it is reasonable to expect that ABC will increasingly be adopted when sufficient reliable evidence is produced.

It is argued that contextual factors influence cost systems. ABC is a cost system which is claimed to be suitable for manufacturing plants operating in situations with complicating contextual factors. This investigation limits itself to the examination of cost systems and moderating factors in order to produce information to assist in the cost system debate. It does not attempt to measure organisational success or profitability, which would inevitably add further complications better suited to a separate undertaking.

The study will seek evidence of relationships between changes in the contextual factors and type of cost system employed. An examination will be conducted of changes in the contextual factors chosen for this study and variation in cost system use. Some of this varying use may be dependent on cost system type.

CHAPTER 2

LITERATURE REVIEW OF THE CHALLENGE TO COST SYSTEMS

2.1 FOREWORD

The aim of this chapter is to establish a literary basis for developing relevant hypotheses for this study. These hypotheses will relate to the Purpose and Aim in Chapter 1.4 by comparing the use of ABC and VBC systems.

The chapter introduces the debate as a challenge regarding cost system benefits and focuses on the activity-based argument that it is usually more useful than VBC cost systems. The rise of ABC has been based on criticisms of VBC system relevance in managerial decision making in an Anglo Saxon based sphere of influence. That argument is in itself not a precisely defined equation but shows an organic type structure which is evolutionary in nature with differing emphases over time. Some of the arguments in favour of ABC have been focused on achieving organisational success, especially internationally for business firms.

The next section examines the history of activity analysis and earlier forms of it which can be traced to pre 1940's. The review proceeds to reveal and examine the criticisms of using volume-based cost systems for overhead allocations. The review includes examining such arguments as the changes in manufacturing environment between the early and latter part of this century. This is identified as a contributing factor to difficulties with the identified purposes of a cost system. It also includes the claim that cost systems have been too focused on macro reporting for financial statements rather than for more relevant decision purposes.

The review proceeds to discuss contextual factors claimed by supporters of ABC, to influence the use of cost systems. Under such circumstances ABC literature is examined. Finally, the warning signals are identified which are said to provide the impetus for thoroughly examining an organisation's current cost system.

The review outlines what activity analysis has come to mean since the 1980's. The changes in focus of ABC's development over the last 10 years is discussed and the case study evidence briefly reviewed. The chapter reveals that the acceptance of ABC has not been universal. The cost system's critics arguments are examined and broadly classified into the different methodological frameworks.

The review ends with a search for existing broadly based evidence of ABC success. Such data is believed to assist the debate into cost systems by yielding reliable statistical information which can compare ABC and VBC systems.

2.2 THE CHALLENGE

Over the recent past the cost system debate has not resulted in any conclusive answer but rather, it has achieved a focus upon cost systems and their use/fulness. "ABC renders a clear contribution to understanding costs obscured by conventional accounting" and "ABC goes beyond a contribution margin analysis..." (Bromwich and Bhimani, 1994, p.79; MacArthur, 1992). ABC is similar to Just In Time (JIT) in that it requires the reconsideration of operational processes. Kingcott (1991, pp.36-37) claims that it is the process and not the system end result which is beneficial. Kingcott claims the focus should be on opportunities and that ABC has been oversold. Any accounting tool should be used to exploit opportunities (Kingcott, 1991, p.37). This focus has been remarked upon by both advocates and critics of ABC as being a useful result in itself (Bromwich and Bhimani, 1994; Airsworth, 1994, p.31). However, Dopuch (1993, p.619) criticises cost driver studies for failing to advance further and provide evidence that the changes to cost systems were beneficial.

The current debate takes a broad view of Kaplan and Johnson's (1987) view of relevance for management accounting in managerial decision making and the developments since. The term cost system is widely interpreted to be inclusive of the mechanism by which a plant allocates production overheads or indirect manufacturing overheads. The method normally used by manufacturers is absorption costing which

includes fixed and variable indirect costs of production. The focus of this study will be upon the technique by which this allocation/attribution occurs and examining intervening contextual factors believed to be important.

Supporters of activity-based systems focus attention on the mid 1980's and in particular the book by Johnson and Kaplan in 1987. From around this time period onwards a plethora of writings, discussions and various contributions has emerged evaluating cost systems. This was referred to in its wider context in Chapter 1.2. The time period also paralleled political concerns in the United States with a perceived declining international competitiveness viz a viz Japan and parts of East and Western Europe (Lowe, 1991, p.5; Cooper, 1996, pp.22-24). It has given rise to publicly highlighted bilateral and government to government balance of trade negotiations and various Congress Acts such as the Export Enhancement Programme Legislation.

More directly, the focus on Japanese practice has enjoyed wide popularity with Deming's book, *Quality, Productivity and Competitive Position* (1982). Deming (1982) became popular with views on Total Quality Management which involve statistical analysis of production to produce 'hard' mathematical numbers and which justified 'teamwork'. Prior to this, 'teamwork' was associated only with the 'human relations' school of industrial psychology. As adviser to Japanese firms in the 1950's Deming gave credibility to theories of greater concern over the challenge to USA productivity from Japan. The theory is based on an analysis of standardised production (Ford technique) after WW2 but was largely ignored by USA firms until the 1980's. Womack, Jones and Roos (1990) argued that the Japanese model could be successfully imported into the USA, after a 5 year MIT study of Toyota plants in Japan and overseas. The concept of 'lean production' became popularised.

Activity-based analysis has enjoyed wide coverage and debate in industrial economies under USA influence as part of an answer to declining competitiveness, and increasing decision making based on relevant (statistical) information. It has also been somewhat enthusiastically supported in the United Kingdom (UK) by the Chartered Institute of Management Accountants (CIMA) which has argued for its adoption and funded

relevant research. The UK has also experienced significant challenges to its manufacturing sector, probably accelerated as its economy has been drawn into the European Community (EC).

The next section investigates the reasons for the interest in activity-based systems and some of the evidence presented to date in Anglo-Saxon type countries.

2.3 THE HISTORY

In Chapter 1.2 the Research Question background of cost systems in capitalist industrial manufacturers since the mid 19th Century was examined. The problem which has recently emerged has been the failure of cost systems to update beyond around the 1920's (Kaplan, 1984, p.125). This has led to strains on volume-based systems as they provide information which is too late, too aggregated and distorted to be relevant (Johnson and Kaplan, 1987, p.128).

The argument for ABC taken at its simplest level by some proponents (Raffish, 1991, p.36) is not that volume-based cost accounting does not work, but rather the world it was designed for is rapidly disappearing. More generally, typical supporters of ABC cite: existing cost systems are meant primarily to value inventory for Balance Sheets, Cost of Goods Sold (COGS) calculations and other data for Profit and Loss Statements. They were not used to discriminate between product lines or even internally within those lines, into individual products (Cooper, 1989; and Kaplan, 1992; Drury, 1990a; Novin, 1992; Clark and Baxter, 1992)

The simple view of ABC as expressed by Raffish, raises issues of validity. The modern industrial world is highly interconnected with capital flows and technology. In October 1996 the Australian Stock Exchange (ASX) introduced a levy on its listed companies to raise funds for research into harmonisation of international accounting standards. If the simple view is correct then a universal move to ABC should be expected. Paradoxically for this simple view Japan and Europe continue with cost systems which are functional in nature rather than adopting ABC which is process orientated (Kingcott, 1991, p.36).

The European cost systems tend to take as their cost pools the organisational and departmental structure as the main framework to which costs are to be causally related (Boons et al, 1992, p.111; Innes and Mervellec, 1994, p.8).

ABC will be viewed in this study within its contextual surroundings and its assessed suitability/benefits within the Anglo Saxon based economies/cultures from which it is derived. These economies have emphasis on accruals rather than the cash based emphasis of Germany and even behavioural expectations of France. (Bescos and Mendoza, 1994, p.18)

A focus on activities (processes) rather than functions is not as new as the 1980's emphasis on ABC may suggest. Functionalist grouping of cost pools has a theoretical basis in the scientific management group of Taylor as outlined in Chapter 1.2 and Fordism. ABC is similar in some ways to that management philosophy of specific accountability and production analysis but is orientated towards processes not functions. The ideal type of design for an ABC system starts by collecting the homogeneous actions into activities and then subjecting them to further aggregation into centres or processes (Cooper, 1989, p.39).

Perhaps the first activity centred cost system was initiated as part of the New Deal by President Roosevelt during the time of the Great Depression. The Tennessee Valley Authority (TVA) was an enormous project of linked dams for the provision and control of power and water. It was highly capital intensive with large overheads and its major revenue was the sale of its generated electric power. Its initial cost accounting system was based on an adaptation of a Steel and Wire company (Aiyathurai, 1991, pp.62-3). The new TVA Comptroller appointed in 1938, Kohler, scrapped the cost accounting approach and replaced it with a new method of "Activity Accounting" as he came to call it (Aiyathurai, 1991, p.63). Kohler devised a system which regarded all costs as subject to variation or elimination and to assign all cost elements to someone who could be held responsible for the incurrence of the cost as well as the functions performed.

Coincidentally, evidence has emerged that managers can feel threatened by this factor (Innes and Mitchell, 1995, p.137). The activity approach was applied to the total company across the seven states it operated in

While Kohler developed an activity-based version for cost accounting there are important differences between it and the modern ABC. The TVA operated in a product standardised and competitive stable market. The ABC system of today has computers to assist and often operates in circumstances of high product diversity, production process complexity and intense market competition. An activity-based system is argued to be highly useful by providing relevant data for decision making under such circumstances. (Clemens, 1991, pp.43-4; Clark and Baxter, 1992, pp.54-5).

Perhaps one of the last persons to emphasise the importance of activity costing before its popular rise (re-emergence) in the 1980's was Staubus (1971, pp.138-140). He drew attention to the issue of accurate costing and restated ten principles of activity costing. Johnson (1988, p.30), in an end-note, acknowledges conceptual dues to Oliver Williamson and Michael Porter, but differentiates between himself and Staubus' activity accounting.

2.4 CRITICISM OF VOLUME-BASED COST SYSTEMS

In Chapter 1.2 the development of modern manufacturing was outlined. To support the larger multi-faceted manufacturing plants being built, cost systems were developed. Early cost systems concentrated upon conversion costs and on a cost per hour or unit measure. This was expressed in terms of process and labour quantities. Examples of these rudimentary early systems can be seen in Marx. (1974, pp.402-5).

These volume-based systems were generally regarded as being well developed by 1925 (Kaplan, 1984, p.390). The core objective was to support a decentralised functional production process with a centralised accounting system. The cost system allowed management to finance capital investment opportunities and allocate funds for investments between competing projects. Specific operating statistics were calculated

for cost reporting for materials and direct labour which were based on scientific methods to optimise resource usage.

VBC systems allocate indirect production costs in a straight linear relationship to a volume-based independent variable. The exact manner of cost allocations and then attribution to individual products may differ, but the common relationship is always a volume-based one. Common bases used are: direct labour hours or dollars; machine time; direct material dollars or units produced

Up to the end of the pre-war period, manufacturing plants may have been relatively large scale but operated in a much simpler environment than a plant in the 1980's and 1990's. It is these changes in operating environment that form the basis of the criticisms of volume-based systems of overhead allocations, particularly as plants produced more lines and different products. It is also the variations in operating environment that form the basis of this study.

In general terms there is widespread criticism of volume-based overhead allocation systems from a plethora of critics in achieving the three distinct purposes of cost system. The three are identified as:

- a) inventory valuation;
- b) product costing; and
- c) process control;

in studies by Kaplan (1988) and others such as Howell and Soucy (1987a, p.44).

While the critics may agree on problems of volume-based systems there is no such uniform agreement on the remedies. One of the potential remedies, activity-based analysis, is the subject of study here, because of its perceived importance and current interest. This interest can be evidenced by the number of seminars, conferences etc., produced by various organisations, particularly for commerce. Other alternatives, such as contribution margin (CM) costing, have been fully debated for many years and lie outside the scope of this study. It is also still possible to do CM costing at the product unit level with ABC. Surveys of current costing practice provide evidence that

practitioners reject the short term view of contribution margin and use full cost plus a margin when making pricing decisions. This is also often related to what the market will bear (Brignall et al, 1991, p.230).

The major criticism of VBC systems is that it is the practitioners who have generally failed to keep pace with significant changes that have occurred in the manufacturing and competitive environments (Spicer, 1992, p.2). At the initial level these contextual factors result in a shortcoming of product cost information in manufacturing firms. This usually occurs by inappropriate overhead assignment and over emphasis on the control of direct labour (Drury, 1990a, p.124).

It is claimed that there is an over-emphasis on product costing for inventory valuation purposes - a disappearance of managerial product costing (Johnson and Kaplan, 1987, pp.135-6). These concerns are supported by organisations like the National Association of Accountants in the USA and the Society of Management Accountants in Canada (Bromwich and Bhimani, 1989, p 5) which assert subservience of management accounting to external reporting requirements. However, in Chapter 1.1 the work of Clark (1922) clearly stressed the difference between cost concepts for different purposes. Clark (1922, p.36) emphasised the need for collecting information for different problems and controversy between the general accountant and cost accounting could be reduced by extending information gathering for any particular need.

Holzer and Norreklit (1991, pp.4-5) found evidence of earlier texts dating before World War II stating as objects of cost accounting:

- ascertaining manufacturing costs for price establishment;
- to guide in deciding what products to make.

Fundamental changes have occurred in the post war period in manufacturing technologies and process complexity. More companies have adopted advanced manufacturing technologies (AMT) in the drive for reducing costs and improving quality and service levels. The ever increasing complex products, often with sophisticated electronic circuitry have added to the challenge of a plant's cost system.

There is an implicit recognition that poor quality is a significant cost driver (Howell and Soucy, 1987b, p.22). Post war AMT has not necessarily been claimed as the sole causal factor for problems of using VBC systems. Rather, the increasing adoption of AMT has highlighted cost system and decision making inadequacies according to a wide range of researchers (Rosenblatt and Zucker, 1979, p.65; Hayes and Garvin, 1982, p.71; Kester, 1984, p.153; Hayes et al, 1985, p.78; Howell and Soucy, 1987b, p.22; Bonsack, 1988, p.38; Swamidass and Waller, 1990, p.183; Sawhney, 1991, p.353).

In addition to increased manufacturing process complexity, competition between manufacturers has intensified with the ability to provide product diversity. Research by CIMA, 'Management Accounting: Evolution not Revolution', investigated this factor in an attempt to identify any gaps which might justify further research (Bromwich and Bhimani, 1989, p.5). The long term trend to product diversification is noted by Howell and Soucy, 1989b, p.24); "The trend toward flexible flow lines also reflects the emphasis to produce more than one product on a production line."

Similarly Howell and Soucy (1987a, p.42) note that customers are demanding more product variety and that domestic and foreign competitors are pressuring manufacturers to compete in this new arena or face oblivion. A survey by Swenson and Flesher (1996, pp.49-53) found that a major criticism of volume based systems was the lack of information for engineering and design changes. There is significant attention paid by mainly US authors to the competitive threat from overseas manufacturing sectors (Howell and Soucy, 1987b, p.21; Johnson, 1988, p.23; Barton et al, 1988, p.49; Drucker, 1990, p.95; Aiyathurai et al, 1991, p.60; Kingcott, 1991, p.36; Hopper et al, 1992, p.307; Tanaka, 1994, p.57; Ainsworth, 1994, p.28; Cooper, 1996, pp.22-24;).

Johnson (1988, p.24) states that the pre-World War II period was, in direct contrast to the 1980's, noted for relatively simple processes of low production complexity and fairly homogeneous product lines.

The impact of product diversity was turned to competitive advantage by Ford against General Motors (GM), between the late 1970's to the late 1980's, when it was accepted

that they could not match their competitor on economies of scale (Shank, 1990, pp.20-1). Instead, the proliferation of product line in models and variations proved a production time disadvantage for GM as it took them longer to produce one of each product line (Shank, 1990, p.20). Product diversity had been allowed to erode GM's prior advantages in scale, cumulative experience and technology.

It is apparent to supporters of ABC from the above, that reliance on volume-based cost systems will almost certainly result in less than optimal decision making by management. Bromwich and Bhimari (1989, p.5), in a summation of the 1988 CIMA study into management accounting, state that there is reliance on redundant assumptions concerning manufacturing processes. This is reflected in over concern with direct labour and components produced in-house, rather than contracted out/brought in components. Manufacturers using VBC systems are unaware of the relative profit attributable to individual products because they have product cost information which is unreliable (Smith, 1995, p.75).

Pricing requirements is another cost system task in addition to determining product cost for inventory valuation (Zimmerman, 1995, pp.291-4). Survey evidence (Brignall et al, 1991, p.229) of pricing procedures in manufacturing industries have shown that product costs play an important role in the complex pricing decision process.

Figure 2.1 shows that cost-related pricing is the most common method used in manufacturing and that the majority use full costing. It is Johnson and Kaplan (1987) who premise their call for cost system changes on the basis of the manufacturing industry changes which have occurred. They evidence this by referring to greater customisation and shorter runs combined with non volume related costs such as set ups, inspection and scheduling, and product line diversity. These activities are increasing proportions of total manufacturing costs and are represented as overheads which require causal attribution.

Figure 2.1
Pricing Decisions in Practice
Manufacturing %

Basic methods:

a)	Cost related	71
b)	Market determined	17
c)	Combinations	<u>12</u>
		<u>100 %</u>

of the 71 % contained in (a);

a)	Cost related	
	i) Contribution	27
	ii) Absorption	59
	iii) ROI	12
	iv) Other	<u>2</u>
		<u>100 %</u>

Other surveys have supported this finding. Scapens et al (1990, p.301) found many pricing decisions rely to a great extent on data provided to the accountants from the design of the routine cost systems. Drury (1990b, p.22) believes the use of cost based pricing is particularly true for customised products which do not have readily available market prices. It is in these thin markets that cost-plus pricing is used most frequently. Modern manufacturing is noted for increased customisation for value adding and an intense competitive environment.

Cooper (1989a) provides an outline of warning signals to managers to assess whether their product costing system is appropriate. He uses analytical reasoning and anecdotal evidence to explain the signals that obsolete cost system emit. It is argued generally by supporters of ABC that managers should learn to recognise the signs that the cost system is no longer relevant and is not providing useful information. It is some of the following warning signals that should provide the impetus for a thorough analysis into the operation of the current cost system (Cooper, 1989a, pp.77-82).

- line managers want to drop seemingly profitable lines;
- profit margins are hard to explain;
- difficult to produce products show large profits;
- departments begin using their own cost systems;
- accounting departments are required to spend much time on special projects;
- high margin niches are not targeted by competitors;
- competitor prices are set low;
- customers readily accept price increases;
- contract bids (acceptances and offers) are difficult to explain;
- reported costs change because of any new financial regulations.

Supporters of activity-based analysis believe that the signals are changes in environmental variables which make a cost system obsolete. According to Cooper (1989a, pp.77-82) the following characteristics are supportive of the beneficial use of ABC.

- low measurement cost associated with obtaining the additional data required;
- operation within a highly competitive markets;
- very diverse product mix.

Johnson and Kaplan (1987) discuss the importance of accurate product cost information for pricing, new product introductions and decisions to drop obsolete products and timely response to competitors actions. Johnson (1991, p.225) claims that although simple in concept ABC was a practical impossibility until the advent of low cost microchip technologies in the 1970's made it economic to collect and compile large quantities of non volume related cost driver data.

2.4 OUTLINE OF ACTIVITY ANALYSIS

The rise in interest in ABC has not proceeded on a singular and well defined path. In response to the criticisms of volume-based cost systems outlined in section 2.3, various researchers have suggested alternative analysis. Some of the alternatives have a close

resemblance to components of what has come to be known as ABC, which has developed through an organic cybernetic like growth and development mode.

Pre-dating Johnson and Kaplan's seminal work, Miller and Vollmann (1985, pp.142-4) discuss a 'hidden factory' which incurs overhead costs. They claimed that volume of output does not drive overhead costs in the modern manufacturing age. Miller and Vollmann support the principle of overhead allocations but suggest looking at those transactions which drive overhead costs, instead of over reliance on measures of physical volume. Bromwich (1990, p.27) called for a transactions based accounting. While there are similarities and differences in these alternatives it is the documented and published ABC argument which the scope of the study includes.

The early articles on ABC around 1988 focused upon product costing, pricing and alternative mix choices. 'How Cost Accounting Distorts Product Costs' (Cooper and Kaplan, 1988, p.21) emphasised the need for a two stage allocation system. The primary cause for concern was the accuracy of product costs. The Schrader Bellows case (Cooper, 1991) was advanced as evidence that the cost system was misreporting the costs the company was actually experiencing in its product lines. Consistent with Cooper's general signs of cost system irrelevance outlined in section 2.4, Schrader Bellows was operating in an increasingly competitive market and used direct labour to attribute its overheads. With the use of activity-based cost drivers, particularly for the support department, the organisation had improved information for cost and pricing decisions. Cooper and Kaplan (1988) also used the 'Rockfords' and 'Mayer Tap' cases as supporting examples of the same dilemma as Schrader Bellows.

Zytec (Cooper and Turney, 1990) provides further case evidence of how activity analysis can assist in environments subject to intense competition. Zytec provided components in the price sensitive internationally competitive business of electronics. ABC succeeded in focusing design attention on production inputs, and included emphasis on the complementary productive philosophy JIT.

Tektronix Personal Instruments Division demonstrates ABC in harmony with JIT and Total Quality Control (TQC) to achieve continuous improvement. The use of ABC is also sometimes linked to Key Performance Indicators (KPI) (Clark and Baxter, 1992, p.55). Tektronix experienced intense competition, particularly with Japanese rivals.¹ The electronic oscilloscope manufacturer changed their cost system to support a new manufacturing strategy based on a better cause/effect relationship of cost and causal factors. It was based on the number of parts of each product.

The case study by Kaplan and March (1987) 'John Deere' demonstrated that a plant producing high volume complex parts for internal and external customers could systematically over allocate costs to parts. This was evidenced by the plant winning bids for simple to produce components and losing bids for parts the plant was specifically designed for. From quoting for the supply of 275 parts the plant had been successful for only 58. The plant design was centred around a belief that a competitive advantage for complex production existed but the cost system used volume-bases like direct labour hours. The change to an ABC system significantly altered reported product costs by using more cost drivers like set up time, and number of production orders.

Differences in setups, production volume batches/runs and type of material inputs are thought to be causes of significant actual cost differences which can be accurately identified by adopting ABC. Siemens Electric Motor Division (Cooper and Wruck, 1989) experienced severe European competition and had a diverse product range. In a strategic move towards producing customised motors, Siemens found the cost system inadequate in tracing overheads. The small orders of customised motors were undercosted while large batches of simple motors had the extra costs allocated to them. The change to using order numbers and number of special components used in the job captured the cause/effect relationship better. Within a diverse operating plant managers were better placed to decide upon what orders to accept/reject.

Cooper (1988) uses the John Deere case to illustrate the effects of:

¹ See discussion section 2.2.

- a) production volume diversity, and
- b) size diversity in product costs.

Conventional volume-based systems are demonstrated by Cooper to overcost large high volume products and simultaneously under cost small, low volume products when the diversity range is high. Cooper amplifies the examples and proposes that other forms of diversity act likewise: complexity of production process, number of different materials or parts, and production run set-ups.

The developing arguments in support of ABC have changed emphasis as the debate has progressed. As outlined in section 2.1 ABC has developed and there are now four generally accepted stages of ABC classification:

- i) unit level
- ii) batch level
- iii) product level
- iv) facility level.

Early emphasis was on accuracy of the product costing, and even to achieve 'the true cost of products....' (Miller, 1996, p.1). Critics of ABC seized this claim to argue that as allocations were involved, a 'true product cost' is a logical inconsistency or unobtainable goal (Gupta, 1993, pp.210-1). Piper and Walley (1991, p.42) state that ABC contains a tautology: activities cause costs, but products and customers cause activities. The development of activity-based analysis to include management (ABM) was to "... make better decisions, improve performance and earn more money on assets deployed" (Miller, 1996, p.15).

Initially ABC was used to provide data on more accurate product costing. Subsequently, ABC has emerged as a very useful guide for management action that can translate directly into higher profits (Cooper and Kaplan, 1991, pp.130-1). Decision-making, profit reporting and performance evaluation may be aided by re-examining the need for standard costing techniques (Hartnet and Lowry, 1994). "A realignment of the cost object to the customer....an extended value chain perspective....improvements in the

performance of customer level activities” (Turney and Reeve, 1990, pp.49-50); “...embraced by some of the world’s most successful companies” (Cindrich, 1996).

These later developments were assisted by Cooper’s identification of the four levels of hierarchy for activity costs. The fourth level, facility sustaining activities, is not intended to be attributed to products but expensed in the Profit and Loss (Cooper and Kaplan, 1991, p.133). Cooper has authoritatively described ABC to be an allocation of overheads according to the activities that the plant has analysed and found to drive costs. It assumes that relying solely on a volume-based linear relationship of cost allocation is likely to provide misleading data. Activity-based systems recognise up to two more types of allocation bases (cost drivers) than VBC (Cooper, 1990, p.5). In addition to unit-based measures, activity-based systems can include:

- (i) Batch-level bases which assume certain inputs are consumed in direct proportion to batch numbers from the product range; and
- (ii) Product-level bases which assume certain inputs are used to develop and produce different products.

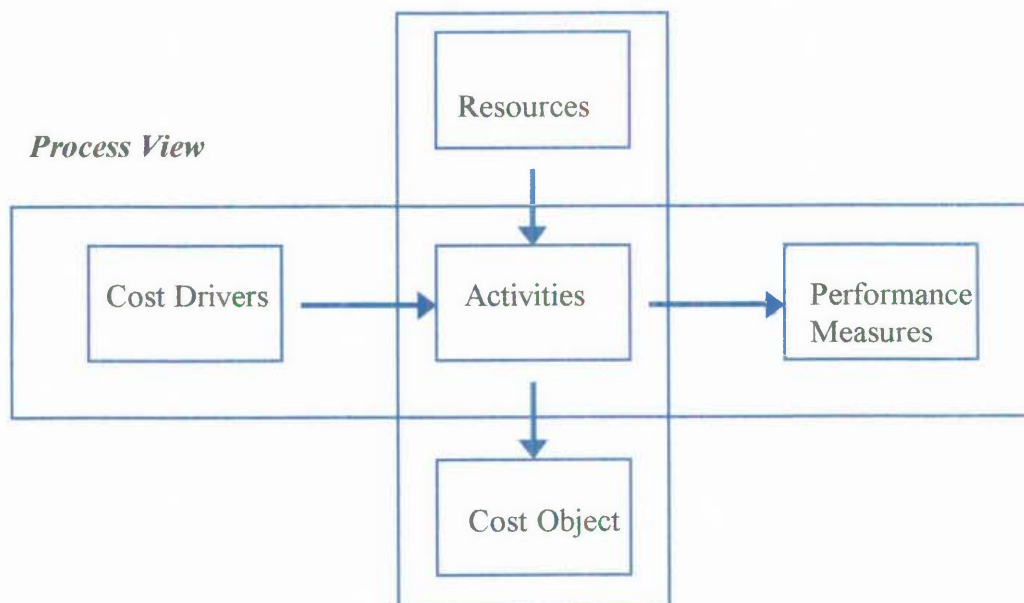
Cooper (1990, p.6) included a fourth category: facility level activities referred to above. These sustain the plant’s general manufacturing process but Cooper considers this too arbitrary to contain costs which should be directly attributed to individual products. Cooper defines an ABC system to be one that identifies and then classifies the major activities of a production process into one of the four categories. The emphasis is placed on capturing the underlying behaviour of costs being assigned.

Recent activity analysis has included use for performance measurement and behaviour modification, benchmarking, Key Performance Indicators (KPI), and evaluating outsourcing of activities and improving quality. Cooper (1996, p.20) regards proactive management of costs to be a matter of survival for many companies with increased global competition and lean enterprise.

Turney and Raffish (1991, pp.53-63) undertook the responsibility to redefine ABC as a cost model. In contrast to earlier definitions of ABC which focused only on product

costing,² Turney and Raffish produced a glossary of terms which redefined ABC in terms of activity-based management: a methodology measuring cost and performance of activities, resources and cost objects which are assigned and recognise the causality of cost drivers to activities (Turney, 1992, p.54). Turney provides the diagrammatic structure Figure 2.2 of ABM, on cost assignment and process views (Turney, 1992, p.55). Discussion of ABC and ABM now overlaps to the degree where drawing distinctions is likely to lead only to inconsistencies and confusion.

Figure 2.2
Cost Assignment View Diagram



2.6 CONCEPTUAL CRITICS

Any cost system which is implemented in actual practice has strengths and weaknesses and ABC in turn has advocates and detractors. From being a saviour of cost systems to being just another conceptually flawed system (Kingcott, 1991, p.36), ABC is subject to intense debate. What is beyond doubt is the factual situation - ABC, in various forms, has been implemented in a number of manufacturing plants and is the centre of attention for many seminars aimed at practitioners. This above all makes the search for evidence of its use worthwhile.

² This referred directly to Cooper (1988) "The Rise of ABC - Part One: What Is An ABC system?". Cooper had provided a product costing definition of ABC.

This section briefly outlines some of the concerns with activity analysis. It may be a harsh but pertinent comment by Clark and Baxter (1992) in their aptly titled article “ABC+ABM=Action”: “...now have a comprehensive management tool that could be put to work immediately while the theorists and academics get lost in the continuing debate over ABC” (Clark and Baxter, 1992, p.55). The authors believe that this holistic and integrated approach to the future means, “*relevance of information not finite accuracy*”, (emphasis in original).

Banker and Hughes (1994, p.480) question the assigning of support activity costs to units of production. They criticise ABC for not specifying:

- a) the precise correspondence of costs to prices;
- b) the efficacy of relying on product cost systems to make pricing decisions;
- c) the information required by accountants in designing cost systems; and
- d) the information required by marketing managers in implementing pricing policies.

While the authors adopt a Positivist theoretical model approach to product costing, much of the criticism may still apply to existing volume-based systems.

A study by Mills and Sweeting (1988) provided evidence that 71% of British manufacturers used cost related methods for pricing decisions in practice. This finding is irrespective of any conceptual flaws in systems used. The same survey found 59% of manufacturing firms used absorption costing rather than alternatives like variable costing.

In an interview with King (1991, p.13), Kaplan reportedly claimed that the previous saying, that all costs are variable in the long run is the wrong way to think about it. The correct expression ought to be, according to Kaplan, ‘in the long run spending on resources will tend to follow their usage’ (King, 1991, p.25).

The fixation on absorption costing is in error and ABC is based on a ‘sinking sand foundation’. ‘Allocations of overhead is arbitrary, time-consuming and the resultant cost unlikely to be appropriate for decision-making’ (Kingcott, 1991, p.36). Even critics like

Kingcott mention at the same time as they make criticisms of methodology, that ABC is interesting and 'should improve cost awareness and better interaction between departments'.

Sharp and Christensen (1991, p.32) also believe that ABC repeats the error of volume-based cost systems by allocating overheads. They suggest that analysis should focus upon costs and revenues that are avoidable in the absence of the product segment. The authors believe that ABC could be modified to allocate only those costs which can be eliminated by discontinuance of the activity (Sharp and Christensen, 1991, p.34).

Wells (1993, p.2) argues a similar line. Allocations of any type are dysfunctional because they obscure the nature of underlying costs. They also hinder the process of knowing which costs will change and which will not as a result of a contemplated action. Wells envisages no improvement with costing methods for production decision making. His advice is for accountants to develop data bases containing decision useful information. However, he does not specify any techniques for achieving this. The traditional and widespread relational databases have operational difficulties for those not very familiar with them and can only answer queries on data already contained within its files and in the specified field (domain) formats.

Piper and Walley (1990), in an article entitled 'Testing ABC Logic', challenged the assertion that activity causes costs. Using an exposition of ABC by Jeans and Morrow (1989, p.42), they claim that no logical link exists between two critical assertions:

- (a) overheads are no longer a mere burden to be minimised and even have customer value; and
- (b) activities cause costs, not products.

They submit the assertions concerning causation of costs can be useful in different contexts, but there is a danger in believing only one to be correct or true (Piper and Walley, 1990, p.37). They further challenge the assertions on the basis of failure to establish a logical or empirical case.

In a follow up article by Piper and Walley (1991), which is self descriptive by title, 'ABC relevance not found', they further criticise ABC and in particular a reply by Cooper 'Explicating the Logic of ABC' (1990). They defend decision relevant analysis which they propose, and reiterate the faults of an absorption costing model and its inherent deficiencies. This also includes the quality of information claimed to be provided by activity analysis.

Azzone and Bertele (1990) draw attention to the deficiency in new product analysis in terms of quantity and timing impact over other products produced. This gives rise to the familiar criticism of accounting from economics; the ignoring of opportunity cost. ABC is not alone in that criticism and it does not seem to be a difference between the two alternatives examined in this study.

The criticism of lack of opportunity cost information is also referred to by Bromwich (1993) which may reflect an economics background. ABC costs are generally incremental costs of production activity and should not be allocated to units of production (Bromwich and Bhimani, 1994, p.93).

A fairly uniform agreement amongst the critics of ABC is expressed by Bromwich and Bhimani (1989, p.5) that there is insufficient empirical evidence in the UK to support wholesale cost system changes. They also claim that the evidence presented for ABC is anecdotal and not systematic. Accordingly the next section examines some of the wider systematic evidence collected.

2.7 SEARCH FOR BROADLY BASED EVIDENCE

There is debate about the type of evidence best suited to resolve the argument about ABC. While that debate can be at different conceptual levels and paradigms, the call for broadly based empirical evidence is alluring, in part because it may be generalised.

A number of cross sectional surveys do provide evidence that is supportive of the issues and claims ABC makes. Khandwalla (1972, pp.26-7) surveyed empirical relationships

between different types of competition. In particular he searched for a link between profit and

- a) price competition, and
- b) intensity of competition in product quality and variety.

This survey found evidence that 'competition is a factor that tends to increase the usage of sophisticated accounting ... controls'. Of the three competitions Khandwalla tested, he found product competition to have impacted most on the usage of management controls.

Commenting on his findings above, Khandwalla did not claim his data was the principal phenomena for control usage. He referred to his other research that suggested that more environmental factors such as technology, and internal factors, such as organisational structure could impact on the use of management controls.

Banker and Johnson (1993) used data in the public domain in an analysis of cost drivers in the technologically sophisticated airline industry. They sought to produce evidence of non volume related cost behaviour. Their study was a specific response to the concerns and suggestions of Miller and Vollrann, and Cooper and Kaplan (1987), regarding conventional volume-based cost system inadequacies.

The factors examined by Banker and Johnson included the cost of production complexity and diversity of product line. The study supports the ABC claim of use and effectiveness of cost driver analysis for tracing product costs using linear least squares regressions of cost functions and cost drivers. The conclusion made in the study was that both volume and operations based cost drivers were statistically significant. Importantly, they revealed that empirical cost driver analysis is managerially significant (Banker and Johnson, 1993, p.577).

A part of the importance of the airline study above was that it provided a statistical contradiction to a limited survey of 37 manufacturing plants of a single organisation undertaken by Foster and Gupta (1990). In their article 'Manufacturing Overhead Cost Driver Analysis', the authors' cross sectional data found that volume related measures

of output were highly correlated to manufacturing overheads. While they tested factors of complexity the association was limited (Foster and Gupta, 1990, p.309).

Although qualified, the results of their study into complexity and efficiency factors did not suggest any immediate concern with reliance on volume-based systems. The ABC contention of misallocations and distortions in information generated by VBC for managerial decision making, failed to be supported. In fact, Foster and Gupta's findings were challenged in an article claiming that the statistical analytical techniques used had a downwards bias effect on their results for complexity and efficiency variables (Banker and Johnson, 1993, p.577).

Some surveys have revealed that ABC is little known. A Canadian survey of 352 companies in 1992 reported by Bronwich and Bhimani (1994, p.197), revealed one third of respondents did not know of ABC methods. In the years that have passed since, and the significant attention ABC has received by consultants at seminars aimed at industry, that lack of knowledge should have decreased. A 1994 USA survey by Institute of Management Accountants (IMA) found 29% of respondents using ABC systems (Ainsworth, 1994, p.28).

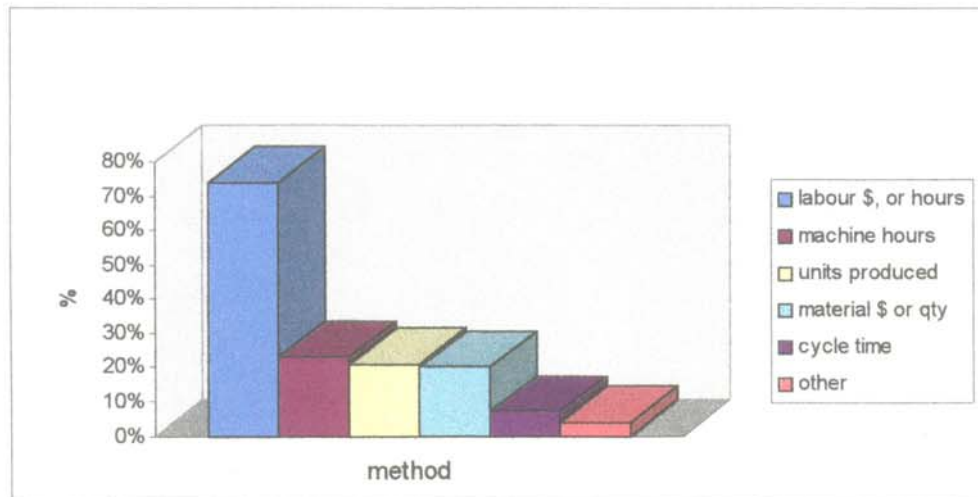
A survey of 70/348 mid western USA manufacturers by Emore and Ness (1991) provided discouraging results for the adoption of newer and more relevant cost systems. There is little evidence to demonstrate that firms in competitive and modern manufacturing environments realise the need for advanced cost management systems.

Many firms have concentrated on integrating and automating diverse accounting and manufacturing systems rather than improve the conceptual basis of their cost systems. Some 74% of their respondents identified direct labour as being more than 3 times in use than the nearest other method for manufacturing overhead allocations (Emore and Ness, 1991, p.36). Direct labour was approximately equal to all other means combined.

Figure 2.3 does reveal that a number of companies are using multiple allocation methods. However, the authors suggest their findings did indicate that many

respondents were not collecting detailed product cost decision useful information. This revealed that product profit analysis was not well understood.

Figure 2.3
Manufacturing Overhead Allocation Bases



Source: Emore and Ness (1991, p.37)

Various reports of the level of qualifications/training of Australian managers reveal lower achievement levels than for other industrial countries, particularly those of the OECD. The Emore and Ness claim that a “new breed of manager must emerge” (Emore and Ness, 1991, p.45) may be supported.

A North American survey was undertaken by Cohen and Paquette (1991) of mostly manufacturing plants. Although their purpose was to enquire into variance analysis, their study revealed information that led the authors to conclude that changes in management accounting practices occur slowly (Cohen and Paquette, 1991, p.83).

Karmarkar, Lederer and Zimmerman (1991) surveyed 39 manufacturing plants in addition to a field study of 5 North American plants, and concluded similar results to the above though qualifying their findings with some doubts as to the efficacy of the test instrument used.

Bromwich and Bhimani (1994) concluded that the empirical studies and aggregate surveys of current cost systems practice indicate that changes in production technologies, work practices and environment do not have an immediate and generalisable relationship to costing systems (Bromwich and Bhimani, 1994, p.201). This could suggest that even where the technology and methods do exist and are being implemented for advances in cost systems, that there are problems in using them. These implementation type problems could result from inexperience of managers, uncertainty in interpreting output and training/qualification inadequacies.

Drury et al (1993) cited in Bromwich and Bhimani (1994, p.213) surveyed over 300 UK manufacturers for a broadview of cost system use. It was found that over a third of companies were considering ABC but less than 15% used it or had committed themselves. It was noted that simplistic overhead allocation methods were still used and that manufacturing technology and production process changes were not resulting in significant changes to cost systems.

Despite the conclusions above, evidence continues to emerge which supports the arguments for ABC. Anderson (1995, p.367) obtained data on manufacturing plants of a leading US textile manufacturer. His results indicated that manufacturing overheads increased with the heterogeneity in the manufacturing process of a plant's product mix and the number of setups (Anderson, 1995, p.38).

Gul (1991, p.60) conducted a survey of South Eastern Queensland light engineering manufacturing firms. His study found that the effects of cost systems on performance were dependent on environmental uncertainties. From this he concluded that when contextual factors of uncertainty were high, sophisticated cost system data/information was needed by managers to make effective decisions. Gul claimed that managers would find timely and frequent cost system information particularly useful.

The survey by Gul should support the argument in favour of ABC. If ABC provides more decision useful information when combined with increased levels of competition,

production complexity and product diversity, it should be used more than a VBC system.

CIMA has sponsored a series of surveys by Innes and Mitchell in 1989, 1990, and 1994. The first survey was limited in scope but found some evidence that management accounting practice was changing. In contrast to North American experience Innes and Mitchell (1990, p.29) claim that their study sheds light on the issue by demonstrating ABC effectiveness in actually achieving cost savings. The lack of such evidence had been a particular concern of Bromwich and Bhimani (1989, p.5).

Innes and Mitchell (1990, p.29) differentiate British applications of ABC from North American by claiming the systems have been kept simpler. The emphasis has been assisting process and cost control decisions rather than concentrating on a revised product cost.

Davies and Sweeting (1991, p.44) claimed that new costing techniques were creating confusion amongst management. Data which was collected often was not made available to managers.

The scale of interest in ABC was gauged by a survey of CIMA members with 187/720 responses, some 26% (Innes and Mitchell, 1992, p.28). A few organisations had implemented ABC but many were still assessing their commitment. The main reasons given for considering ABC were:

- a) product cost accuracy; and
- b) profit analysis of product lines.

Evidence emerged that cost issues of implementing ABC arose and also complexity of its use. Those firms that have implemented ABC gave predominantly positive feedback (Innes and Mitchell, 1992, p.30).

Innes and Mitchell (1995, p.137) surveyed the 1,000 largest companies in the UK and found 20% of manufacturers were using ABC. While they found a significant number of companies to be using ABC, they stated its impact was often restricted in scope

(Innes and Mitchell, 1995, p.142). The study provided detailed statistical data on uses, importance ratings and the ways ABC was actually used. The survey revealed a need for top management support, spreadsheet and database assistance, and the important role the internal accountant played.

Importantly, half the users of ABC systems in the above survey found the design of the system did not work well with the structure of management responsibilities. 41% of users had some reservations about the way the information could be used and noted that activity analysis increased levels of personal accountability (Innes and Mitchell, 1995, pp.142-3). The study did not attempt a measure of any difference between actual use and a perceived potential usage which could have indicated difficulties in achieving expectations. It is possible that the current emphases on benchmarking and KPI's (Kaplan, 1994, pp.15-16; and Norton, 1992, p.73; 1993, p.134; Green, 1993, p.5; Newing, 1995, p.22) could lead management to have predetermined expected uses of their system.

By contrast the survey by Swenson and Flesher (1996, pp.50-51) found significant support for the adoption of ABC. The survey was of diverse firms in the United States and reported high levels of satisfaction by users.

Foster and Gupta (1994) in a survey based on marketing use of cost systems with 50 responses, did develop a test for an 'information gap'. Their article frequently referred to ABC and benchmarking practices (Foster and Gupta, 1994, pp.52-54. and pp.61-2). The information gap evidence resulted from respondents assessing the difference in value of accounting information:

- (a) from existing cost systems for actual decisions made, and
- (b) the value of accounting information potential to decision making.

The evidence revealed the largest difference to be for pricing decisions (Foster and Gupta, 1994, p.65). Other factors examined included product mix, and new product development.

Foster and Gupta's study provides evidence that there is a problem with cost systems in achieving the level of use desired by management. The survey provides broadly based empirical evidence of this claim and consequently there is a need for cost systems which provide relevant and reliable information to users. An information gap is evidence that the perceived potential of a cost system is not being reached.

2.8 CONCLUSION

This chapter undertook a review of the challenge of cost systems in providing data/information which is relevant and reliable for managerial use in manufacturing environments. The development of activity analysis as a remedy for the perceived shortcomings of volume-based systems is not without criticism. This includes views such as ABC being conceptually flawed and that specification of an exact model for empirically based research is too difficult for the effort required. The argument concerning ABC's advantages does not have a conclusive answer established from the literature. In fact, a conclusive answer may not even be possible.

Those who lack enthusiasm for activity analysis often do so on the basis that allocations of manufacturing overheads are conceptually flawed, no matter the mechanism used to achieve it. Allocations of overheads are sometimes viewed as being too arbitrary and producing information which lacks decision usefulness for managers.

Activity analysis was supported by case studies which developed arguments for its superiority in closed situations. A call has emerged for broadly based empirical studies to demonstrate the use/usefulness of ABC systems related to contextual factors in the operating environment of manufacturing. Survey evidence concerning ABC use and benefit has emerged. The evidence is inconclusive, but does reveal ABC has not been as widely adopted as many first thought it might be. This reveals that there is a need for some similarly based evidence to demonstrate support for ABC. Alternatively, continuing unreliable evidence could indicate that ABC is more related to a philosophy of what managers ought to be doing, including accountability purposes in the workplace.

If the preceding is correct, then findings revealing that ABC is not adopted and used as expected by manufacturers, would be partially explained.

Further particular local survey evidence may assist in deciding upon the benefits of using ABC as the individual case studies reviewed in this chapter have not been accepted as providing enough support to warrant the majority of manufacturers to change cost systems.

If ABC systems deliver an advantage to cost system users when contextual factors vary, further specific survey evidence may identify some of these advantages and assist in gradually resolving the issue.