

CHAPTER 3

COST SYSTEMS AND CONTEXTUAL FACTORS

3.1 FOREWORD

Chapter 1 revealed that organisations have internal cost systems which provide data for many purposes, including product pricing, production mix, capital budgeting and marketing based decisions. Chapter 2 discussed two cost system types which differ widely in methods of information processing. This research study will focus on the part of internal accounting systems broadly called cost systems and the provision of quantitative data for plant level decision making. The first section reveals specific areas for consideration in developing the research theme and issues to be addressed.

Managers making operational and planning decisions use, to some extent accounting data. A cost system, which is relevant and reliable, should provide (Zimmerman, 1995, ch.1):

- a) data/information necessary to identify the most profitable products and the pricing and marketing strategies to achieve the desired production volume levels;
- b) information to detect production inefficiencies ensuring that the proposed products and volumes are produced with minimum cost.

This chapter will develop specific hypotheses aimed at testing explanations of ABC systems, when compared to VBC systems, under the conditions described and identified by the literature study. The specific contextual factors are identified and later incorporated into the hypotheses. Chapter 2 revealed there is a need to substantiate that ABC cost systems do provide the benefits claimed. Evidence is also required to provide information about the use of cost system types and how contextual factors intervene, as outlined in Chapter 2.

The issue of non significant support for ABC, as evidenced in some prior surveys, is addressed. The study examines whether there are factors which can explain why ABC evidence often does not reveal the strong associations expected. Failure to achieve the

potential use of ABC is discussed as possibly being able to contribute some understanding to the issue. In order to assess the validity of this possibility it is first necessary to gain some empirically based evidence of it in relation to decision making use of cost systems.

Finally, hypotheses are developed to allow testing for differences between the use of cost systems and cost system type.

3.2 COST SYSTEM STUDY

Chapter 2 considered the evidence which has been produced in support of the case for adopting ABC. The role of financial accounting and external reporting requirements has been advanced as a major detriment for management accounting (Bromwich and Bhimani, 1989, p.5).

The dominance of financial accounting requirements, 'sounds like a reasonable hypothesis' (Holzer and Norreklit, 1991, p.10). It could be that the benefits of sophisticated cost systems do not outweigh their additional cost (Holzer and Norreklit, 1991, p.11). The authors sum the view of many who have not been convinced by anecdotal and case study argument; 'lacking any strong empirical evidence, ...the Kaplan-Johnson hypothesis cannot be accepted as generally valid' (p.11).

The research undertaken into ABC systems has been criticised by Banker and Hughes (1994) for not precisely specifying the links between the assigning of support activity costs to products. Bromwich and Bhimani (1994, p.201) extended this criticism to include empirical studies and aggregate surveys of cost systems. They suggested that, among others, changes in environment factors are not immediately and directly related to cost systems. While these views may well be valid, the authors do not provide details on how specification and measurement should occur.

The need for systematic survey research into ABC systems has been recognised (Spicer, 1992, pp.23-24). Further studies continue to use survey methods like Swenson and Flesher (1996) which aimed to investigate the relationship of cost system activities and

ABC. At present no one claims a definitive and conclusive answer which is capable of exact specification and replication.

The argument that ABC provides the most accurate product costs has largely been superseded by the way the system can be used to improve behaviour (Cooper and Turney, 1990; Cooper, 1996). This may have resulted from the critics of ABC who have stated that ABC reports a 'cost' and not the cost (true, real or actual) of an activity (Piper and Walley, 1991; Wells, 1993; Banker and Hughes, 1994).

The benefit of ABC has been suggested to be reflected in its use and direction of management effort. Measurement of cost system efficacy, via profitability or some form of product cost accuracy, is not likely to capture the broadly based worth of ABC systems in situations where contextual factors are not constant.

Chapter 2.7 outlined surveys which have contributed to the understanding of cost systems. In order to obtain data which indicates cost system benefits the surveys have mostly been of people who use them. Khandwalla (1972) examined control techniques by usage and his work has been a foundation for other studies. Chenhall and Morris (1986) surveyed perceived usefulness of accounting information, and Simons (1987) combined a test of usage and the importance of components in accounting control systems. Gordon and Narayanan (1984) examined intensity of competitive variables and Gul (1991) used an indicator of management accounting system sophistication. Foster and Gupta (1990) and (1994) surveyed complexity activities relating to manufacturing overhead cost drivers and the usage of accounting information in decision making. Other studies which have also contributed to the literature of cost system knowledge have been examined (Emore and Ness, 1991; Cohen and Paquette, 1991; Karmarkar, Lederer and Zimmerman, 1991; Drury, 1993; Anderson, 1995; Swenson and Flesher, 1996).

Swenson and Flesher (1996, p.49) separated 'preparers' from 'users' of financial data. They found that the users were the most dissatisfied with the way product costs were calculated and that ABC users were significantly more satisfied with their systems. This study will assess the usage of cost systems by their users. These are the persons most

closely involved with using the system for management activities. This method, evidenced by use, should allow an evaluation of cost systems based on their wider benefits than assessed accuracy of a single computation.

The cause of ABC has been argued in contextual surroundings. Contextual factors are believed to be important in the need for an ABC system and were discussed extensively in Chapter 2. Recent studies have continued to emphasise the importance of examining management accounting issues within the context of environmental factors (Cooper, 1996, pp.20-21).

Despite the studies undertaken and evidence gained, there is widespread dissatisfaction in the balance between theoretical models and the practice of managerial accounting (Davies and Sweeting, 1991, pp.44-45; Innes and Mitchell, 1995, p.137). This study will attempt to gain some further information on parts of the unresolved debate into the issue of the benefits of cost system types which have been identified in the foregoing. The following sections will examine the effects of different contextual factors upon the use of cost accounting systems.

The study will examine three contextual factors which have been identified in the literature as having a direct moderating influence on cost system use:

- a) Intensity of competition;
- b) Production complexity;
- c) Product diversity.

3.3 CONTEXTUAL FACTORS AND COST SYSTEM USE

3.3.1 Intensity of Competition

Intensity of competition is the risk and uncertainty for the organisational unit brought about by the product and factor markets experienced by the firm. A cost system containing appropriate competitive information should be used more to reduce uncertainty.

Intensity of competition increases uncertainty in the operating environment (Khandwalla, 1972; Gordon and Narayanan, 1984). It increases the likelihood of adverse consequences both in cost and revenue terms of poor or ill informed managerial decisions. Other parties are likely to exploit opportunities brought about by poor information and decisions of a competitor (Cooper, 1996, p.20).

Chapter 2 produced evidence that ABC is a cost system which is claimed to provide reliable and accurate information, in highly competitive environments, demanding responses to the actions of competitors. Literature supporting activity-based cost systems suggests that they will be more useful to decision making than volume-based systems under such competitive circumstances.

Khandwalla (1972) found in his survey that output market competition was associated with greater use of cost systems. If the foregoing assumptions and findings are correct then the claims that activity-based systems contribute to more efficient production and control systems should be evidenced by a positive relationship associated with these factors.

Figure 3.1 details the attributes of intensity of competition for the study which have been derived from the literature and prior surveys. These will form the basis of developing the hypothesis, and the identified attributes will be tested by using items which have had prior use in surveys. Items will be changed as little as possible and only if necessary.

Figure 3.1

Intensity of Competition

- i) product price competition
- ii) product input competition
 - a) cost of materials
 - b) cost of labour
- iii) competitor behaviour predictability

- i) Product price competition places an organisation under competitive stresses. The more uncertain prices are the less confident the organisation can be about meeting the requirements of its revenue operating budget and rates of return. These stresses can impact quickly upon a firm's share value and its potential investors. Porter (1985) identified price competition as being one of two major strategies a firm may choose.

Intense product price competition can be characterised with a reduction in prices by a competitor, which in turn compels others in the same product market to adjust their behaviour (Khandwalla, 1977). Under such circumstances, where price competition is intense, evidence cited in Chapter 2 indicates the need to use information more frequently for pricing. It has also been an important motivation for firms considering the adoption of activity-based systems (Innes and Mitchell, 1991 and 1995).

In an USA survey of plant managers (Sullivan and Smith, 1993) adopting or considering adopting a new cost system, 51% stated that the need for improved information for pricing products was a motivating factor. The most common type of system the plant managers considered were ABC, Target or Life Cycle.

In a highly competitive price market the firm should rely on its cost system to accurately and confidently allow it to respond to changing revenue circumstances and individual product profitability. It is posited that under these circumstances a volume-based cost system would be used less than an activity-based one.

- ii) Product input competition impacts upon organisations and places them under competitive stresses. The more volatile the cost of resources and labour, the less certain the organisation is about meeting the requirements of its cost operating budget and rates of return. The stresses are likely to affect share value and potential investors who recognise the risk. Product inputs comprise labour, other products and natural resources like energy.

Activity-based systems have been found in surveys (Innes and Mitchell, 1994) to assist decision making for resource inputs due to the visibility given to plant activities and costs. Instead of only recording resource costs by type of input class, activity orientated systems categorise resources by the way in which they are consumed and allow their cost drivers to be easily recognised.

An analysis of input resource usage and mix allows focus on cost reduction possibilities, and is an important competitive factor. Gordon and Narayanan (1984, p.38) found the intensity of resource procurement negatively correlated with a firm's environmental stability. Uncertainty with materials, availability and price, as well as labour uncertainty, have been found to be linked to the increased use of sophisticated cost systems (Lawrence and Lorsch, 1967; Gul, 1991, pp.58-60). Govindarajan (1984, pp.130-32) found, as these activities increased in uncertainty, they were negatively correlated to reliance upon purely financial performance. There was a need for more sophisticated data and information.

One or all of these activities operating at high levels of uncertainty, should increase the reliance on a cost system which provides relevant and reliable information to assist managerial decisions for inputs and labour sourcing/substitution, mix and yield analysis.

It is posited that under higher levels of competitive uncertainty, activity-based systems should improve the credibility and comprehension of cost information, and have higher comparative use than VBC systems.

iii) Low levels of competitor behaviour predictability increases the competitive stresses upon organisations operating in the market place. Increasing competitiveness challenges a firm's control of its stable and more profitable customers, and places its operating budget and rates of return goals under high stress levels.

The predictability of competitors activities has been demonstrated to significantly add to contextual uncertainty, which in turn, increases the need to use information which can itself lower the contextual stress (Gordon and Narayanan, 1984, pp.38 and 42; Khandwalla, 1972, pp.275 and 280-81).

Being pro-active and reactive to threats from competitor behaviour is likely to require decision makers to refer to their cost system more frequently. The cost system can be consulted to obtain data for operations like sensitivity and customer profitability analysis. It is posited that at higher levels of competitor action uncertainty, activity-based systems should be used more frequently than volume-based systems.

The foregoing forms the basis for Hypothesis 1 which is a testable explanation of activity-based cost systems compared to volume-based ones.

H1. As intensity of competition increases, cost systems comprising activity-based methods will be of more use than volume-based cost systems.

3.3.2 Production Complexity

Production complexity is defined in this study as the predictability (routineness) and ease of the resource management phase until the product is completed. Production complexity was hypothesised, and found to have some empirical support by Foster and Gupta (1989, pp.311 and 327) in influencing the level of manufacturing overheads. The research study by Miller and Vollmann (1985, pp.144-46) also emphasised transactions which were complexity based. Datar et al (1993, pp.606 and 613) found empirical support for the ABC hypothesis on non volume cost drivers and in particular, machine complexity.

Banker et al (1990, p.288) found that complex activities increased expense and required the design of a more detailed cost system than one reporting volume-based information to managers. Volume-based cost systems are typically regarded by proponents of activity-based systems as placing too much emphasis on volume variables. This over emphasis is claimed to distort accuracy of reported product costing and lessen the decision benefit of the information. It is believed that increasing production complexity would require an activity-based system to report more accurate product cost activities. These activities are the actual drivers of product costs, as outlined in Chapter 2.

Complexity, as a driver of costs, has received considerable literature support including by Miller and Vollmann. Cooper and Kaplan (1987) use the Schrader Bellows case study to argue that the real driving force of costs is not volume. They believe any allocating of indirect costs based on volume ignores complexity costs and produces inaccurate data for managerial decision making.

Inaccurate costing data increases the likelihood of adverse consequences as a consequence of decisions being made with unreliable data. This can lead to poor business profitability decisions as product margins are distorted. Literature supporting ABC (Cooper, 1989a) claims low volume and more complex products typically receive lower allocations of overheads than they are responsible for creating with VBC systems.

If the literature advocating activity-based cost systems is supported, a cost system which provides reliable and more accurate data should be used more in a complex production environment, as managers come to rely on it. Accordingly, when higher levels of production complexity exist, managers should use ABC systems more than VBC systems.

Figure 3.2 details the attributes of production complexity for the study which have been derived from the literature. These will form the basis of developing the hypothesis.

Figure 3.2

Production Complexity

- i) Different processes an average product passes through
- ii) Product completion predictability
- iii) Subcontracting (contracting out) relative to DM purchases

- (i) The number of different production processes has been identified as a complex factor in a study by Foster and Gupta (1989, pp.323 and 331). They provided some survey evidence that the number of different processes which products pass through is an attribute of complexity. Continuous process flow plants are typically noted for simple materials management, whereas custom or small batch processes tend to incur more complex activities.

Support for the number of activities representing process complexity, was also found by Banker et al (1990 pp.277-288). 'A significant implication of our analysis is that the existing cost system presents an incomplete picture to management...'. The Banker et al survey related complexity variables to costs and identified important activities that acted as explanatory variables in the consumption of overhead.

Volume-based measures of cost are argued as unlikely to accurately capture underlying overheads (Cindric, 1996, p.50). It is posited that activity-based cost systems can lead to better decision making due to the focusing of attention on production complexity issues, such as the separate processes through which products must pass. ABC facilitates better planning and cost reductions through design and process planning changes that reduce complexity. ABC systems should record a higher rate of use than volume-based systems.

- ii) Product completion predictability (routineness) typically falls in more complex production environments like batch processes (Karmarkar, Lederer and Zimmerman, 1990). The increased uncertainty may be compensated for by

holding excess inventories beyond the optimum efficiency level. As volume-based cost systems are unlikely to provide accurate information the effect would be to reduce a firm's profitability due to excess safety. Cooper (1988) also suggests that ABC is useful to determine batch and other related unit product costs which would lead to increased use of a reliable cost system.

Production timing differences between minimum and maximum lead times of products indicate manufacturing process complexity (Karmarkar et al. 1990). Machine reliability in the production process system will indicate production control problems (Karmarkar et al, 1990, p.360) which give rise to the difficulty in achieving consistent production times for products.

A cost system which more accurately examines costs of production is posited to assist in better decision making and should be used more than a cost system which does not provide such reliable data.

- iii) External outsourcing (subcontracting) relative to direct materials purchases is a measure of manufacturing process complexity (Foster and Gupta, 1989).

Foster and Gupta (1989, p.334) believed outsourcing was a relatively simple way manufacturers reduced complexity stresses within the plant. They found evidence within the electronics industry in the USA that outsourcing was used as a means of reducing manufacturing process complexity (1989, p.318).

Production process complexity increases the stress on cost accounting systems to produce reliable and accurate data for plant decision making. Such reliability is believed to be inversely associated with complexity. The more uncertain the accuracy of overhead allocations, the more likely sub-optimal decisions are being made with regard to make/buy decisions. This problem is likely to affect a firm's operating profitability budget and target rates of return. The risk of poor decisions for allocation of capital are increased, while seemingly unprofitable production stages may actually be of higher yield than the cost system indicates. These

difficulties are likely to lead to a low use of the cost system, as it is believed to be unrealistic.

The survey by Banker et al (1990, p.281) found evidence that the overcosting of less complex products had led to recommendations for outsourcing while more complex and difficult production processes would be retained in house.

Activity-based cost systems should more accurately indicate production stage/process costs with its emphasis on activities. When contextual factors are controlled for, managers are likely to use volume-based systems less than an ABC alternative. Innes and Mitchell (1995, pp.138-9) in their survey of large UK companies found that around half of those adopting ABC did so to gain better information towards output decisions. This included a requirement for decisions to be made on subcontracting or outsourcing components.

The foregoing leads to Hypothesis 2:

H2. As production complexity increases, cost systems comprising activity-based methods will be of more use than volume-based cost systems.

3.3.3 Product Diversity

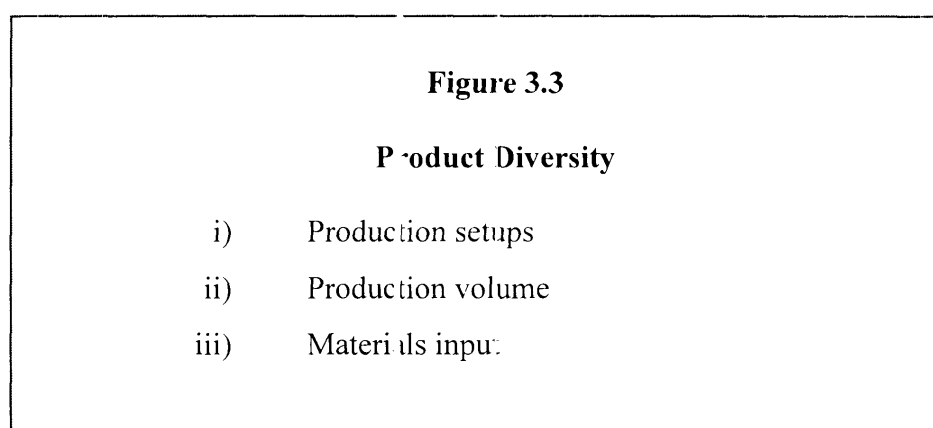
Product diversity is defined in this study as the range of resource consumption of plant products. High levels of product diversity indicate a firm is producing many products that would consume differing prime costs and especially, overheads. Volume related product costing systems assume individual production items drive costs. They use cost drivers which are attributes of the product item, such as direct labour hours, machine hours, or material dollars (Cooper, 1988). Conventional product costing systems may report accurate product costs where overhead is consumed in relation to volume. Inventory costs are likely to be inaccurate where overhead consumption is not related to volume (Turney, 1989).

Supporters of ABC systems believe them to provide reliable information that describes the range, cost and consumption of operating activities throughout the manufacturing

process when product diversity is high. It helps management understand the demands made by a diverse range of products (Turney, 1989, p.37).

Systems which tend towards being activity-based are claimed to produce more accurate and reliable data. Consequently, management possesses better decision making capability. This is, in terms of product decisions and costing, where levels of product diversity are high. Some examples are when products may require more engineering support than others. New processes may need substantial attention to design drawings and the like. Similarly, product level cost drivers such as engineering changes, part numbers, number of insertions/processes are less likely to be costed accurately using volume-based measures where these activities are diverse and have differing costs.

It is posited that firms with high levels of product diversity would be likely to use cost systems more if they are ABC rather than VBC systems. Figure 3.3 details the attributes of product diversity for the study which have been derived from the literature. These will form the basis of developing the hypothesis.



i) Production setups which are not proportional to product volume are likely to distort the allocation of overhead compared to actual cost when using volume-based methods of allocation. The more set ups needed, the more diverse is the manufacturing operation and the chance of misreporting costs between products (Cooper, 1988, pp.52-53).

Cooper and Kaplan (1987, p.218) found in their case study of Schrader Bellows that most transactions that generated work for the support departments could be proxied by the number of line setups. This can be partly explained by plant material movements for production run completions or commencements.

Managerial decisions based on inaccurate set up cost allocations may cause the firm to have difficulty attaining overall profitability goals related to revenue. Such firms are likely to experience increasing sales in products reportedly profitable, but experience less than expected overall profits. Conversely, market share may decline where products are 'over costed' and competitors apparently 'underprice'. The Schrader Bellows case (Cooper, 1991b) was an example of this problem.

The use of an activity-based method should identify increased support costs which are recognised by the number of set ups. It should allocate support overheads more accurately than a volume-based system. The result is a better decision making capability which has greater use.

- ii) ABC literature focuses upon production volume diversity to highlight volume-based cost system inaccuracies (Cooper 1988; 1990a; and Kaplan, 1990; Turney, 1989; and Reeve, 1990).

An analysis of the John Deere plant (Kaplan and March, 1987) revealed that volume diversity between production runs led to a volume-based cost system systematically overcosting the high volume more complex product parts, and a similar undercosting of low volume simple product parts. Turney and Reeve (1990, p.45) state that where there is:

- i) diversity of activities across the production line; or
- ii) total volume diversity across the product line,

ABC will be superior to VBC systems. Innes and Mitchell (1995) in their UK survey found almost half of the companies which had adopted ABC cited product output decisions as a major reason for doing so. A significant proportion of those used ABC to establish output volume levels (Innes and Mitchell, 1995, p.145).

High volume products are believed to be typically over allocated costs while low volume ones are under allocated due to the ignoring of activities required to convert resources to finished products. Volume-based cost systems do not recognise differences between simple and complex products for overhead allocation. An ABC system should allow for identification of the resources being consumed by the product. The outcome of ABC should, it is claimed, be more informed decisions for each product (group).

It is believed that the use of a cost system should be higher for firms experiencing varying levels of production volume and having ABC systems. At low levels of production volume variation, volume-based cost systems may be used frequently because of the absence of factors of distortion.

- iii) In production environments with high product diversity there is most likely to be differing material inputs. These inputs would require significantly varying amounts of overhead resources (Cooper, 1988; Turney, 1989).

Material inputs have differing qualities: fragility, special storage requirements, ease of transportation and handling in the actual production process. In such situations, a volume-based cost system may provide sub-optimal information where diversity results in the allocation of averages rather than the specific volume related and non volume related overheads.

ABC systems assist in the product design phase by providing data which can be used to reduce numbers of parts needed by the plant and which do not contribute to product value. (Turney, 1989, p.30). Commonality of parts and a reduction in supplier numbers, which an ABC system can highlight the cost benefit of, can lead to better management decision making. An analysis by Cooper and Turney (1988) at Tektronix found that half of the overhead costs were based on the number of parts used. With ABC management could focus on the cost of part numbers and seek ways to reduce the diversity of parts used within the product range. Foster and Gupta (1989, p.334) in their survey of electronics plants, examined the sum of part numbers in usage and found them correlated to manufacturing overheads.

The consequences of the above lead to the conclusion that when materials input to products is highly varied cost systems which are activity-based in allocating indirect costs will be used more than volume-based systems. Managers could rely on a cost system which delivered accurate and reliable data for product pricing, make/buy decisions, batch runs and marketing activities.

The foregoing leads to the development of Hypothesis 3:

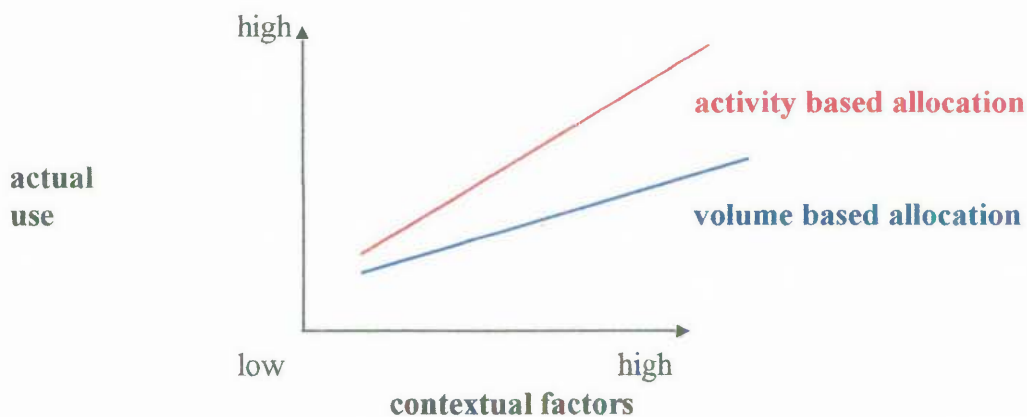
H3. As product diversity increases, cost systems comprising activity-based methods will be of more use than volume-based cost systems.

3.4 COST SYSTEMS AND POTENTIAL USE

If the literature advocating ABC methods is substantiated, measurement of the use of ABC and VBC systems should reveal that ABC systems are used more often when the contextual factors are high. Figure 3.4 conceptually describes that at a point on the contextual factor continuum, the coefficient of cost system use will be greater for ABC systems than for VBC systems. This greater coefficient would be evidence that the ABC system was reliable and used more.

Figure 3.4

Cost System Type Diagram



Although there are not a large number of cross sectional studies of the use of activity-based systems, many results so far fail to strongly support the predictions. (Foster and Gupta, 1990; Emore and Ness, 1991; Karmarkar, Lederer and Zimmerman, 1991; Drury, 1993; Innes and Mitchell, 1995.) These results could occur for many reasons which

may include survey difficulties, measurement problems and the failure of these relatively new systems to achieve their potential in the time span to date.

The Innes and Mitchell (1995, p.137-8) survey discovered that the design of many cost systems did not integrate well with the structure of management responsibilities. A survey of US manufacturing plants (Karmarkar et al, 1990) revealed that cost systems while meeting the requirement of external reporting and cost control, they often failed their potential in operational decision making. Similarly, Sullivan and Smith's (1993) survey of US manufacturing plants identified:

- a) inadequate information for product and costing/pricing, and
- b) a major problem with lack of information for management decision making.

Davies and Sweeting (1991, p.44) claimed that new costing techniques were creating confusion amongst management. Information which was collected by new systems was often not made available to managers in a meaningful and comprehensible form.

It is possible that ABC systems may have difficulties in actual implementation, or sometimes fail to reach the potential that users expect. There has been very little broadly based evidence collected concerning any difference between cost system use and the assessed potential use by actual users. It may be that the expected benefit of using ABC does not result in a finding as depicted in Figure 3.4. For the above reasons, a supplementary hypothesis will be developed for Hypotheses 1 to 3 for testing potential use of ABC and VBC systems and the influence of the contextual variables upon this perceived potential. The testing of the supplementary hypotheses may reveal if any systematic difference exists between ABC and VBC systems. It could provide some explanation as to why the evidence usually collected on the actual usefulness of ABC has not always yielded the expected supportive results that the theory predicts.

The foregoing leads to the development of the supplemental hypotheses:

Hypothesis 1a: As intensity of competition increases, cost systems comprising activity-based methods will be of more potential use than volume-based cost systems;

Hypothesis 2a: As production complexity increases, cost systems comprising activity-based methods will be of more potential use than volume-based cost systems;

Hypothesis 3a: As product diversity increases, cost systems comprising activity-based methods will be of more potential use than volume-based cost systems.

The inclusion of the supplemental hypotheses may reveal whether managers assess there is a potential use of cost system information not currently being achieved. This potential use may be related to contextual factors. A difference between the actual use and potential use, relating to the type of cost system interacting with contextual factors, may provide specific contextual information. It could reveal difficulties with the implementation of ABC. It could possibly explain that the implementation of activity-based systems lag the expected use of the information managers believe they could be provided with.

Foster and Gupta (1994) conducted a survey into the difference between actual cost system use for activities which contributed to marketing decisions and the assessed potential use of those activities by financial managers. The study did not attempt to investigate whether contextual factors intervened, but concentrated on searching for differences in an 'information gap'¹ between management activities. The information gap represents an implementation and/or recognition shortfall in the cost system which results in sub-optimal use. It occurs when there is a perception that the current cost system does not deliver, in decision making use terms, the perceived potential that knowledge of those accounting information activities could give.

A large difference in the assessed current use of each activity provided by the cost system and the potential use to decision making of that activity, would indicate an area where improvements in the cost system would be highly valued by users (Foster and Gupta, 1994). A fourth hypothesis will test the supportive literature for activity-based

¹ The term 'information gap' was used by Foster and Gupta (1994) to describe the difference between use of a cost system and its perceived potential use and was calculated using a weighted measure of importance of each activity. Chapter 4 will explain the precise measure.

systems in that these systems, 'support manufacturing excellence... support the quest for continuous improvement by allowing management to gain new insights...' (Turney, 1989, p.23). Any difference found may yield information that cost system users are not using their systems to the potential they believe should be possible. It could help explain why some studies have indicated that ABC systems have not achieved the use or usefulness explained by the theory. If ABC does not have any implementational difficulties then there should be no identifiable difference of information gap between cost system type. The hypothesis will assume that there is no systematic difference.

Hypothesis 4 is derived from the foregoing and will test whether there is any difference in information gaps which can be identified according to system type, irrespective of the operating environment. It replicates to some extent the Foster and Gupta (1994) study to NSW/ACT manufacturers but on a wider basis than just marketing use.

H4. There is no relationship between the difference in use and perceived potential use of cost systems and cost system type.

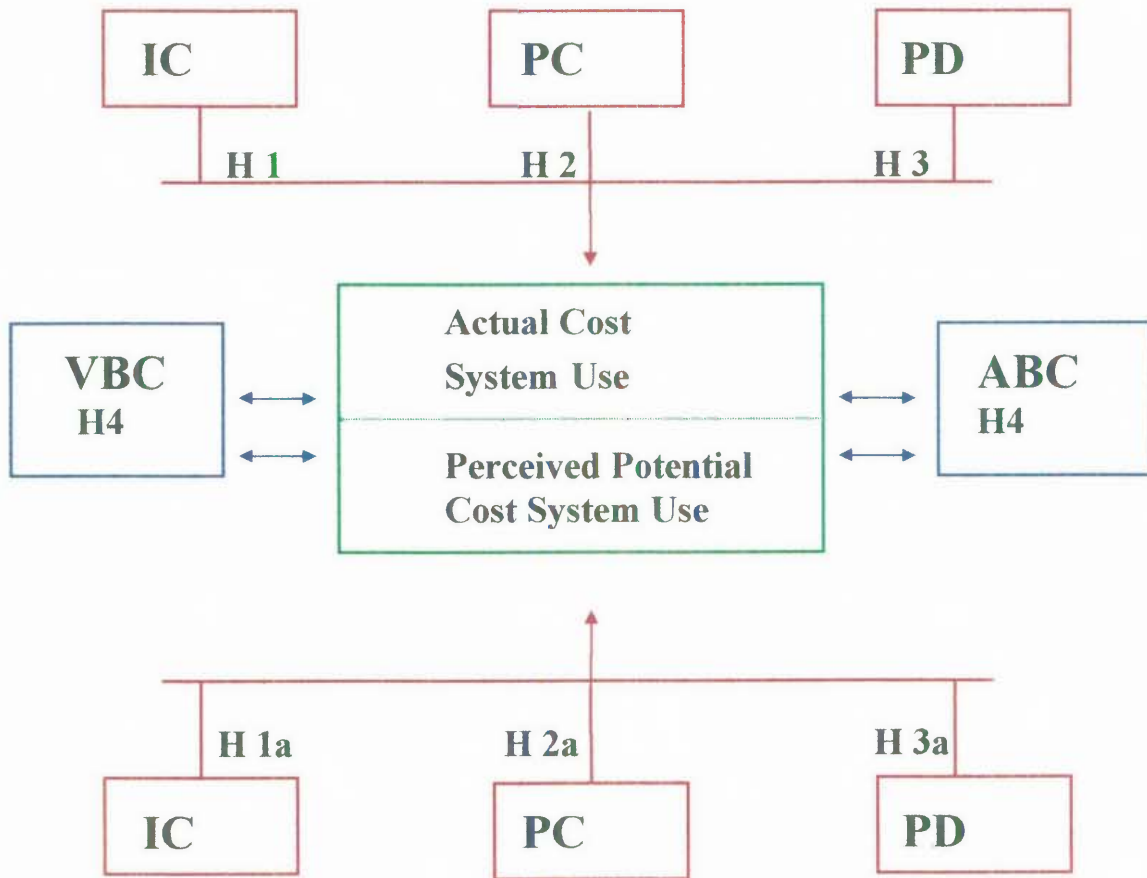
3.5 MODEL

Figure 3.5 shows the three contextual factors of this study directly interacting with the use of cost systems, as management attempts to reduce uncertainty and achieve organisational goals. It also shows the contextual factors affecting managements' desired use of and recognition of the potential use of their cost system. A relationship is hypothesised to exist between the potential and actual use of cost systems, and an interaction of the contextual factors with the cost system type.

The model in Figure 3.5 also shows an interaction between cost system type and the actual and potential use of cost systems, without directly examining the contextual factors. The testing of this relationship should indicate whether any systematic difference exists between the cost systems under examination.

Figure 3.5

Contextual Factors, Cost Systems and Use: Activity-Based and Volume-Based Model.



- Model abbreviations:
- VBC: Volume-Based Cost Systems (volume related)
 - ABC: Activity-Based Cost Systems (activities related)
 - IC: Intensity of Competition
 - PC: Production Complexity
 - PD: Product Diversity
 - H: Hypothesis

3.6 CONCLUSION

It has been demonstrated in this chapter that there is a belief, evidenced to varying degrees, that contextual factors differently influence cost system use according to cost system type. This chapter has examined this claim and discovered a number of deficiencies in accepting the argument, without further broadly based empirical

evidence, that ABC systems are used more than VBC systems. It is still not clear how contextual variables will actually interact with the use of a cost system and the cost system type.

Three hypotheses were developed to explain the relationship between cost system use and type moderated by each defined contextual factor. Prior survey studies have had mixed results in developing an explanatory significance of ABC versus VBC cost systems and the postulated interaction of contextual factors. A supplementary hypothesis has been developed for each hypothesis on cost system use which seeks to explain the perceived potential use of the cost system type being examined, moderated by a contextual factor. This supplementary '(a)' hypothesis seeks managements' perception of what use they should be able to make of their cost systems. It could partly explain why the evidence available has not always clearly supported the advantages of ABC systems for managerial decision making.

Hypothesis 4 is specifically developed to test for any information gap that may exist between ABC and VBC systems, independently of the contextual factors examined. If such an information gap is found, it may contribute to explaining why the support for the adoption and benefits of ABC is often mixed or less supportive than predicted.