

**A Critical Review**  
**of the**  
**Opportunity Cost Concept**

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## **Abstract**

The opportunity cost concept has been advocated as the prime decision cost concept by economists and accountants, notably scholars of the London School since Nineteen Thirties. However, there are certain conditions as discussed by Edwards (1937) and Coase (1938) which have to be met before the opportunity cost concept can be functionally applied in the accounting context. Moreover, there are few research into the decision practices of accountants and business managers relating to the application of the opportunity cost concept in business decisions. Thus, it is uncertain if the concept is adopted in practices by managers and executives. The purposes of this paper are, therefore, to carry out a critical review of the opportunity cost concept, both in terms of its theoretical validity and its applicability to the business context, as well as to investigate whether the concept has actually been adopted in practice for business decisions. Based on the contents of the agency theory, behavioural decision theory (which includes the Resouceful, Evaluative, Maximising Model), expectancy theory, and the theory of choice, a model which is termed the Expectancy Decision Processing Model is proposed to explain the decision behaviour of business managers and how they would adopt or otherwise the opportunity cost concept, represented by the opportunity cost accounting model within the accounting context, in making decisions under different circumstances. Results of the analyses indicate that accountants and managers very often do not invoke the opportunity cost accounting model in making decision calculations. Managers will only invoke the opportunity cost accounting model in calculating the possible payoffs of different decision alternatives when two conditions are satisfied. The first condition is that they find no difficulty in making use of the opportunity cost accounting model; the second condition is that the opportunity cost accounting model will provide a priority ranking of the decision alternatives that is desired by the managers who are maximising their own decision benefits.

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# CHAPTER 1

## INTRODUCTION

### **Proposed Contribution of the Research**

Managers inevitably make decisions every day in running businesses. From the accounting perspective, managers require accounting and related data which can provide valuable information for them and assist them in making the right decision and selecting the correct course of actions. The ways to collect, process, and present accounting information, however, depend very much on how managers select and adopt different accounting approaches and models. Although the opportunity cost approach has been advocated as the prime approach to be adopted for decisions (Edwards 1937, Horngren 1986), there is no sufficient evidence that this model is actually adopted by managers in practice. Thus the main purposes of this research are to identify the managers' behaviour in the selection of accounting decision models which provide required information for decision making purposes, and to compare and explain these identified behaviour with the Expectancy Decision Cost Model as proposed by the candidate. The main contribution of this research will thus lie on the validation of the Expectancy Decision Cost Model which can be used as a corner stone for further studies in the revelation of the interactions between managerial decision behaviour and the choice of accounting decision models.

Moreover, since the research sample units are chief accountants and executives of the listed business corporations in Hong Kong, who have much knowledge about the Chinese market and the ruling party of China, and who are actually making huge investments in the Chinese market, an understanding of their decision behaviour greatly facilitates business people and investors of the Western World to have more knowledge on how Chinese people make business decisions and how they feel about the Chinese market. Pleased or not, China will be one of the major markets in the world for the next decades, with substantial potential of return and profitability. However, many businessmen in the Western countries still are not familiar with the business practices and habits of the Chinese merchants. The results of this research will provide a good example of how businessmen in Hong Kong make business decisions, and how they deal with their investments in the Chinese market.

### **Contribution of Chapters**

For the purpose of achieving the desired contributions as proposed by the candidate in performing this research, it is expected that the individual chapters of the research report will contribute to the overall value of this research as follows :

## **Chapter One - Introduction**

A summary introduction is made at the beginning to signify the theme of the research and the background that leads to the justification in performing various research activities. An encounter of the origination of the opportunity cost concept together with a detailed analysis of the arguments regarding the rationality and conceptual validity of this concept is also made in the first chapter. These background analyses form the core base for subsequent analysis to be carried out in achieving the desired objectives.

## **Chapter Two - Decision Process and the Theory of Opportunity Cost**

In this Chapter a detailed analysis is carried out regarding the role of the opportunity cost concept in a decision making process. The opportunity cost concept is viewed from a value perspective, and based on the value perspective, the cost concept is critically reviewed about its applicability and adaptability in decision situations in the present day commercial environment which is drastically different from what was perceived decades ago, when the opportunity cost concept was rigorously advocated by the London and Austrian scholars. Through the critical review process, it can be demonstrated that the opportunity cost concept may not be viable to business applications, unless certain conditions are fulfilled. Chapter Two thus contributes to the whole paper by providing a conceptual base for the

necessity to pursue studies in the revelation of managerial decision behaviour.

### **Chapter Three - A Review of the Literature on Opportunity Costs**

In Chapter Three the results of a review of the literature regarding economics, accounting, and management fields will be presented to show that the concept of opportunity costs, despite its being advocated by many economists and accountants for its relevance in decision making, has not been systematically analysed and presented in most textbooks of these disciplines. The unrivalled phenomenon of non-existence of systematic discussion about the concept of opportunity costs has posted strong evidence to the validity of this research. It is suspicious if managers and accountants actually adopt the opportunity cost approach in decision practices, when many scholars and authors who are supposed to be experts in economics, accounting, and management disciplines do not mention and discuss about the concept to the knowledge of readers. Thus there is a need to investigate into accounting and management practices to identify if the opportunity cost approach is adapted to any significant extent in practice.

Chapters Two and Three together thus form the core base of substantiating the rationales both in terms of theory and practices, that this research needs to be carried out, and that some insights can be obtained from this research

regarding the decision behaviour of managers with respect to their choice of costing methods and approaches.

#### **Chapter Four - A Model Establishment for the Framework of Decision Making and the Opportunity Cost Concept**

The main theme of Chapter Four is to build up the whole research framework for this research, and to put forward the research hypotheses that are going to be tested for the purposes of achieving the objectives hereof. In this Chapter the candidate has successfully build up a new research framework on the bases of the behavioural decision theories, the agency theories, the expectancy theories, and the concept of opportunity costs. This new research framework provides insights on how in theory a manager's decision behaviour will be affected by various factors as proposed in the expectancy decision cost model through the integration of the above mentioned theories. Research hypotheses are then proposed and put forward in accordance with the new model for tests and verification.

#### **Chapter Five - A Field Study of the Decision Behaviour from an Academic Perspective**

The results of the survey carried out among academics are shown in Chapter Five. These results serve two purposes. The first purpose is to identify the decision behaviour of academics and assess if academics in general show any

inconsistency between decision behaviour and academic behaviour. That is, will academics on the one hand favour the opportunity cost approach in decision situations, but on the other hand do not wish to provide a detailed analysis in their own publications. The second purpose of this academic survey is to treat academics as the control group, so that practising managers' decision behaviour can be compared to see if there exists inconsistency in perception between academics and practitioners.

## **Chapter Six - The Adoption of the Opportunity Cost Model**

Similar to Chapter Five, results of the researched data regarding accounting practitioners and business managers are analysed and interpreted in this Chapter. The results shown in this Chapter are crucial to the whole research as they collectively demonstrate the circumstances under which accounting practitioners and business managers will adopt the opportunity cost model in their decision making processes. These results have confirmed the validity of the integrated theories as proposed by the candidate, and formed an evidence of the managerial decision behaviour with reference to the theoretical assertion in the context of Hong Kong. A comparison of the academic perception and managerial decision behaviour is also carried out, with results thereof indicating a divergence of views and perspectives in the adoption of the opportunity cost concept between these two categories of accounting and

business people.

## **Chapter Seven - The Case of a Chain Supermarket Store**

To further substantiate the results gained in Chapters Five and Six in confirmation with the theories put forward in this research, a chain supermarket store is selected to perform a detailed case study. This detailed case study with one of the largest supermarkets in Hong Kong is to provide more concrete evidence that the results obtained in Chapter Six actually reflect business reality; and that these results are not biased results because of any unidentified reason. A detailed study of the management practices in this Supermarket Store have reiterated the external validity of the research results shown in the previous Chapters, that the opportunity cost concept and decision model will only be invoked in the circumstances as indicated by the expectancy decision cost model.

## **Chapter Eight - A Critical Review of the Opportunity Cost Concept**

This Chapter summarises all the research findings and based on which, a critical review of the opportunity cost concept with special emphasis on its applicability to the business circumstances is carried out. Two issues have been identified in the critical review and assessment process:

1. The opportunity cost concept has to be interpreted in a dynamic way for it to be operative and viable to business applications. The perception of highest value from a decision maker's view represents a dynamic process of value judgement which is affected by the interactions of many factors. Thus, the adoption of cost models, in particular the opportunity cost model, in a decision process should be regarded as a process analysis instead of a static, point of time analysis, and a value processing model such as the Expectancy Decision Cost Model should be established to identify the realistic application of the opportunity cost concept in a decision process.
2. Disregarding the dynamic process in the alteration of values due to changes of contingency factors, there is always a limitation of the concept in a sense that the opportunity cost concept becomes undefined in a situation when decision alternatives have no defined calculated values. In a business context, there are often situations when the degree of uncertainty and degree of complexity of the circumstances can render calculation of opportunity costs (even by the decision maker himself) a very difficult task, and thus the concept of opportunity costs can be practically invalidated in such situations, unless the pure form of subjective value judgmental process such as the Resourceful, Evaluative Maximising

Model is adopted to release the practical barrier of applying the opportunity cost concept .

Suggestions for future research directions are put forward in this Chapter. It is hoped that the identified issues and suggested research directions can contribute to the research arena in the context of the opportunity cost concept. It is also hoped that summarised results could provide an insight to the decision behaviour of managers in business decisions, and the factors that would affect the formulation of such behaviour.

### **Definition of Opportunity Costs**

Before I start to present the thesis, a discussion of the definition of opportunity costs which is to be adopted throughout the thesis would be necessary. Although phrased in different notions of wording, the commonly accepted definition of opportunity costs is “the highest possible value that has been sacrificed or given up by the selection of a particular course of action and reject the other alternative course of actions.” (Coase 1938, Schumpeter 1954, Amey 1969, CIMA 1984, Drury 1992). This definition of opportunity costs is well accepted by accountants (Neumann & Friedman 1978, March 1987, Horngren and Foster 1991, Chenhall & Morris 1991), but the fundamental conceptions of the nature of opportunity costs may not have attracted much attention (Buchanan 1973, Coase 1990).

According to the definition of opportunity costs, several issues, which are fundamental to the concept of opportunity costs, need to be addressed upon. A brief discussion of these issues will be made in the following paragraphs, and I will proceed with a more detailed analysis of these issues through the various chapters of this thesis.

1. The concept of opportunity costs is essentially related to the process of choice.

As stated by Robbins in his article, *Remarks Upon Certain Aspects of the Theory of Costs* (1934),

“The conception of costs in modern economic theory is a conception of displaced alternatives. The cost of obtaining anything is what must be surrendered in order to get it. The process of valuation is essentially a process of choice, and costs are the negative aspect of this process.”  
(page 22)

Opportunity costs exist when there are at least two courses of action, and the decision maker can select either course of action as his own choice. The value of the rejected choice is sacrificed or given up by the decision maker, and this sacrificed value is the (opportunity) cost of the choice. Thus, it is not crucial what “accounting costs (the calculation of transacted or recorded costs as appeared in the cost accounts) are incurred for the selected choice, rather it is crucial to know what value has been given up by rejecting other choices (Thirlby 1946).

2. Opportunity costs involve the calculation of value, which is not necessarily equal to the general meaning of accounting costs that are represented by the monetary units. This fundamental concept is crucial to the determination of opportunity costs, because once the value concept is differentiated from the money concept, it is immediately identified that the opportunity costs of a particular course of decision choice may not be presentable by the mere use of accounting costs. Coase in his article (1938) has described the importance of non-monetary factors in a decision :

“A businessman may wish at the present time not to buy German or Japanese goods quite apart from any considerations relating to their price or quality; or his views on the problems of national defence may make him desirous of, or averse from, supplying firms in the armament industries. .... The figures of costs and receipts produced by the accountant are incomplete, and without a knowledge of the preferences of the businessman no decision on questions of business policy can be reached.” (page 103)

The close relationship between opportunity costs and subjective value judgement of the decision maker has rendered the calculation of opportunity costs a process which often involves non-monetary considerations, and the subjective valuation process of the decision maker which may be very difficult to be communicated to other people's knowledge (Buchanan 1973).

3. Opportunity costs are essentially decision costs that are future oriented, and

related to the expectation of the decision maker about future happenings. In the process of making decisions, the decision maker always needs to estimate or forecast the expected outcomes of each course of action, or decision alternative. He will then make a decision according to his expectation. Whether his expectation actually turns out into reality is not important, because the decision maker has already made his decision and complete the process of decision making. Thus, decision is always affected by expectation rather than fact, although the decision maker may wish that the expected outcomes of his selected course of choice will subsequently turn into fact (Thirlby 1946).

These fundamental characteristics of the concept of opportunity costs raise doubts to the applicability of decision cost models, when most of these cost models are based on accounting costs calculations. To verify whether the opportunity cost concept has been applied in business decisions, therefore, it is necessary to carry out the present research and study under what circumstances accountants and business managers will adopt the opportunity cost concept in making decisions.

### **A Historical Introduction of the Opportunity Cost Concept**

With the simple beaver and deer example, Smith (1776) first introduced the concept of opportunity cost in the Eighteenth Century. Since then the concept of opportunity cost invoked occasional discussions by various scholars (Wieser 1893, Green 1894,

Marshall 1920). However, the concept did not arouse much debates until the Nineteen Thirties, when scholars of the London and Austrian Schools made use of this concept to urge and argue that the socialist view was incorrect in arriving at an optimal resource solution for society (Buchanan 1973). These London and Austrian scholars argued that, in a planned economy, it would be impossible to arrive at any optimal social choice calculations, because the choices of actions of people at large could not be transformed or transferred to the knowledge of the social planners. Individual choices, they argued, were selected based on the concept of opportunity costs, which were in essence a value judgement that could not understood or transformed to the knowledge of other people. Therefore, the opportunity cost concept could be used to prove the impossibility of optimal socialist calculations (Hayek 1933, 1935).

Originated from the arena of economics and socialism, the opportunity cost concept is now advocated to the theoretical perspective of the accounting craft, and becomes a key concept of the total decision cost system. However, when we trace back the original analysis of the concept of opportunity cost and its theoretical deduction, we are immediately faced with a confusion of the applicability of the said concept in the present business world in which situations of matrix controllership, acute pragmatism, and increasing uncertainty about the future can be observed. These changes in the business settings and operating atmosphere have made what we

perceive today drastically different from decades ago when the scholars of London and Austria advocated the opportunity cost concept in decision making processes and transferred it to business applications (Edwards 1937, Coase 1938). As a result, what was viewed logical and practical previously may now become illogical and obsolete. Although the existence of time lag between the identification of obsolescence of paradigm and conception and the proposition of new or revised concepts and practice can be viewed as a usual phenomenon (Hopwood 1987, Yip 1990), an explicit review of the relationship between conception and pragmatism can nevertheless reduce the painful period of frustration and mis-apprehension of practical functionalism to a minimum. By way of reviewing and assessing the current accounting practices, and to search for possible ways of improvement to any identified deficiencies thereof, the accounting systems and methods can be improved in a more efficient way (Yip 1987). Favourably or otherwise, time has changed, and thus there is a need to carry out a critical review of the opportunity cost concept, in particular its applicability in business decisions under the current contingent setting of the business world.

### **The Role of Opportunity Cost in the Socialist Debate**

With the downfall of the (classical) analytical economics in the Nineteenth century, people tended to discredit its analytical and predictive function (Neurath 1919). Faced with rapid and severe changes in the late Nineteenth Century, people often felt

that the classical economic theories provided little explanation power for them to understand the reasons of the perceived economic changes of the society (Hayek 1933), and they further suspected that with the uncertainty about the future in mind, the well known theories and models of economic analyses could not provide a prediction of the possible changes that would be realised in future. Accordingly the classical thoughts lost their influence (Hayek 1935). In an attempt to substitute the Classical School, the Historical School tried to establish another set of economic theories from a different perspective. In accordance with Professor Friedrich von Hayek,

"But the abandonment en bloc of analytical economics was mainly due, not to the detection of faults in the foundation of concepts but to the fact that, just at the time of this revolt, what professed to be a substitute method of analytical reasoning offered itself to the more practical-minded economist - a method which, from their point of view, had none of the objectionable features of the existing body of economics. I refer to the methods of the famous Historical School in Economics." (page 125, 1933)

Scholars of the Historical School professed that the economic phenomenon as perceived by people about the society at each interval of time was a result of many contributing factors acting in an integrated and inter-dependent way among them. Since for each particular interval of time there were different contributing factors with varying degree of interactions among each and other factor, the observed phenomenon at each different interval of time would be dissimilar to any other interval of the economic state. Those scholars claimed that by observing the

interactions of different contributing factors they could describe and explain the perceived phenomenon at each particular interval (Ingram 1888, Veblen 1919, Mitchell & Scott 1967). However, as the naturalistic composition and interaction of factors could not be ascertained beforehand, they also disclaimed the ability to predict the future state of economic world as the classical people did before. As a corollary, historical economists did not provide any statements of analysis or establish any models that suggested hints of how the economic society could be improved in future (Landreth & Colander 1994).

An important consequence of the downfall of the classical economic theories and the rise of the historical school of economic thoughts was that people in those decades thought that the classical economic knowledge could hardly lead them to an improved state of better economic world (Hayek 1933). Moreover, the success of planned economy during the First World War in Britain and Europe, and the confusion of the free world had furthered the growth of socialism and collectivist planning. A careful study of the thoughts put forward by different scholars in those decades revealed that there are many alternative forms and structures concerning how the world could be improved, not all of such to say the truth could be termed socialism; and advocates of some particular forms of society even explicitly distinguished themselves from the socialists (Webb 1987). However, for the purposes of broad classification all these schools of thought about social and

collectivist planning are called socialism in this thesis. With reference to the War experience, socialists claimed that it was possible to dispense with the free market system and competition. They argued that a society with central planning was superior to a competitive system, and the value and price system which were essential to the free market would no longer be required for the successful implementation of a central planning system (Neurath 1919).

One of the fascinating objectives claimed by socialists was that by introducing social planning, the welfare of the society and its people could be improved and a better tomorrow would be expected for. This was a fascinating promise that had never been made possible by the classical economists nor the historians. Classical economists viewed the market place as a complex mechanism bringing together individual behaviour to form a social choice, in which an equilibrium state could be obtained (Smith 1776). However, the equilibrium state of market behaviour was not necessarily an optimal state of economic affairs for all its participants, nor even could a Pareto optimal situation be claimed. Albeit economists among themselves viewed the market mechanism as a comparatively perfect tool for allocating economic resources, the same view was not generally held by people in the early Twenties (Hayek 1935). By referring to the simple classical model of demand analysis, socialists were able to point out that producers often determined and set output levels at some inefficient level, when the average costs of production were not at a

minimum. These and other demonstrations of social wastage because of competition, and the emphasis of individual benefits rather than social benefits had allowed socialists to proclaim that the free market mechanism advocated by economists actually did not bring to any better future to the society as a whole, and only by way of collectivist planning could the welfare of a society and state be improved (Neurath 1919). The Western economists, on the other hand, sought to rebut the ideas of socialist planning. In order to demonstrate that the socialists' advocate was erroneous and to restore the functional role of economic thought, the scholars of the London and Austrian schools put forward the opportunity cost concept to explain and argue about the fundamental concept of value and cost, and to clarify the vast conceptual incompatibilities between the market economy and the planned institutional settings. The domain of argument put forward by the London scholars laid on the assertion that cost was essentially related to the process of choice, of give up and take, which was necessarily a personal process that was hard to be communicated and agreed by other persons except the choice maker himself (Robbins 1938). Given that human perceptions were heterogeneous and personal perception of value and choice was impossible to be communicated and transferred among people in a planned society, economists of the London School furthered their argument on the impossibility of socialist calculation, by saying that no person could in the absence of knowledge of other people's perceptions of value and cost execute a social plan which could benefit the society as a whole (Hayek 1935), or accredited

as a functional and "optimal" plan in any meaningful sense.

### **The Concept of Individualism**

An important issue of the basic nature of human beings has to be clarified here. In the process of decision making, the concept of true individualism places significant weight on the process of thinking and selection of alternatives and the subsequent results that arise from the selection of choices. Under this concept of individualism, a person is distinctive from other persons, and is entitled to live in his own way and make decisions in his own right. Thus a person is free to make his own choice of action in a decision case, even though his choice is a sub-optimal or erroneous one. If the person is not allowed to make any free choice of actions and has to be abode by regulations and wishes of the society (or its ruling party), then the identity of the person is lost. In the measurement of personal consumption and enjoyment, there is always a relative scale that can be used to differentiate the better from the good, the happier from the less happy, and the greater utility from the less. However, there is often an absence of measurement for the collective consumption and enjoyment, which is sometimes referred as the right from the wrong. Since from the collective economic view, right or wrong is a concept of relativity that is reflected by some other scales as mentioned above. If the collective actions can be differentiated as right or wrong, then it is possible for a small group of people to tell the majority of what should be done and what should not, in order that social benefits can be

maximised. In this respect socialist calculation is made possible and the opportunity cost concept has to be completely revised to include the social perspective of choices and actions. The assertion of freedom of choice and action is to support the basic rationale against the advocate of socialism and socialist calculations. Thus the true individualism concept is crucial in the support of the argument about the impossibility of transformation of utility measurement among individuals, as reflected in the calculation and determination of opportunity costs.

A practical application of the concept of individualism in terms of individual choices is that whether a person is regarded as a rational person who would make his own choice of action in an economically rational way. With reference to modern management theory and behavioural science, it is now recognised that a person can be multi-purposed, taking decisions and actions from a variety of concerns apart from the pure economic motive only (Jensen & Meckling 1994). Thus a person often makes decisions that are not economically optimal in order that he achieves some other purposes that are not economic in nature (Drucker 1990). Moreover, with the interpretation of individualism a person often makes irrational decisions because of impulse and other irrational motives. If a person makes irrational decisions for himself, then it is possible that he makes decisions for other people in the same irrational way. However, there is little evidence which can demonstrate how in practice people handle these kinds of decisions situations involving rationality

of decisions and its consequence to the impact of other people. The major consequence of this uncertain situation is that, in the consideration of the opportunity costs of decision, it is uncertain if a decision maker will take into account other people's benefits. Although Jensen & Meckling have proposed that people do take every thing into account in making decisions (1994), the true individualism concept still casts a doubt on decision behaviour and the way that a decision maker adopts the opportunity cost approach in making decisions.

### **Accounting Application of the Opportunity Cost Concept**

Given that the opportunity cost concept is essentially related to the process of individual choices, it is inadequately transferred to the accounting perspective, in view of its subjectivity and the heterogeneity of human perception (Buchanan 1973).

It is because that the original notion of the opportunity cost is essentially a value concept, which includes elements that may not be represented by the monetary units.

On the other hand, accounting is essentially a craft that uses monetary measurement as its basic tool in the compilation of accounting reports, and thus some of the individual value calculations may be unable to be presented in the accounting statements. In applying the concept in business and accounting applications, therefore, the subjective notion of value has to be changed to the objective notion of monetary measurement or its equivalent. By adopting the monetary measurement system an implicit connotation is that people are in essence economic oriented, that

they always prefer more money to less, so that as long as profit maximisation can be regarded as a prime objective of a businessman, the process of substituting utility measurement scale with the monetary measurement scale is perfectly logical without necessarily invalidating the underlying economic theories (Edwards 1937). As a corollary of this substitution process, the opportunity cost concept in the accounting perspective with respect to decision is still related to choice. Accordingly, based on the theory of choice only the cost data that can influence policy should be considered, and costs and receipts which will remain unchanged whatever decision is taken can be ignored (Coase 1938, Horngren 1986). Since World War II the opportunity cost concept had been gradually recognised and adopted by accountants; and scholars and authors in writing their books also advocates its correctness and superiority in decision situations (Horngren 1977, Kaplan 1982), although some writers have pointed out its incompatibility with reporting and performance evaluation situations (Drury 1988). Notwithstanding the wide acceptance of the opportunity cost concept, however, we know very little about whether the concept in practice has been adopted by the professional managers who manage and control a firm on behalf of the shareholders of the firm; and more than that we might doubt the validity of applying the concept to the business world which is drastically different from fifty years ago when the opportunity cost concept was first rigorously put forward in the Nineteen Thirties.

## **Background of the Current Research**

It is more than fifty years since the re-introduction of the concept of opportunity cost, and there have been substantial changes in many aspects of the business environment. These changes have caused the world, notably the business world, to produce a situation that is quite distinctive, if not completely different, from the world that appeared to be in decades ago when Edwards and Coase asserted the possibility of transformation of the opportunity cost concept to a business application. As accounting concepts, paradigms, and models of calculation are developed and applied to an environmental perspective (Yip 1987), when there are substantial changes in the business world, the existing cost concepts may not be applicable in the new environment, and either new concepts are developed and applied to the business situations, or the existing concepts are modified to suit the new environment. Because there have been substantial changes of the business world (Pollard 1983), the applicability of the concept of opportunity cost in the present world needs to be reviewed. To clarify the uncertainty of the current application of the concept, a closer look into the various aspects of changes occurred during these decades is taken.

## **Changes in the Business and Organisational Context**

Since the end of World War II rigorous changes have been experienced by the business world in many different ways. The size of organisations, the remoteness of ownership control, the ever increasing degree of interactions and interdependency among organisational units and environmental factors, and the advancement in technology all produce a resultant business context that is drastically different from what has been forty years ago. The impacts of these changes are discussed in below.

One of the fundamental changes of the business world is the emergence of the giant firms and international conglomerates. With the emergence of the modern concept of marketing and the philosophy of competitive edge, organisations are trying to build up sustainable competitiveness over other firms in order to generate greater profitability and lesser business risks (Kotler 1994). One of the major methods commonly used to build up competitive edge is to increase the size and resources of a firm. By expanding the size and asset value of the firm, management has more available resources to satisfy different strategic requirements and gain access to various possible ways of successful establishment of competitive edge. There are also other reasons for the emergence of giant firms and international conglomerates. For example, to cope with national barriers to imported goods many firms prefer to establish local production plants in a foreign market so that goods produced can be directly sold in the local market and avoid many problems for imported goods (Otley

et al 1990). Disregarding for the reasons, the mere fact that the size and geographic dispersion of firms, both national and international, have been increased to an extent that is completely out of consideration decades ago results in the following effects to the decision making theories and practices, including the choice of adoption of the opportunity cost concept:

### **The Separation of Ownership Control from Management**

Unlike previous times when the owner and shareholder of a firm could exercise personal supervision over the running and management of firm which was relatively smaller in size, the increase in size in terms of asset value and staff number, and diversity of geographical regions of operating plants and administrative units are keeping the shareholders more and more remote from the management of the firm they have placed their investments thereto, in a sense that they have to rely on more indirect mode of observation and control rather than the direct, physical supervision as before (Porter 1986, Mouritsen 1995) . To these giant firms the share holdings of individuals or even family groups become relatively smaller, and many shares are held by minority shareholders who have no practical right to participate in the management of the firm (Pollard 1983). These minority shareholders have to rely on the management objectives and the management skills of the professional managers who manage the daily operations of the firm. In order that professional managers act for the best interests of the shareholders of the firm, the shareholders have to inform

the professional managers of their wishes and objectives. To facilitate this communication process of informing the managers about the shareholders' wishes, both the shareholders and the professional managers have to establish a common system of performance measurement for the ascertainment whether performance of the firm meets the objectives of its shareholders (Watts and Zimmerman 1990). However, once the separation of ownership and management exists, there is a suspicion if the shareholders' wishes can be correctly communicated to the managers' knowledge, because it has been repeatedly argued that the value cost consideration is essentially a process of personal choice, which can hardly be transferred and communicated to the knowledge of another person (Hayek 1933, Buchanan 1973). If it is assumed that the pure profit maximisation objective is the sole objective of all individual shareholders, it would be feasible for managers and shareholders to select a measurement model that can incorporate the criteria for decision making, and indicate the optimal choices that should be selected by the professional managers who are assumed to act in the interests of the shareholders (Buchanan 1973). This profit maximisation concept can also be expressed in another way, when the prime objective of a company is to maximise the market value of its shares. By maximising the market value of the shares, shareholders can obtain maximum returns for their investments (Copeland & Weston 1983). However, both the profit maximisation and the share value maximisation objectives are still based on the assumption that shareholders are primarily economically motivated in making

investment in shares, and it has been proved already that such assumption may not be true in many cases (Drucker 1964, Kreitner 1989). When it is accepted that people may have multiple objectives in making investments, including some of the objectives that are not economic in nature, then the measurement model that could be adopted in measuring profitability or market value of shares are not appropriately to be used as the common measurement model for the ascertainment of whether performance of the firm meets the objectives of the shareholders. In the absence of these kinds of decision and performance evaluation criteria, professional managers will find it difficult in making correct decisions through the application of the opportunity cost approach, as they would not know how opportunity costs are viewed and calculated by the shareholders concerned.

Neo-classical economists assert that the market price mechanism can still be functional in the sense that if the managers are running the firm in a sub-optimal way, shareholders will sell their shares to bring the price down, eventually forcing the management to improve their performance at the satisfaction of the shareholders, or they will be removed from their office and substituted by a new team of managers. Thus through the process of market mechanism managers will know about the wishes of the shareholders and act to their wishes accordingly. However, this assertion can only be valid in a perfect market, or in a market atmosphere where strong form of market efficiency can be observed. In a perfect market, it is supposed

that all information are available to all people, and thus shareholders are able to judge whether managers are optimising their benefits. However, in an inefficient market, it is unlikely that individual shareholders can obtain all the required information in evaluating the performance of the managers. Moreover, with reference to the agency theory, agents (professional managers) are supposed to have more and better information than the principal (the shareholders), and agents will try to maximise their own benefits as far as possible, even at the expenses of the principal (Jensen & Meckling 1976, Baiman 1990). Although agency theorists propose the use of either some form of control and monitor system, or reward system, or both, to minimise or eliminate the possible negative impacts of agency behaviour, and to induce the agent to act in the best benefits of the principal, recent researches have indicated that it is suspicious if the negative agency behaviour can be minimised, because the problem of information asymmetry is hard to be solved (Dejong et al 1985, Walker 1989). Given the ambiguity of the profit maximisation concept, the separation of owner and management, and the possible existence of the agency effect, there is an uncertainty whether the opportunity cost concept has ever been applied in practice. The uncertainty in the application of the opportunity cost concept in practice thus supports the need to carry out the present research.

### **The Increase in Complexity and Interdependency of Organisational Structure**

As the size and geographical dispersion of firms increase, the simple form of

functional organisations are found to be inappropriate to many giant firms. To cope with the size and geographical expansion, more complicated structures have been developed for organisations to deal with these changes. It is now well recognised of the different types of organisational structure including, inter alia, divisional structure, matrix structure, and the establishment of strategic business units (Dunning 1993). These more complex organisational structures impose further complications for managers running the organisations and making decisions. Some of the complications relate to the transfer of capital and resources (Hymer 1968, Aliber 1970), impact on the ownership benefits (Johnson 1970, Kumar 1990), and the diversification of risks (Rugman 1979, Lessard 1982). These issues and aspects of these concerns have all contributed to a resultant situation of complex interaction and interdependency among people, organisations and the environment (Burchell et al 1980). As the degree of complication and interdependency among organisational units and managers increase to a greater extent, the applicability of the opportunity cost approach in a complex decision situation becomes more remote and uncertain. The main reason of the remoteness in the application of the concept of opportunity cost is that the concept requires a measurement model which is simple and clear enough to reflect the economic rationality as mentioned by Coase (1938), where decision cost models primarily deals with the variation in costs and receipts. Such simple and clear model would be diminished in a situation of vast complexity and interdependency among units of concern, when results arrived at by most decision

cost models are restricted in terms of accuracy and prediction power in identifying the best decision alternative.

### **Purposes and Contribution of the Research**

In view of the changes in the business and organisational context that have been observed during these decades, and with reference to the social and behavioural theories of accounting, there is a need to identify the present practice of how business people and managers make decisions in an observed situation of complex interactions and interdependency of intertwining factors, and in particular whether the opportunity cost concept and approach, which is much advocated by the neo-classical economists, is still applicable and being adopted by business managers in making decisions. The main purpose of this research is therefore:

*To identify how business managers make decisions under different circumstances, and indicate under what circumstances do managers invoke or abandon the opportunity cost approach in business decisions.*

Specific to the main theme of the research, various selected decision variables and moderating variables will be studied to investigate their possible effects to a manager's decision making behaviour, and the adoption or abandonment of the opportunity cost concept throughout the decision process. In accordance with the

analysis of decision behaviour of business managers through the proposed expectancy decision cost model, which is presented in the subsequent chapters, it will be demonstrated that certain factors exert more influence to a business manager's choice of selection of decision cost models in making decisions. Identification of this cluster of important factors and attributes and how these factors interact under different circumstances thus form the core concern of this research.

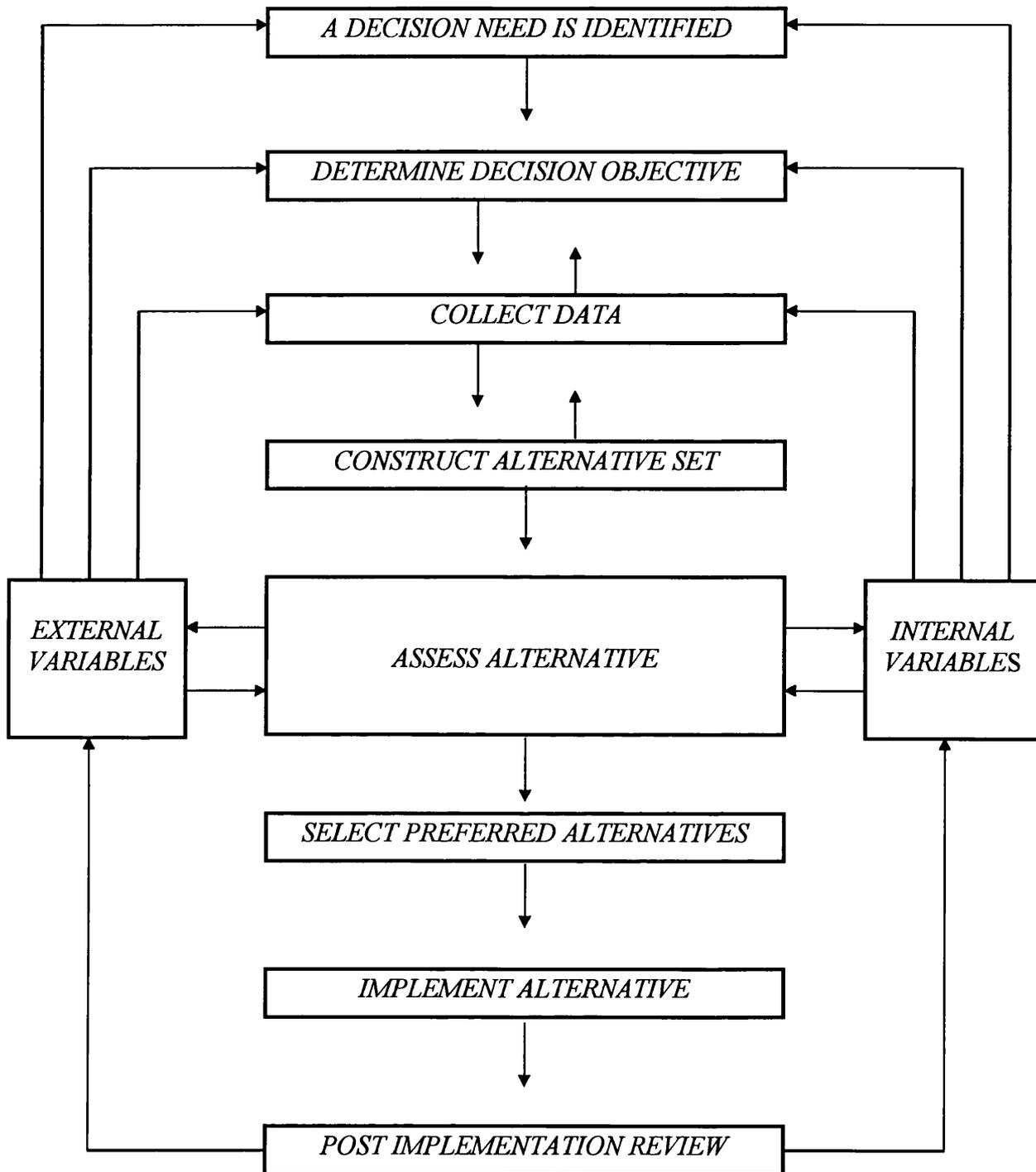
## **CHAPTER 2**

### **DECISION PROCESS AND THE THEORY OF OPPORTUNITY COST**

#### **A Stepwise Analysis of the Decision Process**

The decision process, by its very nature, consists of various stages and procedures from the ascertainment of the decision objective to the implementation of decision choice. Throughout the decision process, both external and internal factors interact with the decision model as represented by Figure 1 below:

**Figure 1: A General Model of Decision Analysis**



## **The Role of the Decision Objective**

The starting point of a decision process is when a manager is aware of some need to make a decision in response to the situation as composed by both the internal and external variables. A manager can initiate his own needs to make a decision, or he is compelled to do so by the circumstances or other external forces. In the latter case the decision maker has to decide the objective of making decisions, that is, what he would expect from the decision and selected choice of action. The determination of decision objective exerts much influence to subsequent steps and procedures of the process, from the collection of data to post implementation review of a selected course of actions.

From a utility perspective, the decision objective of a decision maker in general is to maximise his expected utility arisen from the decision, subject to the constraints that exist in the decision case. Because a decision maker may assign disutility values to some unfavourable actions or choices, such as making effort to obtain certain information that is not readily available, he may accept a less than optimal result in accordance with the maximising utility principle.

$$\begin{aligned} F(\text{Decision}) &= \text{Max } E(U) \text{ [ choices, constraints ]} \\ &= \text{Max [ } E(U) - E(E) - E(C) \text{ ]} \end{aligned}$$

Where,

$E(U)$  = expected utility of a particular decision choice

$E(E)$  = expected disutility of the effort in executing the decision choice, and

$E(C)$  = expected disutility of the effort in reducing or eliminating constraints

In the calculation of expected utility of each decision alternative, the decision maker will pay attention to two aspects, which refer to the level of positive utilities brought by the alternative, and the level of disutility incurred by spending efforts to carry out the alternative. Thus there is often a trade off between results and efforts, and a decision maker will always maximise the net utility in each case. Moreover, as constraints are reduced, more alternatives are available and greater utilities may be obtained from these additional alternatives. But, again, effort is required to reduce or eliminate constraints. Therefore, it is another trade off consideration between improved results and additional efforts. Because of the possible disutilities arisen from effort consumption, the subjective utility judgement of a decision maker affects the amount and quality of data that are going to be collected, the tool and model that are used to assess different alternatives, and the ranking process of alternatives. If a decision maker considers it too costly to obtain useful information, he will rather lower his expectation and accept a less than optimal outcome. This utility judgement then

renders decision data that are originally important to become irrelevant, and in turn decision alternatives that are originally distinctively ranked become indifferent to one another.

Although in theory it can be easily proved that people are maximising their expected utilities in decision processes, however, it is very difficult to prove that people are actually taking such economically plausible actions. The perceived decision behaviour, in many cases, confuses an observer as it seems that the decision maker is taking some choices of actions which do not maximise his utilities. One of the possible reasons can be explained by the utility formula shown in the previous discussion. As the negative utilities of efforts are usually unobservable in practice, it is very difficult for an observer to decide the negative impacts of efforts and judge that the decision maker is actually maximising his utilities in taking a particular course of action. However, there is a lack of evidence according to research results to prove that people do maximise expected utilities in making decisions, and what factors will affect the effectiveness of carrying this utility maximising activities. These factors may include exogenous variables, endogenous variables, and the decision characteristics of the decision maker. A decision maker in determining the decision objective probably has paid due regard to the internal and external

factors which specify a situation within which certain constraints exist. Within the context of decision theories, the actual process taken by a decision maker in achieving his decision objective with respect to the endogenous and exogenous variables is an interesting and important issue which is going to be tested and analysed in this research.

### **Assessment of Alternatives and the Selection of the Preferred Alternative**

From a functional perspective of the decision process, the crucial stages lie in the assessment of decision alternatives with respect to the collected data, and the selection of preferred alternative among the set of feasible alternatives that is perceived to be the best alternative in satisfying and achieving the desired objective of the decision maker. To ensure that all available alternatives are identified and properly assessed, data relating to those alternatives must be collected and compiled in some meaningful way. Thus, the importance of the procedure of data collection should not be overlooked, since it is clear that the set of collected data has direct influence on the subsequent assessment of alternatives. An alternative set of collected data can render the assessment and ranking of alternatives resulting in a completely different result, as all assessment tasks are only based on the available set of collected data. Therefore, the level of information collection forms part of the decision problem. There is often a

possibility that a decision maker, knowing the important effect of this data collection procedure, tries to collect only those data that are biased towards certain preferred alternative. In this way the assessment process becomes a rationalisational machine aiming at justifying why a particular alternative is selected and course of action taken (Burchell et al 1980). However, disregarding the impact of data collection, the assessment of decision alternatives is still the crucial procedure to determine which alternative best achieves the decision objective. This procedure of selecting the "best" alternative among others may be concluded with an absolutely preferred choice, in which case there exists a stochastically dominant alternative that overweighs all other alternatives in every aspect. When this absolutely preferred alternative is identified, the decision maker inevitably will take the choice and satisfy his decision objective in a perfect way. However, in the absence of such an absolutely preferred alternative, the assessment procedure inevitably invokes at the outset a comparison and ranking process among different alternatives in terms of their expected values, so that the decision maker understands and visualises which alternative produces the greatest benefits to him and assists him in achieving his desired objective. The comparison and ranking process based on the perceived value can only be fully functional and operative if two conditions can be satisfied. The first condition relates to an appropriate determination of the value

concept, and the second condition is that there must exist of a measurement tool that can allow for the proper measurement of the values of different alternatives in accordance with the prescribed concept of value judgement. It is argued that when either of the stated conditions cannot be satisfied any comparison and ranking process would not produce satisfactory results in enabling the decision maker in an attempt to pick up the "best" alternative (Coase 1938, Coase 1990, Hogarth 1991).

In order to ascertain the impacts of different decision alternatives, a set of criteria has to be established in the first place so as to identify what elements differentiate them. Since the process of making decision is to achieve some desired objectives, such achievement will be fulfilled with the increase in satisfaction level of the decision maker through the perceived increase in the endowment of value as attached to the physical ownership of commodities, as most people will favour more goods (or their money equivalent) than less, despite the rate of increase in marginal utility may be decreasing; or in the absence of such increases in physical ownership, the increase in the abstract state of mental enjoyment (such as more leisure time). In order to "calculate" the increase in satisfaction level through the ownership of physical commodities or mental enjoyment, there must exist a measurement and transformation model to convert

them into some value scales. Only when the resulting values of each alternative can be calculated and ascertained, could the alternatives be ranked in a preferred order. Therefore, determination of value of each alternative will be crucial to the selection of the "best" alternative.

### **The Theory of Value**

The value of a commodity, or an abstract state of mental satisfaction, can be subject to different identification and interpretation. With reference to the value of a physical commodity, the identification of this can be described in most cases as a relative comparison process, either through the subjective judgement of individual persons, or through the external process of some observed measurement scale of value judgement.

The absolute value of a commodity, as the term proposes, refers to the subjective valuation of the commodity by its owner, who regards this commodity as valuable to a degree that he will never wish to give it away in exchange for any other commodities. This is an extreme situation when the owner no longer wish to compare the value of this commodity with other commodities, as he regards the commodity as most precious and no other commodity will be of the same value. When a person precludes a comparison process, the value of the

commodity will be definitive and absolute. However, it is argued that the absolute value of a commodity practically does not exist (Jensen & Meckling 1994). Moreover, when a decision maker precludes any comparison process, then the process of choice and selection will be eliminated, and there is no decision which needs to be made. The concept of opportunity costs in this case is not needed at all (Robbins 1934). Thus, a decision only needs to be made when the relative value of a commodity is concerned.

With reference to the relative concept the value, the value of a commodity is essentially an expression of the exchange value between that commodity and any other commodity. Its value is relatively depending upon the values of other commodities that also exist in the exchange market. As a result, the relative value of commodities can be subject to change from time to time, depending on the market situation of supply and demand, and other conditions such as consumer preference. Whether the market price of a commodity is equal to its value, however, depends on the state of market demand and supply conditions (e.g. the existence of consumer surplus). Because of the relativity in value determination among commodities, the process of choice and decision will need to be repeated each time the relative value judgement of these commodities is altered by whatever reasons, and the decision that is made will be contingent to

when it is made, and under what conditions it is made. Thus, it is clear that both the time factor and the decision variables may have significant impact on the decision process. More detailed analysis of the factors that will play a significant role in the decision process will be made in Chapter Four, when the framework for decision analysis is established.

### **The Labour Cost Theory of Value**

According to the labour cost theory of value, value of a commodity is expressed as a relative measurement based on the amount of labour quantity spent on the production of that commodity. This can be traced back to Smith's example of the value between the beaver and the deer, although he also put forward other theories of value including the cost theory (Smith 1776). Based on his theory, the natural value of a commodity in exchange will be depending upon the required costs of production for the production of a unit of such commodity, relative to utilising the same magnitude of costs of production to produce other commodities. In the simplest form of economic society in which land and capital are not used, or in which both land and capital are free, and the determining factor of production is labour time, then relative costs of production can be substituted for by a measurement of the relative labour time required for the production of the products. Accordingly labour quantity becomes an invariant

standard of measurement by which variations in value of different commodities can be ascertained and ranking of commodities according to attached values made feasible. The rationale of the theory, that was developed through the Eighteenth Century when production labour was the prime and primitive factor of production (in the absence of substantial autonomous production mechanisms), can be expressed in its simplest form that since labour quantity is a scarce factor of production which ultimately governs the choice of production of commodities, the value of a commodity must be greater if people are willing to spend more time to produce that commodity. Thus, by the comparison of production preference patterns, the values of different commodities would be ascertained. In this interpretation of the relative choices of production, the classical theory embodies the notion of opportunity cost. To utilise productive time to produce one commodity means giving up the possible production of another commodity by utilising the same productive time, and thus the opportunity cost of producing one commodity is the value that can be brought about by the production of another commodity, if the productive time is used to produce that commodity (Smith 1776, page 47).

Several points of clarification have to be made regarding the labour cost theory of value. It is always argued that the labour cost theory is unrealistic or at least

incomprehensive, ignoring the fact that there are other factors of production (land and capital) which are, from time to time and under different situations, also scarce in quantity. Therefore, for an effective analysis of the value of commodities under the labour cost theory, it has to be assumed either labour is the only factor of production that is scarce in supply, or that labour factor contributes to the majority of the ultimate value determination of such commodities, so that labour quantity can be a good approximation throughout the range of analysis. Smith and later, Ricardo, tried to reduce the complexity of multiple factor analysis by proposing that heterogeneous units of input were measured in terms of money prices established in the factor market (Ricardo 1953). However, the above opposition to the labour cost theory does not materially affect the analysis of the dichotomy in the opportunity cost concept, since it is compatible to include the general set of production factors into analysis, if the labour cost is proportionate to the final price of the products. In this situation although the price of a product includes various factors of production of labour, land, and capital, labour can still be used as an indication of the relative prices of the products and commodities. Moreover, the concept of opportunity costs is related to the process of choice in the determination of productive resources are utilised, and thus so long as there exists some measurement models which can calculate the relative values of utilising different

components of productive resources to produce various kinds of commodities, the process of a choice and selection still applies (Edwards 1937). The technical inconsistency of variation in labour quality (which includes the differential period of required training, etc.) as opposed to the assumption of simple, unvaried labour quantity forms another argument against the theory. Smith recognised this argument and he had suggested that the relative value of a commodity could be determined by the relative wages paid to the labour instead of counting the clock hours. However, Ricardo disagreed with Smith and argued that:

“ The value of a commodity .... depends on the relative quantity of labour which is necessary for its production, and not on the greater or less compensation which is paid for that labour.” (1953, page 11)

It is not intended here to go into further details of the economic analysis of the possible difficulties that are encountered by the labour cost theory of value. Rather the relationship between the labour cost theory and the analysis of the opportunity cost concept will be looked upon. The crucial concern of the labour cost theory which has a significant impact to the analysis of the opportunity cost concept is the determination of commodity price which is different from the "value" as arrived at by the theory. Economists like Ricardo who advocated the labour quantity theory did admit that the observed price of a commodity was a resultant settlement of the intertwining forces of demand and supply and thus

incompatible with the labour theory which determined the normal exchange value of a commodity by quantity of labour embodied (Schumpeter 1954), although it was also argued that the two prices would become the same in the long run equilibrium state. Moreover, although the normal exchange value of a commodity can be determined with reference to its realised costs of production, realised exchange value can and does diverge from realised costs, because demand patterns of the commodity are not determinable by costs (Buchanan 1969). Referring to the beaver and deer example, hunters will have killed beavers and deer according to their personal preference, although they may find it indifferent in killing one beaver or two deer in a particular day. The total supply of beavers and deer then depends on the collective behaviour of the hunters. On the other hand, if demand for deer in that particular day suddenly shifts upwards, then the realised exchange value of deer will rise, and those hunters who select to kill beaver on that day will conclude that mistakes were made. Despite this possible error that may be committed by a particular hunter (who happens to decide to kill the animals that have a lower exchange value), the labour cost theory makes a clear demonstration of the opportunity cost concept in the decision making process. The decision of a hunter to kill beaver or deer on a particular day is a sole personal preference, based on his expectation that the realised price of the beaver and deer will be the same. Thus the decision is based

on some value judgement which is not necessarily related to the monetary concern of the prices of the commodities. Moreover, the decision is based on an expectation of the realised prices of the commodities, which indicates that in the consideration of opportunity costs, value determination and future expectation are closely related.

### **The Utility Theory of Value**

With the contributions made by Jevons, Menger, and other utility theorists, the value theory developed into two paradigms in the late Nineteenth century. These theorists considered costs of production occupied much less importance in explaining exchange value of a commodity. The value of a commodity, from a utility perspective, connotes quite different meaning from that of a predictive market perspective as stated in the classical analysis. From the utility perspective, value of a commodity comes from the satisfaction in enjoying that commodity, the perceived benefits obtained from ownership and / or consumption of that commodity becomes the core basis in determining its value. If a person perceives that he will obtain greater satisfaction in consuming product A than product B, then the value of product A to that person must be greater than product B. The degree of utility of each product of consumption depends upon the marginal utility that can be obtained through the consumption process, and

thus exchange value of a commodity is mainly determined by the marginal utility that carries with it. With reference to the water and diamond example as put forward by Smith, he suggested that the value in use of a commodity is often different from its value in exchange. However, Smith did not consider that although the total value of water is greater than diamond, its abundance in quantity virtually allows people to have sufficient quantity of consumption in most cases. The marginal utility of obtaining one more unit of water is thus very low as perceived by many people. On the other hand, because of the scarce in supply, the marginal utility of obtaining one more unit of diamond can be very high, and thus people are willing to pay for much more money to buy an additional unit of diamond than water. In this interpretation, thus, the marginal utility theorists can explain the dilemma of the diamond and water case (Landreth & Colander 1994).

Like the Labour Cost Theory and based on the same reasons, the value concept discussed in this paragraph also refers to the relative concept of value, that utility measurement has to be determined according to the comparison process amount different perception of enjoying various products and services. However, the utility theory of value differs from the labour quantity theory in two main aspects. The marginal utility economics is often assigned the description of "subjective-

value" economics, as marginal utility must refer to personal perception which is subjective by nature, and thus it may not be possible to carry out empirical verification. In this interpretation of the utility theory, these two value concepts are initiated from the opposite ends of the line. The labour cost theory proposes to calculate value from the beginning, when production pattern is determined according to value judgement; the utility theory, on the other hand, proposes to calculate value after the ultimate consumption would have taken place. There is no possibility of compatibility between, unless one situation which is regarded as practically impossible does really occur, that personal satisfaction in the ownership and consumption of a commodity is completely identical to the amount of labour quantity input for the production of that commodity. If the utilities and satisfaction that are brought about by commodities are directly proportionate or equal to the relative input of the labour quantity for their production, then the resultant production schedule and price pattern will be the same irrespective of which value concept is being adopted. The closest approximation to their mutual compatibility may lie in a perfect and complete economy, where information regarding user utility and supplier preferences are fully available to all the parties involved in the economic activities. In this situation, because the suppliers have perfect and complete information about user utility and other suppliers' production preferences, each producer can select to



produce the kinds and quantity of commodities in the optimal manner. However, even in a perfect and complete economy, the assigned value of a commodity can still be two fold in terms of both absolute value and relative value, for only the ranks or ordinal preferences of all commodities will be identical under both perspectives, but the same does not necessarily apply to their respective measurement scale. Therefore based on whatever arguments, it seems inevitably that only one of the two value concepts can be accepted as "correct" while the other concept needs to be placed in a less significant role in the determination of commodity value.

The other major difference between the utility theory as against the labour quantity theory lies in the theory of demand and supply, which has been recognised as providing a mechanism in reflecting the relative values of different commodities. Marginal utilities are recognised to be dependent upon quantity, and for the whole group of consumers, the total supply in the market. Therefore to determine the marginal utilities of a product, which in turn determines the realised exchange values, both the demand and supply information must be available; and these two factors of analysis are intertwining with each other. On the demand side the realised exchange value represents the willingness of consumers and users to give up their own wealth (to pay the price) for the

exchange of a particular commodity. With knowledge of the respective demands at each realised exchange value level, a demand curve can be construct to indicate the relative value of the commodity. A commodity with a demand curve that is positioned at the right and outer part of another commodity's demand curve denotes that the former commodity is generally perceived at a higher value than the latter one, although this is not necessarily true for a particular individual.

Thus price is a perfect reflection of the relative values of different commodities. From the supply side, the supply curve represents the willingness of the suppliers to produce commodities at each given level of price or the perceived benefits of production to them. Determination of production schedule is not solely based on the relative input of the labour quantity (or even expanded to include all production factors), but rather on the expectation of possible utility that can be brought about to the suppliers by the production (and thus sales) process. If the relative price of a commodity increases, more producers are willing to produce that commodity because the marginal utility brought by the production of an additional unit of that commodity will be higher. Therefore the relative values of commodities are fully compatible with the marginal utility theory thereof. In a perfect market where both demand and supply information are available to all participants, the market price of a commodity reflects the choices of actions that are taken by the collective consumers, and therefore

represents the opportunity cost of giving up the consumption of alternative products.

### **The Theory of Value and the Opportunity Cost Concept**

With an understanding of the theory of value from both the labour quantity perspective and the marginal utility perspective, it is obvious that the price mechanism plays a crucial role in the process of identifying the validity of the value concepts. The labour theory, advocating the determination of value according to the relative contribution of the labour factor, or its composite alternative, asserts that cost of a commodity is the displaced market value of the alternative product, thus relating the ascertainment of opportunity costs with the factor market and the alternative product markets. However, it does not indicate direct relationship between the costs of production with the commodity price, or the realised exchange value thereof, which inevitably takes into account demand analysis. Therefore it is subject to the criticism of being unable to explain the existence and operations of the price mechanism. The utility theory, by providing an explanation with regard to both demand and supply, relates the determination of cost of a commodity to the marginal utility it carries with reference to the demand and supply conditions, which in turn directly relates to the price mechanism, successfully demonstrates its theoretical validity of

equating relative value judgements with relative prices. However, the utility theorists have never tried to explain that in an imperfect and incomplete economy, where prices do not exist for some commodities or prices are not determined according to perfect information, how should the value of these commodities be ascertained in an objective and measurable way, and whether any observed price as provided by the price mechanism represent the value of these commodities.

On the other hand, with reference to the labour cost theory, the labour factor or other factors of production are more feasibly adopted to physical measurement and therefore even in the absence of the price mechanism the relative values of individual commodities may still be able to be measured and ascertained. If one hunter kills two deers and the other hunter kills a beaver, and both hunters spend the same quantity of labour time, then they can initiate exchange of goods on a relative value basis, such that each hunter will have half a beaver and a deer.

However, the utility theory builds up its value concept from the perception of utility satisfaction, which is a mental process of individual consumers, and thus cannot be measured unless by way of physical transformation system (here the price mechanism), and in the absence of such there will no longer be a viable system that links up individual value perception with the value of commodities.

If a hunter favours beaver to deer, he may not agree to give up half of a beaver in exchange for a deer, although in terms of labour quantity input he would not have any loss in value. Thus, based on the utility theory production of commodities without available market prices would result in a confused pattern, and will in general not be commensurate with the consumption preferences of consumers. Thus the validity of the utility theory of value essentially links with the presence of the price mechanism or similar functional mechanisms that can transform mental judgmental processes into an observable and measurable scale system. With reference to the arguments put forward in the previous chapter regarding the controversy between social objective and individual objectives, it is obvious that in the fulfilment of a social objective, where individual preferences may be placed in a less significant role, the market price mechanism is more dispensable; while in considering the theory of choices applicable to individuals, the market price mechanism which indicates the marginal change of the relative values of commodities at each price level becomes an absolute necessity for the effective application of the marginal utility theories.

Having analysed the theory of value from its economic orientation, the characteristics of the opportunity cost concept become more transparent and surmountable to analysis. When the opportunity cost concept was put forward

by the London and Austrian scholars in the Nineteen Thirties, it was a decade when the social theory and the idea of planned economy were wide spread and advocated by many politicians as well as distinguished scholars, who gained their support from the experience during the World War I, when Britain made use of planned economic activities to monitor and control the consumption and distribution of economic resources to the survival and victory of the country. Experience as shown during World War I had provided a successful picture to the socialists that it was a tenable possibility that a planned economy could provide better economic result than a free market economy (Pollard 1983). Moreover, after the War people who bitterly suffered damages from the war affairs wished very much to have ideas that could restore the economy of the country, and guide them through the way to a better economic life. However, both the classical economic thoughts and the propositions of the historians were unable to provide any viable propositions in the improvement and restoration of the economy from the tragedy of war damages. This inability of the classical economists and the historians to provide required economic policies magnified the impact of the then sustainable theories of the socialist thoughts, turning the situation into an era of social and collectivist planning (Hayek 1935). Socialists attacked free market economists on the ground that the price mechanism, although claimed to reflect relative value of commodities, did in fact drive

producers to produce at the most profitable level, even against the general wishes of the people, and it could only be feasible to provide a better welfare to people by substituting the price mechanism and the free market economy with a central planning system (Neurath 1919). Hoping to restore the confidence previously held by people of economic theories and the free competitive market mechanism, the London and Austrian scholars put forward the opportunity cost concept to demonstrate and argue that the socialists were erroneous in determining social value from the labour cost theory perspective, in trying to calculate an compatible equilibrium between individual satisfaction and institutional planning without reference to any viable transformation systems, and in developing a social choice system that is impossible to measure and substantiate (Hayek 1935, Buchanan 1973). Based on the generally accepted view that the function of economics is to enable optimal allocation and utilisation of scarce economic resources in the fulfilment of human needs, the London scholars argued that fulfilment of human needs could only be justified by the increase in satisfaction level of individuals. However, because individual utilities would not be reflected in a central planning system, as the central planner would not know about the opportunity cost concerns of individual persons among different choices of economic activities, the London scholars argued that the socialist planning process could only result in a situation where it is uncertain if human needs were fulfilled (Pierson 1935).

The opportunity cost concept interpreted in the utility theory perspective was hence advocated by the London scholars.

Based on the definition of the opportunity cost concept that is stated in Chapter One, the opportunity cost concept will be critically reviewed with respect to the utility theory perspective. This is not to say that opportunity cost concept does not exist in the socialist theory, or is incompatible with the labour cost theory.

Quite the contrary, opportunity cost can equally well be applied within the realm of socialist theories, the critical difference lies only on the definition and interpretation of the concept.<sup>1</sup> Human satisfaction and utility obtained through the consumption of physical commodities or services are in the original sense abstract process of mind, the exact process of which cannot be perfectly visualised by another person (the solipsistic view) (Ijiri 1981). In order to understand this mental decision process in an objective and viable situation there must exist some measurement tool which possesses the characteristics of reflecting such mental process in a way accepted by the majority of people.

Based on this criterion of reflecting mental process, any measurement and

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<sup>1</sup> When the labour theory is taken for granted, opportunity cost is the amount (quantity) of alternative commodities that has to give up in the determination of making use of that same quantity of factor inputs in the production of selected commodities. Here opportunity cost is measured in terms of some physically measurable units, so that even though the price mechanism or other similar tools does not exist, one can still draft an optimal plan in accordance with an ordinal production preference list based on the (socialist) opportunity cost model.

judgement process about commodity value must be aided with such a measurement tool. Otherwise it has to be admitted that the objective measurement criterion is dispensable because there is no available tool to measurement mental process.

### **The Situation Since World War II**

Before the end of World War II business organisations were mostly small and medium size firms with the sole proprietor or dominant shareholder being involved in the management of their businesses (Pollard 1983). When these capital providers were personally involved in the daily operation and management of their businesses, it did not matter what business objectives were held by them, and whether such objectives could be objectively measurable or not. They could make decisions which would lead to optimal achievement of their desired business objectives through their own mental process of mind, such process being unnecessary to be known by other people who did not have participating interests to the business. However, since the decades after World War II business structures and management practices were changed radically or otherwise from small and medium size firms to more and more national and international giant firms. The number of shareholders were ever increasing and the relative interests of one single shareholder or group of related shareholders

(such as family members) were diluted into a less significant position as compared to the Pre-War periods (Pollard 1983). Most of the shareholders of these giant firms did not have control and would not participate in the daily management of the company, and thus they did not thoroughly appreciate what was going on in the company and whether their economic benefits had been fully looked after. The case became more complicated with the emergence of the professional managers who were not shareholders of the firm but were only "employed" to run the business on behalf of the shareholders. These professional managers were recruited to achieve business objectives for the shareholders, thus although they were decision makers in operations they were not the ultimate beneficiaries. Therefore they had to know not only about the objectives of the shareholders but also the tools to measure their decision consequences with respect to such prescribed objectives. Problems and conflicts arose here.

If the shareholders who are remote from running and controlling the company's business hold a simple objective that is economic oriented and can be represented by the mere measurement of the change in monetary wealth, then management who are assumed to look after the interests of the shareholders takes the simple task of running the business with profit maximisation in mind, so that for all decisions the impact on cash flow induced by each alternative can be

measured and assessed to determine which alternative can best achieve the corporate objective. In this respect the concept of opportunity cost which is a value based concept arouses no problem to the business firm (Edwards 1937, Coase 1938). However, when shareholders hold a set of multiple objectives part of which is not economic oriented and cannot be represented by some economic measurement tool, then (albeit the agency problem can be put aside at this stage) the manager who is supposed to make decisions and act for the benefits of the shareholders will have no idea at all how they can act to achieve the shareholders' objective, unless the manager can safely ignore all the non-economic objectives of the shareholders, as usually assumed in the finance objective applying the Fisher separation theorem (Fisher 1930) or similar arguments.

Taking a simple example, suppose X Company is a private company with four shareholders who are all economic oriented and wish to obtain maximum profit from the business. The manager of X Company, who is not a shareholder, will stick to this profit objective to make business decisions. In one case he has to decide which model of a passenger lift would be installed in the company's building. He has obtained the following information regarding different models of passenger lift all of which comply with the Statutory safety rules:

	<u>Lift A</u>	<u>Lift B</u>	<u>Lift C</u>
Cost of Installation	\$360,000	\$600,000	\$850,000
Annual Operating Costs	25,000	40,000	60,000
Safety Indexes	75	85	95
Passenger Loading	Same	Same	Same

The safety index is an estimation of possible malfunction of the passenger lift that may cause injury to the passengers, such that for lift A there is a 25% chance that the lift might be erroneously operated and causes personal injury. Given that all lifts comply with Statutory safety rule, and shareholders wish to maximise profitability, the manager, acting in the interests of the shareholders, will inevitably select to install lift A in the company's building (assuming all other costs being constant). On the other hand, if the shareholders consider that personal safety is the utmost important rule of the company, that any additional expenditure would be worthwhile in improving safety measures, the manager will most probably select Lift C (it is noted that in this special case personal safety is supposed to be measurable by way of the safety index). However, what happens if the shareholders wish to maintain both profit motive and personal safety as dual prime objectives of the company? The manager will then be much confused in determining which lift should be installed, because in this case the

measurement tool for profit motives and safety objective is hard to be transformed between one another, and the manager will have no idea how to "trade off" increased costs with increased safety and ascertain the opportunity costs of each alternative to "optimise" the shareholders' desired objectives. Of course mathematically it is possible to calculate that the safety index can be improved by 10 units for \$240,000, but the manager cannot tell if the shareholders consider this additional expenditure a worthy expenditure in this regard, unless he presents the figures to the shareholders and seek their views about which lift should be installed.

To solve the problem of multiple and conflicting objectives as perceived by the manager, there are several general solutions that can be adopted. The first solution as indicated above is to inform the shareholders and seek their consent as to the preferred choice of action. But this is not real solution for solving the problem of non-transformation of value judgement, as effectively the shareholders are now the decision maker instead of the manager himself, thus the shareholders must know their own view on each particular choice of action. Another perceived solution is to set up some conditions for decision process, such as setting up a minimum safety index and/or a minimum required profit level. This kind of conditional solution will lead to a constrained situation where

one or more of the original objectives will no longer be regarded as an objective, but rather a constraint or condition in achieving the remaining objectives. Moreover, the setting of acceptable and feasible margin for each conflicting objective only narrows the feasible set of alternatives, and a clear solution does not necessarily exist by the establishment of such conditions, unless a combined utility function is also established to enable the calculation of optimal solution by way of mathematical analysis such as linear programming.

The above simple example will become more complicated if one or more of the objectives cannot be represented by quantitative data, and thus there is no measurement model for that objective. In that case it is impossible to build up any transformation process between the measurement tools of two (or more) objectives, since one (or more) of the measurement tools is not available to facilitate the transformation process.

With the recognition of multiple objectives in modern day management (in contrast with the simple profit motive objective in the traditional sense), the applicability of opportunity cost concept for decision making process has to be questioned as its original construction is contradictory to the situation where the decision maker is not the beneficiary. Based on the discussions that have been

made in the previous sections, it is suspicious if the current management practice in a firm where the managers are separated from the shareholders will be in line with the neo-classical theory of opportunity cost and the utility theory of value, because they may be unable to carry out business decisions which maximise the shareholders utilities (other than the simple profit motive assumption). In view of this conceptual incompatibility as described by Robbins (1934) and Coase (1938), therefore, this research investigates how managers make business decisions under the present context of business, social and political environments; and discusses in what way these managers are affected by contingent decision variables in applying the opportunity cost concept in making decisions.

## **CHAPTER 3**

### **A REVIEW OF THE LITERATURE ON OPPORTUNITY COSTS**

#### **The Opportunity Cost Concept from a Management Perspective**

Before field research is carried out to identify management practice and decision acts, a research and review of the opinions and ideas from the academia would provide a reference for subsequent field analysis and form a core foundation in critically reviewing the conceptual validity of the opportunity cost concept. In view of the involvement in the multi-discipline aspects of knowledge, the literature review process will be separated into three sections. In each section the views of the economists, the accountants, and the business managers will be surveyed and analysed. The reason of selecting management, accounting, and economic literature to study and analyse is because this are the three major disciplines which are related to the use of the opportunity cost concept. Because the core issue of this research is to discover the managerial practices in the business context regarding decision making processes, thus it is crucial to identify if there is any prescription or description of the management decision process in the management texts. Based on the same argument, because the opportunity cost concept is originated in the economic context, and is being applied in the accounting practices, therefore, a search and review of the

accounting and economic literature is essential and useful. The first part of this literature review process will be a critical review of the management literature to identify what the management writers say in getting through the decision process.

The views of the accountants and the economists are then reviewed. At the end of this chapter an integrated analysis will be made to reveal the inference from the literature in the adoption of the opportunity cost concept in a decision making process.

To find out whether management writers mention about the opportunity cost concept, 25 management texts written between 1960 and 1991 are randomly selected. The time frame is set between 1960 and 1991 is to ensure that the books are more related to modern management theories and practices. These books are scrutinised in general including the subject reference part at the end of each of the books; and where decision making processes are discussed, a more in-depth review will be made. Through this process of scrutiny and selective in-depth review of the randomly selected management books, it is found that the concept of opportunity cost is not mentioned in most books, as the cost term does not appear anywhere in the contents part or in the subject reference section, although the management decision process is inevitably mentioned in almost all books within the sample. A summary of the findings is presented in Table 1:

**Table 1: Selected Topics Included in the Management Books**

	VALUE CONCEPT	OPPORTUNITY COST CONCEPT	DECISION PROCESS	BUSINESS OBJECTIVES
BOOKS MENTIONED	2	2	25	25
BOOKS NOT MENTIONED	23	23	0	0

From table 1 only two out of the twenty-five books under study have mentioned about the concept of value and the opportunity concept. However, even in these two books (Beer 1966, Marshall 1975) very brief discussion about the value concept and the opportunity cost concept are found, as the authors spend a few lines only to discuss these concepts. These findings serve to indicate that management writers, in the process of describing and prescribing management theories and practices, do not pay serious attention to the concept of value and the correct approach to the decision making process. However, as discussion of business objectives and decision process has been mentioned in every studied textbook, the opinion of these management writers are worth being analysed to identify the conflicting issue between economists, accountants and managers. Since the concept of opportunity cost is essentially related to decisions, which must be made in view of some business objectives, an understanding of the

discussion of business objectives will facilitate the research of how business managers make decisions, and whether they would adopt the opportunity cost concept in making such decisions.

### **Existence of Multiple and Conflicting Objectives**

As discussed in the previous chapter, opportunity cost is the highest value foregone in making a decision and selecting a particular alternative. If the calculation of decision value is based on a single objective, the process of calculation will be relatively simple. However, with respect to the discussion of business objectives, the existence of multiple objectives within an organisation has already been recognised by most writers during these thirty years (Drucker 1964, Kreitner 1989). They unanimously put forward the argument that as the business atmosphere is becoming more complex and involving more and more people of different interests, a simple, univariate definition of business objective will no longer be appropriate to the modern business world. Specifically the traditional advocacy that profit maximisation is the primary business objective is challenged by these writers with the following common arguments :

1. There is no available tool that can provide accurate measurement and calculative techniques for maximising profitability, given the uncertainty of

event occurrence in the real world. Since whether profit can be maximised by any action is subject to risk and uncertainty from both the ex ante and ex post perspective, it is hard to rationalise the selection of profit maximisation as corporate objective (Beer 1966, Ijiri 1981, Heirs 1986).

2. Many factors that would otherwise affect profitability might not be quantifiable and included in any calculation model. Although the bounded rationality concept as proposed by Simon (1957) can be applied by business managers who will just do the best they can, this is not recognised as a profit maximisation concept accordingly. Thus, when there exist a large number of qualitative factors that affect the calculation of maximised profits, it is very difficult to maintain the profit maximisation objective (Kreitner 1989, Anthony et al 1989).
3. Whenever there exists more than one business objectives, profit maximisation will no longer be regarded as an acceptable objective, since many identified business objectives are contradictory with profit maximisation concept. For example, if social responsibility has to be looked upon, the price of products would be lowered to ensure that general customers can afford to buy these products; and expenditure is incurred for

the purposes of environmental protection. Both of these actions reflect the company's commitment to social responsibility, but these actions will surely reduce the level of attainable profits. It is admitted that a company must earn profits to survive. However, once multiple objectives are simultaneously held, as in the example of social responsibility mentioned above, it is clear that no "maximised" profits can be earned (Dale 1978).

Many writers have proposed that with regard to profit objectives managers (and owners of course) may have already adopted a modified objective of obtaining a satisfactory return on investment fund instead of trying to "optimise" profits (Simon 1957, Dale 1978, Anthony et al 1989). As proposed by Simon, shareholders and business managers would adopt a satisfying concept in running businesses, because they have realised that with respect to the many constraints that are faced by them, it is more realistic to adopt a satisfying objective than the profit maximisation objective. Apart from observing the changes happened in setting business objectives, these writers also advocate this "new" profit objective a good substitute to the profit maximisation concept as many challenges to the maximisation concept will not apply to the satisfying concept.

Once the satisfying profit concept is adopted, the application of opportunity cost concept would become more feasible as in this case profit motive counts as a constraint rather than a prime objective in the feasible profit region, so that other objectives can then be looked upon and satisfied, no matter what it is and whether it is quantifiable or not. Both management and shareholders are satisfied and thus no problem would be arisen from the decision process. Therefore the proposal of satisfying profit objective substituting profit maximisation objective will be compatible with one of the suggested solutions put forward in the previous chapter. However, apart from Simon's research (1957), there is very few empirical research that provides concrete evidence about shareholders and managers' view on satisfying profit concept, thus it is not totally confident in saying that the satisfying profit concept is widely practised by business managers.

Because the opportunity cost concept can be applied more satisfactorily to the single objective situations, where a uniform measurement scale can be used to assess opportunity costs (Edwards 1937, Coase 1937), the existence of multiple business objectives with the possible adoption of the satisfying profit concept may distort the application of the opportunity cost concept to business decisions. To clarify the situation, a study of how management writers describe the

business decision making processes is essential.

### **Use of Judgement in Making Decisions**

Most writers of the management texts devote considerable space to the discussion of management decision making process. The normal pattern of discussion is to begin with a description of the decision process in general, and the factors that need to be considered in each decision procedure. Emphasis is, however, unanimously made by all writers about the importance of judgmental process in selecting preferred alternative. All writers have considered management judgement as the crucial attribute for a successful decision, although they have put forward different reasons to apply judgement in the decision process, such as the existence of multiple objectives (Drucker 1964, Benton 1973, Kreitner 1989), and the assertion that decision process is an art, not a science (Heirs 1986). On the other hand, although all writers within the sample advocate the importance of [personal] judgement, not a single book thereof has ever mentioned about how the judgmental process is carried out, and it is virtually left as a black box of how business managers perform the judgmental process. In this respect every writer simply tells the reader to make judgements, but no writer tells the reader "how" to make judgement in the correct way. It is questionable whether there can be communicable erudition about the correct

process of judgement, or the reality is that judgement is an art of purely personal choice where conceptual perfection is either non-existent or disregarded, so that no specific guidelines can be given whatsoever in the description of the judgemental process (Heirs 1986). No matter what the reason is, if judgement is an important attribute in the decision making process and no concrete guidelines are provided for it, it is a corollary that the ultimate decision as arrived at through judgement would be idiosyncratic involving some form of mental process that cannot be communicated to the comprehension of other people who get involved in the process. In this respect the observed phenomenon is compatible with the criticism that opportunity cost concept cannot be applied in a business world where the manager is distinguished from the shareholders. If the shareholders run the company by themselves, they will make decisions according to their own judgements. However, when they delegate the managerial authority to professional managers who are not shareholders, these managers will then make decisions according to their judgements, which are not necessarily similar to the judgements that would have been made by the shareholders (Hayek 1935, Buchanan 1973). Both judgemental processes would be similar only if there exists available guidelines that are observed by both the shareholders and the managers, such as using profitability measurement as the prime concern in making decisions (Coase 1937). Therefore, in a business context where multiple

business objectives exist, the judgmental process becomes more complicate, and it is difficult to provide any simple guidelines of how to make "correct judgements". As mentioned above, the lack of some concrete guidelines of how to make correct judgements in the sampled books support this proposition.

### **Discussion of The Opportunity Cost Concept**

As shown in Table 1 the opportunity cost concept only appears in two out of the twenty-five books, and even within these two books the concept is only mentioned in a few lines and does not attract any material attention. Also discussions about value, both from a labour quantity or marginal utility perspective, do not occupy any notable position in all these management texts. From this survey it is obvious that the concept of opportunity cost does not receive much attention from the management writers. Because these authors of management texts will surely include the topics that are considered crucial or important managerial practices in their books, it is logical to question if they consider the opportunity cost concept is an essential concept for business decisions. Moreover, as these authors are either experienced managers or scholars, their perception may also reflect to some extent the business practices. Thus it is a logical proposition that managers, in making decisions, do not always invoke the opportunity cost concept and apply the concept in practice. Research

interests thus arise here to visualise and ascertain management practices today regarding decision making processes, with a particular reference to whether managers adopt the opportunity cost concept in making decisions.

As a matter of interests, authors of management texts adopt a management perspective in describing managerial functions, including decision making. They seldom mention the relationship between managers and shareholders and the fact that managers in terms of corporate ownership actually act in the capacity of agents and discharge managerial functions on behalf of the shareholders (albeit the agency theory was no longer a new theory in the 1980s). Discussions and prescriptions are made simply in the sense that managers discharge managerial functions just for the sake of the managers themselves, as if they do not need to think about the wishes of the shareholders in discharging their duties (Spriegel 1960, Dale 1973). Perhaps the reason is because the authors unanimously take the corporate objective as simply given and ascertained, be it single minded or multiple. Any alteration or change of business objectives is beyond the authority and responsibility of the managers, so long as they can safely wait until the prescribed corporate objectives are officially amended. Moreover, since in many large organisations the directors are normally nominated by shareholders who hold a relatively large proportion of issued shares, or these directors hold proxies

of many small shareholders to enable them to be elected to retain their directorship and managerial control of the organisations, thus effectively they would have some ideas about the wishes of the majority shareholders (Spriegel 1960, Pollard 1983). Based on this assertion managerial functions can be restricted within the company, and external communication with remote shareholders will be regarded as unnecessary and ineffective. The geographical dispersion of small shareholders across a country or even across countries (such as multinational firms) often deter them to participate and vote in the annual general meetings and express their opinions of the managerial effectiveness of the organisation. It is also argued that many small shareholders do not really care about the management of a company, as long as they can receive a satisfactory dividend, and the shares can attain a satisfactory capital appreciation (Dopuch & Sunder 1980, Dunning 1993). Despite the arguments made above, however, there is a lack of discussion in the sampled books of what should the managers do if the corporate objective is not ascertained and officially announced. I have also found little discussion about the dynamic process of determination of business objectives. Business objectives are not necessarily static objectives that are not changed over years. It is admitted that business objectives can be subject to constant and instant changes. In this respect managers have to assure themselves that the corporate objective is a valid one in the course of a major

project decision and strategic plan. Almost every management text in the sample emphasises on the discharging of managerial functions with respect to system and environment, but too few discussions have been found for the discharging of managerial duties from an owner-manager perspective. From the owner manager perspective, the manager either works for the benefits of the owners (shareholders), or they do not. If it is presumed that a manager behaves for the benefits of the shareholders, based on the arguments just made it is uncertain if a manager can be sure that he is acting for the optimal benefits of the shareholders, because he may not fully visualise their business objectives. On the other hand, if the agency theory applies and managers do not act for the benefits of shareholders, then they do not necessarily make optimal decisions on the shareholders' behalf (Jensen & Meckling 1976, Baiman 1982). Both situations indicate that the opportunity cost concept may not be invoked for the purposes of making decisions. Unfortunately a comprehensive discussion on this part of the arena is not provided in most management texts, thus it is necessary to carry out a research study to investigate the situation.

Before turning attention to the accountants and economists' view of the opportunity cost concept, two questions can be asked here. The first question is that, when managers are employed to run the business for and on behalf of the

shareholders, would they take care of the shareholders' benefits? The second question is that, in case the answer for the first question is in the affirmative, do existing management techniques and systems as described and prescribed in the available management texts really serve to allow for the managers to fully discharge their duties? Given that the opportunity cost concept is rarely mentioned in the management texts, there is uncertainty as to how managers make business decisions with respect to the theory of choices which inevitably involve the ranking process of the assigned values of alternatives and the determination of the opportunity costs of these alternatives as discussed in the previous chapters.

### **The Opportunity Cost Concept from an Accounting Perspective**

The views held by the professional accountants as well as accounting academics are regarded most important to this research as the accountants are the people primarily responsible for the compilation of the cost statements that will be brought by each decision alternative. It is already well recognised that a variety of accounting results can be arrived at through the use of different methods and calculation models, thus an accountant to a greater or lesser extent can influence a manager's decision by selecting a particular method of calculation and rejecting other alternatives. Through a study of the accounting texts, it is purposed to

identify what views are held by the accountants in arriving at decision data which affect the ultimate decision choice.

### **Functions of the Accounting Craft**

A major mission of adopting the accounting craft is to provide useful accounting data to users who benefit from such data in achieving their objectives (Beaver 1973, Horngren & Foster 1991). There are numerous groups of users each of them having their own peculiar objectives and needs of accounting information (Dopuch & Sunder 1980, Drury 1992). For the sake of simplicity we can classify the various groups of user into two basic categories, internal users and external users. External users are mainly served by published financial statements and the objective of financial reporting is "to provide information about the financial position, performance and changes in financial position of an enterprise that is useful to a wide range of [external] users in making economic decisions (IASB 1989, para. 12). However, in order that the financial reports can be used by external users in making economic decisions, the data provided in the reports must be relevant and useful for decision making purposes. Thus it is apparent that decision oriented information is crucial to the usefulness of financial [accounting] statements (Zeff 1978). Although there are explicit statements of criteria and qualities for the assessment of decision usefulness (e.g.

SFAC2), they are not taken into further analysis here as they are irrelevant to the present study, which is more concerned with the decision process pursued by business managers who are regarded as internal users of financial reports.

Regarding internal users a major mission of adopting the accounting craft is to provide useful accounting data to managers who use these accounting data to discharge managerial functions in a more effective and efficient way (Horngren and Foster 1991). Managerial functions can be broadly classified into different categories, namely reporting and stewardship, decision making, and planning and control (Drury 1988). Managers are employed by shareholders to run the business on their behalf. Since all business activities are initiated by decisions, managers have to frequently make decisions of how to carry out business activities (Garrison & Noreen 1994). Planning and control functions form a coordinated part of the decision making process, ensuring that better decisions can be made. Reporting function is essential to provide information regarding results of the business decisions made by the managers, so that shareholders can base on the results to assess if managers are acting for their benefits. In order that better decisions can be made, managers inevitably need financial information to assist them, so that they can visualise the financial impacts of each decision alternative.

Therefore decision making is one of the crucial functions for the adoption of the accounting craft.

Despite the fact of agreed (or at least accepted among a majority of the accountants?) objectives of the accounting craft, there has been no unanimous agreement as to what reporting system and data calculation and interpretation models can best fulfil the prescribed objectives. The controversy is apparently solved by the adoption of the Golden Rule that "for different purposes there are different costs" (Clark 1923, Vatter 1950, Horngren 1986). The advantage of adopting the Golden Rule is that it provides no constraint nor barrier to the development of the accounting craft, that whenever new managerial requirements emerge new concepts and models can be innovated to meet these new requirements, if it is considered that existing models are not appropriate in this respect, thus allowing the accounting craft to continuously serve the society. However, such trajectory of development also leads to unfavourable results which include coexistence of conflicting models, impossibility in the establishment of general theories or the framework of theories, and more important to the present study, a possibility of arbitrary choice of accounting models.

Because of the Golden Rule, it is always feasible to innovate new accounting models in the hope of serving certain business requirements. However, because

these models are innovated on an ad hoc basis, depending on when new business requirements arise, it is unable to call for co-ordinated efforts for a systematic development of accounting theories and models for these business requirements, which are not emerged in any systematic or sequential order. Therefore, there are times when a conflicting model is created to meet some objectives which are simply not compatible with the existing business objectives. Moreover, because accounting models are innovated to meet ad hoc management requirements, a general framework of analysis does not exist. Business objectives reflect the wishes of people who either own or operate the business. Since people's wishes are so diversified, the development of accounting models must also be diversified, to the extent that the degree of diversity has paralysed the establishment of a general framework of analysis. As a corollary of the existing of various models including conflicting models, and the admitted phenomenon that there is no established general framework of analysis, accountants and managers have to exercise judgement of the matching of available accounting models with the business requirements. Because judgements vary with people and unanimous agreement does not exist in many cases, the selection and matching process of accounting models with business requirements may fall into an arbitrary exercise, where accountants and managers can arbitrarily select accounting models in each circumstance, and justify that he has made a correct

matching decision. As a result, a manager (or an accountant) may arbitrary select the opportunity cost model in a decision making process; or he may select another cost model which theoretically may not be totally appropriate to be adopted for decision purpose. The explanation power is often vested with the manager.

### **The Relevant Cost Concept and the Opportunity Cost Concept**

For the purposes of this research study, 3 selected texts (Kaplan & Atkinson 1989, Horngren & Foster 1991, and Drury 1992), and 22 randomly picked accounting texts are studied in terms of contents. The reason of selecting the three identified books is because these books are perceived to be widely adopted by the accounting academia in Britain, the US, and world wide. A study of these books have revealed the fact that all books under study mention the decision process and the relevant cost concept:

**Table 2: Frequency Distribution of Selected Accounting Topics**

NO. OF BOOKS	MENTIONED	NOT MENTIONED
VALUE CONCEPT	2	23
RELEVANT COST CONCEPT	25	0
OPPORTUNITY COST CONCEPT	23	2
DECISION PROCESS	25	0
BUSINESS OBJECTIVE	23	2

Note : Value concept refers to the discussion and analysis of different concepts of value, including the marginal utility theory of value

Both relevant cost concept and opportunity cost concept are defined in accordance with the Terminology issued by the Chartered Institute of Management Accountants. Reference is also made to the generally accepted meanings of these terms as used in many accounting texts.

All 25 books discuss about the decision processes and the relevant cost concept that forms the core concept in the calculation of payoffs in each decision alternatives (Drury 1988, Kaplan & Atkinson 1989). The relevant cost concept, according to one author, refers to "those expected future costs that differ among alternative courses of action" (Horngren & Foster 1991). These future expected costs are, by the very nature of accounting, quantitative costs that are measurable in numeric scales. Almost all authors detail the process to find out the relevant costs among alternatives and to calculate their respective consequences in terms

of profitability (or other criteria such as return on equity basis) to determine which alternative should be adopted per calculated results. For example, in the book written by Drury, Management and Cost Accounting, 3rd Ed., he has spent a full chapter with numerous examples to demonstrate the process of using the relevant cost concept in different decision situations. One of the examples used by Drury, example 10.3, illustrates a decision situation to sell products at below full costs:

A company produces a single product and has budgeted for the production of 100,000 units during the next quarter. The cost estimates for the quarter are as follows :

	(£)
Direct labour	600,000
Direct materials	200,000
Variable overheads	200,000
Fixed overheads	400,000
	-----
	1,400,000
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The company has received orders for 80,000 units for the coming period at

the generally accepted market price of £18 per unit. It appeared unlikely that orders will be received for the remaining 20,000 units at a selling price of £18 per unit, but a customer is prepared to purchase them at a selling price of £12 per unit. Should the company accept the offer?

(Drury, C, Management and Cost Accounting 3rd. Ed., page 243)

Drury then discusses the example and points out that fixed overhead will not be altered irrespective whether the order is received, thus it is an irrelevant cost item in the example. He then goes on to show the relevant costs calculation in arriving at the decision :

		(£)
Additional revenue		240,000
(20,000 units at £12)		
Less relevant costs :		
Direct materials (£2)	40,000	
Direct labour (£2)	<u>40,000</u>	<u>80,000</u>
Excess of relevant revenues		160,000
over relevant costs		=====

(Drury, Page 244)

Similar examples have been used by authors of these accounting texts. This measurement of the flow of costs reflects the movement of monetary funds which are compatible to the measurement concept of the accounting craft. The relevant cost concept attempts to measure real cash flows in future rather than the change in value perception. On the other hand, contrary to the relevant cost concept, the opportunity cost concept receives much less attention from the authors. Most authors just mention the concept with a few lines of general discussion, and only two authors have included in their books working examples of using opportunity cost approach in decision making process (Horngren & Foster 1991). Moreover, only one author has discussed about the limitation and defects of the opportunity cost concept. This finding arouses a suspicion about whether the opportunity cost concept is viewed as a prominent concept for decision among accounting authors. If an author does not talk much on the concept, and provides no working example or demonstration to its application (in contrary to the treatment of the relevant cost concept), it is perfectly logical to conclude that the author holds the view that internal accounting reports need not be produced using the opportunity cost approach in assisting the manager in arriving at his decision. The fact that opportunity costs are seldom incorporated into formal accounting system which only records what is accepted rather than what has been rejected

bears some relationship to this observation. Normally the internal accounting system are maintained either on actual costs or standard costs basis, with both costing systems largely relate to transaction costs occurred by the organisation. As accountants usually need to justify the accounting data in terms of their objectivity and reliability, the design of the accounting systems is often geared to transaction bases, which must relate to actions and activities accepted by the organisation. On the other hand, those proposed activities that are rejected will not be carried out, and thus they do not form actual transactions and part of the accounting records. Opportunity costs, by definition, often relate to the process of value judgement that is not necessarily based on transactions. Therefore it is more difficult to calculate and justify the magnitude of opportunity costs. This is perhaps one of the main reasons that opportunity costs are seldom incorporated into the formal accounting system. However, apart from this observation, it is uncertain as to the main reasons why authors of accounting texts do not provide any thorough discussion of the concept (Horngren & Foster 1987, 1991). For the purpose of investigating the application of the opportunity cost concept from an accounting perspective, discussion in the next section may provide some hints to the answer.

## **The Classification of Costs**

Unlike management authors and economists, accounting authors have provided lengthy discussions in the accounting literature about the classification of costs under different situations. Until the turn of this century, the calculation and ascertainment of costs (which were mainly production costs) were based on a single cost concept (Edwards 1937). The calculation of production costs was essentially of the total costs approach, including the allocation of fixed overheads, in all situations. Most accountants in that time held the view that the total costs approach should be used for all decision situation, because only by way of this approach could total costs be recovered. Although the view that "for different purposes there are different costs" was first put forward as early as in the Twenties (Clark 1923), this view was not widely adopted and few authors continued to further the view in their publications (Edwards 1937). To the authors who had put forward similar views as that of Clark (Vatter 1950), they still found it quite difficult to persuade others to accept the view (Horngren 1986). However, since its gradual acceptance by accountants in the Fifties, the asserted view has now become a golden rule among accountants and authors, who support the view that when the costing situation has changed, different cost concepts and calculation models may be needed to provide relevant and useful accounting information to users (Kaplan 1982, Drury 1992, Garrison & Noreen

1994).

Based on the golden rule, classification models of costs are developed to meet with different managerial requirements. With respect to the classification model of classifying costs according their purposes of cost ascertainment, costs are basically classified as reporting costs, decision costs, and planning and control costs. This classification model is based on the general classification of managerial functions of reporting and stewardship, decision making, and planning and control, as discussed in the previous sections (Drury 1992). Within this classification model, each category of costs holds a different conceptual rationale and owns a different perspective of calculation approach. Reporting costs refer to record costs of past transactions that are used for preparation of accounting reports. It is more related to the stewardship function of the accounting craft. As reporting costs are mainly actual transaction costs (subject to certain accounting treatments such as depreciation adjustments and stock valuations), there is less normative concern in respect of the calculation model in domain, and judgement is largely restricted to the selection of agreed accounting practices. These costs in the sense of economics resemble choice determined costs, as in essence these are the costs incurred after a particular decision is made and activities are carried out.

Planning and control costs reflect the views of management about the level of normal costs. Management controls the magnitude of actually incurred costs by prescribing the normal cost level that is expected to be occurred under the forecasted situations. Staff within the organisation will then aware of this normal cost level, and whenever actual costs are possibly deviated from the normal cost levels, responsible staff will take actions to prevent over spending of costs, or to minimise any adverse effects that may be happened. The ascertainment of these costs can be based on past transactions with modifications, or ingenious conjecture by management. Subsequent management performance is then compared with these controlled standards to arrive at an opinion about whether managers are managing in an effective manner. Planning and control costs are normative in concept, although a positive approach can be adopted for their mathematical derivations.

Decision costs, on the other hand, adapt the concept of choice and opportunity in a way that only costs which are affected by decision choices will be counted, whereas costs that are not affected otherwise will be excluded. Both the relevant cost concept and the opportunity cost concept resemble the concept of choice. Thus decision costs are choice determining costs.

The explicit recognition of different paradigms of costs in the accounting literature bears important consequences for the recognition and ascertainment of the cost concept. Unlike economic literature, there is no argument in the accounting literature that cost concept is best; or which cost concept should be regarded as the ultimate concept. The spirit of the accounting craft is to identify and ascertain the most appropriate cost value in the particular circumstances, and cost values become a relative concept subject to change and alteration in accordance with the factors that are prevalent in each particular circumstances (Clark 1923, Otley 1980). Moreover, there is unanimous consent among accountants that cost values as arrived at under different purposes and with respect to different circumstances do not bear direct relationship to one another, so that reporting costs often are not equal to decision costs, and in turn decisions costs often are not equal to control costs (Edwards 1937, Horngren 1986). The variability of cost values has promoted the flexibility of accounting applications in the identification and ascertainment of costs and values in the business context; however, it has also restricted the possibility of searching for a single, ultimate conception of cost. With reference to the golden belief, the opportunity cost concept can be invoked to the extent that accountants consider appropriate in business applications. Thus the relevant cost concept, which can be regarded

as a subset of the opportunity cost concept because of its resemblance to the true opportunity cost concept (but not the nominal opportunity cost concept), is favoured in decision processes in the accounting literature, whereas the original concept of the opportunity cost is generally avoided or intentionally omitted from the publications. The advantage of this practice is that accountants can select to employ an accounting system which they are more confident of, and exclude what they cannot do with the accounting craft. Economists, in a less flexible way, have to find out an answer that may not even exist.

### **Irrelevance of the Accountants' Approach**

Comparing the contents of the accounting texts with the management texts, and referring to the discussion of the previous sections, it is clear that methods contained in the accounting literature mentioning about the processes of arriving at a decision choice do not reflect the actual situation. This is not to say that the accounting reports are totally invalid, or useless; but the fact is that the accounting reports alone often cannot lead to any meaningful decisions at all.

Three reasons have led to this proposition:

#### **1. Impact of the Business Objectives**

Similar to the survey of the management texts, nearly all accounting texts

under survey carry a discussion of the business objectives, and the core of discussion lies around the profit maximisation concept. However, most of the books (20 out of 25 books) adapt the profit maximisation objective as given and agreed in the business environment. There is little discussion about the appropriateness of the maximisation concept and the existence of multiple business objectives in the modern business world (Burchell et al 1980, Pollard 1983). For the writers who have mentioned multiple business objectives, they do accept that the profit maximisation concept can be a suitable substitute in discharging managerial functions (Drury 1988). As a result the sheer volume of discussion of the appropriateness of profit maximisation concept and their alternatives in the management texts do not find their place in the accounting texts. However, it is already well recognised that business objectives in the modern world can no longer be represented by any simple economic goal, and contemporary management accounting researches have become more primarily emphasised the positive and empirical aspects of professional practices (Ashton et al 1991). In the light of these apparent movements in both practices and researches, it is very doubtful if the contents of general accounting textbooks are still appropriate in providing adequate accounting knowledge for the benefits of accountants and managers.

## **2. The Problem of Quantification**

The inherent characteristics of the accounting craft induce many basic defects that cannot be totally eliminated or avoided. These defects include the problem of source information, the problem of time constraints, and others. With particular reference to managers' requirements and accountability, the problem of quantification has accounted for a greater degree of ineffectiveness in the application of accounting outputs for decision making.

The basic characteristics of the accounting craft require that there must be quantitative, numerically measured data for a particular aspect of factor of analysis be included in the decision model and the calculation process. If any factor falls into the category of qualitative factor and its "value" is not measurable and presentable in terms of financially viable data, such factor is bound to be rejected from the decision model by an accountant in arriving at his calculated results. The best thing an accountant can do is to mention in his accounting report about the existence of some qualitative data that have not been included in the calculations, and this is also the usual practice of the accounting text writers to state in their books. It is abundantly found in many accounting paper examinations held by both

academic institutes and professional bodies which ask candidates to state "further concerns or other considerations that are needed to be made before the final decision is taken", and the answers to these questions are a list of the qualitative data that should be taken into consideration other than the quantitative, calculated results. Regrettably, however, not in a single case can a quantified answer can be found in the "model answers" of these questions; and there has not been any discussion at all, either in these examinations or in the accounting texts, of how should an accountant make a balance between quantitative results with qualitative data (Drury 1988, Ashton 1991, Hanson 1993). It is thus either assumed that any "competent" accountant should know how to strike a balance between the known and the unknown, or that the accountants have no responsibility at all in striking such a balance.

It is admitted that continuing efforts are made to quantify qualitative data as far as possible, and there are successful examples about these conversion exercises (such as capitalisation of future revenues brought about by a good customer relationship). However, to date there are still too many qualitative concerns that cannot be successfully converted into quantitative models for incorporation into the accounting system.

Unfortunately opportunity costs in many cases fall onto the side of qualitative concerns because firstly opportunity costs seldom form part of the normal accounting system which lead to an absence of available quantitative data (Horngren & Foster 1991), and secondly there are cases when opportunity costs refer to the giving up of other alternatives that are really qualitative in nature (Buchanan 1973). Referred to the simple example of lift installation quoted in the previous chapter (pp 60-61), the opportunity cost of selecting to install lift C would be \$490,000 (being the difference between the cost of lift C and lift A); but the opportunity cost of selecting to install lift A would be uncertain, as personal safety is very hard, if not impossible, to be quantified at the moment of making a decision. Thus application of the opportunity cost concept in accounting calculations inevitably commits the basic defect of the problem of quantification, which leads to the impossibility of providing an accounting report which presents meaningful comparison among decision alternatives other than a mere presentation of the available data. If the opportunity cost concept is considered a core concept in the decision making process, it is hardly conceivable that the accounting report can provide any meaningful analysis in a comprehensive sense. The adoption of the relevant cost concept may minimise the adverse effect thereof, but it can

never totally eliminate the defects brought about by the exclusion of the opportunity cost concept.

### **3. Discussion of Decision Judgement**

Unlike the management texts that advocate the judgmental process in selecting a preferred alternative, there is a complete absence of discussion about management judgement in arriving at a decision in the accounting literature. Quite the contrary, most authors of accounting texts either explicitly or implicitly advocate the conclusiveness of the calculated results, and recommendations on management choices of action are primarily based on these results (e.g. Hanson 1993). These observed phenomena are understandable by relating them to the adoption of the profit maximisation objective. If the profit maximisation objective is the only prime concern, calculated consequence of each individual alternative in terms of profitability can actually be taken as the determining factor in the selection of decision choices, and the domain of concern is how to accurately calculate these consequences and present them in a way to demonstrate the differential effect of them. It is not surprising to find that the accounting texts in this respect devote much discussion of how to modify the calculation models in each situation, when some quantitative

factors have changed in another aspect (Dearden 1988, DeCoster et al 1988, Horngren & Foster 1991), to a degree similar to the management authors devoting their effort to the discussion of the judgmental process in making decisions.

### **The Economists' View - Where the Differences Are**

#### **Absence of the Business Context**

Since the concept of opportunity cost is originated from an economic perspective, it is quite reasonable to assume at the outset that the cost concept must have been mentioned by the economic authors. However, although economists like Sir Edwards and Coase have asserted the possibility of transforming economic concepts into business application, most economists do not regard themselves having any close relationship with the business context. Thus it is also a realistic assumption that economic authors will not mention about business application of the economic concepts in their texts. A review and study of 25 basic and introductory economic books written between the Sixties and Nineties supports this proposition as most sampled textbooks do not take into account business application of the economic theories. Rather the fact is that little about the business context has been mentioned by these sampled books.

Results of the findings are shown in Table 3:

**Table 3: Frequency Distribution of Selected Economic Topics**

	VALUE CONCEPT	OPPORTUNITY COST CONCEPT	DECISION PROCESS	BUSINESS OBJECTIVE
MENTIONED	25	25	25	5
NOT MENTIONED	0	0	0	20

As revealed from Table 3 discussion of the business objectives are not widely made among the economists (Albrecht & Zember 1985). When business objectives are mentioned about, all writers inevitably advocate the profit maximisation concept as the starting point for discussion (Bach 1987). This is understandable, as economists must initiate discussion from the economic perspective. It is only surprising that economists seldom talk about the indeterministic nature of the maximising concept. Contrary to the management writers there are very few criticisms found in the economic texts about the uncertainties in measuring "maximised" profits. Perhaps the upheld of maximisation concept among economists is inherited from the basic advocacy that economics is to "maximise" benefits obtainable from scarce resources, and most economists observe this rule without any intention or courage to hold a

second look on its validity. Thus the widely mentioned "satisfying profitability" concept among the management writers is hardly discussed about among the economists. Moreover, only one writer devotes more space to the discussion of the existence of multiple objectives in business organisations and the impossibilities of developing measurement systems in such complicate situations (Baumol 1988). However, as stated in his book, Baumol explicitly mentions that:

*"it is not the economist's job to tell what the business goal should be. He only helps to achieve the goal given it is known." (1982, pp 378)*

With the absence of discussion of alternative business objectives and the supposition of Baumol's statement as representing the economists' view, it is tentatively concluded that economists, being bound by their own discipline of learning, take regard the profit maximisation motive as the prime business motive for the firm; and in case of contrary situation economists will then disclaim the functional responsibility in the assistance of objective setting processes. If the above tentative conclusion can be upheld, then it is questionable if economic theories can be satisfactory applied in the business context, since it has already been recognised that the modern business world is no more as simple before, when a single economic motive can be regarded a prime objective for most of the firms. The situation does not vary much even if textbooks of managerial

economics are taken into concern. Managerial economics make special references to the business entities, and thus with a simple random survey of ten books out of a collection of 81 books reveals that all these ten books discuss about business objectives. However, out of them only one book provide much discussion on the appropriateness of the profit maximisation concept and the possible substitution of the satisfying concept (Milgrom & Roberts 1992); and for the others the profit maximisation objective is either simply taken for granted, or asserted as the prime objective of business entities even in a world of multiplications (Farris & Happel 1987).

### **The Economic Perspective in the Decision Making Process**

All the books under survey devote considerable volume of context to the discussion of the decision making process. Unlike the managers and the accountants, economists unanimously assert that the essence of making decisions is to maximise utilities of human beings. This utility maximisation theory forms the core analysis of the decision process irrespective whether business applications have been discussed about. Notwithstanding of the vast volume of discussion, there is however a complete lacking of any description of the decision making process in general, which is contrary to the practice of the management and accounting authors. Rather authors of economics literature spread discussion

of the topic in different sectors of analysis. They have provided considerable discussions as how to maximise profits in individual decision situations, including the particular decision models and equations that are applicable to the situation concerned.

Regarding the cost concept that are advocated in the calculation and measurement of payoffs among alternatives, the relevant cost concept, which is primarily mentioned in the accounting texts, completely disappear in all the basic economics texts under survey, and appears only in two out of the ten managerial economics texts (Mulligan 1989, Pappas & Hirschey 1987). Most economic textbooks adopt the marginal utility approach and provide detailed discussions of marginal cost analysis. Authors of these economic texts also provide a variety of discussions about the opportunity cost concept. Similar to the discussion of decision models, however, not more than a single page thereof can be found in nearly all the studied books. For example, in the book written by Schumpeter, *History of Economic Analysis* (1954), discussion of the concept of opportunity costs can only be found in four pages (page 917, 1044, 1051-2), and the concept only occupies less than a few lines in each of these pages. On the other hand, the discussion of marginal utility can be found in Schumpeter's book in more than 30 pages. As in Schumpeter's book, in most books that are under reviewed the

concept is again mentioned in part under each individual topic of analysis, and it is not uncommon that discussion of the concept and its application is absent in a particular topic. To this phenomenon perhaps Buchanan has provided a possible answer:

“One reason perhaps lies in the fact that the critique of orthodoxy is too fundamental; to accept fully the implications of the theory of opportunity cost ..... requires the modern economists to throw overboard too much of his invested intellectual capital. How can we write the elementary textbooks and teach the elementary course if we cannot draw the standard cost curves? How can we carry out benefit-cost analysis and pretend that we are assisting in social decision-making?” (1973, page 13)

The consequence is that there is no collective general discussion about the application of the opportunity cost concept, and when it is applied, the importance of such can be easily overlooked. Such non-existence of direct reference to the opportunity cost concept in decision choices can also be observed even in classical economics literature, such as Marshall's Principles of Economics (eighth edition, 1920). In the analysis of demand and supply equilibrium, Marshall elaborated the expenses of production and the determination of supply price (pp 343), how equilibrium price could be arrived at

between supply and demand (pp 345), and how values of a commodity were affected by demand and supply with respect to time period (pp 348). But throughout the analysis, Marshall has not mentioned the term “opportunity cost concept” (although in his analysis marginal costs of production equal to the opportunity costs.)

### **A Comparison of the Views**

Based on the findings from the survey of texts, the following issues regarding the rationale and application of the concept of opportunity costs are identified:

#### **1. The confusion about Business Objectives**

Economists have long regarded profit maximisation as a prime business objective, and accountants to a large extent follow the view. However, managers hold a different view and recognise more about the multiplication of business objectives and the conflicts that may arise in the fulfilment of these multiple objectives. Thus in terms of business applications there exist a confusion between accountants and managers of how should the issue of business objectives which affects the determination of the kinds of information required in discharging managerial functions be treated upon, and the accounting information

system that is best fit into the company for the acquisition of such information. This confusion in the determination of business objectives is related to the discipline of learning and training between the economists, the accountants, and the managers. Accountants, by the very nature of accounting, are trained to make use of quantitative (accounting and financial) data to aid in discharging managerial functions. Although it has been recognised by some accountants that the business world is ever more complex in nature, and the functions of the accounting craft must be re-examined and expanded to cope with the complex world (Burchell et al 1980, Hopwood 1987), these pioneered views do not really reconstruct the heritage of the accounting practice and the views of the majority of accountants (Drury 1992). It is still a harsh consideration if accountants in general should give up what can be calculated upon and slide into a space of imagination and judgement, where the traditional merits of objectivity and reliability of the accounting craft can hardly be held any longer (IASC 1989). Accountants exercise judgement, of course. But in most cases judgement are either exercised for the selection of the quantitative model that should be used, or the interpretation of calculated result (rather than the interpretation of the problem situation which includes factors that have not been merged into the quantitative model) arisen from the selected

model. As a corollary, accountants favour a corporate objective that facilitate the selection of the accounting information system, and try to avoid maintaining a system that involves complex information processing which include qualitative factors as well. Thus accountants always cling to reduce the complexity of reality to a simpler, economic oriented business world with simple economic business objectives.

Managers, on the other hand, are trained to adopt complex business objectives without restriction to the quantitative side of analysis, and are thus claimed to exercise total judgement instead of partial judgement arisen there from. Managers therefore require more information than an accountant can provide. It is not uncommon to hear of a manager neglecting an accounting report simply because of the more important qualitative considerations that step in to reflect the reality of the multiplication of business objectives. The inconsistency of business perceptions between accountants and managers thus leads to a diversity of distinctive orientation of the approaches used to analyse and solve managerial problems.

## **2. Controversy of the Cost Concept**

A major barrier in harmonising the views among the economists, accountants, and managers lies on the controversial issue of the concept of cost. Both managers and economists have not provided any detailed analysis of the fundamental nature of the cost concept, and neither have they provided any categorisation about the cost paradigm comparable to that of accounting classification. As a result, there exists a confusion whether the nature of cost is understandable in the same sense between the professional managers and the economists. On the other hand, accountants generally adopt the view that for different purposes there are different costs. Thus, they will and do always alter and change the calculation models to suit different circumstances. Disregarding whether this multivariate cost concept is perfectly logical, the practice in itself has made many managers lost in the myth of the accounting craft. Without thorough training in the accounting process, managers often find themselves unable to tell if the report submitted by accountants are true and correct with respect to the circumstances, and they are confused by what constitutes the nature of costs. The divergence in the understanding of the cost concept has thus led to a controversy of how should a cost be defined, and how should it be measured and ascertained. Given the

controversy in the understanding of the cost concept, therefore, it is not surprising that there are diversions of model constructions and cost calculations. In cases of decision making, the situation is disappointing as well.

### **3. Inconsistency of Application of Decision Costs Concept**

Scholars of all the three disciplines unanimously regard cost benefit analysis as a prime concern for decision making and the determination of the preferred choice. However, in the process of cost recognition and ascertainment, diverged opinions are expressed by different interesting groups. Authors of management texts do not explicitly express any favourite choice of the concept of decision costs; whereas the accountants in majority favour the relevant cost concept which represents prospective cash flow analysis of available alternatives, and the economists base on the domain of marginal utility concept in their analysis. It is apparently evident that the opportunity cost concept is different from the relevant cost concept as one refers to value judgement but the other refers to prospective cash flow analysis. Thus there is inconsistency among the managers, the accountants, and the economists of which concept is more theoretically sound or practically functional in applying to decision

analysis. By applying the relevant cost concept, accountants inevitably calculate the differential cash flows in each alternative in an inhuman manner. As a corollary, different decision makers should arrive at the same conclusion and preferred choice of action. By contrast, economists apply the marginal utility analysis in many cases to determine the final preferred choice of alternative; and thus albeit with the same differential analysis in cash flows, different decision makers still have their own preferred choice. Managers, most likely trained to acquire both accounting and economics knowledge, do not explicitly specify which cost concept constitutes the prime basis of analysis in the decision process. Therefore they are more flexible to shift between different concepts in making various decisions. In any case, as economists do not care much on business applications of economic concepts; accountants do not regard the opportunity cost concept as a prime concern; and managers say nothing more than the importance of judgement, there is no evidence that the opportunity cost concept is applied in business decisions.

#### **4. The Role of Judgement**

In arriving at decisions, management literature proclaims the importance of judgement while accounting and economics literature assert the importance

of system-specified calculations and analysis. The divergence of reliance on different approaches at the crucial stage of the decision process once again demonstrates the incompatibility of the learning and training processes between managers and accountants (and economists as well). Management practice, by its very nature, depends in essence the intelligence of the manager who handles the situation; but in contrast thereto economic and accounting analysis are substantially built up on models and theories that exist on their own irrespective of who handles the situation. The generally inhuman nature of accounting and economic models has led to the consequence that judgement be relatively viewed as a less than necessary process.

There is no intention to propose that economists and accountants completely disregard the importance of judgement, and no argument would be made on whether model specified analysis is more important than managerial judgement. However, the absence of any detailed discussion of merging the two approaches together into a single process to arrive at better decisions does create a knowledge gap between information provision and decision analysis. As revealed from the management literature, judgmental process is a black box and an unexplained process

that is unable to be represented by any formal modelling analysis. Thus there is always a possibility that judgmental opinion deviates from model representations. But can there be some general analysis or guiding theories as how to solve such conflicting situations? Should a manager sticks to his own judgement, or should he sticks to the model implications? Moreover, this knowledge gap probably has deepen the confusion in the application of the opportunity cost approach in the decision making process.

#### **5. The Opportunity Cost Concept - A Common Omission**

Despite the identified differences in various aspects of analysis, there is however a common consensus among the three parties to omit, or neglect, the discussion and the concept and application of the opportunity cost concept in decision analysis. Referring to the results of scrutiny of texts in these disciplines, it is found that the opportunity cost concept has been placed on an inferior degree of attention by the authors, and management authors even simply ignore its existence. Such omission or neglect must be an intentional act, which reflect the views of the authors collectively.

The reasons led to the omission or neglect of the opportunity cost concept

are not known, as the authors have not been interviewed or questioned about. However, one issue is ascertained. To these authors, whether a management writer, an accountant, or an economist, the opportunity cost concept is either a disposable concept or a concept that can hardly be touched must be beyond doubt, otherwise majority of authors would have already included the topic in their books. Disposable concept here indicates that either the concept is not regarded conceptually valid and useful, or the authors believe that the concept is not being widely practised in the business world, and such phenomenon of non-practice is not viewed as unacceptable. To find out the real implication, the views of practitioners are sought and analysed.

## CHAPTER 4

### A MODEL ESTABLISHMENT FOR THE FRAMEWORK OF DECISION MAKING AND THE OPPORTUNITY COST CONCEPT

Given that little evidence can be found from the literature, especially from textbooks, that are able to describe the decision behaviour in actual practices with particular reference to the adoption of costing approaches and models in the business environment, it is suspicious about the actual decision behaviour of business people, and whether they adopt the opportunity cost concept in making decisions. Some early researches have placed doubt on the application of the opportunity cost approach in decision cases (Becker & Ronen 1974), whereas later researches demonstrate that managers include opportunity costs for concern (Neumann & Friedman 1978), especially when these opportunity costs are explicitly provided or made available to the managers (Friedman & Neumann 1980, Northcraft & Neale 1986). However, March (1987) has indicated that managers often do not have knowledge of decision alternatives which constitute the calculation of opportunity costs, and decision uncertainty is a major barrier to the adoption of the opportunity cost approach in decision making processes. Despite the researches mentioned here, there is still a lack of concrete evidence to explain managerial decision behaviour of using the opportunity cost approach in decision processes, and how do they select to accept the cost concept under

different situations (Chenhall & Morris 1991). To explore this arena of knowledge and practice, therefore, a framework of analysis is proposed for research and tests to be carried out in the identification and insights of the unknowns. Since the purpose of this research is to identify the decision behaviour of business managers under the present context of environments, context of the behavioural decision theories, the agency theories, and the expectancy theory are invoked in the establishment of the research framework and subsequent analyses.

### **The Behavioural Decision Theories**

Within the arena of behavioural decision theories, studies are carried out to identify how people make decisions, and in general what factors would affect or constrain the decision behaviour of people (Demski & Swieringa 1981). Different models of analysis and schools of thoughts have been proposed by researchers in explaining why people behave in a certain way and make particular decisions. In general, most theories try to explain the interactions among external factors, internal factors, and the decision characteristics (Einhorn & Hogarth 1981).

## **The Resourceful, Evaluative, Maximising Model**

For the purposes of studying people's decision behaviour, it is essential to arrive at a definitive set of human nature, which can be based upon to analyse and explain human behaviour and decisions. Regrettably, there is substantial controversy among scholars of different disciplines, or even among scholars of the same discipline, about the nature of human beings (Maslow 1970, McGregor 1960, Ouchi 1979, Jensen & Meckling 1994). Because of the differences in the perceived human nature, various models are developed in different directions, each pertaining to its own assumptions and inference of human behaviour including decision behaviour. For the purposes of this research, the Resourceful, Evaluation, Maximising Model (REMM) as proposed by Jensen and Meckling (1994) is adopted as the base model for the analysis of human behaviour.

According to the REMM, the following postulates are put forward:

Postulate I : Every individual cares : he or she is an evaluator

Postulate II : Each individual's wants are unlimited

Postulate III : Each individual is a maximiser

Postulate IV : The individual is resourceful

(Jensen and Meckling 1994, Page 4 and 5)

Based on the REMM, every individual is a utility maximiser. The major

difference between a REMM person and an economic person is that the REMM person does not calculate total utility purely on economic terms. He cares other things be they economic, sociological, psychological, and ethical. This proposition is more compatible with the contemporary management theories, as it has been demonstrated that human beings have multiple goals and are willing to trade off economic benefits for qualitative rewards. Another important postulate of the REMM model is that the individual is resourceful. Thus the individual can always react to the changes of circumstances and identify new opportunities in maximising total utilities. This resourceful characteristics will thus enable the individual to change his decision behaviour and adopt a new decision approach under different circumstances in order that he can maximise his total utilities in every case, rather than sticking to one or just a few "programmed" behaviour that cannot provide optimal results to a variety of uncontrolled circumstances.

The adoption of the REMM model enables this research to be carried out according to the proposed theoretical framework:

1. The research is carried out with an emphasis of individuals, rather than individuals as a group, or even from a social approach as proposed by many sociological models. This is crucial because models used to test

decision behaviour from an individual perspective are distinctive from those used to test decision behaviour from a social perspective, which emphasise the social impact of individual decisions, and how individuals observe the social constraints in making decisions. Adopting the REMM allows the test of decision behaviour from the individual perspective, which is the core concern in this research.

2. The adoption of the REMM model as a base model allows different predictions to be made about decision behaviour, and incorporates non-economic factors in the analysis to make it more close to reality.

### **Attributes of Decision Behaviour**

Although the candidate has suggested a basic model in the formulation of the basic nature of human beings, it is admitted that the REMM model is only concerned with the broad based issues in human nature, and divergence in behaviour will certainly be observed among different persons although their behaviour are all compatible with the REMM model. This divergence in behaviour is observed among people in each of the stages throughout the decision process in arriving at the ultimate decision. Starting from the information gathering stage, people would demonstrate different behaviour and

attitude in collecting data that are required. It is always recognised that perfect information cannot be obtained in most cases, and thus there is always a decision of how much information should be obtained before the decision can be made, and what constitutes the acquired set of information. The collection and acquisition of information consumes resources that include time, effort, and monetary expenses. According to the costs and benefits criteria, the benefits brought by the information must exceed the total costs in acquiring the information. However, the calculation of costs and benefits inevitably involves judgement in most cases. Thus either the cost benefit analysis is not effectively carried out, or it involves subjective judgement that cannot be transmitted to the knowledge of the others (Einhorn & Hogarth 1981). A possible solution is the bounded rationality approach in making decisions (Simon 1957, 1976). However, if the costs of effort (which constitute pain costs) are taken into concern, perhaps the bounded rationality concept which relates more to the satisficing approach is incorrect, as the decision maker considers himself making an optimal decision in maximising utilities (Einhorn & Hogarth 1981, Jensen & Meckling 1994). The same situation repeats in each subsequent stage as detailed in the paper by Einhorn and Hogarth (1981), and thus it is not intended to restate here to avoid tautological repetition.

Apart from viewing different behaviour at each stage of the decision process, previous researches have demonstrated possible interactions of external and endogenous factors with decision behaviour, including organisation structure and system specification (Hopwood 1972, Otley 1980), organisational culture (Soeters & Schreuder 1988), and communication symbols (Dent 1991). Personality and cognitive style of decision makers also constitute an important area of study in decision behaviour (Gul 1984). Despite a handful of research literature is available for the behavioural decision theories, most research is aimed at providing explanations in specific settings without an attempt to establish an integrated framework, from an accounting perspective, for a complete analysis of how managers employ different accounting concepts and models in decision making processes and whether they have invoked these accounting models and concepts functionally or otherwise. More recent application of the behavioural decision theories is found in research in the auditing areas (Hogarth 1991). But even in these research the essence of theoretical base are borrowed from previous research in other disciplines such as sociology. This lack of an integrated framework between decision behaviour and accounting information context has lead to an uncertainty of how accounting craft can be used effectively and functionally in assisting managers in making business decisions, given the postulate that he will try to maximise total utilities

under the circumstances. Thus there is a need to put forward a model of analysis to bridge the gap.

### **The Agency Theories**

The agency theories in dealing with the relationship between an agent and his principal accept the general proposition that the agent will maximise his own benefits even at the expenses of the principal. This is compatible with the REMM model, which also signifies that an individual will always behave to obtain maximum utilities. The agency theories have put forward certain further assumptions about the circumstances that have important impacts to the behaviour of both the principal and the agent:

1. An agent is effort adverse. Thus if he can spend less effort in doing his job without affecting his subsequent rewards, the agent will not work any harder to finish his assigned job (by the principal) in any better way.
2. The agent possesses asymmetric advantages over the principal. That is, either the agent possesses some information that is not obtainable by the principal, or the agent has acquired certain knowledge (technical or otherwise) which the principal is lacked of.

3. As a corollary of point 2 above, or because of other constraints such as geographical or location constraints, the principal cannot observe and assess the amount of effort provided by the agent. Rather the principal only observes the results of the agent to determine whether the agent has done a satisfactory job in fulfilment of his requirements.

Given the basic presumption that an agent will work for his own benefits, and the three assumptions about the principal agent relationship, it is suggested that an agent may act in such a way that his own benefits are maximised while the principal's benefits are not. This outcome is of course contradictory to the intention of the principal, who engages the agent to work for the benefits of the principal. Undesirable behaviour such as adverse selection or moral hazards are mentioned in literature, with an expectation of making use of some form of arrangements to get rid of such undesirable behaviour from the agent (Baiman 1982). With the development of different branches of the agency literature, proposed solutions also diverge into different aspects of analysis, and distinctive methods and models are put forward to solve the agency problems (Baiman 1990). However, despite the agency literature represents one of the major research domains since the 1970s, most researches are emphasised on the design

of various reward and compensation models, or control and monitoring models, that can avoid or minimise the negative impacts brought about by the possible undesirable behaviour of the agent. Hardly is there a paper in the agency literature which investigate the application of the theory into analysis of actual decision behaviour of an agent through the adoption of different cost models in maximising his own benefits.

Combining the behavioural decision theory with the agency theory, with the REMM model being bear in mind, some initial postulates can be formed regarding the managerial decision behaviour of a business manager, who is supposed to be an agent of either his senior officers, or that of the shareholders:

1. A business manager will try to maximise his own benefits. If there is incompatibility between his self-benefits and the benefits of the company (or its shareholders), the manager probably behaves in a way to maximise his benefits at the expenses of the company.
2. Because the manager as the agent often possesses asymmetric advantages (information or knowledge) over his principal, and the manager is resourceful, he can always adopt a particular mode of decision behaviour

in accordance with different decision circumstances that may not be easily challenged by the principal.

3. Given the accumulation of cost data and the use of a particular cost model reflects to certain extent asymmetric characteristics, the manager can often shift his preference of using a particular cost model in arriving at managerial decisions, and justify his selection choice of costing models in a way easily acceptable by the principal.

These propositions taken together have demonstrated the fact that despite the opportunity cost accounting model is regarded as the preferred model that should be used for decision making, in practice this is not necessarily the case. A manager will only employ the opportunity cost model if this model can bring to him maximised benefits. Because the manager needs to project expected results of the adoption or otherwise of the opportunity cost model, therefore, the expectancy theory is also regarded important in the formulation of a comprehensive framework for decision behaviour analysis.

### **The Expectancy Theory**

In his original formulation, Vroom (1964) tried to explain the pattern of human

behaviour with the expectancy theory. According to the theory it is presumed that people in the absence of coercive force behave in a way to obtain personal benefits. The intention of obtaining personal benefits directs people in formulating certain behaviour patterns, which are affected by certain factors and valence, through the perceived expectations of people. According to this proposition, human behaviour is a resultant expectation among three variables, that include the self perception of effort (E), a perceived or expected relationship between the magnitude of effort and its resulting performance (a factor P, such that E --> P), and a perceived or expected relationship between the expected performance that will be achieved given certain effort is provided and the possible reward or value (V) that will be obtained by the person in achieving such performance (P --> V). This proposed relationship can be expressed as a function:

$$\text{Behaviour} = f(E, P, V) \text{-----} (1)$$

In a symbolic context, expectancy theory suggests that a person will try to behave in a particular way or pattern that can maximise his own expected total value brought by the interactions of these factors, such that:

$$\text{Max Behaviour} = \text{IE} + \text{IP} + \text{IV}, \text{-----} \quad (2)$$

Where, IE = intrinsic value that is brought about by the utilisation of effort in achieving some task and performance

IP = intrinsic value that is brought about by the relative achievement of task performance, and

IV = intrinsic value that is associated with the possible rewards brought about by the achievement of task performance

Note: The term intrinsic value is used to denote that value calculation and judgement are performed purely by the decision maker, and represent personal views that may not be objectively justifiable in any way

The intrinsic value that is brought about by the utilisation of effort can be positive or negative. In a more general interpretation most people view effort as an undesirable input, as also proposed in the agency theory, so that the more effort is needed, the greater the negative value is assigned thereto. However, to people who are fond of work (as in extreme cases the workaholics) the provision of effort can be positive, such that they will gain enjoyment through the work process in itself without any necessity of achieving some targeted result. The intrinsic value of performance is usually positive, its magnitude being dependent

upon the relative perception of the degree of achievement with respect to the provision of effort. The intrinsic value associated with the rewards brought about from successful task performance is also positive. Of course there can be negative rewards such as disciplinary actions or penalties for unsuccessful performance, which provide negative values to the decision maker. One of the suggested solutions in the agency literature is the institution of negative reward systems to deter managers (agents) from performing in a sub-optimal way (Baiman 1982). Thus, it should be noted that the additive sign in this formula is a symbolic sign rather than a precise mathematical sign.

In the simple case of certainty, if a person can be sure of the relationship between effort and performance, the relationship between performance and reward, and the values associated therewith, then he can easily calculate how much effort he should provide in achieving a certain level of task performance and receive the associated rewards brought by such level of performance. For example, suppose a student knows that he can get an A grade in a certain subject if he studies six hours a day, or a B grade if he studies four hours a day. It is further supposed that the student's father has promised him that he will be given a model aeroplane if he gets a B grade, or a bicycle if he can even get an A grade. Then the student can simply plan to study either four hours a day or six hours a day, depending on

whether he wishes to have a model aeroplane or a bicycle. In other words, if the student is already satisfied with a model aeroplane, then he will not spend six hours a day to his studies, given the assumption that he views study time as a negative factor and would like to spend as less study time as possible in obtaining his desired rewards.

As the intrinsic value associated with effort is a very personalised factor, which is not subject to control and manipulation (except by using cultural control and related mechanisms), the domain of research in the expectancy theory lies on the setting and design of the performance and reward mechanisms so that these settings would induce people to behave in a certain desired pattern. Referring to the simple example of model aeroplane and the bicycle, if the father knows that the child does not like cycling and only wishes to obtain the aeroplane which is his favourite toy, then he can manipulate the reward structure by saying that no gift can be obtained for a B grade result, and a model aeroplane will be given as an award for an A grade. In this way the child would be induced to study harder for an A grade, which is desired by his father. The essence of motivation as demonstrated in this simple example is the clear demonstration of the relationship between performance and reward, and the setting of an appropriate reward structure. The crucial success in the application of the expectancy theory is the

ability to formulate the perceived relationship between effort and performance, and in turn between performance and reward, so that ultimately there is a perceived relationship between effort and reward.

Based on the expectancy model, two situations will destroy the whole process of determination of behaviour pattern. The first situation is that there is a clear breakdown of the relationship among the factors of concern. If the person who is going to act and behave cannot identify any existence of relationship between effort and performance, or between performance and reward, then he is only left to act in the least way to save effort and minimise the negative impact thereof. For example, if a person considers that he can never achieve the task no matter how much effort he wishes to provide (such as achieving an ideal level of budgeted performance), which leads to a result that he can never obtain any rewards (salaries or bonus) associated with such task performance, then he will choose to provide minimal effort in his job, disregarding if the resulting performance is worse or not. The same behaviour will be observed if the person finds out no matter how good his performance is, he will only be paid a basic salary which is fixed irrespective of any improvement in performance. In these conditions the expectancy model still applies, but the problem is that the value assignment to the latter two factors becomes zero:

$$\text{Behaviour} = \text{Min } E + IP + IV$$

$$\text{Where } P = 0, \quad V = 0$$

An exception to this situation applies to those people who are fond of work or even workaholics, since these people enjoy work in itself. Also in order to restore the expectancy relationship, coercive forces and / or penalties for failed task performance are proposed by many organisational theorists where situations warrants. With the use of coercive forces or penalties, a negative value is assigned to performance and reward factors, so that people although gaining nothing by their positive behaviour, but are nevertheless forced to behave in a way to avoid negative results. These coercive forces and subsequent penalties can either be a physical measurement (such as a tough and close supervision), or they can be applied through the use of accounting and other informational system controls. The use of accounting controls in the context of expectancy theory as a motivational device or a controlling device has been proved to be successful in different circumstances (Ronen and Livingstone 1975, Otley et al 1990).

The second situation that will distort the application of the expectancy model in identifying behavioural patterns is the remoteness of perceived relationship

between the factors due to uncontrollable variables such as event uncertainty or data inaccessibility. In a world of imperfect information and asymmetric distribution of information, the simple case of certainty usually does not apply to most of the decision and action situations in practice. Since there is uncertainty about the performance or reward factors, the decision is unable to calculate a single value for his expected effort. Rather there will be different possible results arising from his expected effort, which lead to different values as judged by the decision maker on each possibility. Therefore, the possible outcomes of performance and reward have to be represented by some statistical models of analysis that provide a cluster of event payoff probabilities for people to consider. When the factor of uncertainty is introduced, the expectancy model will be framed in a different way:

$$\text{Behaviour} = IE + \sum R_1 IP + \sum R_1 R_2 IV \text{ ----- (3)}$$

Where  $R_1$  = probability that task performance is observed,

$R_2$  = probability that performance leads to reward

In a business context, a manager can often determine how much effort is to be provided, because his principal may not observe and determine whether he is

contributing enough effort to his assigned duties. However, based on his effort, there may be different possible outcomes of performance, each level of performance having a probability of turning into occurred performance. Because the manager will probably assign different intrinsic values to the various levels of performance, he will find that the actual satisfaction level depends on which performance level is realised by his effort. For the purpose of arriving at an estimation or expectation of his realised values, the manager has to make use of certain method to determine the aggregate value of possible outcomes given his effort. Moreover, if given a level of performance is observed, there are different possible rewards that may be obtained by the manager, then the manager again has to make use of some method to determine the aggregate value of possible rewards given a particular performance. The resultant behavioural pattern will depend on under what methods the manager accounts for the aggregate values of performance and the aggregate values of rewards. No matter which method is used, however, the calculated values become more and more remote and indeterministic as the probability occurrence of performance and reward become more and more uncertain and unpredictable, to the extreme when probability distribution is completely unavailable, the relationship among the factors breaks down as if there is no relationship whatsoever among these factors. Thus in order to withhold the expected relationship among these factors, the probability

distribution of different possible events must be established in some acceptable way as perceived by the business manager. With reference thereto it is proposed that people will try to take actions to reduce the degree of uncertainty and increase the degree of predictability in order that he can construct his own behavioural pattern according to his value perception and expectations.

Moreover, as proposed in the agency literature, the principal cannot observe the effort of the agent in many cases. Thus there are cases where a manager can provide less effort and arrive at a sub-optimal performance without affecting his predetermined rewards. Combining the agency literature with the expectancy model, it is obvious that a manager will, based on the corporate rewards system and other observed benefits (monetary or otherwise), calculate the possible expected outcomes of his behaviour pattern with reference to efforts and performance, to arrive at an optimal decision choice that will grant him maximum utilities in expectation. And because the manager is resourceful, he can often shift his decision choices even if the rewards and other systems change for the purposes of invoking desirable behaviour as advocated in the agency literature, so that his expected total utilities are still maximised under the new and revised circumstances.

## **The Framework of Decision Behaviour**

### **And the Adoption of the Opportunity Cost Approach**

With the context of the behavioural decision theory, the agency theory, and the expectancy theory, a framework of decision making behaviour is constructed for tests and verification. Before the proposed model is put up for substantiation, certain issues have to be clarified. As stated by Hogarth (1991), researchers looking at the decision making behaviour focus their work on three questions:

1. How well do people perform particular mental tasks?
2. How do people perform particular [decision] tasks? And
3. How can you help people perform better? (page 278).

Although the above three issues are core concerns and deserve much effort in providing insights thereof, it is impossible to incorporate all these three issues in a single research study, and thus this research study will only emphasise on the second issue to gain an insight of how do people make use of different accounting models to perform decision tasks.

### **How Well do People Make Decisions**

In the process of decision making, people will go through the processes of information processing, identifying the possible alternative actions and their

relative consequences, and assessing the risks that have to be borne in the light of possible errors in making judgement. People under normal circumstances which allow them to maximise their expected utility, are expected to select a particular choice of action that gives the highest likelihood to achieve their perceived objective in making the decision. Although it is impossible to directly observe the cognitive process of human beings in making decisions (Buchanan 1973), cognitive researches in auditing has demonstrated that it is possible to assess how well a decision has been made in a retrospective mode, when a comparison is made to test how close the chosen decision and action are in achieving the expected results (e.g., Ashton & Ashton 1988). However, since these research studies mainly focus on the arena of auditing tasks, it is uncertain if any results and conclusions arising from such research studies can be applied to other tasks specific situations, because different task representations may affect the behaviour of the decision makers (Hogarth 1991). With regarding to the general business environment, there is a lack of sizeable volume of literature that can provide any concrete insights of how well business decisions have been made by managers (Jensen & Mackling 1994, Hammer & Champy 1995).

Apart from the lack of sufficient reference literature in pursuing a study of how well managers make decisions in the business environment, the following issues

also lead to a deferment by the candidate of such studies to a later stage, not until the issue of how people make decisions has been thoroughly studied and understood in the cognitive decision researches. These issues include:

1. The impossibility of assessing the validity of a decision in an integrated, retrospective sense.
2. The uncertainty of whether decision makers in fact always aim at making optimal decisions
3. The difficulty in the calculation of error parameter in making sub-optimal decisions

### **The Impossibility of Assessing Integrated Decision Validity**

As proposed by some researchers (e.g., Ashton & Ashton 1988), it is possible to assess how well a decision is made by looking at how close (or how far) the actual results brought by this decision and choice of action adheres to the expected results. However, the retrospective assessment of decision validity only gives an illusion of the whole situation. In this kind of validation process, only the selected course of action is checked to see if it really hits the target, or

how far this chosen action misses the desired objective. However, the possible outcomes of other alternatives that originally can be chosen are discarded and have not been taken into consideration. There is a possibility that some of these discarded alternatives actually provide a better result than the chosen action, but this situation will not be known, because these discarded alternatives are not tested in any way to see if they achieve the desired objective more effectively. Since the discarded alternatives are not retrospectively tested and compared with the chosen action, a person can never know how well he has made a decision by selecting a particular choice of action and giving up all other alternatives. Once the alternatives are discarded, the actual results (which are possibly different from their calculated or expected results) that would be brought by the adoption of such alternatives then disappear and would never be known to any one else. This irrevocability of decision making process thus leads to the situation that the decision maker can only observe the results of the chosen alternative, and thus form a partial judgement as to how well the decision has been made (Ijiri 1981).

To provide a comprehensive measurement and analysis of how well a person makes decision, the only possible way is to go back to the original situation and look at the actual outcomes by selecting other alternatives. Since this mode of comprehensive analysis is virtually impossible, therefore the retrospective

assessment of decision validity is usually adopted. I am not saying that assessing the partial validity of decision judgement is completely useless, rather continuous improvement of decision judgement in the partial sense enables the decision maker to make better decisions and obtain greater benefits. I just wish to point out the inherent limitations in the work of measuring and assessing how well do people perform mental tasks and make decisions, which can be solved only if the REMM model is proved to be valid in the explanation of decision behaviour. Thus, the present research study can provide a support to the future research studies of assessing decision validity.

### **The Uncertainty of Decision Objectives**

Notwithstanding the inability in measuring and assessing the comprehensive validity of decision process, these measurements have to be based on the presumption that the decision maker wants to make "good" decisions. As interpreted in the partial sense in above, a possible way to measure how well a decision has been made is to look at how close the actual results of the selected alternative adhere to the expected results. To ensure that a comparison process can made between expected results and actual results, it is crucial that the decision objective and the perceived expected results are calculated and ascertained at the time of decision. However, unless otherwise clearly

announced by the decision maker, it is difficult for an observer to determine what is the real objective of the decision maker in making decisions, and this in turn leads to an uncertainty of what constitutes expected results. In the absence of a clear indication of a decision objective and of expectations, it is vary hard, if not impossible, to measure and assess how well a decision has been made, and how well do people perform decisions. It is clear that whether a decision is good or bad can only be determined by the decision maker himself / herself, because only he / she really knows about the objective and the desired results in making the decision.

Even if the decision objective and expected results are made known to the observer other than the decision maker himself, the studies of how well people perform mental judgmental process and decision making choices still face the problem of ordinal comparison as a constraint to the determination of decision fitness. An assessment of fitness involves the abstract conception of value judgement and interpretation, which is unable to be analysed and presented in a simple, cardinal scale. It is safe to conclude that a decision that leads to an achievement of 90% of the original expected result is better than its alternative which can only achieve 80% of the expected result. But it is very hard to provide a satisfactory answer in stating how far the first alternative is "better" than the

second one, other than a simple, superficial response of stating that the first alternative earns 10% more. The problem emerges here is that a cardinal scale system is often used to represent an ordinal ranking process, which leads to a trap of misinterpreting the ordinal results in a cardinal sense. If the decision objective is to fill up a bag with 100 units of commodities, then an alternative that brings in 150 units is as good as another alternative that brings in 200 units. The quantitative difference in this case between the two alternatives does not bring in any ranking difference in the ordinal sense, and thus any proposed discrimination between the two alternatives is inappropriate, other things being constant.

Moreover, there is not sufficient evidence that people always want to make "good" decisions. Although in the classical economic context people are always assumed to act in a rational way, modern management literature has already abandoned this presumption and recognised that there are times when people make irrational decisions and perform judgement without any wish of obtaining rational or desired results (Rowe et al 1994). In these circumstances, an attempt to measure "how well" a decision has been made will result in a total loss. For if a decision is made for some irrational objective, it is arguable if a decision that achieves such irrational decision objective can be regarded as a "good" decision

from the general view. One may argue that the decision is still a good decision if it can help to achieve the objective of the decision maker, be it a rational or irrational objective (Hayek 1935). However, from the theoretical perspective only decisions that can improve the welfare and benefit of the decision maker can be regarded as good decisions, and in most cases an irrational decision objective will invoke actions that reduce the benefits obtainable by the decision maker to a greater or lesser extent. The controversy in the definition of good decisions under these circumstances thus renders a measurement and assessment of how well people perform mental decision process falling into a mist of uncertainty (Hogarth 1991).

### **The Difficulty in the Calculation of Error Parameter**

Another restriction to the study of how well a decision has been made relates to the difficulty in calculating the error parameter of the decision alternatives. Although ideally it is in the people's best interests if people can always make best decisions. In practice, however, it is unrealistic to imagine that any person can make best decision in every single case. It is also proposed that in many cases a person does not need to make the best decision (Toda 1962). Decisions, in many cases, are not isolated actions but rather part of a series of decision chains that interact with each other in building up a chain effect of ultimate results. There

are many cases when an apparent isolated decision choice subsequently proves to have significant impact to the decision maker and the environment and affect other decision choice consequences unexpected by the decision maker. The existence of this kind of unexpected chain effects in the decision processes brings out the issue of when to determine whether a decision is erroneous and how great is the committed error (Einhorn and Hogarth 1981).

The first problem in measuring the error parameter is the fact that a decision that is optimal in itself does not necessarily bring to optimal results for subsequent decisions, and vice versa. If one can successfully calculate all the chain effects of individual decision choices, then he can safely assess the resultant opportunity profits and losses of the whole series of decision chains and select the best combination of decision choices in arriving at the best results in the total and ultimate sense. However, as mentioned in the previous chapter, a person may not even aware of the possible chain effects that could have possibly arisen, so that the potential opportunity costs are not taken into calculation at all. Thus in the presence of potential opportunity costs and the reversibility of decision effects, a choice has to be made if decisions are assessed at the time when it is made and with respect to its direct consequences under the principle of bounded rationality (Simon 1957), or if the assessment are continuously revised as and

when new impacts are identified, until the time when it is certain that the chain effects of the original decision have ended? The second alternative of course would result in an impossibility of calculation of decision value and error parameter in most of the decision cases. In fact it can be argued that application of the bounded rationality principle in a decision case is the only feasible way in arriving at the best decision compatible with the general decision theories. But the problem of adopting this approach is that a manager may give up any concern of what would happen in the long run by hiding behind the bounded rationality principle. It is well understood that as the time frame of concern extends farther into the future, more and more uncertainties and potential opportunities will appear, making the calculation of the chain effects of any immediate decision choices more difficult. Thus a consideration of long run effects by its inherent nature must involve risks and uncertainty, and a higher degree of magnitude in the error of judgement. Given a consideration of long run is regarded as desired in the business environment (Drucker 1991), the calculation of error parameter among decision alternatives in the presence of unidentified chain of effects seems to be an inevitable problem in assessing how well a decision has been made.

A closely related problem in the measurement of the error parameter is that since people do not always need to make best decisions, sub-optimal decisions are not

necessarily dysfunctional. Repeating the same simple example in the previous section, if the decision maker only aims at filling up a box which requires 100 units to fill it up, then an alternative of getting 150 units is as good as another alternative that brings in 200 units, since both alternatives can meet the decision objective. Based on the task orientation argument people will view it perfectly functional to take the alternative and obtain 150 units, even though the other alternative of obtaining 200 units is also well known to the decision maker. The problem here is whether the alternative of obtaining 150 units only should be regarded as a sub-optimal solution with errors committed in the sense that 50 units less have been obtained. One may argue that the 150 units alternative is an erroneous choice because although in the present situation only 100 units are required, the decision maker should nevertheless get 200 units now and leave 100 units for future uses if all other concerns are indifferent between these two alternatives. This argument emphasises the results of the decision alternatives by themselves, and assumes that people always favour more endowment than less; but it disregards the basic issue of a person's need to make decisions.

### **How do People Perform Mental Decision Processes**

Because of the issues and problems stated in the previous section, it is suggested that research effort should be focused on the more basic question of how do

people perform mental decision processes. I of course admits that it is very important to identify how well are decisions being made. The problem is what we should know is not equivalent to what we can find out and know about. Moreover, it is strongly argued that unless and until sufficient evidence have been obtained for a thorough understanding of how people make decisions, it is rarely fruitful to jump one step and assess how well people have made decisions. To substantiate this argument, the following reasons are put forward:

**1. A Study of Fact must Precede A Study of Rationale**

Although to date research, notably in the auditing profession, has been carried out in identifying the process of judgement and decision making by the decision maker [auditor], most of these researches have been focused on some restricted tasks that are isolated from the more general and complex environment in which judgement and decisions are made (Hogarth 1991). Thus there still lacks a comprehensive and thorough understanding of how people perform the decision and judgmental process in different environments. However, it is a priori crucial concern for a person's decision behaviour be observed and studied before an assessment of how well such decision has been made. With the presumption that people make judgement and decisions based on some predetermined

objectives, there are three possible circumstances that are needed to be clarified upon:

- A. Given people have determined to achieve an objective, they will make the same decision and take the same action disregarding the changes of circumstances.
- B. People change their decision and behaviour under different circumstances in order to achieve the same predetermined objective.
- C. People modify or change their decision objective when the circumstances have changed, and in turn people modify their judgement and decision behaviour to suit for the new decision objective.

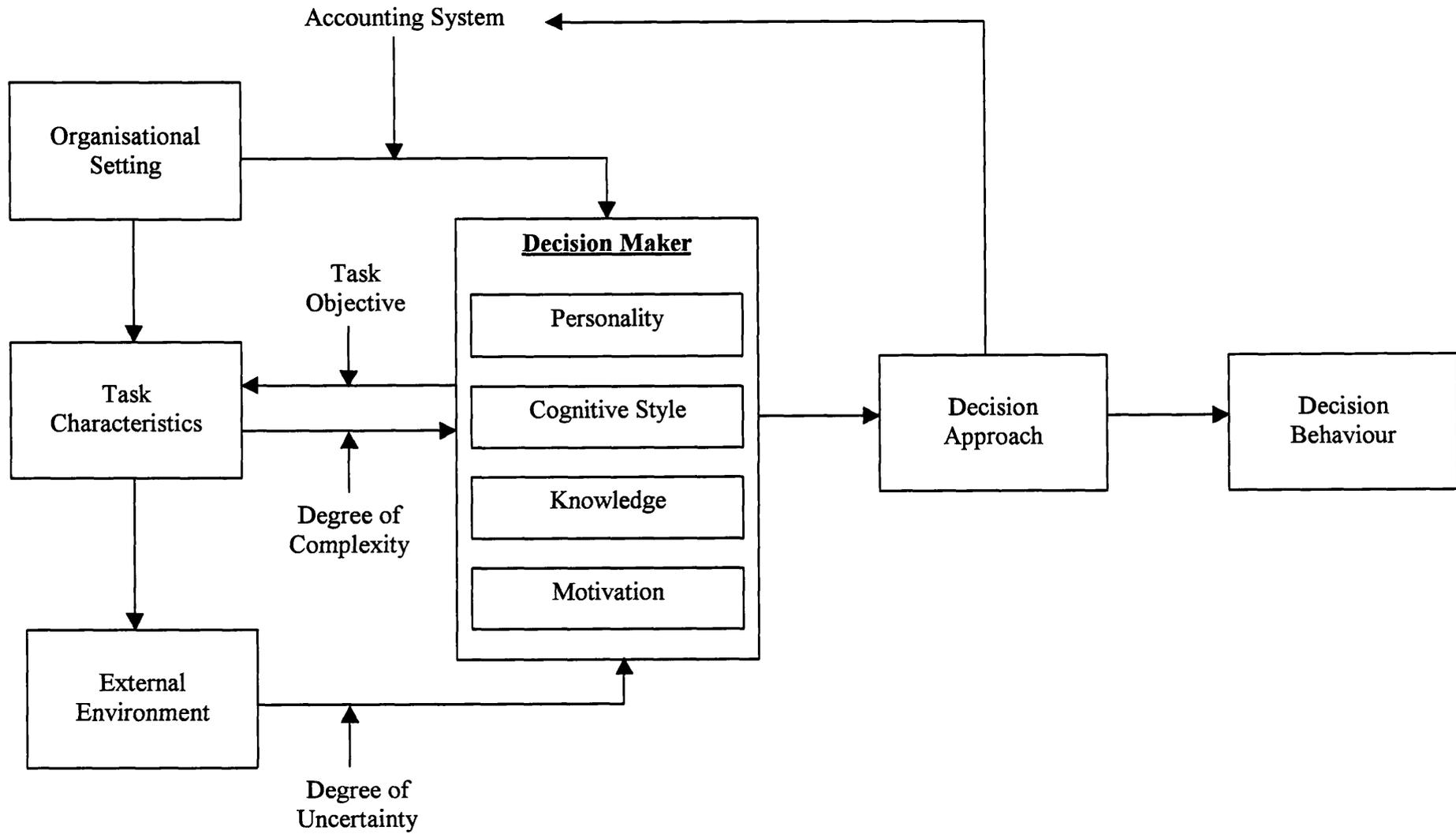
To enable any assessment of decision behaviour, it is crucial in the first place to have a thorough understanding about how people behave in respect to different circumstances and the reasons and rationale that induce them to behave in such a way. In light of the environmental factors and their impacts, a decision maker will decide to go ahead with his decision

and act in the predetermined manner if he considers that the circumstances have not contravened his opportunity for success with the chosen actions. He may select to change his decision behaviour if given the circumstances he considers that only by modifying his behaviour can he have a chance to achieve his predetermined objective. The decision maker can also find that the circumstances are in such a situation that he will not have any chance to achieve the original objective, so that he has to modify his original objective to suit the circumstances. However, there is little knowledge about what factors would constitute the circumstantial perception of the decision maker, and how he would be affected by the different compositions of these factors either in a mutually independent state of occurrence or interacting together in a matrix context.

## **2. How Managers Act is More Important**

It is recognised that an understanding of the rationale of behaviour is important in the study of decision behaviour. However, from a functional perspective and in the role of the observer, an understanding of how managers actually behave assumes a more direct and important role in the prediction and adjustment of decision behaviour. From a positive view (Watts and Zimmerman 1990), it is not necessary for a researcher to

**Figure 2 : Framework of Cognitive Decision Theory**



understand the underlying rationale of a person's decision behaviour, rather it is more important if the research can accurately predict how the person under study will behave in different moderated situations. As long as decision behaviour can be observed and predicted, decision consequences can more easily be calculated and predicted, so that moderating actions, if needed, can be implemented well before to safeguard the occurrence of desired behaviour. By taking the positive approach, it is not necessary if people would have the same common belief or shared values. If people can arrived at some agreed behaviour which provide benefits to all parties concerned in the achievement of their respective objectives, then they will observe this agreed behaviour and act accordingly. Behavioural congruence can thus be formed for the mutual benefits of the parties concerned.

To operationalise the study of decision behaviour in the understanding of circumstantial factors, a theoretical framework which is called the Expectancy Decision Processing Model, and which is constructed with reference to the decision behaviour theories, the REMM model, the agency theories, and the adoption of the opportunity cost concept in different decision situations is proposed herewith and illustrated in Figure 2.

The Expectancy Decision Processing Model is constructed with the aids of the REMM model, the Expectancy Theory, the Behavioural Decision Theories, and the Theory of Choice which constitute the corner stone for the concept of opportunity costs. The basic framework of analysis for the model is as follows. With the presumption that the decision maker has in mind a certain predetermined or modified decision objective, it is argued that the decision maker would either modify the state of existence of the factors under concern, or modify his selection choice of decision behaviour, or both, in order that he can have a greater chance of achieving his desired objective. With reference to the adoption of the opportunity cost approach in the decision making process, it is understood that the opportunity cost approach is just one of the many costing approaches that can be invoked and used by the decision maker. It is also well known that different costing approaches will arrive at different results (Clark 1923, Horngren 1986). These cost results then act as an indication for the ranking of preference orders among different decision alternatives, in a way that different cost models give a different preferential ranking list with alternatives placed in different positions. An alternative that ranks first in respect to one model may rank in a much lower position if another cost model is adopted. Thus the adoption of a particular cost model and cost approach affects the final selection and adoption of a particular decision alternative and the taking of certain decision behaviour by

the decision maker. As a corollary a decision maker will only adopt the opportunity cost approach if he finds out that the opportunity cost model would give him a desired calculation and ranking process that points to his desired behaviour in the achievement of the predetermined decision objectives. However, as discussed in the previous sections, a decision maker may or may not adjust his decision behaviour or even decision objectives (which would again lead to an adjustment of behaviour) under different circumstances, thus there is a possibility that a decision maker would select the opportunity cost approach to aid him in the decision process in one situation of circumstances, but alter to select another cost approach when the conditions change. Previous research has proposed that decision behaviour is a function of task characteristics, decision maker characteristics, and the interaction between the two (Hogarth 1993, Peters 1993). However, it is argued that other factors also contribute to the explanation of decision behaviour in a commercial environment apart from task characteristics and decision maker characteristics. With reference to the expectancy theory, it is also argued that perceived reward structure also forms an important factor in the determination of decision behaviour. Therefore, in order to have a clearer understanding of how people perform decision and judgement, and under what circumstances would they select the opportunity cost accounting model and approach, research is to be carried out to identify the factors that

would affect the decision maker's choice in the selection of the opportunity cost model in the decision process. At the initial analysis, it is proposed in the first place that certain factors exert more influence to the decision maker's behaviour in the decision making process.

### **The Organisation Setting**

A manager makes decision in a particular organisational setting. Every individual organisation has its own peculiar settings. These organisations differ in many aspects, such as the nature of business, the corporate culture and the management philosophy, and size of the firm, the background of its staff team, the accounting information system that is adopted, and performance evaluation and reward calculation system, and many others. All these factors when acting together form a peculiar organisational setting within which a manager is to make decisions. Some of the factors that contribute to the particular mode of organisational setting may be adjustable by the manager within a short period. However, other factors may not be adjustable unless and until a complete restructuring of the organisation is undertaken. The peculiarity of individual organisation in its setting often forms a constraint or boundary for a manager to restrict his choice of actions in different situations, and in some cases it can even modify the behaviour of its staff (Hofstede et al 1990). Disregarding the

socialisation process of organisational setting, at least it is argued that organisational setting will affect the attitude and behaviour of a manager in making decisions, because except in rare cases a manager cannot make any decision that is completely contradictory to the established setting of his organisation. Among the different factors that contribute to the organisational setting, two factors are particularly viewed as more influential to the manager's decision behaviour:

#### **1. Accounting Information System**

According to law every limited company, private or public, must maintain a full set of financial books for the recording of the transactions and affairs of the company (Hong Kong Companies Ordinance, Chapter 32). This set of financial books will enable the directors (accountants) of the firm to prepare the set of financial statements including the balance sheet, the profit and loss accounts, and other statements to be presented to the shareholders of the firm at the annual general meeting. Moreover, the Companies Ordinance has laid down some prescriptions and guidelines as to the kind of information that have to be presented to the knowledge of the shareholders.

However, with respect to internal operations, there has not been any prescription in the Regulations that a company must maintain any set of cost and managerial accounts, and thus the maintenance of a management accounting system is purely at the discretion of the management of the firm. As a corollary, some companies maintain a cost and management accounting system, while other firms do not. And to the companies that maintain a management accounting system, the format and context of this system vary according to the perceived requirements of individual managers. Because of the variety in the design and operations of a management accounting system by different firms, different information will be provided accordingly. The core concern is that in most cases a financial accounting system general prescribed in Hong Kong does not provide opportunity cost information, and neither do many management accounting system. In the absence of an accounting system or database that can provide opportunity costs for decision making purposes, managers will find it very difficult to apply the approach, and the application of such an opportunity cost approach may well enhance the degree of uncertainty in the process. Although ad hoc opportunity cost information may be searched for and obtained by the manager, such search processes increase the level of required effort which contribute to a greater level of negative

value as asserted in the expectancy value model, and thus managers are unwilling to do so unless there is concrete evidence that the positive values generated by the decision using such opportunity cost approach will exceed the additional effort required for such. Accordingly it is proposed that unless a company has maintained a management accounting system or database that is capable of providing opportunity cost data, otherwise in its absence managers of the company will obtain opportunity cost information in decision making processes less frequently. Parallel to this argument, the adoption of the opportunity cost model and approach requires in general an advanced management accounting system that is capable of providing sophisticated accounting information including the opportunity cost information. Moreover, maintenance of an advanced management accounting system reflects the level of sophistication of management of the firm, which is required in the use of the opportunity cost model for analysis. Thus it is hypothesised that the adoption rate of the opportunity cost model would depend on the degree of advancement of the management accounting system maintained by the company:

H1: *The more advanced a management accounting system is maintained the higher will be the adoption rate of the Opportunity Cost Model in decision cases.*

## **2. The Reward and Compensation System**

Managers usually receive reward and other compensation packages in accordance with prescribed criteria, such as a fixed monthly salary plus a bonus that is based on a certain relationship with managerial or corporate performance. As advocated by many researchers and scholars, the rewards of managers must be related, to a greater or lesser extent, either to his personal performance or to the departmental performance concerned (Flower 1971, Watts & Zimmerman 1990). When rewards are related to performance, the system of reward calculation may have a direct effect to the final determination of the level of performance of the manager and the amount of rewards he is going to receive. To maximise his personal reward in a certain period, a manager is often tempted to perform in such a way that would maximise his own rewards in accordance with the prescribed rewarding system, even though it is not in the company's interests (Moizer & Pratt 1988). Because of the specification of the reward system, attitudes to perform in a way to maximise required performance would even be encouraged by top management, albeit such biased performance will probably lead to some unfavourable results in other aspects. A problem usually arises here, however, that optimal

decision performance is often distinctive from perceived performance as reflected by the normal accounting reports, thus initiating a conflict between a choice of selecting optimal decision choice or the sub-optimal choice that maximises reporting performance, at least in the short run (Anthony et al 1984).

To enable a reward to be calculated on some objective basis, the formulae of calculation is often linked to some form of accounting profitability or to investment return. These kinds of accounting related formula are inevitably suffered from two defects. The first issue is that since accounting calculations are subject to arbitrary selection of accounting treatments in numerous items of concern, managers can either select his own preferred choice of accounting treatments, or manipulate his personal or divisional performance to suit for the prescribed accounting choice. The second issue in terms of decision making is that data used for decision making is different from the data that are incorporated in the accounting report, so that an optimal decision may lead to an unfavourable accounting report in the initial accounting periods, and vice versa. Since performance evaluation and reward calculation are based on the reporting figures, the system will in many cases drive or induce a manager to behave in a way to

maximise reported performance rather than optimal decision performance (Solomons 1965, Flower 1971). Following the logic of these arguments, it is immediately apparent that the adoption of opportunity cost concept encounters difficulty in the decision making progress, as this concept requires data that are not employed and recorded in the normal or routine financial and managerial accounting system. Thus the results arrived at under the opportunity cost concept are surely to be different from the subsequent accounting reports, and unfortunately the magnitude of difference is in many cases inversely related, forcing the manager to face the dilemma that selecting optimal decision choices [under the opportunity cost approach] would mean a deteriorated performance report (at least in the initial years). With reference to the arguments of Solomons (1965), Flower (1971), and Moizer & Pratt (1988), it is hypothesised that a manager will not invoke the opportunity cost concept in decision making processes unless the same approach is also used for performance evaluation and reward calculation purposes. This argument is also compatible with the context of expectancy theory, when the decision maker perceives that a particular effort (the act of using the opportunity cost approach to make decisions) cannot produce successful task performance that carries some forms of reward, or even produces a

counter effect on the positive values of performance and rewards, he is not willing to provide the effort but rather he will select to make use of alternative effort in securing his value perception. Based on these propositions the second hypothesis is formed:

H2 : *The Lesser the Use of the Opportunity Cost Concept in the Performance Evaluation and Reward Calculation System, the Less Frequent a Manager will invoke the Concept in Decision Making Processes.*

### **The Task Characteristics**

Task characteristics are long recognised as one of the main factors in affecting and modifying decision behaviour (Hogarth 1993, Peters 1993). Two aspects of task characteristics are of greater concern here. The first issue in studying task characteristics relates to the matching of task characteristics with decision maker characteristics. Different decision makers possess different characteristics in various aspects such as personal attributes including personality and cognitive styles. These differences in personal attributes lead to different perception of task characteristics, which in turn lead to different reactions and decision behaviour even though the same decision situation is faced by the collective decision makers (Gul 1984). The second issue relates to the barriers or constraints that are created by the task characteristics. There are often

constraints in a decision situation that restricts a decision maker's choice of actions, and task characteristics form a major source of constraints. From a broad base of categorisation, task can be categorised in the following aspects.

### **Task Difficulty**

Task performance can only be achieved with effort. However, the various requirements of the level of effort for the accomplishment of a task performance contribute to the classification of task difficulty. In general task difficult refers to the possibility of fulfilling task requirements in achieving the desired objectives of performing the tasks. A task is classified as on low difficulty if it is perceived that the task can be accomplished with little effort, and there are no foreseeable constraints that will restrict the possibility of completing the task. On the other hand, a task is classified as on high difficulty if it is perceived highly unlikely that the task can be completed, either because the level of effort required for the task is very great, or there are problematic issues that are very hard to be solved, or both. For example, the degree of task difficulty in carrying two books from one classroom to another classroom is completely different from carrying two cases of books between the same venues. Although different people perceive task difficulty in a different way, ranging from a strong stimulation to a painful deterrent in accomplishing a task, the degree of task difficulty however has direct

effect to the probability of achieving task performance.

As stated above, based on the expectancy theory a decision maker's behaviour is a function of the efforts, expected performance, and expected rewards. In a world of imperfect conditions, the functional relationship between the decision maker's behaviour and the factors of concerned is expressed by the formula as stipulated before:

$$\text{Behaviour} = IE + \sum R_1 IP + \sum R_1 R_2 IV \text{ ----- (3)}$$

The degree of task difficulty, among its other impacts, has a direct effect to the determination of  $R_1$ , which is the probability that a particular level of task performance is achieved. Originally there is always a desired relationship between the provision of effort and the achievement of task performance, so that a person can reasonably calculate how much effort he should provide in achieving some desired task performance. However, as a task becomes more and more difficult, a person will be less confident of holding the task performance with proposed effort, and thus it is also more and more imprecise that a particular level of effort will lead to a desired level of task performance. This change in perception may be at a greater or slower rate, depending on the

personal characteristics. However, no matter it is at a faster or slower rate in the reduction of the confidence level in accomplishing a task, such deterioration of confidence occurs anyway as the task difficulty increases. Thus among others the probability,  $R_1$  is a function of task difficulty. Moreover, since the calculation of expected rewards is affected by the perceived probability of task performance,  $R_2$  is also indirectly by task difficulty.

### **Task Uncertainty**

Although task uncertainty is one of the main causes contributing to task difficulty, I propose to assess task uncertainty in a separate role due to its peculiar relationship with the concept of opportunity costs. Task uncertainty refers to the remoteness in the linkage between the provision of effort and the performance of outcome, such that the decision maker is uncertain of the choice of actions and the subsequent event payoffs of these choices. A major reason for the occurrence of task uncertainty is the lack of required data. If important data regarding choices of actions and / or possible outcomes are lacking, then the decision maker is placed in a mist of unidentified directions, wandering around the crossover without knowing which way he should go. Another major reason for task uncertainty is the cluster of possible outcomes arising from a single action or decision. When a decision or action may induce reactions of external

parties that are totally beyond the control of the decision maker (or his company in a broader sense), and the cluster of possible external reactions is more than just a few, again achievement of the task performance will be subject to a vast degree of uncertainty. In general the greater the degree of task uncertainty, the more remote will be the relationship between effort and performance. The application of expectancy theory in explaining decision becomes harder in a situation of high uncertainty. However, as discussed in previous sections, in order to regain the linkage between effort, performance, and reward, action will be taken by a decision maker to reduce the degree of uncertainty inherent in the circumstances.

A combination of task uncertainty with the adoption of opportunity cost concept in a decision making process reveals that task uncertainty is greatly enhanced by the concept, which in its original context involve data that are dynamic and disconcrete in its very nature. Opportunity costs, unlike transaction costs, do not have realised cost data in most cases to justify its existence and magnitude, and thus estimation and subjective judgement have to be invoked in arriving at the opportunity costs data. Moreover, opportunity costs in an economic context involve the highest value foregone by selecting a particular decision alternative, where the calculation of value foregone is not necessarily restricted to basic

accounting calculations. The inclusion of opportunity costs in the decision models render the decision maker to face more and more imprecise and uncertain data that damage the linkage between foreseen effort and expected performance, and thus in accordance with the expectancy theory, a decision maker will try to reduce task uncertainty and drop the opportunity cost concept in making decisions. Only by so doing can he gain more confidence about his possible rewards in making a particular decision choice. Based on these arguments the following hypotheses are further proposed:

H3 : *The higher the degree of task difficulty in terms of effort requirement and task complexity, the less likely will the opportunity cost concept be invoked in a decision making process by the decision maker.*

H4 : *The higher the degree of task uncertainty, the less likely will the opportunity cost concept be invoked in a decision making process by the decision maker.*

Taking the four hypotheses together, it is clear that the adoption or other wise of the opportunity cost concept in a decision making process is a function of and dependent upon the availability of appropriate information system, the degree of task complexity and task uncertainty, and the nature of the reward model which relates to expressed performance:

$$\text{Decision Model Choice} = IE_M + R_1 IP + R_2 IV$$

Where,  $IE_M$  = intrinsic value of the effort in making use of a particular cost model

$R_1$  = probability of successful task performance given a particular cost model, expressed as  $f(\text{task difficulty, task uncertainty, cost model})$

$IP$  = intrinsic value of task performance given the adoption of a particular cost model

$R_2$  = probability of getting the reward with reference to the measured task performance given the cost model

These four important issues are also compatible with the context of the expectancy theory. Although expectancy theory has been verified in many specific situations, the application of such in a decision making process with special reference to the adoption of the opportunity cost concept, which is regarded as a crucial concept and approach in decision theories from an economics perspective, still needs to be tested and verified for its possible validity in the business context. Tests of the proposed application model combining expectancy theory with opportunity cost model will be carried out and reported in the next two chapters.

## **CHAPTER 5**

### **A FIELD STUDY OF THE DECISION BEHAVIOUR**

#### **FROM AN ACADEMIC PERSPECTIVE**

To validate and substantiate the proposed framework and hypotheses as stated in the previous chapter, field researches are carried out to obtain evidence of how people make decisions in a commercial atmosphere. However, before such a research is carried out, a control test is first conducted in an academic perspective in order to identify if the proposed theories are valid in a controlled mode of circumstances. During the control test process a set of questionnaires is distributed to selected student groups to collect their views regarding decision behaviour and the adoption of the opportunity cost concept in the hypothetical business decision situations. The use of students as control groups is acceptable in previous doctoral studies performed by students of other institutes (Chan 1993). Moreover, making use of student groups as control groups can serve other functions in the validation of the proposed framework of theories. Firstly, most students have not got any professional and practical experience, and their ideas about decision theories are come from teachers and textbooks, that are regarded as more academic in nature. So the students' responses can be viewed as an academic perspective for subsequent comparison with the practising accountants and managers who may have taken some

other approaches for decision making according to their real life experiences. Secondly, by way of selecting both accounting and non-accounting students for study, some insights can be revealed of the possible difference in decision making approaches between accounting students and students of other disciplines.

### **Selection of Student Groups for the Control Test**

In the process of selecting students groups for the purposes of this control test, three student groups are selected:

1. Full time final year students who are taking undergraduate course of BA (Hons) in Accounting. These students have received three years' accountancy training and are supposed to have acquired adequate accounting knowledge both from an academic or professional perspective. Moreover, the candidate has taught this group of students so that the candidate can be sure that this student group has learned about the concept and application of the opportunity cost concept. To substantiate this assertion, some preliminary questions have also been given to the students to ensure that they have adequate knowledge about the opportunity cost concept. On the other hand, student records have been checked to ascertain that most of the accounting students have no working experience at any managerial level in the commercial field.

2. Full time final year students who are taking undergraduate course of BA(Hons) in Business Administration. These students have taken two modules in management accounting and thus acquired basic knowledge about the concept and application of the opportunity costs in business decisions. However, as their core studies are management and business administration, the content and depth of knowledge regarding the management accounting modules are less advanced as those modules designed for accounting students. For example, these management students have no idea about the potential opportunity cost concept, and know little about the technical details in the collection, preparation and presentation of opportunity costs data. Another major difference between the management students and the accounting students is that about half of the students of this selected group have working experience in a commercial context from one year to more than three years, although most of them have not held any responsible position before taking the management course.
3. Part time first year students taking the master course in finance. These students are working in commercial firms during daytime, and only attend classes in the evening. The minimum working experience for these master

students is about three years, with some students already working for over ten years. Moreover, many of the master students have already held managerial positions, such as financial controller, senior finance manager, senior financial analyst, and bank credit managers, and thus these students have had experiences in business decision making at the managerial level. Regarding knowledge about the concept and application of the opportunity costs in business decisions, records show that out of the sample population group only two students have taken undergraduate courses in accounting, while other students are graduated from courses of economics, business administration and finance. To test their knowledge about the opportunity cost concept, the same set of preliminary questions are asked, and results indicate that in general the master students have not acquired knowledge about the said concept at any level beyond those of the management students (the second test group).

The purpose of selecting three different groups of students in the control research is to ascertain whether results obtained in an academic atmosphere would be affected by some exogenous factors including previous teaching in the opportunity cost concept and the working status of the students. The accounting student group is selected to serve as the main control group. These students being final year

students have received accountancy training for a few years, and the ways to analyse and solve issues in a decision case. In general they are taught to make use of the opportunity cost concept in decision cases. Therefore, presumably they are more confident than other student groups in applying the opportunity cost concept in decision cases. This great degree of confidence would lead them to a more positive attitude in the perceived relationship between the selection of the opportunity cost approach and the expected performance of a company. Thus with reference to the expectancy theories they are more ample in adopting the concept than other student groups. Moreover, since these accounting students do not have any commercial experience, their decision behaviour should reflect a more academic view as influenced by staff of the academia.

The management student group is selected to differentiate between accountancy training process and management training process. Although these students also receive accountancy training to some extent, since their core studies are management subjects, they are more influenced by their management lectureship.

As discussed in the previous chapters, management writers advocate much on the importance of judgement in business decisions, and have rarely discussed about the application of the opportunity cost concept, the decision behaviour of management students (who are supposed to be influenced to a greater extent by these

management writers) are probably different from the accounting students. Moreover, since these management students also do not have any significant working experience in the commercial world, their decision behaviour should similarly reflect a more academic view from the management perspective. By comparing the views of the accounting student group with the management student group, it is possible to identify the enduring influence between accountancy training and management training in terms of decision behaviour.

The group of master students, on the other hand, represents a mixed view between academics and business practitioners. Because these students have taken various courses in their undergraduate studies, they view about decision processes and the adoption of the opportunity cost concept do not represent the influence of any particular discipline in any collective sense. Moreover, these students being junior to middle managers have already accumulated experiences in business decisions through their career, and thus their decision behaviour should have been moderated by such real time experiences. Given the distinctive characteristics of the master students in terms of business experience, their collective view can be used to test the moderating effect of practical experiences to academic view regarding the adoption of the opportunity cost concept in decision processes.

To collect data from the students a set of questionnaires is distributed to selected samples of the respective student groups. For the accounting students a simple random sample is selected, with sample size equal to 50% of the total population.

Because of the small group size for management students and postgraduate finance students questionnaires are sent to all the students concerned. Accordingly 80 questionnaires are sent to accounting students, 33 questionnaires to management students, and 20 questionnaires to the group of master students. Response rate ranges from 50% for master students to 35% for accounting students, with a total number of 53 questionnaires returned from students. Returned questionnaires are categorised and analysed according to group basis.

### **Organisational Setting**

Students are asked in the first place, which proposed objectives are regarded by them corporate objectives of business corporations in general. Basically all responding students except two regard profit maximisation as either the sole business objective or one of the prime objectives of a business corporation. Roughly about half of the respondents in each group also regard provision of quality services to clients as a prime objective, while the respondents neglect other proposed business objectives. Thus in terms of perceived corporate objectives the

views held by the student groups are very similar. The purpose of asking students' perception of corporate objectives is to establish a priori situation that all analyses are based on a unanimous view of recognised business objectives. Given the opinions of the responding students, the priori situation is confirmed. Students are then asked about their opinions regarding the operation and maintenance of accounting information systems.

### **Maintenance of Management Accounting Information System**

The opinions of students regarding the operation and maintenance of accounting information systems are presented in Table 4 to 6 below. Table 4 lists out the respective views about the maintenance of a management accounting system:

**Table 4: Maintenance of a Management Accounting System**

	<b>MSc Students</b>	<b>Accounting Students</b>	<b>Management Students</b>
Financial system only is maintained	1	1	0
An integral system is maintained	7	19	14
An interlocking system is maintained	2	5	1
No management accounting system is maintained	0	3	0

According to Table 4, most students irrespective of student groups consider it worthy to maintain an integral accounting system that includes both financial and management accounts. This reflects what has been taught in class and stated in textbooks (Drury 1992, Hansen & Mowen 1995). Although it is possible to maintain a management accounting system under the interlocking system mode, more recent discussions have restricted in the operation of integral accounting systems. Also it is surprising to find that, contrary to the opinions of other student groups, three accounting students have opted to reject the maintenance of any management accounting system, which means they are in the opinion that the maintenance of such a system is not necessary nor functional. Before making further comments to the results, students' opinions about the maintenance of opportunity cost database is analysed below in Table 5 and 6:

**Table 5: Maintenance of Opportunity Cost (OC) Database**

	<b>MSc Students</b>	<b>Accounting Students</b>	<b>Management Students</b>
OC database form part of the accounting system	4	13	5
OC database separately maintained	2	7	6
OC data only collected on ad hoc basis	4	6	3
OC data is not required by management in most cases	0	2	1

Although in general more than half of the students consider it appropriate to maintain an opportunity cost database, only a portion of them agree that the opportunity cost database should be maintained as part of a management accounting system. About 30% of the students consider that ad hoc opportunity cost data can be obtained without the necessary maintenance of a formal opportunity cost database, or that opportunity cost data is not required by management in most cases.

An interest point here is that with reference to the textbook context and class teaching, opportunity cost data is seldom mentioned to be recorded in the normal accounting information system. Albeit it is possible to maintain opportunity costs data in the accounting routine, rarely can we find demonstrations in the accounting texts, as in many cases the opportunity cost data do not meet with the transaction judgement, and are hard to fit in with other "routine" accounting data. This possible incompatibility of accounting data with opportunity cost data in the normal accounting system has been indicated both in textbook and during class demonstrations (Drury 1992, Horngren & Foster 1991), thus in the absence of practical experience it is amazed at the fact that about half of the responding students in each group indicate their preference to include opportunity cost database as part of a management accounting information system.

To clarify the situation, a small sample of accounting students are interviewed and asked about their view of including opportunity cost database in a management accounting information system. These students do not necessarily fit in with the group of students who hold such view, as the identity of the responding students to the questionnaires cannot be recognised in accordance with the norm of data collection process through questionnaires. However, the interviewed students do give some plausible explanations:

1. In examination questions opportunity cost data are given together with other accounting data for the calculation of decision payoffs. Thus students have the impression that opportunity cost data are maintained simultaneously with accounting data.
2. Students are led to realise the expanding role of the management accounting craft, which is no longer restricted to a simple technical model. Thus they form the view that in modern world a management accounting information system may have been designed in a way to incorporate other data which in older days were excluded from the old fashioned accounting systems.

As there is no question asking about the technical considerations in designing a management accounting information system, thus students feel that they only express what they think should be done, without any need to consider the feasibility or otherwise of their opinions. These kind of “academic” views are further enhanced when students are asked about the appropriateness of maintaining economic and quantitative data that at the outlook has nothing to do with a normal management accounting information system. The set of economic and quantitative data are carefully selected with reference to their possible degree of importance to a corporation for decision making purposes:

**Table 6: Maintenance of Economic and Quantitative Information Database**

	<b>MSc</b>	<b>Accounting</b>	<b>Management</b>
Competitors' product price movement	10	28	15
Materials' price movement for main products	10	26	14
Relative utilisation rate of labour	9	19	10
General economic data of Hong Kong	6	17	9
General economic data of main export country	9	23	14
Product line profitability statistics	10	26	14
Input contribution ratios of company's input resources	9	25	9

From the table it is obvious that students across the groups hold unanimous view that the stated economic and quantitative data should be maintained in the information database. As predicted these answers are well expected in an academic environment, because the problems and costs that are encountered in the maintenance of such are usually precluded or avoided in the general accounting texts (Kaplan & Atkinson 1989, Drury 1992, Horngren & Foster 1991, Hansen & Mowen 1995). Students have expressed a view that is desired in an idealistic circumstance, so that better decisions are made in the presence of more useful information. Although the academic view does not necessarily represent business reality, the establishment of such view is crucial in the research for decision behaviour in the context of different decision environments and circumstances.

### **Rewarding System of Managers**

The determination of rewards is a crucial element in the expectancy theory, and is expected to have significant influence to the decision behaviour of a manager. Thus it is inevitable to collect students' opinion about the appropriate bases and criteria in calculating a manager's rewards. Although there are other benefits and rewards mechanism which are adopted in special circumstances (such as the share option schemes to key executives), basically the majority attention would direct to the way of determination of salaries and bonuses of managers. With reference to these two

basic and universal units of compensation package to all and every business manager, students have expressed their opinion as presented in Table 7 and 8 below:

**Table 7: Calculation of Salary Scales for Business Managers**

	<b>MSc Students</b>	<b>Accounting Students</b>	<b>Management Students</b>
A fixed scale across managers except annual increments (A)	0	4	3
A variable scale based on senior's comment on manager's performance (B)	4	14	4
A pre-determined scale linked to target achievement (C)	5	10	8
Other suitable criteria (B)+(C)	1	0	0

Note: The symbols of (A) to (C) refer to the sequence of proposed answer in the questionnaire

The proposed criteria or schemes of calculation of salaries are the common methods generally adopted in the commercial and service industries, including even non-profit making organisations. Although the magnitude of salaries is not the sole reflection of achievement, it is however recognised as an indirect reflection of position status as well as the degree of perceived achievement within the corporation. Therefore virtually every manager would like to have a larger amount

of salaries payment than others (especially those managers of the same rank and level) do. In this respect proposed scheme (A) cannot differentiate managers' ability other than their years of service. For proposed scheme (B) which relates manager's salaries with his own performance as perceived by senior management, the claimed advantage is that the sum of salaries are related to performance, so that managers have to perform well and contribute to the company for the return of a greater reward. This scheme is in general compatible with the expectancy theory and the agency theory. Proposed scheme (C) that relates salary payments with target performance achievement has the same advocacy with scheme (B). However, both schemes are subject to the technical risk of setting of performance measurement systems. The success or failure of a performance related salaries scheme is largely depended upon whether the performance measurement system is appropriately designed and operated to ensure that managerial performance are truly reflected through such a measurement system (Otley et al 1990). Despite the possible risks of technical deficiency, performance related salary schemes are advocated in general by both academics and practitioners (Hopwood 1974, Otley et al 1990, Drury 1992). With reference to Table 7 the majority of students in fact follows the norm and advocates the performance related schemes for salary determination. Also students' t-tests with unpaired matchings indicate a one tail t-value between 0.12 to 0.31, showing that there is no significant difference in the opinions among the

groups of students, although individual groups of students bias towards scheme (B) or scheme (C). Before further analyses are carried out at this point, opinions of students regarding the determination of bonuses are first looked at in Table 8 below.

The proposed schemes of calculation are based on descriptions made in textbooks and professional articles and are regarded as commonly adopted methods in the business sector with majority of companies selecting one or more of the schemes as their bonus calculation schemes:

**Table 8: Calculation of Bonus Payments for Business Managers**

	<b>MSc Students</b>	<b>Accounting Students</b>	<b>Management Students</b>
Manager's own or departmental performance	5	15	7
Overall corporate profitability	1	3	6
Departmental performance with senior's subjective judgement	2	8	2
A fixed and pre-determined scale	0	1	0
Pure discretion of management	1	1	0

According to Table 8 students in general are still of the opinion that bonus payment of managers should also be related to his own performance or reflected in his departmental performance, although about one third of the accounting students also

consider senior management's judgement should be counted as well. However, an interesting finding lies on management students' opinions, where 6 out of 15 students representing nearly 40% of the sample claim that bonus payment should be based on overall corporate profitability, and discrepancies in performance among individual departments should be disregarded. Less than 20% of the MSc finance students and the accounting students submit the same claim. The response of the management students in this respect is not totally compatible to their views about determination of salary scales (where they advocate much on performance related salaries payment schemes). If individual performance does not form the core basis for calculation of bonus payments, then there is a possible risk that, in the context of both the expectancy theory and the agency theory, managers would be tempted to become free riders, hoping that his improved bonus payments are based on others' hard working instead of his own contributed efforts. According to the expectancy theory, a manager in this situation has not perceived any direct relationship between his efforts and his expected rewards, and thus he will probably minimise his own efforts in order to maximise his total expected values.

Despite the exceptional view hold by a proportion of the management students, when the student views about salaries payment and bonus calculations are combined for a closer look, obviously the majority view holds that some form of performance

related calculation models should be adopted in determining a manager's salaries and bonus payments. This is a reiteration of the extrinsic validity of the expectancy theory, that performance must be related to reward in order to invoke managers to improve their performance. However, despite the constructive validity of the expectancy theory, the content validity especially task and environmental constraints is still subject to more detailed investigation for a more functional application of the concept into practice. For the purposes of getting more understanding about decision behaviour, students are further asked more directly about their opinions under different decision circumstances.

### **Cognitive Decision Behaviour within an Academic Atmosphere**

To start with an analysis of the cognitive decision behaviour of students within an academic atmosphere, where they are trained to follow certain decision traits and processes from a more academic and idealistic perspective, the students are first asked the basic question about the concept of opportunity cost concept. With reference to the accounting and management students it is sure that they have been told about the basic definition of the opportunity cost concept, that is, the highest value foregone from giving up other alternatives when a particular decision alternative is selected. This value displacement concept is explained to the students in their management accounting modules with an example which is widely used in

other accounting courses and examined in professional examinations (such as the AICPA examination, 1982). However, surprising results are received from students:

**Table 9: Definition of the Opportunity Costs**

	<b>MSc Students</b>	<b>Accounting Students</b>	<b>Management Students</b>
Highest value foregone in selecting a alternative	9	21	12
Shadow price of input resources	0	2	2
Equal to the relevant cost concept	1	2	0
Cost definition is situational	0	2	0
Uncertain about its definition	0	1	1

Given the results of preliminary questions it is quite apparent that both the MSc finance students and the management students have little idea about the concept of shadow prices, thus it is within expectation that students of these groups will not select proposed answer (B) above as the definition of opportunity costs. The major surprise that is revealed from the students' choices is that, there are 7 accounting students representing 25% of the total respondents who do not select the told definition as their choices. Since the accounting students are the group of students who have gone through in-depth and thorough discussions about the concept and application of the opportunity cost concept, it is hard to imagine why one fourth of

the accounting students desert the well recognised definition of the opportunity cost concept. Bearing in mind the students' perception about the concept of opportunity costs, their opinions about decision circumstances are asked to establish the tasks and environmental characteristics. With reference to the framework of analysis, task characteristics are one of the hypothesised factors that affect the cognitive decision behaviour of a decision maker. Since the nature of different decisions exerts various degree of information demand and cost characteristics, a decision maker will possibly be affected to select different costs data in pursuing the decision processes of these decision situations. Table 10 below presents the opinions of the students regarding the possible adoption of different costs data under different decision situations. The relative frequency is denoted by its average frequency from 1 to 5, with 1 being referred to in every decision case, and 5 means that the source data is not required:

**Table 10: Frequency of Data Sourcing for Different Decision Situations**

	<b>MSc Students</b>	<b>Accounting Students</b>	<b>Management Students</b>
<b>Data from Accounting system</b>			
Product pricing decisions	1.4	1.93	2.14
Asset replacement decisions	2.1	1.93	2.29
Asset acquisition decisions	2.0	2.39	2.14
Expansion of existing operations	1.6	1.61	2.43
Investment in new business line	1.9	2.14	2.50
Investment in new geographical area (excluding China)	2.1	2.18	2.00
Investment in the China market	2.0	2.18	2.14
<b>Data from information database</b>			
Product pricing decision	1.6	1.89	2.07
Asset replacement decisions	2.2	1.79	2.50
Asset acquisition decisions	2.1	2.18	2.29
Expansion of existing operations	1.6	1.61	1.86
Investment in new business line	1.8	1.75	1.43
Investment in new area	1.8	1.89	1.93
Investment in the China market	1.7	1.64	1.79
<b>Ad Hoc Internal Data</b>			
Product pricing decisions	2.4	2.57	2.54
Asset replacement decisions	2.8	2.54	2.46

**Table 10: Cont'd**

Asset acquisition decisions	2.8	2.50	2.46
Expansion of existing operations	1.8	1.89	2.31
Investment in new business line	1.7	2.18	1.92
Investment in new area	1.8	2.29	2.00
Investment in the China market	2.0	2.0	2.31
<b>Ad Hoc External Data</b>			
Product pricing decisions	2.3	3.21	2.92
Asset replacement decisions	3.0	2.79	3.08
Asset acquisition decisions	2.9	2.43	2.46
Expansion of existing operations	2.2	2.11	2.23
Investment in new business line	1.7	1.82	1.85
Investment in new area	1.5	1.86	1.69
Investment in China market	1.3	1.71	1.77
<b>Data Provided by Consultants</b>			
Product pricing decisions	3.3	3.21	2.79
Asset replacement decisions	3.6	3.29	3.07
Asset acquisition decisions	3.5	3.14	2.64
Expansion of existing operations	2.8	2.64	2.29
Investment in new business line	2.1	2.32	1.43
Investment in new area	1.9	2.07	1.34
Investment in China market	1.7	1.65	1.64

The same set of data is also rearranged with respect to types of decisions to show the relative data-retrieving rate of different data source under different decision situations:

**Table 11: Relative Data Retrieving Rate for Different Decision Situations**

	<b>MSc Students</b>	<b>Accounting Students</b>	<b>Management Students</b>
<b>Product Pricing Decisions</b>			
Data from accounting system	1.4	1.93	2.14
Data from information database	1.6	1.89	2.07
Ad hoc internal data	2.4	2.57	2.54
Ad hoc external data	2.3	3.21	2.92
Data provided by consultants	3.3	3.21	2.79
<b>Asset Replacement Decisions</b>			
Data from accounting system	2.1	1.93	2.29
Data from information database	2.2	1.79	2.50
Ad hoc internal data	2.8	2.54	2.46
Ad hoc external data	3.0	2.79	3.08
Data provided by consultants	3.6	3.29	3.07
<b>Asset Acquisition Decisions</b>			
Data from accounting system	2.0	2.39	2.14
Data from information database	2.1	2.18	1.86
Ad hoc internal data	2.8	2.50	2.46
Ad hoc external data	2.9	2.43	2.46
Data provided by consultants	3.5	3.14	2.64
<b>Expansion in Existing Operations</b>			
Data from accounting system	1.6	1.61	2.43
Data from information database	2.2	2.11	2.23

**Table 11 : Cont'd**

Ad hoc internal data	1.8	1.89	2.31
Ad hoc external data	2.2	2.11	2.23
Data provided by consultants	2.8	2.64	2.29
<b>Investment in New Business Line</b>			
Data from accounting system	1.9	2.14	2.50
Data from information database	1.8	1.75	1.43
Ad hoc internal data	1.7	2.18	1.92
Ad hoc external data	1.7	1.82	1.85
Data provided by consultants	2.1	2.32	1.43
<b>Investment in New Geographical Area (Excluding China Market)</b>			
Data from accounting system	2.1	2.18	2.00
Data from information database	1.8	1.89	1.93
Ad hoc internal data	1.8	2.29	2.00
Ad hoc external data	1.5	1.86	1.69
Data provided by consultants	1.9	2.07	1.34
<b>Investment in the China Market</b>			
Data from accounting system	2.0	2.18	2.14
Data from information database	1.7	1.64	1.79
Ad hoc internal data	2.0	2.0	2.31
Ad hoc external data	1.3	1.71	1.77
Data provided by consultants	1.7	1.65	1.64

Governing from the data as grouped and presented in both tables, a general perception can be formed that different sources of data are used in varied frequency among alternative types of decisions. The data sources are broadly classified into

three categories, including routine source data from established accounting and information database, non-routine ac hoc data collected from time to time by corporate staff in individual cases, and data as well as professional advice obtained from external consultants. With a descriptive discriminant analytical approach, the shift of data reliance from routine accounting and management data to ac hoc data not maintaining by a company and further apart to external professional service following the traits of decision characteristics in respect to decision uncertainty and complexity. For decisions that are more routine in nature and relatively less uncertain and non-complex, routine data are more frequently resorted to in making decisions; whereas for decisions involving a higher degree of task uncertainty and complexity, the relative degree of importance of ad hoc and external data increase substantially to a level that is pari passu and even more important than the routine accounting and management data. The descriptive discriminant test is also supported by the non-parametric Wilcoxon test. To reveal the statistical relationship of various source data under different decision situations, data of different student groups are merged together to form a unified test of the academic views. This particular treatment will then facilitate subsequent analysis between the academic view and the practitioners. The collective view are stated in Table 12 below:

**Table 12: Wilcoxon Test of Data Retrieving Frequency by Decision Type**

	5%	1%
<b>Product Pricing Decisions</b>		
Ad hoc internal data	----	p=0.0004
Ad hoc external data	----	p=0.0007
Data provided by consultants	----	p=0.0000
<b>Asset Replacement Decisions</b>		
Ad hoc internal data	p=0.0175	----
Ad hoc external data	----	p=0.0003
Data provided by consultants	----	p=0.0000
<b>Asset Acquisition Decisions</b>		
Data provided by consultants	----	p=0.0002
<b>Expansion in Existing Operations</b>		
Data provided by consultants	----	p=0.0008
<b>Investment in New Business</b>		
Data from information database	----	p=0.0083
<b>Investment in New Geographical Area</b>		
Ad hoc external data	p=0.0238	----
<b>Investment in The China Market</b>		
Data from information database	----	p=0.0013
Ad hoc external data	----	p=0.0044
Data provided by consultants	p=0.0196	----

The table is compiled with the frequency in retrieving of accounting data used as the reference set. According to Table 12 it is clear that for product pricing decisions and asset replacement decisions, students are of the opinion that in domain data from the accounting and information system should be referred to, whereas there is seldom need to obtain other ac hoc data or professional advice for decisions of these types. These opinions follow the trajectory of academic training; since product pricing decisions especially cost plus pricing decisions are largely a matter of internal control with costs and revenue data forming the core data of analysis. These costs and revenue data are normally available within the routine accounting and management information system, and thus it is not unusual for students to consider that additional information is rarely required in product pricing decisions. The same logic apply to asset replacement decisions, as this type of decisions are usually based on an actual need of replacement, which is revealed and disclosed by routine accounting and management information systems other than physical inspection reports of managers. For asset acquisition decisions and expansion decisions, the only significant difference in relative use of data sources is the data provided by independent consultants. With reference also to table 11, consultants are seldom employed in these two situations. Apart from the infrequent employment of consultants, however, both routine and ac hoc data are called for in similar frequencies in these types of decisions. The shift in the data range has reflected the

change in situation characteristics where data normally are not needed for a wise decision to be made. Special attention should also be paid to the significant difference in the use of external data including professional advice in an investment decision in the China market. In making the investment decision, existing accounting data is almost the least frequent data that will be called for, rather ac hoc external data and data provided by external consultants form the core base of information analysis. Although apparently not well recognised by a Western reader, the view clearly represent students' understanding about the cultural reality in the Chinese business sector, where informal, unofficial data obtainable in domain only through personal contact and relationship account for the most important part of business decisions. Thus the general perception is that to invest in the China market, a business manager must obtain ac hoc external data from sources outside the firm, and to seek advice from professionals who have close contact with the Chinese officials and businessmen. This difference in cultural perception also explains the less frequent calls for professional advice in respect of investment decisions in other geographical regions other than China.

To obtain a more thorough analysis about the relative utilisation rate of different source data in respect to various types of decisions, non parametric Wilcoxon test is also carried out from a data source perspective:

**Table 13: Wilcoxon Test of Data Retrieving Frequency by Data Source**

	5%	1%
<b>Data from Accounting System</b>		
Nil	---	---
<b>Data from Information System</b>		
Asset acquisition decisions	p=0.0214	----
<b>Ad Hoc Internal Data</b>		
Expansion of existing operations	----	p=0.0001
Investment in new business line	----	p=0.0008
Investment in new geographical area	----	p=0.0031
Investment in the China market	p=0.0106	----
<b>Ad Hoc External Data</b>		
Asset replacement decisions	p=0.0240	----
Expansion of existing operations	----	0.0087
Investment in new business line	----	0.0001
Investment in new geographical area	----	0.0000
Investment in the China market	----	0.0000
<b>Data Provided by Consultants</b>		
Expansion of existing operations	----	0.0069
Investment in new business line	----	0.0000
Investment in new geographical area	----	0.0000
Investment in the China market	----	0.0000

From the perspective of data source, it is revealed in Table 13 that accounting data will be called in roughly the same frequency for all selected types of decisions. This means that no matter what type of decision making, students in general still regard accounting data as a necessary source of reference. The same view is also held with respect to data maintained in the information database. However, apart from accounting data and information database, the relative utilisation rates for ac hoc data and professional advice is significantly different between the decisions. It is also interesting to find out that students are of the opinion that for expansion and investment decisions, ac hoc data and professional advice should be called for in greater frequency than in the more routine pricing and asset replacement decisions, as the relative retrieving rates for these data are significantly different.

Based on the findings in table 10 to 13, there is clear evidence that from a more theoretical and academic perspective, task and decision characteristics do affect the choice of information that are supposed to be used in the decision processes. Since different data originated from different sources will lead to a particular choice of calculation model for payoffs of decision alternatives, and there is already a general recognition that there does not exist a universal accounting model which can incorporate different types of cost data without affecting its internal validity (Horngren 1986), thus a logical argument can be established to the fact that the

nature of decision characteristics would affect a decision maker's choice in the selection of cost calculation models and the cost data that are going to be used and fitted into the selected model. Built from this premise evidence is further sought to substantiate and prove the validity of hypotheses 3 and 4.

As proposed in the framework of analysis, task difficulty constitutes a major factor in affecting the decision maker's choice and behaviour. Task difficulty, in its own turn, will be greatly affected by task uncertainty and task complexity. The more uncertain between task effort and task result, the greater is the degree of task uncertainty, and the task is viewed as more difficult to accomplish, since the decision maker finds a greater risk in going through the processes of accomplishment for the said task. Task complexity also leads to the same assertion as the more complex a task environment is, the more uncertain will be the relationship among task factors and their interactions, and the less will be the confidence in getting total control of the processes of accomplishment for the task.

Task uncertainty and task complexity, from a decision perspective, can be interpreted as a lack of sufficient information from the routine information database, accounting or otherwise, which allows management to exercise adequate control to the decision consequence. With insufficient information on hand, a manager cannot carry out satisfactory analyses to identify the best alternative in a decision situation,

which renders him beginning to realise a higher degree of task uncertainty or task complexity as the case may be. To relieve from the quasi controllability of decision processes, the decision maker will begin to seek data from other sources, including ac hoc data and data from external consultants. The collection of additional data other than from internal established sources is thus a clear indication of perceived changes in task uncertainty and task difficulty. Therefore, with reference to data presented in table 10 to 13, significant differences in the retrieving rate of various sources of data also acts as indication of significant differences in the perception of degree of task uncertainty and task complexity under various decision situations. However, a direct questioning about the perceived degree of task uncertainty and task complexity is made to reiterate the proposition:

**Table 14: Perceived Variation in Task Uncertainty and Complexity**

	<i>Decision Complexity</i>				<i>Decision Uncertainty</i>			
	<i>MSc</i>	<i>Accounting</i>	<i>Management</i>	<i>Group Average</i>	<i>MSc</i>	<i>Accounting</i>	<i>Management</i>	<i>Group Average</i>
<i>Product Pricing</i>	3.2	3.43	3.13	3.30	2.6	2.71	2.8	2.72
<i>Asset Replacement</i>	2.7	2.71	3.13	2.83	2.4	2.25	2.4	2.32
<i>Asset Acquisition</i>	2.7	2.89	3.33	2.98	2.5	2.39	2.6	2.47
<i>Expansion Decision</i>	3.5	3.71	3.67	3.66	2.9	3.18	3.6	3.25
<i>Investment in Business Line</i>	4.0	4.39	4.27	4.28	3.9	4.07	4.07	4.04
<i>Investment in New Area</i>	4.2	4.54	4.4	4.43	4.0	4.07	4.4	4.15
<i>Investment in China Market</i>	4.3	4.43	4.13	4.32	4.3	4.25	4.27	4.26

In Table 14 the perceived data are presented in the range from 1 to 5, where 1 denotes a perception of very simple decision or a highly certain case; and 5 denotes the other extreme of a very complex case or a highly uncertain case. The data contained in Table 14 clearly reveal that the perceived degree of decision complexity and decision uncertainty for the investment decisions are significantly higher than the more routine decisions. The same conclusion is also arrived at by a Wilcoxon test of the perceived opinions among the various decision situations with respect to decision complexity and decision uncertainty. Based on the Wilcoxon test results, the investment decisions have a significantly higher rating on the level of complexity and uncertainty over and above product pricing decision and asset related decisions at the 1% level of confidence. On the other hand, the asset replacement decision is significantly lower in both levels of complexity and uncertainty than all other decision situations. This is perfectly compatible with the general perception that asset replacement decisions are passively initiated by the factual need within a corporation, thus the decision is more certain and more simple than other decision alternatives where more choices are available.

However, Table 14 also reveals an interesting point that the average perception about the level of complexity is always higher than the average level of uncertainty in every decision situation. These observed results indicate a general perception

across all decision situations that decisions are more complex in nature over and above their uncertain characteristics. This fact is further magnified by the Wilcoxon tests which show significant difference at 1% level between the perceived level of complexity and uncertainty within the routine decision functions, including the product pricing decisions, the asset replacement decisions, and the asset acquisition decisions. A 2% significance is also observed for expansion decisions ( $p=0.0103$ ). Surprisingly, there is no significant difference in the same analysis for all three investment type of decisions. These observations are interpreted that for those decisions that are highly complex, they are also viewed as highly uncertain; whereas moderate complex decisions may give more confidence to the decision makers about the predictability of the decision consequence. Apart from the interesting observations made about the inter-relationship between level of complexity and uncertainty in various types of decisions, the findings have matched with the proposition that different decisions possess specific characteristics with respect to complexity and uncertainty which affect the decision maker's choice of collection of cost data and subsequent employment of cost calculation models.

### *Hypothetical Case Analyses*

With the purposes of testing the students' actual decision behaviour, three

hypothetical cases have been developed to imitate some commonly observed decision situations faced by managers in Hong Kong. These hypothetical cases are developed according to the current situation of Hong Kong, its relationship with China, and the degree of decision uncertainty and decision complexity as general perceived by the business practitioners and entrepreneurs of Hong Kong. Students are asked to select particular course of actions in each hypothetical case so that their decision behaviour can be detected and understood. The same hypothetical cases will be used to identify practising managers' decision behaviour in the subsequent field research process to allow for matched comparison of decision behaviour between the research group and the control group. As a basic information for the analysis of decision behaviour, students are asked to indicate their general preference in making decisions:

**Table 15: Perceived Approach of Students in Making Business Decisions**

	<i>MSc Students</i>	<i>Accounting Students</i>	<i>Management Students</i>	<i>Total</i>
<i>Maximising short term reporting profitability</i>	4	3	1	8
<i>Maximising total reporting project / task profitability</i>	3	2	4	9
<i>Maximising total decision profitability</i>	1	4	1	6
<i>Selecting action as it sees fit, disregarding profitability whatsoever</i>	0	0	1	1
<i>A situational choice, depending on circumstances</i>	2	19	8	29

From an academic view, the most disappointing finding in Table 15 is that, out of 53 respondents, only 6 students would commit themselves to maximise the total

decision profits, even though the optimal decision choice may not bring about maximum reporting profitability in the accounting statements. However, this is generally what has been taught in the basic management accounting courses, that we should make use of decision tools (discounting cash flows, project simulations, etc) to find out the alternative that would bring about optimal from a decision perspective. Because of the differences that exist between cost calculation systems of decision models and accounting reports (Solomons 1965, Flower 1970, Horngren 1986), the advocacy of decision tools simultaneously mean that in finding the optimum solution, reporting profitability should be disregarded. The students' response to this question clearly refutes the advocated decision approach. Moreover, 7 out of the 10 master students claim that they will either maximising short term reporting profits or total reporting profits, while most accounting and management students have selected to recognise the situational characteristics of different decision cases and do not commit to indicate any particular choice of preferred approach in decision making. Since the part time master students are working managers, their opinions demonstrate the perceived importance of reporting profitability in the business practice. These students have recognised that no matter what the decision characteristics are, the crucial important task is to maximise reporting profits, so that an optimal performance accounting statement can be presented. The accounting and management students, on the other hand, have little

practical experience, and are thus unable to recognise the master point of analysis.

A subsequent interview with a sample of accounting students reveals that, in selecting the situational answer, they have actually borne in mind the possibility or otherwise of arriving at any plausible calculations in the determination of optimal reporting profits or decision profits. Thus they consider that the actual decision choice will be largely depended upon the circumstances under which they have to make decisions. These interviewees are then further asked about their preferred course of actions given the assumption that they can practically calculate both reporting profits and decision profits that are different to each other for a certain case. Disappointedly, most students state that they have no idea which profitability measurement is more important in a real life decision case, but somehow they prefer to maximise reporting profits than decision profits.

Based on these understanding about students' perception, the results of the hypothetical cases are presented as below:

### ***Case One: Pricing for Ad Hoc Production Order***

This case hypothesises a situation when a company has idle production capacity which is well sufficient to entertain an incoming ad hoc order. Cost data and their variations are given in the case, so that respondents can easily calculate the total costs for the ad hoc order and determine the price level that should be charged to the customer. Four questions are asked for this case, each question relating to a different condition.

***[Please refer to Case One in the Questionnaire for details of case data]***

*Question one: At what offered price will you accept the order?*

	<i>MSc Students</i>	<i>Accounting Students</i>	<i>Management Students</i>
<i>Only accept offered price at or above current selling price</i>	0	5	4
<i>Accept offered price at or above total production costs</i>	6	13	7
<i>Accept any offered price above the marginal costs of production</i>	4	10	4

*Question two: If competitors have reduced selling price from \$200 / unit to \$180 / unit, at what offered price will you accept the offer?*

	<i>MSc Students</i>	<i>Accounting Students</i>	<i>Management Students</i>
<i>Only accept offered price at or above current selling price (\$200)</i>	0	2	2
<i>Accept offered price at or above reduced selling price (\$180)</i>	2	6	4
<i>Accept offered price at or above total costs of production</i>	6	11	6
<i>Accept offered price at or above marginal costs of production</i>	2	9	3

Question 3: If competitors' price is reduced to \$180 per unit, and future materials price will rise by 50%, then:

	<i>MSc Students</i>	<i>Accounting Students</i>	<i>Management Students</i>
<i>Only accept offered price of \$200 and above</i>	0	9	5
<i>Accept offered price of \$180 and above</i>	0	1	1
<i>Accept offered price at or above revised total costs of production</i>	10	14	8
<i>Accept offered price at or above revised marginal production costs</i>	0	4	1

Question four: If labour costs are fixed on monthly basis, at what offered price will you accept the offer?

	<i>MSc Students</i>	<i>Accounting Students</i>	<i>Management Students</i>
<i>Only accept offered price at or above current selling price</i>	0	4	2
<i>Accept offered price at or above total production costs excluding labour costs</i>	3	8	5
<i>Accept offered price at or above total production costs</i>	6	13	8
<i>Others</i>	1	3	0

With reference to the idle production capacity specified in the case data, a college approach in determining the price level for the ad hoc order is to calculate the marginal production costs, and any offered price exceeding that is acceptable. However, based on the respondents' answers, less than half of the respondents in each group and in total have selected the contribution or opportunity cost approach in determining the price level for the order. From the answers to all 4 questions, it is obvious that more than 70% of the respondents only accept an offered price at or above the total production costs level, which includes fixed production overheads, such as the labour costs as stated in Question 4. Since fixed production overhead will not alter with production volume, the acceptance of the ad hoc order that increases production volume will not lead to any increase in these fixed costs. Therefore the fixed production costs are regarded as sunk costs, and are irrelevant to the decision from a college view. Perhaps a plausible explanation is that since performance related salary and bonus schemes are supposed to be used, *there is always a tendency to have reported profits in every single business transaction*, and thus for each situation a price over and above total production costs (which are reported costs) is favoured upon than merely getting a price over marginal production costs but below total production costs.

Moreover, students change their answers as additional information come in with a surprising direction that less and fewer students adopt the opportunity cost approach as more and more information become available to the choice. This is apparently contradictory to previous research findings, which propose that managers will tend to adopt the opportunity cost approach as more and more cost information are readily available to them (Friedman & Neumann 1980, Northcraft & Neale 1986). In particular the students' response to question 4 needs special discussions. The answers to question 4 has been deliberately set to exclude the alternative of marginal contributions, whereas in the previous three questions a choice to adopt the marginal contribution approach is provided to students. This special treatment is to test the effect of the accounting information system to the students, with an emphasis on the provision of decision alternatives. In answering question 4, only one student still points out that a marginal contribution approach should be adopted, while all other students adopt some form of total cost approach in determining the order price. Students in this respect seem to be induced to behave *in a way as directed by the provision of information*. *The small samples* of students that are interviewed subsequently admit this point, saying that they have not carefully considered alternatives other than those provided in the answer set. The behaviour of these students has partly substantiated the hypothesis that the operation of the accounting information system and the provision of information for decision making can affect

a decision maker's choice of actions. Applying this situation to the actual decision processes, one of the conditions for the adoption of the opportunity cost approach will be whether the accounting information can provide the required opportunity cost data, which is made available only with an advanced management accounting system that caters for a decision database as well. Thus, Hypothesis One is partially proved.

### ***Case Two: The China Investment Programme***

This case is set to test the respondents' view about the opportunity use of scarce resources in an investment decision, and the accounting treatment that would be made. Although investment decisions involve complex considerations in general, case questions are restricted to the more direct aspects of opportunity cost calculations to reduce possible resentment from respondents in completing the questionnaire.

***[Please refer to Case Two in the Questionnaire for details of Case Data]***

*Question one: Treatment of Financing Interests*

	<i>MSc Students</i>	<i>Accounting Students</i>	<i>Management Students</i>
<i>Treat interest on finance as expenses in calculating returns</i>	2	11	6
<i>Treat interest on finance as capitalised costs</i>	8	15	9
<i>Ignore interest on finance in calculating project returns</i>	0	2	0

*Question two: Treatment on Benefits Earned from Existing Funds*

	<i>MSc Students</i>	<i>Accounting Students</i>	<i>Management Students</i>
<i>Charge current benefits as expenses in calculating returns</i>	5	8	11
<i>Include current benefits as capitalised costs</i>	4	15	4
<i>Ignore these earned benefits in calculating project returns</i>	1	5	0

*Question three: Treatment of Contribution Loss to Existing Branch*

	<i>MSc Students</i>	<i>Accounting Students</i>	<i>Management Students</i>
<i>Charge contribution loss as expenses in calculating returns</i>	4	11	8
<i>Charge contribution loss as capitalised costs</i>	4	14	4
<i>Ignore contribution loss in calculating project returns</i>	2	3	3

*Question four: Assessment of Project Returns*

	<i>MSc Students</i>	<i>Accounting Students</i>	<i>Management Students</i>
<i>Use a common assessment model for all projects</i>	2	2	3
<i>Use project geared assessment models for each project</i>	3	14	9
<i>Use opportunity cost based assessment model</i>	5	12	3
<i>Accept only the highest returned project and reject others</i>	0	0	0

In general all students tend to indicate a preference of opportunity cost approach in making investment decisions, as most students prefer to include the opportunity costs (e.g. the finance cost in question one, the benefits currently enjoyed by the

company in question two) in the calculation model, and few respondents select to ignore these opportunity costs in assessing project returns. However, diverse views about the exact accounting treatments for these opportunity costs are found among the students (that are, whether these opportunity costs should be treated as expenses or capitalised costs). The diverse opinions may be partly attributed by the students' lack of knowledge base to handle these accounting treatments, and also partly due to their uncertainty of how opportunity costs should be viewed upon. Disregarding what is the correct approach in handling opportunity costs in an investment decision, the different accounting treatments applied to these costs (as expenses or as capitalised costs) will result in the individual projects showing a diverged rate of returns, and thus the selection of different accounting and cost calculation models obviously affects the subsequent decision choice. Also an important point to note in Case two is that, when the students are directly asked about the decision approach in investment decisions as set out in question 4, a majority (55%) of students selects to compare proposed project returns with hurdle rates geared for that type of decision, rather than comparing with the best alternatives of using the funds other than investing in the China market. This is an indication that although students have some preference to adopt the opportunity cost approach in specific items, there is still a lack of a majority consensus in the adoption of the said approach from a more general and comprehensive perspective.

### ***Case Three: Selection of Plant Site***

This case is the most difficult one among the three hypothetical cases. The case refers to the selection of a city in China to set up a subsidiary. Two cities are quoted and only one city can be selected. Case data are deliberately set so that respondents have to make their own calculations and judgement before they can arrive at a choice of the city. Also, more uncertainties and greater complexity are added hereto in order to test the respondents' reaction to a highly uncertain and complex decision situation.

***[Please refer to Case Three in the Questionnaire for details  
of Case Data]***

*Question one: Recommendation of City for New Subsidiary*

	<i>MSc Students</i>	<i>Accounting Students</i>	<i>Management Students</i>
<i>Investment in China should be deferred</i>	<i>1</i>	<i>3</i>	<i>6</i>
<i>Town One in China should be selected for investment</i>	<i>4</i>	<i>2</i>	<i>1</i>
<i>Town Two in China should be selected for investment</i>	<i>3</i>	<i>5</i>	<i>5</i>
<i>Decision should be deferred as important information are missing</i>	<i>2</i>	<i>18</i>	<i>3</i>

*The provision of data in Case Three is actually insufficient from an accountant's point of view. Many data are missing, such as the magnitude of production costs, the projected time when cost savings would be swallowed by inflation, and the barriers to exit. Without these cost data on hand, the calculation of project life returns for the two alternative sites are greatly paralysed, and no accurate calculations (again, from the accounting perspective) can be arrived at. Thus it is reasonable that about 60% of the accounting students select to defer the decision until more information are sought for and available. However, 80% of both the finance students and the management students have made their choices without*

*being affected by the apparent lack of information. The significant difference in the preference decision composition acts as an indication that managers in a more uncertain and complex situation do not rely on accounting calculations to any significant extent. Rather, they will arrive at their decision choices from a more judgmental sense. The core issue here is that, however, once detailed accounting calculations are dispensed with, there is total uncertainty that the opportunity cost approach can be applied in any satisfactory way within the accounting perspective. Managers (the master students and the management students) may have applied the opportunity cost reasoning approach in selecting their choice of actions. However, from an accounting perspective, there is no evidence if such approach has been taken, as accounting statements showing its effect is impossible to be presented in this hypothetical case.*

*Question two in Case Three further magnifies the degree of uncertainty by adding hereto a discretionary cost item, entertainment expenses, which do not have direct relationship with production function, but which affect the overall operational effectiveness of the prospective factory in the supposed Chinese atmosphere. However, it must be clarified here that the addition of entertainment expenses purely serves as a complication of a hypothetical case, and does not suggest in any way a reflection of the current market atmosphere in China.*

*Question two: Recommendation given Entertainment Expenses in Mind*

	<i>MSc Students</i>	<i>Accounting Students</i>	<i>Management Students</i>
<i>Investment in China should be deferred</i>	<i>1</i>	<i>2</i>	<i>5</i>
<i>Town One in China should be selected for investment</i>	<i>1</i>	<i>1</i>	<i>2</i>
<i>Town Two in China should be selected for investment</i>	<i>6</i>	<i>2</i>	<i>3</i>
<i>Indifferent between Town One and Town Two</i>	<i>0</i>	<i>6</i>	<i>3</i>
<i>Decision should be deferred as important information are missing</i>	<i>2</i>	<i>17</i>	<i>2</i>

The magnitude of entertainment expenses is set to a level that makes the perceived attractiveness of both investment alternatives greatly reduced, so that a revised recommendation may be made by the respondents to retain the production base in Hong Kong, or to defer the decision until more important information can be sought for. For example, the magnitude of entertainment expenses is an average of other companies, the case company may wish to obtain its own estimation of the level of expenditure for this particular item. This being the case, there is an ex ante expectation that more respondents would shift to select to defer the decision.

However, it is greatly surprised to find that more students consider that they can make a decision right at the moment than the situation as stated in question one, and also more students consider that production base should be transferred from Hong Kong to China, even though there are additional costs for entertainment. The results indicate that student respondents favour the situation when *entertainment fees can facilitate business success, or in a negative sense* do not reject the existence of such. With all respondents are Chinese students (since the proportion of non Chinese students are less than 1%) and the case is hypothesised in the China market, the opinions clearly demonstrate the Chinese culture and perception of personal relationship, that Chinese people are very much fond of linking business relationship with personal relationship, and find their "happier" ways through informal discussion for business solutions. Of course this issue of personal relationship is unable to be explicitly expressed in any formal accounting calculations.

*Question three : Recommendation given Uncertain Labour Mobility Costs*

	<i>MSc Students</i>	<i>Accounting Students</i>	<i>Management Students</i>
<i>Search for a reasonably accurate estimation of labour costs before decision</i>	5	19	8
<i>Arbitrarily estimate labour mobility costs and proceed with investment calculations</i>	3	6	2
<i>Ignore labour mobility costs</i>	2	3	5

Question 3 sets a special cost item (the labour mobility costs) with high degree of uncertainty to its magnitude. The expected response from a college perspective that further information should be searched for before a decision should be made is, as in question one and two, held by a simple majority of students. However, a significant proportion of the master students and the management students (roughly occupying 50% of each group of students) select to take an arbitrary approach or simply the labour mobility costs. These students have indicated some kind of decision behaviour that is not compatible with the accounting perspective, when costs (including opportunity costs) should be ascertained in a decision process. Perhaps they have behaved in accordance with the REMM model as proposed by Jensen and Meckling, so that they would not bother finding out the “more accurate

calculations” which require greater efforts.

The responses to these questions, together with students' responses to Case one and Case two, are compatible with the findings of previous research findings, that managers will only adopt the opportunity cost approach if data are readily made available (Friedman & Neumann 1980), and that managers often do not have adequate opportunity cost information (March 1987). Despite these reiterations, a new finding from this research is that, managers are affected and dominated by the setting and operations of the accounting information systems. Managers have no initiation to search for opportunity cost data to any significant extent if these cost data are not readily available. They will make decisions largely based on what are available to them with the existing accounting information system. Once the information system stops to provide certain data, managers will tend to neglect the missing data set and continue to make decisions.

### ***Concluding Remarks for the Controlled Students Test***

The engagement of this controlled test with students carefully selected to monitor their knowledge base and business experience is to establish some controlled results from an academic perspective, so that comparison can be made between academic

views and practising views. From the results obtained in this controlled test it seems that the framework of analysis and the hypotheses as proposed in Chapter 4 above are at least substantiated from an academic perspective. In a decision making process, decision makers have to select their calculation and ranking models in order to analyse and rank alternatives that are available for selection. Thus for the purpose of testing the possible use of the opportunity cost decision model, the cognitive decision behaviour of a decision maker (the students) is tested and studied to identify in what way he will select a particular cost calculation model, and under what circumstances he will select an opportunistic cost model for analysis and decision purposes. His selection of a particular cost model reflects his willingness and perceived ability in invoking that cost model to substantiate his decision choice.

With the results obtained from the controlled test, the following observations can be made in respect to the proposed framework of analysis and the hypotheses:

1. Students collectively prefer performance related salary and bonus schemes, which represent performance related reward and compensation packages in a broader sense. Since many companies use reporting profitability in its various forms as a measurement yardstick for performance (Reece & Cool 1978), it is reasonable to expect that the MSc students who are managers in their day time employment, have also experienced with a performance

measurement system using reporting profitability. Thus, the established relationship between performance and reward system have led managers trying to select the reporting cost model instead of the decision cost model in making decisions.

2. Various results across the controlled test prove that the setting and operation of the accounting information system exert much influence to the decision behaviour of a decision maker, in a sense that a decision maker will be largely restricted and affected by what are the accounting outputs and in what way information are collected and presented to his knowledge. Thus a major constraint in the adoption of the opportunity cost model in decision making is whether accounting outputs based on such a cost model can be produced and made available to the decision maker or not. Since only a relatively more advanced accounting information with a wider scope of database can provide such kind of accounting outputs, hypothesis one (which proposes that the more advanced a management accounting information system is maintained, the higher will be the adoption rate of the opportunity cost model in decision cases) is proved in a logical deductive way.

3. There is also clear evidence from the test results that the students try to get away from detailed cost calculations and refer to more judgmental process in a decision situation which is highly uncertain and complex. Since the opportunity cost model, like other accounting models, requires accurate and comprehensive information to show an acceptable analysis in respect to decision alternatives, a desertion of detailed calculations logically means that the more uncertain and complex a decision situation is, the less possibility will a decision maker invoke the opportunity cost model in calculating alternative payoffs. As stipulated in previous chapters, a decision maker may still apply the opportunity cost reasoning in accordance with his own judgement, and include for his own model such items that cannot be quantified and presented in an opportunity cost statement. However, with reference to the theory of choices and the REMM model, it is still evident that the decision maker has not applied the opportunity cost model in the accounting perspective (that is, calculating and presenting opportunity cost statements for decision purposes). The master students may have considered from an opportunity cost reasoning to reject the adoption of the opportunity cost decision model, because the extra effort is great for them in pursuing such a cost model in the formal calculation process. Thus hypotheses 3 and 4 are also proved.

Since the above conclusions are only arrived at through a research with the students groups, another research based on a sample of practising accountants is simultaneously carried out to find out the decision behaviour of real life managers and their views about the adoption of the opportunity cost model in a decision process.

## CHAPTER 6

### THE ADOPTION OF THE OPPORTUNITY COST MODEL IN A REAL LIFE COMMERCIAL ENVIRONMENT

There are very little management and accounting researches that are related to the studies of the cognitive decision behaviour of business managers in Hong Kong. It is partly because of the lack of initiatives in performing researches with the stipulated group of population, and partly because of the peculiar culture and tradition of the Chinese people in Hong Kong (Hofstede 1980). In Hong Kong businessmen regard almost every part of their management practice as confidential, and unless a strong personal relationship has been built up between the researchers and these corporate managers, rarely would these "confidential" information be released to the knowledge of people outside the firm. Thus, in Hong Kong the response rate of researches through questionnaires is usually lower than the normally accepted minimal. Despite this major constraint in performing researches, an understanding of the decision behaviour of business managers in Hong Kong is crucial to the success and value of the current research. As stipulated in the first Chapter, Hong Kong is the major business partner of China. Many listed firms in Hong Kong are involved in investing projects in China. Thus, they have accumulated valuable experiences of the better ways to carry on businesses with the Chinese officials and entrepreneurs.

In this respect the experiences of managers in Hong Kong are good examples to managers in the Western Hemisphere in dealing with Chinese entrepreneurs, and to carry on business in China. Also the success of the current research will contribute to the expansion of the cultural perspective analysis in combination with the behavioural decision theories, reflected in the accounting and management practices of the adoption of cost calculation models in decision processes.

### **Selection of Population and Sample Group for the Field Study**

Public companies listed on the Hong Kong Stock Exchange are selected as the population group for the purposes of the current research. The reasons for selecting listed companies as the research domains are to ensure that all sample companies are comparatively large in size (because there are prescriptions about the minimum asset base of listed companies), and have had the business experiences required for this research. Moreover, these companies employ well qualified accountants who have acquired adequate professional and managerial knowledge in handling with decision situations. These accountants could well operate and maintain an opportunity cost database and provide opportunity cost data in case management require said data for decision making purposes. Thus, there is feasibility that these listed companies could employ the opportunity cost

approach in decision making processes if management wish to. These two stipulated factors of concern, that the sample companies have the required experiences and the ability to invoke opportunity cost models for decision making purposes, are prerequisite for a company to be qualified as a sample. Therefore, the population group of companies is restricted to the listed companies in Hong Kong. With reference to the population list there were roughly 580 listed companies in Hong Kong in 1995, and a random sample of 200 listed companies was constructed therefrom. These randomly selected companies represented diversified interests in different industries and cultural background. Based on the sample list, a set of questionnaires was sent to the chief accountant / financial controller of each company to obtain information regarding the real life decision practices of management of these companies. Questionnaires were sent to the chief accountants of these companies for three reasons :

1. The chief accountant is the person who provides accounting and cost information to management for decision making purposes. Thus the accountant is in the best position to know about the accounting routines that are used by the company and the variation of information needs by management under different circumstances.

2. The chief accountants of these listed companies (in Hong Kong) are qualified professional accountants, so that they are well equipped and acquainted with the questions being asked in the questionnaire, especially the case study part.
  
3. The chief accountant as information processor and provider can provide company wide information about managerial decision behaviour whereas individual managers may only provide feedback from personal experience or intuition.

As mentioned in the previous paragraphs, since management of many companies kept internal information in confidentiality, 48 completed questionnaires only were returned and received, representing 24% of the total sample size. Included in these 48 replies actually some accountants had indicated that they completed the questionnaire and agreed to release their corporate practices to the knowledge of the candidate just because they had some personal connections with the candidate, either as past students of the candidate or professional companions frequently met in professional and academic gatherings. The circumstances in the data collection process had reconfirmed the situation that Chinese people like to keep things in confidentiality, and personal relationship is

an important factor to the success of business interactions. Several companies replied that they would not release any information regarding corporate practices to outsiders in accordance with senior management's decisions. Other companies did not provide any reply. I had tried to improve the response rate by making phone calls to about 30 companies who had not given any reply. This was feasible because for those companies who gave me a reply, they sent back the questionnaires in their own envelopes which bore the name of the company. Despite my follow up calls, all companies denied my request with the same reason, that decision practices were regarded as confidential information and would not be released. After all, a response rate of 24% would be regarded an acceptable rate for the proceeding of data analytical works.

### **Organisational Setting**

To obtain important background data from the respondents, and to follow the normal sequence of general questionnaire design (so that prospective respondents will feel more comfortable with the questionnaire), data regarding organisational setting are asked at the beginning of the questionnaire. Replies from the respondents reveal that the total group of replies represent a wide variety of interests among different categories of industry as suggested by the Hong Kong Stock Exchange, with each individual category of companies counting less than

one sixth of the total respondent size. This is a desirable combination because industrial characteristics of any particular category of companies will not be dominant enough to affect the collective results across the responding companies.

The respective asset size of the responding companies also constitute a well balanced portfolio as below:

**Table 16: Size Distribution of Responding Companies**

Asset Base	Below HK\$200M	\$200M - \$500M	\$500M - \$1000M	\$1000M - \$5000M	Above \$5000M
No. of Companies	9	12	5	10	12

With reference to Table 16 broadly 21 companies fall into the smaller size group (asset size below HK\$ 500 millions) and 22 companies represent the larger size group (asset size above HK\$ 1 billion). Based on the size distribution of the companies, the size effect to managerial decision behaviour will also be minimised. Given the industrial and size data, it is presumably true to say that subsequent findings and analyses reflect what management of listed companies in Hong Kong would practise in general, and do not bias towards any particular industrial or size group of companies.

The announced corporate objectives of the responding companies are similar to normal expectations of a commercial firm. Out of 48 companies, 41 have claimed profit maximisation as its sole or prime objective. A less expected answer is that 21 companies have claimed an objective of providing quality service to clients. Among these 21 companies 14 have dual corporate objectives of profit maximisation also, but still there remains a total of 7 companies who claim that quality service to clients is their sole objective. Based on the response the listed companies in Hong Kong are also aware of the importance of client service and satisfaction in the securing of profitability in the current business atmosphere. This finding is also matched with the finding in the control group test, as the students also regard profit maximisation and provision of quality services the two prime business objectives in Hong Kong. However, since a study of the trend of business objectives is beyond the scope of this research, no further data collection and analysis is made in this respect.

### **Rewarding System of Managers**

With reference to the proposed framework of analysis the current commercial practice of the determination of salaries and bonus schemes is an important piece of information to the study of the effect of rewarding system to decision behaviour as proposed by the agency theory, the expectancy theory, and the

behavioural decision theories. Details of the current salaries and bonus structure are tabled below:

**Table 17: Bases for the Determination of Salaries Structure**

	No. of Companies
A fixed scale without variation except annual increments	5
A variable scale by senior management's recommendation on staff performance	39
A pre-determined scale linked to target achievement	3
Others (unspecified by respondent)	1

**Table 18: Bases for the Determination of Bonus Scheme**

	No. of Companies
Some scales directly related to managerial performance	15
Overall corporate profitability disregarding personal or departmental performance	3
A balance between departmental achievement and senior management appraisal	13
A fixed scale irrespective of corporate profitability nor departmental achievement	3
Discretion by senior management or board of directors	12
Others (No bonus payment)	2

Data presented in table 17 and 18 provide clear evidence that most business managers' salaries and bonus payments that constitute a majority part of the total compensation package are performance related. Only five companies out of a total of 48 have selected a fixed salary scale irrespective of performance for the determination of salaries for their managers, while six companies have selected to pay bonus to managers without due regard to their performance. To the majority of managers who have to rely on assessed performance to get their share of increased salaries and bonuses, they will have to maximise their performance.

Since about 80% of the responding companies are profit maximised companies, it is perfectly logical to presume that managers' performance are measured by their ability in enhancing profitability of the company, either through generation of more revenue, or through reduction and saving of costs, or both. These listed companies have to present and provide published accounts to the shareholders and general public as required by the Stock Exchange of Hong Kong, and thus maximisation of profits can be interpreted as maximising reporting profits in the published financial reports, which means that all the financial accounting domains would be followed, and performance assessment will also follow the same traits. With reference to this fact it is quite probable that the findings and arguments of Solomons (1965), Flower (1970), and Moizer & Pratt (1988) find their places here, and managers in Hong Kong will attempt to maximise reporting

profits even from a decision perspective a motivation of such may not lead to optimal decisions. The consequence of adopting reporting performance bases for reward calculation will thus lead to a temptation of the business managers to reject the employment of the opportunity cost model in decision making processes.

### **Maintenance of Management Accounting Information System**

One of the essential features for the adoption of the opportunity cost model in decision making processes is the operation and maintenance of a management accounting information system which caters for opportunity cost information.

Since the listed companies have sufficient funding and expertise to maintain a reasonably sophisticated management accounting information system, management of these companies have every feasibility to adopt such an information system if they wish to. Despite the apparent ability to maintain a management accounting information system, results indicate that not all listed companies have maintained same:

**Table 19: Maintenance of Management Accounting Information System**

	No. of Companies
Only the financial accounting system is maintained	9
An integrated accounting system is maintained	27
An interlocking accounting system is maintained	4
Management accounting data are collected on ad hoc basis without maintaining a routine accounting system	8

Out of the total respondents 17 companies do not maintain any management accounting information system. The general distribution of both the group of thirty one companies who maintain a management accounting system, and those seventeen companies who have not maintained such a system, is diversified across the respondents both in terms of industry and size. The diversified distribution of group companies thus act as an indication that both industrial and size factors do not exert any significant influence to the research results. The major concern here is that, despite the availability of resources and expertise, what are the main reasons that lead to management of these seventeen companies giving up the maintenance of a management accounting information system. Comparing with the students' perception, less than 10% of the students admit the disposal of the management accounting information system, whereas about 35%

of the companies take the view. To clarify the situation, interviews have been arranged with the chief accountants of five listed companies, with one company happened to be a company not maintaining a management accounting system. The accountant of this company gives an explanation that management does not perceive any real need to maintain such a system, rather they prefer to have ad hoc information every time they see a need. The accountant further admits that the process of information collection and analysis will be ineffective in times because of the absence of a formal information database, but he is in the opinion that management does not bother much about the possible ineffectiveness of information processing. When the accountant is asked about the frequency of using the opportunity cost approach in decision process, he states that the adoption or otherwise of the opportunity cost approach depends on each situation, and actually in the minds of the management they have not bothered about which cost concept has been adopted, so long as they are happy with the provided data. The other four accountants also express their views which, based on their experience present or past, they do not perceive that business entrepreneurs in Hong Kong really rely on management accounting information in making decisions. Thus, in their opinions it is not unusual that some of listed companies in Hong Kong do not maintain a formal management accounting system.

The observed phenomenon in the maintenance of a management accounting system is that, in the absence of such, it is with reservation that management of these companies will and could employ the opportunity cost approach in making decisions, as they may probably lack adequate cost information in this respect. Of course it is possible that companies maintain separate opportunity cost database other than a routine management accounting system. To verify the situation respondents are also asked to indicate whether they have maintained an opportunity cost database:

**Table 20: Maintenance of Opportunity Cost (OC) Database**

	No. of Companies	Student Response
OC database form part of the management accounting system	8	22
OC database separately maintained	1	15
OC data only collected on ad hoc basis	25	13
OC data is not required by management in most cases	14	3

Based on the accountants' responses, out of 31 companies who have maintained a management accounting system, only 9 companies claim that they have also

maintained an opportunity cost database. On the other hand, 14 companies constituting about 30% of the total respondents do not make use of opportunity cost data in most cases. This is clearly different from the students' perception that OC database should be maintained. With less than 20% of the companies claiming maintenance of a routine OC database, it is suspicious if management decision making will be based on opportunity cost approach in a systematic way.

Since more than 50% of the respondents state that OC data would be collected on ad hoc basis, it seems more plausible to say that management of the listed companies in Hong Kong will only make use of opportunity cost approach in certain decision situations from time to time. The results thus constitute supporting evidence that the employment of opportunity cost model is affected by some variables, which form the core concern for the following analyses. An analysis of the specific items of economic and quantitative data maintained by the responding companies further substantiate this observed fact:

**Table 21: Maintenance of Economic and Quantitative Database**

	No. of Companies	Students' Response
Competitors' product price movement	22	53
Materials' price movement for main products	31	50
Relative utilisation rate of labour	17	38
General economic data of Hong Kong	24	32
General economic data of main export country	24	46
Product line profitability statistics	30	50
Input contribution ratios of company's input resources	15	43

With approximately the same number of respondents between the academic group (53 students) and the professionals (48 accountants), the results show a significant difference between perceived need and actual practice. Although the selected items are important data for various types of decisions, at most about 30 companies only will maintain record of a particular item. Further breakdown have shown that only 4 companies have kept track of records for all these data, while 5 companies do not keep any record for these data at all, and 30 companies have maintained records of four items or less. All these results undoubtedly point to the assertion that managers of listed companies in Hong Kong will only selectively use opportunity cost data which meet their own requirements.

## **Cognitive Decision Behaviour of Managers in Practice**

In studying the cognitive decision behaviour of business managers, their understanding of the opportunity cost concept is verified as the starting point. However, based on the accountant's responses only 18 accountants have selected the "normal" definition of opportunity costs, that is, the highest value foregone in selecting a particular course of action. On the other hand, 18 accountants have selected the alternative answer that the opportunity cost concept is a situational concept, which means that the opportunity cost concept could be interpreted in different ways under different circumstances. If this is the case, then an accountant could adopt different conceptual bases and approaches in calculating opportunity costs, although in each time he claims that he is (or is not?) adopting the opportunity cost concept. The remaining 12 accountants have selected other definitions as shown on Table 9 which are not usually adopted in textbooks. Based on the accountants' responses, they have not indicated an unanimous or overwhelming agreement on the definition of the opportunity cost concept. The diversity of views about the interpretation of the opportunity cost concept may affect the accountant's choices of provision of data to managers in discharging managerial functions. Disregarding this possible influence about information choices, the respondents are asked about their understanding of the practices of their companies in soliciting information sources under different task

characteristics.

### **Task Characteristics and Data Sourcing**

Although in the student group controlled research it has been proved that task characteristics, notably task complexity and task uncertainty, contribute to the modification of decision behaviour reflected in the choice of selection of information source for decision making purposes, the same test must be repeated with the business perspective to ascertain its validity in practices. Thus the same set of questions regarding task characteristics and data sourcing are asked to solicit the opinions of the accountants on behalf of their companies. The accountants as respondents are clearly reminded in this situation to indicate the practice of their company and management - and not their own perception about which data source should be solicited.

**Table 22: Frequency of Data Searching for Different Decision Situations**

	Accountants' Response	Students' Response
<b>Data from Accounting System</b>		
Product pricing decisions	1.91	1.89
Asset replacement decisions	2.31	2.06
Asset acquisition decisions	2.50	2.25
Expansion of existing operations	2.11	1.83
Investment in new business line	2.46	2.19
Investment in new geographical area (excluding China	2.76	2.12
Investment in the China market	2.56	2.14
<b>Data from Information Database</b>		
Product pricing decisions	2.41	1.88
Asset replacement decisions	2.94	2.06
Asset acquisition decisions	2.81	2.19
Expansion of existing operations	2.55	1.68
Investment in new business line	2.60	1.67
Investment in new area	2.67	1.88
Investment in the China market	2.69	1.69
<b>Ad Hoc Internal Data</b>		
Product pricing decisions	2.46	2.53
Asset replacement decisions	2.83	2.57
Asset acquisition decisions	2.75	2.55
Expansion of existing operations	2.56	1.98
Investment in new business line	2.61	2.02
Investment in new area	2.80	2.12
Investment in the China market	2.46	2.08

<b>Ad Hoc External Data</b>		
Product pricing decisions	2.67	2.96
Asset replacement decisions	2.89	2.91
Asset acquisition decisions	2.74	2.53
Expansion of existing operations	2.70	2.16
Investment in new business line	2.47	1.80
Investment in new area	2.50	1.75
Investment in the China market	2.33	1.65
<b>Data Provided by Consultants</b>		
Product pricing decisions	3.67	3.11
Asset replacement decisions	3.89	3.29
Asset acquisition decisions	3.40	3.07
Expansion of Existing Operations	3.51	2.58
Investment in new business line	3.13	2.04
Investment in new area	3.20	1.84
Investment in the China market	3.00	1.66

The same set of data is also rearranged with respect to types of decisions to show the relative data retrieving rate of different data source under different decision situations:

**Table 23: Relative Data Retrieving Rate for Different Decision Situations**

	Accountants' Response	Students' Response
<b>Product Pricing Decisions</b>		
Data from accounting system	1.91	1.89
Data from information database	2.41	1.88
Ad hoc internal data	2.46	2.53
Ad hoc external data	2.67	2.96
Data provided by consultants	3.67	3.11
<b>Asset Replacement Decisions</b>		
Data from accounting system	2.31	2.06
Data from information database	2.94	2.06
Ad hoc internal data	2.83	2.57
Ad hoc external data	2.89	2.91
Data provided by consultants	3.89	3.29
<b>Asset Acquisition Decisions</b>		
Data from accounting system	2.50	2.25
Data from information database	2.81	2.19
Ad hoc internal data	2.75	2.55
Ad hoc external data	2.74	2.53
Data provided by consultants	3.40	3.07
<b>Expansion of Existing Operations</b>		
Data from accounting system	2.11	1.83
Data from information database	2.55	1.68
Ad hoc internal data	2.56	1.98
Ad hoc external data	2.70	2.16
Data provided by consultants	3.51	2.58

<b>Investment in New Business Line</b>		
Data from accounting system	2.46	2.19
Data from information database	2.60	1.67
Ad hoc internal data	2.61	2.02
Ad hoc external data	2.47	1.80
Data provided by consultants	3.13	2.04
<b>Investment in New Geographical Area (Except China)</b>		
Data from accounting system	2.76	2.12
Data from information database	2.67	1.88
Ad hoc internal data	2.80	2.12
Ad hoc external data	2.50	1.75
Data provided by consultants	3.20	1.84
<b>Investment in the China Market</b>		
Data from accounting system	2.56	2.14
Data from information database	2.69	1.69
Ad hoc internal data	2.46	2.08
Ad hoc external data	2.33	1.65
Data provided by consultants	3.00	1.66

An initial descriptive analysis shows some interesting findings. Although students representing some form of academic views emphasise the important roles of accounting and information database, the revealed practices do not reflect the same degree of reliance in making decisions. In fact accountants have demonstrated a much lower frequency of retrieving data for decision analyses for

almost every single source of data. This fact alone gives an indication that management of these listed companies in making decisions have placed less reliance on information as what is originally expected. As a corollary, it is believed that judgemental process in making decisions is exercised to a greater extent than a direct dependence on the calculated outcomes from source data. Notwithstanding the less frequent uses of source data in general in decision processes, the relative retrieving rate among various data sources still varies across different types of decisions, showing that data from a certain source may be more frequently called upon for one type of decisions, but less frequently called upon for another type.

With reference to Tables 22 and 23, even a glance will immediately identify that external professional advice is seldom invoked in all prescribed decision situations. This is contradictory to the students' perception, who think that as the degree of uncertainty and complexity increases, external advice will also be increasingly called upon. However, it is still arguable that the relative degree of retrieving rate increases as the decision case involves more and more external factors (from 3.89 in asset replacement decision to 3.00 in China investment projects). Another obvious finding is that, except in the China investment projects and other geographical investment projects, accounting data are the data

source that is most frequently called upon. However, with regard to the geographical investment projects, ad hoc external data are more frequently called upon, indicating that accounting data play a less important role in the decision process of this type. These findings are compatible with the theoretical framework, as decision task characteristics will affect the decision maker's choice of selection of accounting and information processing models. The statistical relationship of these source data also substantiates these comments :

**Table 24: Wilcoxon Test of Data Retrieving Frequency by Decision Type**

	5%	1%
<b>Product Pricing Decisions</b>		
Accounting data - All other data source		p=0.000
<b>Asset Replacement Decisions</b>		
Accounting data - All other data source		p<0.008
Information database - Other data source		p<0.01
<b>Asset Acquisition Decisions</b>		
Accounting data - All other data source		p<0.001
<b>Expansion of Existing Operations</b>		
Accounting data - All other data source		p<0.001
Information database - other data source		p<0.002
<b>Investment in New Business Line</b>		
Accounting data - All other data source		p<0.002
<b>Investment in New Geographical Area</b>		
Accounting data - ad hoc internal data	p=0.0219	
Accounting data - Consultant's Data		p<0.003
Ad hoc external data - consultant's data		p<0.01
<b>Investment in the China market</b>		
Accounting data - consultant's data		p=0.000
Accounting data - other data source	p<0.0320	

Matched with the fact that only 9 companies have maintained a routine database system, and less than 5 companies have kept record of important economic and quantitative data, it is not surprising to find that the retrieving rate of accounting

data is significantly higher than all other sources of data in all decision cases except investment decisions in new geographical regions. The interesting findings are that, apart from the accounting data, other sources of data are called for in similar frequencies irrespective of the decision types, as there is no significant difference in the retrieving rates of these information sources. The findings apparently contradict with the proposed hypotheses that different decision tasks should require information portfolios that distinguish between each other. However, when the relative retrieving rate of source data are viewed from a source perspective, results are compatible with the hypotheses :

**Table 25 : Wilcoxon Test of Data Retrieving Frequency by Data Source**

	5%	1%
<b>Data from Accounting System</b>		
All other decisions		p=0.0000
<b>Data from Information Database</b>		
Asset replacement decisions	p=0.0177	
Asset acquisition decisions		p=0.0046
Investment in new business line	p=0.0303	
Investment in new area		p=0.0077
Investment in the China market	p=0.0212	
<b>Ad Hoc Internal Data</b>		
Asset replacement decision		p=0.0030
Asset acquisition decision	p=0.0148	
<b>Ad Hoc External Data</b>		
Asset replacement decisions		p=0.0039
Asset acquisition decisions	p=0.0271	
<b>Data Provided by Consultants</b>		
Investment in the China market	p=0.0411	

Following the presentation in Table 13, utilisation frequency of data for other decisions are compared with the rate of product pricing decisions. Based on Table 25, clearly the relatively utilisation rate of source information under various types of decision can be significantly different. A major contradiction revealed from data shown between Tables 13 and 25 is that, although students perceive that accounting data would be used in similar frequencies for all types

of decisions, professional feedback have just provided an answer of the other extreme, where the relative utilisation rates of accounting data are significantly different among decisions. According to analysis, the utilisation rate of accounting data in product pricing decisions are significantly higher than in other decisions. This means that in calculating product prices, more reliance has been made on accounting data; whereas in other decisions accounting data are less relied upon. In fact a cross study of the inter-relationship among all types of decisions indicates that not only do significant differences exist between product pricing decisions with others, but similar significant differences also exist between each paired comparison of decision cases. These results have an important impact to the understanding of the role of the accounting information system in a decision process. A message has been given in the results that the role of the accounting information system is very much depended upon the nature of the decision tasks, which is a clear indication that the selection of the cost calculation model is also depended upon the nature of the decision tasks, thus confirming the proposed expectancy decision processing model put forward in Chapter Four. Apart from accounting data, other sources of data show a similar pattern of analysis towards the interacting effects between task characteristics and the employment of information and cost models which can be supported by the perceived degree of uncertainty and complexity in these decision situations:

**Table 26: Accountants' Perception in Task Uncertainty and Complexity**

	Decision Complexity		Decision Uncertainty	
	Accountants	Students	Accountants	Students
Product Pricing	2.81	3.30	3.88	2.72
Asset Replacement	2.96	2.83	2.83	2.32
Asset Acquisition	2.54	2.98	2.34	2.47
Expansion Decision	2.79	3.66	2.45	3.25
Investment in Business Line	3.65	4.28	3.21	4.04
Investment In New Area	4.22	4.43	3.78	4.15
Investment in China	4.11	4.32	3.73	4.26

As with the analysis of the students, the accountants' view also exhibit the interesting perception that perceived degree of complexity is greater in every decision situation than its counter part of perceived degree of uncertainty, with the exception only in product pricing decisions. Except for asset replacement decisions, a significant difference at 2% level at most is observed in all other decision situations. This observed perception reflects the accountants' cognitive perception between the factors of decision task complexity and uncertainty.

When the smaller sample of accountants are subsequently asked about this perception during interviews, the common response is that most decisions are complex in nature; however, since the companies will accept an expected result

expressed in some acceptable range or margin of error, the possibility of having uncertain outcomes is reduced. Thus they do not view decisions as highly uncertain as that of complexity. According to the accountants' collective view, therefore, degree of complexity is reflected in the process while degree of uncertainty is reflected in the results, and so it is not unusual that different perception exists between the two factors.

### **Hypothetical Case Analyses**

With the purposes of verifying the decision behaviour of the responding accountants and the managers of their companies, the same three hypothetical cases used in the students' questionnaire are also reproduced for the accountants to make decisions. As a basic information the accountants are first asked to indicate their preference about general decision approach :

**Table 27: Accountants' Preferred Approach in Making Business Decisions**

	Accountants	Students
Maximising short term reporting profits	1	8
Maximising total reporting profits for the project / task	5	9
Maximising total decision profits	11	6
Selecting action as it sees fit, disregarding profitability whatsoever	13	1
A situational choice, depending on circumstances	18	29

Out of 48 respondents, more than one third have selected to express a situational concern in making decisions, and this is absolutely normal in terms of realistic situation. As previously discussed in Chapter Three, it is recognised that in many cases businessmen hold multiple business objectives, and the desired objectives that are wished to be achieved could change from time to time (Kreitner 1989, Drucker 1990). Because of this possible shift of business objectives from time to time (although it may not change every time a decision needs to be made), the respondents may consider the alternative answer that the preferred decision approach is a situational choice more reflects their daily practices. A major difference between the students' perception and the accountant' view is that, more accountants tend to favour the alternative answer of selecting action as it sees

fit, whereas students (including the master students who are working managers in the day time) tend to follow a more patternised decision rule. When the last two expressions of the accountants are added together, immediately the accountants have already expressed a clear signal that there is no patternised decision approach, all depending on the circumstances as well as the subjective judgement of the accountants (or the managers of their companies, as they are reflecting the practices of their companies). This is perfectly matched with the expectancy decision processing model, as the model has contemplated the interactions between people's expectation with circumstantial factors in making decision choices, and the probable dispositions of decision makers in adopting any particular decision approach. According to the expectancy decision processing model, managers' (and accountants) choices of decision cost models will vary when situation changes, depending on the perceived situations of the independent variables as described in the Model. Thus, there will not be any patternised decision rule of adopting a particular cost concept and approach in making decisions of all types. Results shown in Table 27 confirm this proposition. With reference to Table 27, the results of the hypothetical cases are presented and analysed in below:

### Case One: Pricing for Ad Hoc Production Order

The respondents are asked about their choices of decision in the same hypothesised case of a company with idle production capacity. Please refer to the Case One in the questionnaire for details of the case data.

Question 1: At what offered price will you accept the order?

	Accountants	Students
Only accept offered price at or above current selling price	5	9
Accept offered price at or above total production costs	25	26
Accept any offered price above the marginal costs of production	15	18

Question 2: If competitors have reduced selling price from \$200 / unit to \$180 / unit, at what offered price will you accept the offer ?

	Accountants	Students
Only accept offered price at or above current selling price (\$200)	3	4
Accept offered price at or above reduced selling price (\$180)	9	12
Accept offered price at or above total costs of production	20	23
Accept offered price at or above marginal costs of production	13	14

Question 3: If competitors' price is reduced to \$180 per unit, and future materials price will rise by 50%, then:

	Accountants	Students
Only accept offered price at or above current selling price (\$200)	11	14
Accept offered price at or above reduced selling price (\$180)	1	2
Accept offered price at or above revised total costs of production	26	32
Accept offered price at or above revised marginal costs of production	10	5

Question 4: If labour costs are fixed on a monthly basis, at what offered price will you accept the offer?

	Accountants	Students
Only accept offered price at or above current selling price	1	6
Accept offered price at or above total productions costs excluding labour costs	17	16
Accept offered price at or above total production costs	21	27
Others (revised marginal production costs)	5	4

Statistical analysis using both Wilcoxon tests and ANOVA models show that decision preferences of the respondents have changed significantly under various hypothetical conditions. For example, a F value of 26.274 is calculated between

the decisions made for the first and the second question, showing a significant difference between the two groups of decision preferences at a level of less than 1%. Thus it is proved that when conditions change, the same respondent will adopt a different costing approach. Moreover, there is a central tendency that the listed companies in question will take total costs of production as the minimum price for their product outputs, no matter whether they have idle capacity or not. Less than one third of the accountants state that their companies will accept orders at marginal costs of production, even though there is sufficient idle capacity. Interviews with the sample of five accountants further confirm this position, as the accountants in general say that their "bosses" seldom admit the concept of marginal contribution approach in business decisions. In order to follow the decision traits of the company (and the senior management), these accountants claim that they will not adopt the contribution approach in decision making in general, rather they tend to follow the full cost approach in many cases. Because the opportunity cost approach is not compatible with the full cost approach in most cases, thus their behaviour in adopting a full cost approach will also lead to the disposal of the opportunity cost approach as a direct consequence.

## **Case Two: The China Investment Programme**

The opportunity use of scarce resources in an investment decision may be different from that of a product pricing decision, as both decisions involve distinctive characteristics in terms of nature of decision and the level of complexity and uncertainty. Questions more directly related to the adoption of the opportunity cost approach are asked in this case to obtain direct response about the issue:

**[Please refer to Case Two in the Questionnaire for Listed Companies]**

### **Question 1: Treatment of Financing Interests**

	<b>Accountants</b>	<b>Students</b>
<b>Treat interests on finance as expenses in calculating returns</b>	34	19
<b>Treat interests on finance as capitalised costs</b>	8	32
<b>Ignore interests on finance in calculating project returns</b>	3	2

Question 2: Treatment of Benefits Earned from Existing Funds

	Accountants	Students
Charge current benefits as expenses in calculating returns	27	24
Include current benefits as capitalised costs	9	23
Ignore these earned benefits in calculating project returns	9	6

Question 3: Treatment of Contribution Loss to Existing Branch

	Accountants	Students
Charge contribution loss as expenses in calculating returns	32	23
Charge contribution loss as capitalised costs	5	22
Ignore contribution loss in calculating project returns	8	8

Question 4: Assessment of Project Returns

	Accountants	Students
Use a common assessment model for all projects	10	7
Use project geared assessment models for each project	14	26
Use opportunity cost based assessment model	16	20
Accept only the highest returned project and reject others	3	0

Again, based on ANOVA tests the respondents' choices change significantly at 5% level ( $p=0.0468$ ) when conditions change between question one and question two. This serves as an indication that even among accountants (and the listed companies in Hong Kong) the treatment of opportunity costs is quite inconsistent. Since the finance charges are directly related to the acquisition of loans for the investment programme, these charges are reasonably charged to the projects. However, when the issue is related to idle funds, a proportion of accountants change their view and state that they will ignore the opportunity loss of interests income currently earned from the depositing of these idle funds. This is because the interests income, although no longer able to be earned, is not a direct expense arisen from the investment programme in a sense as the finance charges that must be paid from time to time after the starting of the investment programme. Actually a profit and loss (reporting) statement will not show anywhere the cessation of the current deposit interests. Moreover, as reflected by answers in question one to question three, accountants tend to bias towards treating financing costs and opportunity costs as expenses rather than capitalised costs. However, the accounting guidelines 2.205 issued by the Hong Kong Society of Accountants has stipulated that borrowing costs should be capitalised, although this is not a mandatory process in financial reporting. The treatment of

borrowing costs as expenses thus clearly demonstrate management of companies will select an accounting processing and reporting model which best suits their own expectations, even though the model is not recommended by the professional authority (since the Hong Kong Society of Accountants is the only professional body in Hong Kong privileged by Law to grant professional accounting qualifications and status). The rationale for the accountants and managers to treat borrowing costs as expenses is an interesting issue. However, a research of such rationale is not directly related to the scope of the current research model and thus will not be proceeded with in here.

### **Case Three: Selection of Plant Site**

Being the most difficult case among the three cases, in fact with insufficient data from the accounting perspective to arrive at some "concrete" answers, there is an ex ante expectation that the accountants will tend to select the alternative that points to the deferral of the hypothesised decisions. This is an expected behaviour from the professional perspective based on the expectancy decision processing model. The processing of decision information is a effort spending task. When a greater degree of decision task uncertainty is added to the situation, accountants will try to minimise their effort by claiming more concrete information from other sources, such as further information provided by other

managers, in order to reduce the degree of uncertainty. Failing of that, accountants will have a temptation to defer the provision of decision choice recommendations to a later date, as they perceive no benefits to make an earlier recommendation of decision choices the benefits of which cannot be calculated upon. The minimisation of decision effort is one of the main concerns in the Expectancy Decision Processing Model, and therefore in the absence of any possibility to obtain further information (after all this is a hypothetical case with defined information set), the feasible action in accordance with the Model is to defer the decision. Based on the ex ante analysis the responses of the accountants are analysed:

**[Please refer to Case Three in the Questionnaire for Listed Companies]**

**Question 1: Recommendation of City Choice for New Subsidiary**

	Accountants	Students
Investment in China should be deferred	2	10
Town One in China should be selected for investment	6	7
Town Two in China should be selected for investment	2	13
Decision should be deferred as important information are missing	36	23

Similar to the findings in the students' research, 75% of the accountants select to defer the decision until more information are obtained. Referring back to students' results, 60% of the accounting students also take the same choice. Thus accountants and prospective accountants share similar views. The difference between the accountants group and the students group is due to the diverged behaviour of management and finance students (who are not accountants anyway) and has been discussed in the previous section, therefore the same arguments will not be repeated here.

**Question 2: Recommendation given Entertainment Expenses in Mind**

	Accountants	Students
Investment in China should be deferred	6	8
Town One should be selected	2	4
Town Two should be selected	1	11
Indifferent between the Two Towns	7	9
Decision should be deferred	29	21

With a perceived similar pattern of decision choices, statistical analysis through ANOVA test also shows an insignificant difference between the choices of action before and after the entertainment expenses information is added to the case. This is plausible as there are still many missing quantitative data that are

regarded as important data by an accountant. Thus the adding of entertainment expenses neither amplifies nor reduces the degree of uncertainty in this case, and the logical behaviour with reference to the Expectancy Decision Processing Model will also be observed here. Disregarding the statistical impact it is noticed that more accountants have selected to make a decision (number of advocators for deferring the decision reduces from 36 to 29), despite the adding of an expense item which is uncertain in magnitude. This surprising result has also been found in the responses of the students, as stipulated on page 226. Therefore, the accountants may also favour the possibility of business success with the expenditure on business entertainment (expenses). Although there is no evidence to substantiate this proposition, it is an interesting point to note about.

### Question 3: Recommendation given Uncertain Labour Mobility Costs

	Accountants	Students
Search for reasonably accurate estimation of labour costs before decision	33	32
Arbitrarily estimate labour mobility costs and proceed with investment calculations	9	11
Ignore labour mobility costs	2	10

As accountants, it is completely logical and professional for them to select the choice of searching for a reasonably accurate estimation for the specific cost item. This is not only compatible with the professional knowledge of an accountant, but also viewed as a reflection of the role of the accountant in a firm. In fact subsequent interviews with the sample of five accountants have confirmed this rationality. The interviewees have given the following explanation. The accountant as the main information provider in the company must often demand for accurate information and estimation of cost and revenue items. He is the officer in the firm who should provide as accurate information as possible to all other managers. In doing so the accountant reduces management uncertainty in many situations and allow for the company to operate in a more established route. Thus from an organisational perspective the accountant is not allowed to lose sight of this doctrine.

### **An Insight of the Decision Practices**

Based on the comments and feedback provided by the qualified accountants of the listed companies in Hong Kong through their responses in the questionnaire, as well as subsequent interviews with the five accountants, an insight of the decision practices of business people in Hong Kong is formed. The first insight is that in the setting of decision environment, based on statistical inference about

60% of the listed companies have maintained a management accounting information system, while less than 20% of these companies maintain an opportunity cost database. Moreover, the usual methods of determination compensation packages for managers are based on performance related models, which in turn relate to the reporting profitability of the companies. These two co-existing facts have lead to a situation where managers usually do not have sufficient information to make decisions within the opportunity cost context. This finding is compatible with the findings of March (1987). At the same time, it is found that managers in Hong Kong do not have the general motivation to make decisions within the opportunity cost context.

As proposed in the Expectancy Decision Processing Model, managers will try to select the cost model that will maximise their expected benefits through maximum performance as reflected by the select cost model. As managers perceive that they are not rewarded according to an opportunity base evaluation model, they incline to use some other decision models that will either minimise their contributed effort or maximise their perceived rewards according to a more financial reporting oriented model. The responses of the accountants who are reminded to provide information of their corporate practices instead of their own perceived professional judgement have confirmed this proposition. A majority of

the companies have not maintained a systematic opportunity cost database, and too often the adopting of decision models is situational to the effect that there is no commitment if the opportunity cost model is adopted in making decisions.

The second insight is that, apart from the organisational context, managers of Hong Kong also favour a closed typed decision process, with little advice being sought from external consultants in most of the decision cases. Managers also do not follow any perceived pattern of decision traits or decision approach, and favour a flexible approach that enables them to adjust their decision choices among different decision task characteristics. The exclusion of external advice together with a flexible style decision approach have allowed managers to select their own favourite decision cost models under different circumstances without depriving their ability to maximise the perceived total value of decision behaviour as expressed in the framework model. To further facilitate the expectancy mode decision behaviour, managers tend to adopt a more human oriented decision approach. As a result, personal contact and relationship form an important element in the decision making process for business operations in Hong Kong.

The responses made by the accountants in respect to the hypothetical case studies have given more weights to the analysed insights stated above.

Accountants have demonstrated that managers prefer pricing products on the total cost approach in accordance with the financial accounting perspective rather than a decision contribution approach; that managers like to have their own preferred cost calculation models which achieve their desired objectives despite there are announced guidelines to the accounting treatment of those items of concern; and that accountants in view of their organisational roles minimise decision losses while managers maximise decision benefits. All these research results have demonstrated a feasibility of substantiating the Expectancy Decision Processing Model.

## CHAPTER 7

### THE CASE OF A CHAIN SUPERMARKET STORE

To obtain a more thorough understanding of the actual decision practices of business managers, a chain supermarket store, The K-K Supermarkets, was selected for a case study. The case study was carried out for the purposes of getting into more detailed analysis of the actual decision behaviour of business people in making various kinds of business decisions. During the case study, interviews had been held with the general manager, the operations manager, and the accountant of the chain store. Certain documents related to operations and policy making of the company were obtained, together with a half day in house observation with the general manager on how he made routine and strategic decisions. The selection of the chain store is based on the following reasons:

1. This is one of the largest supermarket chain stores in Hong Kong, with more than 20 supermarket stores located in various regions in Hong Kong.
2. This is the only supermarket store among other big supermarket groups in Hong Kong that is totally run by Chinese people of Hong Kong. The

supermarket is a subsidiary of a listed company, the chairman of which is one of the billionaires in Hong Kong. This gentleman is a traditional Chinese businessman and thus business practices and decision behaviour of the chain store are representative to the general practices of Chinese people in Hong Kong.

3. The gentleman, as a billionaire in Hong Kong, is also a good friend of many Chinese officials and businessmen including the highest rank officials of the Country. Thus, he is very familiar with the decision mode of Chinese officials and businessmen. An understanding of how managers of the supermarket store deal with China trade thus forms a good example to those business people, who wish to establish business in China.

### **The Organizational Structure of the Firm**

The chain supermarket store was established in 1986. Mr. Yeung, the general manager of the store, headed the firm since its establishment. The company is affiliated with two listed companies in Hong Kong and is now one of the top five supermarket chains in Hong Kong. Annual turnover of the company by itself is about HK\$ 400 million. At present the company is taking positive steps to expand its business into the China market. It is going to launch its first retail

outlet in the form of a discount wholesale club in China by early 1996.

The general manager is the operational head of the whole supermarket chain. Basically the company adopts a functional structure. Managers are appointed to head a functional department and are responsible for a particular function across the company. Mr. Yeung, the general manager, admitted that the functional structure was most appropriate to the company, as at the time of interview all the locus of management was situated in Hong Kong. Moreover, this structure would remain in force for the coming future even though the company is expecting to expand its geographic business region into different cities in China. The main reason for retaining this type of organizational structure is to retain centralised control for management. As expressed by the general manager, the company following the management culture of the holding company and its chairman had adopted a more authoritative or parental type of management control. He considered that this is the normal managerial practice of Chinese businessmen in Hong Kong.

### **The Decision Mode of the Company**

With the establishment of a functional structure and a more centralised locus of control, the company had adopted a more or less top down decision mode in

making business decisions. Generally, the decision hierarchy was compatible with the management hierarchy, with more decision authority rested with the higher rank managers. Staff and managers of lower rank were allowed to submit comments and suggestions in relation to a particular decision of the company. However, final decisions rested with the managers concerned. Once the decision was made, junior managers had no alternatives to object but had to follow instructions to carry out the decision. Only in very rare cases senior management of the chain store invited a participative mode of decision making process, and in most cases senior managers did not even need to explain to subordinates why a particular decision was made.

This top down parental type of decision mode was viewed as acceptable and normal by the general manager and the operations manager, who also held the view that most managers of the company, senior or otherwise, also accepted this type of decision mode and regarded the practice as normal and functional. Because of the non-participative decision mode, decision information was also selectively disclosed to the managers concerned only, while lower rank managers were usually debarred from obtaining such kinds of "confidential" decision information. The retention of confidentiality in information processing was compatible with the mode of centralised control, so that managers could only act

according to instructions without much opportunity to take self-initiated actions. Senior managers were of the opinion that if managers of various levels were able to carry out management plans as told, then the expected performance of the company would more likely to be achieved. Although this view has to be based on the presumption that senior and top management had given appropriate instructions, both the general manager and the operations manager of the company saw no problems to this decision practice. Although they had not expressed to me in a more explicit way, both managers had implicitly demonstrated their confidence in giving appropriate instructions to sub-managers in achieving the company's business objective.

### **Performance Evaluation and Reward**

The performance evaluation and reward system of the company was basically divided into two categories. For operational managers they were usually assessed according to their operational results, together with an appraisal made by their immediate supervisors. With regard to the managers of supportive functions (e.g. the accountant and the personnel manager), performance assessment was largely based on supervisors' appraisal. The general manager admitted that sometimes bias might exist by way of managerial appraisal, but he also pointed out that management judgement was crucial in determining whether

a manager was really performing well or not, as he asserted that in many cases performance could not be visualised merely by some recorded data. Since the emphasis of this case study is primarily related to operations and investment decisions, measurement and reward of operational management receive primary attention.

### **Reward Scheme for Operational Management**

Basically the salaries of operational managers fell within a fixed range according to their ranks. Within the range, the performance of the manager as reflected by both operational results and supervisor's appraisal was counted for the final determination of a manager's salaries. To the branch managers of the K-K supermarkets, the branch's achieved sales and gross profits were taken as the initial indicators for operational performance. As explained by Mr. Poon, the operations manager, the reasons of using these two figures were :

1. Turnover expansion was one of the best indicators to validate the company's claim as a top supermarket chain in Hong Kong. Moreover, because of the peculiar business nature of the supermarket business, more turnover would mean more suppliers' financing, which was beneficial to the company.

2. Some expenses were not controllable by the branch managers, and thus they had restricted effort to effectively control the net profitability of the branch. Actually these branch managers were not allowed to know the magnitude of some of the operational expenses. Therefore, it was useless to require these managers to maximise net profits.

The branch managers were told of the measurement indicators, so that they knew what they should do at the outset. However, both the general manager and the operations manager expressed that managerial adjustment to these two figures would be made. The general manager had quoted examples of population movement to illustrate the point. He said that if a particular branch supermarket was situated in a newly developed area where the population had doubled in one year, then the turnover of the supermarket was also expected to be doubled by way of pure turnover per capita calculation. Moderate increases of turnover from last year thus was not an indication of better performance, but rather an indication of incapable management. On the other hand, for some supermarkets which were located in the "old" areas where more and more residents of the younger generations were moving away, leaving behind only the old people living in these areas, then a decrease of turnover was surely expected. To the

managers of these supermarkets, appropriate adjustments must be made to reflect the reality. Therefore, the branch results were only used as a reference rather than a determinant measurement.

Apart from the branch results, branch managers were also assessed on their managerial capacities. The operations manager would visit the branches himself at intervals. He would see if the layout of the supermarket was good, whether the full categories of goods were available, whether staff of the supermarket were working properly, and whether in his opinion good customer service had been provided. With reference also to the zone managers' (who supervise a group of branch managers) opinion, the operations manager then gave an appraised grade to the manager concerned, which was used as an important reference in the reward calculation.

The salaries of operational zone managers were based on zone performance, together with operations manager's personal appraisal. Again a greater part of the assessment process was based on managerial judgement rather than recorded data of the zone. Branch and zone managers were also paid with a bonus at the end of year. The calculation and determination of bonus payments for each manager were similar to that of salaries setting, and thus better performed

managers would be paid a larger sum of bonuses, and poorly performed managers would be paid a lesser sum, or even deprived of the bonus payment.

Although the managers knew about the basic assessment criteria, the actual assessment process had not been disclosed to the managers concerned.

Managers would only receive the notice of decision as made by the operations manager, and they were not told of the reasons about the decision. Both the general manager and the operations managers regarded this practice as reasonable, and they saw no reason why discussion needs to be held between the branch manager and senior management before the amount of salary and bonus payments were decided, although this practice was advocated in some accounting texts (Drury 1992).

A question was raised to both managers to seek their viewpoint whether they would think that branch and zone managers, knowing that the turnover and gross profitability were looked upon, would take actions to maximise reporting figures of such at the expenses of the company in the long run. Both managers rejected this possibility as they emphasized that managerial appraisals were made and thus managers could not manipulate accounting data to suit self interests. They also pointed out that one of the main reasons to introduce managerial appraisals

was to avoid manipulation of accounting performance by operational managers. Their opinions perhaps have substantiated the argument that managerial judgement is more important than accounting statements in many occasions.

### **Accounting and Management Information Systems**

The company maintained a full set of financial accounts. Basically the set of financial accounts as maintained by the company was similar to most other firms in Hong Kong. The financial accounting system was maintained at corporate headquarters, with branch and zone management being denied of any access to the financial books and records. The following monthly accounting reports were prepared by the accountant of the company :

1. Monthly Profit and Loss Account
2. Monthly Balance Sheet
3. Gross Profit Analysis on Branch Basis
4. Warehouse Scan Report -

This was a report of stock levels and stock movements.

Also, for each half year, an accounting report was produced for the purpose of analysis of gross profitability on important categories of products being sold by

the company through its supermarket chains. All the above-mentioned reports were only circulated among senior management (operations manager and above), except that the warehouse scan report would also be distributed to the inventory control section. Also the accounting system had been designed in a way that only the chief accountant could gain access to the full set of accounting information, and other accounting staff had no opportunity to know about the overall profitability of the company. The purpose of access denial of accounting information was to ensure that the company's financial information would not be released to the knowledge of any third party. This practice also forms evidence that the company incorporates centralised control, and the company similar to most companies in Hong Kong regards its financial data as confidential data which should not be released in any way.

#### **Non-existence of A Management Accounting Information system**

Regarding management accounting system the general manager confirmed that the company had not ever maintained a cost accounting or management accounting system. When asked about the reasons of not maintaining such a system, he admitted that there was no need in the previous years when the trading results of the company were in a satisfactory growing trend. He further admitted that he would only search for ac hoc managerial accounting data as and

when he saw necessary. To further clarify the point, the general manager was asked if he thinks that it was not cost benefit worthy to maintain a management accounting system for the company. Surprisingly he answered that this was not an issue of cost and benefit analysis. In terms of money the company had no problem at all in keeping a full set of management accounts and employing a management accountant to look after the costing books and ledgers. Rather the main reason was that he had never come to his mind that there was a need to establish a formal system to provide management accounting information on a routine basis. To eliminate suspicion the general manager confirmed that he was an accounting graduate and had obtained the designation of AICPA. Therefore, the preclusion in the setting of a management accounting system was not based on his ignorance in the area. During the discussions the candidate had exchanged views with the general manager, Mr. Yeung, on some management accounting issues, and accordingly I recognized that Mr. Yeung was well versed with current management accounting concept and knowledge. Therefore, the explanation as provided by Mr. Yeung for not maintaining a management accounting system (that he did not perceive a need of maintaining such a system) was acceptable.

Referring to the current conditions of Hong Kong, Mr. Yeung agreed that the

business atmosphere of Hong Kong was becoming more unfavourable. Because of more severe competition and the weakening consumption power of people in Hong Kong, his firm was facing with tough times. In order to be more competitive in terms of cost control and market planning, he was planning to establish a management accounting system for the company in order that more accurate cost information are available for decision making purposes. Mr. Yeung's idea also echoes his earlier statement that he had not thought of introducing a management accounting system when times were good and profits were improving in previous years.

Apart from the internal accounting information, Mr. Yeung confirmed that the company had maintained some data that were useful for decision making. These data included:

#### **1. Competitors' Product Prices**

There were two major competitors to the company, namely the Welcome Supermarket Chains and the Park N Shop Chains. To maintain competitiveness of the company, price movements of the products being sold by these two supermarket chains were closely recorded. If the marketing manager was aware that the price of a particular category of

goods was getting much higher than one of the competitors, then prices had to be lowered to regain competitiveness and retain customers from shifting to the competitors.

## **2. General Economic and Demographic Data**

The company had maintained data relating to the general economic conditions of Hong Kong, including the gross domestic production data, populations, gross income range of productive people, the average income per capita, and other useful data that showed reflections on possible consumption power of people in Hong Kong. Moreover, demographic data were also stored, such as population distribution among different areas, age group distribution, and rough customer preferences for different categories of customers.

Apart from data of Hong Kong, the company was also beginning to collect data related to China, especially those data which were related to the Guang Dong Province which would be the target stepping stone for the company to penetrate into the China market. The purpose of collecting groups of data relating to China was to ensure that some comparison could be made between the Hong Kong market and the China market. Through

the comparison processes, experiences of Hong Kong became more valuable for the company to plan for its emergence into China, as the general manager could decide if the characteristics experienced in the Hong Kong market might also apply to the China market.

Although most economic and demographic data were not reflected in the normal accounting reports, the general manager of the company asserted that these data were very important in making decisions. As an example, he confirmed that he would rather decide to open a new branch store in a rural area with growing population than to open a branch store in an established area where people were shifting to other residential areas and only the old ones were left behind. In this example Mr. Yeung asserted that the population and age distribution data were far more important than the basic profitability calculations in the determination of priority of new branch stores.

### **The Decision Making Processes**

To obtain core data for the purposes of this case study, both the general manager and the operations manager were asked about how they make decisions in different circumstances. Similar to other companies, Mr. Yeung, the general

manager, stated that the general approach in making routine decisions was different from making non-routine decisions. As further clarified by the general manager, in general some set of policies and calculation models were maintained for the routine decisions, and the responsible managers needed only follow the rules in making decisions. Managerial judgement was exercised in a lesser extent in these kind of decisions, and accounting data was more relied upon. On the other hand, for non-routine decisions Mr. Yeung preferred to describe the decision practice as a case oriented practice, that in each individual decision situation he had to consider what data should be obtained and used. He confirmed that in general as the decision becomes more complex and more uncertain, he would require more information, and the final decision was to a greater extent based on his own managerial judgement rather than to the accounting calculations. He further said that in many cases accounting data only held a relatively trivial position in the decision process. To understand his ideas more clearly, specific decisions were used as examples to show how decisions were made.

### **Pricing Decisions for the Company's Products**

The operations manager was specifically asked about how does the company determined the prices of the products sold in their supermarket stores. Mr. Poon,

the operations manager, explained that the marketing manager or his delegates determined the price of products. In deciding what prices should be charged, the following data were referred to:

**1. The costs of the products**

Costs of the products included the prices as charged by the supplier and any freight in costs. In general the cost data was used as the reference and also as the base line price.

**2. The prices set by the major competitors**

as mentioned before the company faced competition from two major competitors, the Welcome Shop and the Park N Shop. The prices charged by these two supermarket stores for the same product were duly considered to ensure competitive prices could be set.

**3. The forecasted demands**

Mr. Poon asserted that many products experienced seasonal or cyclical demand periods. In a period of expected peak demands, the prices of those demanded products would be set a little bit lower to further stimulate the buying wishes of the consumers. He quoted soft drinks as an example,

that during the Summer periods when the weather was very hot in Hong Kong, at least one to two brands of soft drinks were priced at a reduced level each time to attract more consumption by customers. Mr. Poon further confirmed that price reduction were seldom made for soft drinks in Winter time when demand was expected to be low, and the products became more price inelastic.

#### **4. Stock conditions**

Some categories of goods and stock had only a short life period, beyond which the products would become obsolete or perished. These perishable goods were carefully monitored to ensure their saleability. When the conditions of these products were good, prices would be set according to other conditions mentioned in the previous sections. But as the products got closer to the end of their life period, special reduction in price would be made to encourage immediate demands for these products.

As confirmed by Mr. Poon, the marketing manager who took into consideration all the factors stated above arrived at final settlement of price for individual products. At present there was no formula or any quantitative model for the setting of product prices, and in all cases managerial judgement was exercised in

determining the prices. Usually he would have a look on the set prices and see if he had any disagreement. If he did not find anything wrong, then the branch managers were informed of the set prices and they would label the prices of the products. Mr. Poon confirmed that in general prices of products would be the same across all supermarket outlets, and branch managers had no authority at all to alter such set prices, nor could they offer any discount to customers.

A question was raised that why were the branch managers deprived of the authority to adjust product prices or give discounts to customers. Mr. Poon, the operations manager, replied that branch managers should not be granted such authority, otherwise the supermarket chain as a whole would be inconsistent in product prices and internal competition might arise among individual branches, especially some of the branches were physically located in nearby regions. A follow up question was asked about the problem that as branch managers had no authority to reduce product prices to attract business, they were debarred from improving their branch performance to a greater or lesser extent. The operations manager then reassured that branch managers could make use of other methods to attract customers, such as providing better services to the customers. Also he stressed that branch managers' salaries, bonuses, and even promotion prospects were not solely based on the branch performance as reflected in the accounting

profitability; rather senior management's view and judgment might count more. Therefore branch managers should not be granted too much authority in order to retain tight control across the company.

### **Expansion Decision**

As the company was still in a growing stage, new branches of supermarkets were being opened from time to time. The general manager and the operations manager were asked about how they decided where to open a new branch, and what factors were taken into serious consideration.

The operations manager in the first place provided the general procedures in the expansion decision process:

1. A search of suitable location for the opening of a branch supermarket was constantly made. Usually a suitable location in the initial sense meant that no sizeable supermarket store had been established in that location either by the company itself or by its major competitors. These locations included the newly developed rural areas, new housing estates, and some loosely populated areas in the countryside.

2. Once a suitable location was identified, a search for a site suitable for a branch supermarket was made. The site might be a shop space in a large shopping mall, or on the ground floor of some commercial buildings. The site must also be located either near the centre of the area, or easily accessible by customers from around the location.
  
3. When a suitable site was identified, the owner of the site was approached to negotiate for the renting or purchases of the site, as the case may be, for the purposes of ascertaining the feasibility of the expansion project.
  
4. Upon initial agreement being sought from the owner of the site, the cost of renting / purchasing the space was known. An estimated profitability analysis was then prepared to consider whether it was profitable to open a branch supermarket at the location. With reference to such, the estimated profitability in the first two to three years formed the core concern from the accounting point of view. However, because of the peculiar situation of suppliers financing in the supermarket industry, turnover would be the crucial factor in the analysis. Moreover, as stressed above by the general manager, there were special circumstances when a branch supermarket

would be planned to open in an area with expected loss in the first years, with a long run expectation of large profitability when population would be gradually building up in the area.

In preparing the profitability analysis, the operations manager admitted that many estimates were subject to high degree of uncertainty, and at times rough guesses could only be made for particular items. When the operations manager was asked if he had ever made use of the opportunity cost approach in arriving at the profitability analysis, he confessed that actually he had never considered what approach should be used in preparing the analysis, and he had never come to mind about the opportunity cost concept in making the expansion decisions. To clarify about the operations manager's opinions, he was asked for a further elaboration of what he said. To start with, the operations manager was tested to ensure that he knew about the opportunity cost concept, at least from a theoretical perspective. After confirming that he was familiar with the basic opportunity cost concept, the operations manager was questioned why he did not make use of the concept in making decisions, as advocated in the accounting texts. He did not provide any reasons for the rejection of such, except from saying that he simply had never considered the concept in practice. Mr. Poon was then further asked if he had ever adopted the opportunity cost concept in

decision making processes. He simply replied that he would identify necessary information for decision making, and he was care about whether he had adopted the opportunity cost approach or not in a particular decision. He further said that he would not deny if he had adopted the opportunity cost approach in some decisions, but he would consider it equally true that he had not adopted the concept in other decisions. The operations manager was then asked if he could identify some characteristics of the decisions for which he had adopted the opportunity cost approach. But he could not provide an answer to this question.

### **The Case of Idle Resources in the Expansion Decision**

To obtain a more exact opinion of how management view about the opportunity cost concept in the decision process, a hypothetical situation was raised with both the general manager and the operations manager to consider.

It was hypothesized that, in the opening of a particular new branch, the required staff and labour could be transferred from other existing branches, so that no additional staff was required to be recruited. Since these existing staff were paying salaries and wages by the company (and presuming that the company had no intention at all to terminate their employment because of whatever reasons), both the general manager and the operations manager were asked if in this case

the staff's salaries and wages would still be charged to the new branch in the calculation of estimated profitability. The question was raised in separate occasions so that either manager did not know that the same hypothetical question was asked to the other party, to ensure that they would give their own view irrespective of the other manager's opinion.

Responding to the question, both managers immediately replied that staff salaries and wages must be included in the calculations. An explanation was then made to the managers, that within the context of the opportunity cost concept, since the staff were transferred from existing branches, and their salaries and wages were being paid, there was no value foregone in transferring the staff to the new branch, and thus the salaries and wages were regarded as "free costs" and should not be included in the cost benefit calculation. These existing staff, in this hypothetical case, were actually "idle capacity" of the company and were thus needed to be disregarded (whether interpreted by the relevant cost concept or the opportunity cost concept) in the calculation of estimated profitability.

The operations manager seemed to be surprised at the explanation. He did not raise any argument on the conceptual validity of the opportunity cost concept. Rather he simply said that this was not the usual practice in making such kind of

decisions. Mr. Poon, the operations manager, further stressed that only by including staff salaries and wages in the calculation of estimated profits could he have a clear idea whether the branch would be profitable or not. Similar answers were also provided by Mr. Yeung, the general manager, who also considered that a new branch would only be opened if expected revenues could cover total costs, including staff wages and salaries, be it staff newly recruited or transferred from existing branches. Mr. Yeung, as an accountant himself, expressed his view that although he knew what were taught at college, he would not follow that simple trick of opportunity cost model and disregard idle capacity costs in real business decisions, especially the expansion decision involved a longer term of consideration.

### **Adoption of the Opportunity Cost Concept**

At the end of the field study, discussion was directly pointed to the adoption of the opportunity cost concept in business decisions. The framework of analysis was shown to Mr. Yeung for his comments, especially on the issue whether he would consider a particular independent factor as shown in the framework could significantly explain the adoption or otherwise of the concept of opportunity costs in business decisions. After carefully studying the framework diagram, and exchanging view with the candidate, Mr. Yeung provided the following

comments about the issue:

1. He would disregard the personal attributes factor and considered that this factor, although a very important factor by itself in the selection of the final decision choice, was not important at all in respect of whether the opportunity cost approach was adopted or not. The reason he provided was that the adoption of the opportunity cost approach was dependent upon technical feasibility and environmental circumstances in essence, which preclude the application of personal attributes.
2. The essence of adopting the opportunity cost approach from an accounting perspective was that, for each decision alternative, all related data must be presented in form of quantified opportunity costs. Only in such situation could a pure opportunity cost model be adopted and used in arriving at the decision choice. However, the quantification of decision data into quantified opportunity costs was a technical issue where barriers existed in most cases. Relating to the framework of analysis, Mr. Yeung first pointed out the mere maintenance of a financial reporting system, or even a routine management accounting system, did not necessarily suffice to provide required opportunity cost data in many situations, as opportunity

costs in many cases were those costs unrelated with any recorded transactions of the company whatsoever. Mr. Yeung pointed out that the accounting systems maintained by companies in Hong Kong were transaction based in domain, and were internally generated in most cases (including the traditional standard costing systems). These transaction based and internally generated accounting systems did not provide sufficient data to present accounting statements from an opportunistic approach, and thus either special accounting reports were solicited by the accountant in isolated circumstances, or that managers had to rely upon these "routine" accounting statements in making their decisions. However, as an accountant himself and being a senior professional manager for many years, Mr. Yeung admitted that preparation of a special accounting report from an opportunistic approach was a very tough task. Knowing the difficulty in preparing such an accounting report he himself rarely demanded it from the accountant.

3. Similar to the effect of accounting system, the task characteristics constituted another important factor to the adoption of the opportunity cost concept. In the opinion of Mr. Yeung, task uncertainty and the possibility of contradictory results from alternatives form the basic deterrent in

adopting the opportunity cost approach. According to Mr. Yeung, most of the real life business decisions involved factors that were highly uncertain in nature, to the extent that even a rough estimation within the tolerable error range about the event probabilities of different alternatives might not be able to be made. In these cases the calculation of opportunity gains and losses from an accounting perspective were virtually impossible, other than applying the (professional) judgement of the manager concerned. Mr. Yeung further blamed the usual examples shown in accounting textbooks that these examples had misled accounting students to the presumption that somehow certain quantitative models must be applicable to most of the decision cases (be it statistical model or otherwise) in arriving at some calculated results from an accounting perspective. Rather he stated in his own experience that many business decisions had to be made in the absence of any applicable quantitative models of analysis. In addition to task uncertainty, the general manager also recognized the effect of task complexity, which exerted a similar burden to the adoption of the opportunistic approach in decision processes.

In his concluding remarks, Mr. Yeung admitted that he would exercise judgment in respect of the opportunity cost reasoning in many business decision situations.

However, invoking the opportunity cost reasoning from a managerial perspective was quite different from an accounting perspective, with the core difference being that he did not need, and had not required, any opportunity cost statements in making such decisions. Mr. Yeung further admitted that even he himself had no idea at all how to quantify the opportunity costs of different decision factors when he made decisions. He quoted an example about his recent investment decision in China involving a capital fund of US \$100 million. The investment was decided to be made in Shanghai of China rather than another alternative city simply because Mr. Chow, the multi-billionaire who was chairman of the holding company, got to know the mayor of Shanghai better than that alternative city. Mr. Yeung said that he had no idea of how to quantify the impact of better personal relationship between Mr. Chow and the mayor of Shanghai in any acceptable accounting calculations, somehow he felt more comfortable in investing in Shanghai because of this better personal relationship. He stressed that this factor of personal relationship was a concern of opportunity cost reasoning, and he considered himself invoking the opportunity cost approach in the investment decision, but the problem was that he could not agree to any assertion or advocacy that he was invoking an opportunity cost accounting model within the accounting perspective in making this investment decision. A further concern of Mr. Yeung was that he would not strike hard to obtain the opportunity

cost data, as there was no motivation for him to do so, and he perceived himself making good decisions that could improve the reporting profitability of the company without such full set of opportunity costs information. He concluded that only if all available data were able to be quantified into opportunity costs could the approach be adopted in business decision processes, but that situation would only happen in very rare cases in the lower levels of concern.

## **CHAPTER 8**

### **A Critical Review of the Opportunity Cost Concept**

#### **The Accounting Craft as an Artifact of the Business World**

Distinguished from the physical world, the accounting craft is after all an invented tool by people to fulfil certain human needs. The original purposes of creating such an artifact were to keep record of human activities and transactions, business or otherwise, from an economic perspective, so that people knew what had happened to their wealth endowment through a series of activities and transactions (Edwards 1937). As an artifact of this kind, the accounting craft is thus a tool or system which is subject to modification, alterations, and even reconstruction from time to time to reflect the different desires of people in different decades (Hopwood 1987). Along the trajectory of time, there were evidence that demonstrate the change of circumstances in the social, economical and other aspects of the human society, which affected and interacted with people in the formation and evolution of a new society. People perceiving the changes in various aspects of the society in turn adjust and modify the accounting craft to the required extent in order that this invented tool will continuously serve the changing demands and needs of people. Thus the concept, paradigm, and operations of the accounting craft are undergoing constant changes along the

passage of time (Yip 1987). As a corollary the identification, recognition, interpretation and operation of a particular cost concept have all undergone changes between decades of time, and opportunity cost concept is no exception to this norm.

### **The Theory of Choice and Opportunity Cost Concept**

Since the very first formal discussion of the opportunity cost concept it has been linked with the theory of choice of actions and the acceptance or rejection of alternative choices. The costs of decision choices are claimed to be the value that is foregone by the decision maker (who is also inherently meant to be the beneficiary as well) in taking up a particular choice and rejecting the others (Smith 1776, Coase 1938, Thirlby 1946, Buchanan 1973). When a person is going to make a decision, he is bound to consider the possible values of all available alternatives and select the one that allows him to obtain the highest value among the choice set (Edwards 1937).

Based on a general interpretation of the Marshallian demand curve analysis, a point on the demand curve of a particular product or commodity represents, strictly speaking, the maximum quantity that people are willing to buy at the corresponding price. This willingness to pay the price and buy the commodity

represents the consumers' preferred choice and decision to spend the amount of money in obtaining utility. In terms of the theory of choice this willingness to buy means that consumers consider that by buying the commodity at the set price, the utilities that can be obtained from the ownership and consumption of the commodity is greater than, or at least as good as, spending the amount of money elsewhere, thus they are willing to give up the alternative opportunities of spending the money. However, the interpretation of the Marshallian demand analysis is usually linked with the statement that "other things being the same". Although there can be different interpretations to this phrase (Friedman 1953), it is the meanings of this conditional phrase that have imposed unsolved constraints to the application of the opportunity cost concept to the demand analysis.

According to the Marshallian demand curve, with the ordinary expression that other things being the same, a point on the demand curve of a person in regard to a commodity represents the maximum quantity that a person is willing to buy at the price, and other points along the curve represent the change of choice action of that person to increase or reduce the quantity of purchases in response to the change of price, and the shifting of the amount of economic resources (money) to and from other commodities that he can obtain at their respective prices. This shifting of purchasing and consumption decisions are demonstrated by way of

marginal utility analysis (Marshall 1920). However, the existence of the demand curve, the analysis of change of consumption behaviour with respect to the relative change in prices, and the validity of the theory of choice all depend on the basic presumption that there is a choice available to the person who selects to consume economic resources in return for satisfaction, as it has been asserted that if there is no choice, there is no cost at all (Robbins 1934). If there is no choice at all, such that there is only one commodity in the world that is available for purchase and consumption, then the consumer would have no choice but to spend all his money to buy whatever quantity he may get of that commodity. He can only decide his own preference list of consumption choices until and unless there are alternative commodities that are available for purchases, which then affect the collective demand curves of individual commodities and make valid the application of the opportunity cost and marginal utility analysis. The problem of applying the above argument in practice is that it is not the issue of whether choices are available as a matter of fact, it is the issue of whether the decision maker has perceived the available set of choices; and base on the perceived set of choices, whether he can actually construct the preferred set of choices according to the theory of choice and the opportunity cost concept.

## **Application of the Opportunity Cost Concept**

With reference to the theory of imperfect information and information asymmetry, the perceived set of available choices will be different from the total set of available choices in many cases. Thus a person in practice is always considering a subset of choices to the universal set that restricts his ability to obtain for an optimal choice of actions in maximising his utilities. It may be argued that the presence of imperfect information needs not invalidate the theory of choice and the application of the opportunity cost concept, that so long as the person makes decision in according to the opportunity cost reasoning given the restricted perceived set of choices, the economic analyses still exert their influence in explaining and demonstrating economic phenomena (Coase 1938).

However, there are two problems arising from the issue. Firstly, making a decision in the knowledge of imperfect information inevitably leads to the risk of sub-optimal decisions which would affect the decision maker's choice, as the decision maker has to make subjective judgement of the risk distribution. As put forward by Coase (1938, pp.104), a person who buys a lottery ticket is not interested in the most probable result. The decision to buy a lottery ticket is inevitably a personal choice of preference, that he rather spends, say, a dollar to buy a lottery ticket than to spend it the other way. However, whether this is a rational, or economic wise a good decision with available opportunities, is unable

to be verified by any observer.

This problem can be better illustrated when the second issue is taken into consideration. To enable an optimal decision to be made, even within the scope of bounded rationality (Simon 1957), the decision maker must be able to decide, at least to his own recognition, the preferred list of alternative actions, and in case of choices of multiple decisions (such as quantity mix in addition to number of commodities), he must be able to construct the marginal preference list of different mix of choices. This ability to construct the marginal preference list is, regrettably, taken as granted in nearly all economic literatures. The ability to construct such a list, however, is subject to various constraints in practice. A major constraint is the time element. Because the shortage of time a decision maker may not be able to construct a marginal preference list for the particular decision he is going to make. A failure of doing so renders the decision situation showing a higher degree of task uncertainty, as the decision maker is uncertain about the possible consequence of his arbitrary choice of actions. The possibility that decision factors could change from time to time imposes another constraint to construct a marginal preference list of choices. The existence of the variety of choices, the availability or otherwise of the information set, and the uncertainty of event occurrence probabilities all contribute to a complex situation where

strict arrangement of preferences is hardly an easy task. Given the constraints that exist in a decision making process, a decision maker may be unable to act in line with what the theory of choice proposes, and select the alternative that can allow for maximum utility or satisfaction in accordance with the opportunity cost concept, because he is not necessarily granting the chance to measure, evaluate, and identify the preferential opportunities that would in theory bring him the greatest satisfaction. As a corollary, a person's decision choice could be a sub-optimal one within available information and choice set. Of course, this statement that a sub-optimal decision could be made is subject to two reservations. The first reservation is that there has never been any research that can provide a rough idea of how fast a person can formulate a marginal preference list, and thus it could be argued that every person could construct his marginal preference list in seconds. The second reservation refers back to the REMM model as proposed by Jensen and Meckling (1994). According to the REMM model, a person is always maximising his total utilities, after taking into accounts all factors pertaining to the decision situations, including non-economic factors that have not been taken into account in most economic literature. However, even with reference to these two possible reservations, the argument that a decision maker, in a business context, may not be able to make optimal decisions by invoking the opportunity cost concept is still valid.

## **Business Applications of the Opportunity Cost Concept**

With reference to the Expectancy Decision Processing Model in a business environment, results of the researches with the students groups and the professional accountants group reveal that business managers in making decisions are shaped by the said Model, and thus they do not intend to make decisions according to the traditional opportunity cost approach as stipulated in the general economic and accounting texts. According to the research, the results and comments have been arrived at:

1. There is still a wide recognition of the profit maximisation objective in the business world. However, apart from the profit concept other concepts are also increasingly regarded as prime objectives by business firms. The inclusion of non profit oriented objectives is compatible with the modern management theories, which recognise the multi-objective phenomenon. However, managers of these firms have to face with multiple business objectives which arouse some technical difficulties in the decision making process, as effects of decision alternatives on the non profit objectives will not be readily recognised, thus increasing the uncertainty between perceived management efforts and successful task performance.

2. Although it is desirable to maintain both a management accounting information system and also opportunity cost database, in practice few companies within the listed companies group in Hong Kong have maintained both systems. Results indicate that only about 60% of the listed companies operate a management accounting system, while less than 20% of the companies maintain a reasonably comprehensive information database for the purposes of providing opportunity cost data in decision processes. The ineffectiveness in the maintenance and operation of the accounting and management information will increase the efforts required in employing an opportunity cost model as managers and accountants have to spend additional efforts in searching for such cost data. Clearly there is no indication according to the responses that the professional accountants have impressive motivation in calling on the opportunity cost model in making decisions.
  
3. Both students and accountants have confirmed that performance related reward calculation systems are preferred in theory and used in practice. Results of the researches however indicate that the common performance criterion is the profit performance, which is

implicitly based on the published accounting reports. Thus there exists a strong perceived relationship between financial performance and expected rewards gained by the managers. According to the Expectancy Decision Processing Model, managers will then try to use the financial reporting model in decision making processes in order to maximise total values of decision. Results indicate that this is the case and managers have rejected the opportunity cost approach and accepted a more financial reporting oriented approach in making business decisions.

3. Managers of Hong Kong in majority favour a closed type decision mode and advocate the importance of judgement in making decisions under different circumstances. Managers of listed companies in Hong Kong seldom invite information and advice from external consultants. With the exclusion of external advice, managers have greater degree of self-initiated judgmental power in making various types of business decisions. Moreover, with a situational emphasis on the decision approach, managers are then free and able to adopt different decision models in each circumstance to maximise their expected total values arising from

the use of such decision models. The self containment of decision authority and flexibility of decision approach are the requisites for the operational validity of the proposed Model, and research results indicate that managers of Hong Kong very much favour the existence of these two requisites.

4. Research results indicate that less than 25% of the listed companies in the sample adopt the opportunity cost approach as the prime approach in making decisions, and about 15% of the firms maximise reporting profits rather than decision returns. Over 60% of the companies employ a flexible and see fit approach in making decisions, which provides an apparent evidence that the opportunity cost approach is not a domain in the business practice for decision processes. Although only 15% of the firms select a reporting profits approach, in fact more than 60% of the firms have picked up answers in the case analysis with regard to this reporting profit approach, and only about one third of the companies select the opportunity cost approach in arriving at their answers. This is strong evidence that the perceived relationship between performance model and reward calculations exerts influence to the

choice of selection of the decision models, thus the proposed framework model is substantiated.

5. The degree of decision task complexity and task uncertainty vary among different types of decisions. This variation in task characteristics in turn affect the employment of different sources of data, and the magnitude of data required within each category of source data. In general as the degree of decision task complexity and uncertainty increase, accounting data from the relatively less relied while ad hoc external data are more relied upon. This is again supportive to the proposed framework managers will wish to have more external data to bridge the uncertainty gap and obtain more secured view between decision behaviour and subsequent performance and reward. Although additional efforts are required to search for external data, it will be reasonably spent if total perceived value increase with the acquisition of such ad hoc external data.

### **A Critical Review of the Opportunity Cost Concept**

Although there are different interpretations of the definition, opportunity costs are generally defined as the highest value foregone in selecting a particular decision

alternative and rejecting the others, that is, the highest value carried among the rejected alternatives. The definition provides a reasonable explanation of the theory of choice and sets out to explain decision behaviour from an economic perspective. However, with reference to the more recent theories and understanding of human behaviour, notably the REMM model, the agency theory, the expectancy theory, and the behavioural decision theories, the concept of opportunity costs needs to be reviewed in light of the ever evolving world.

The first proposition for the review of the opportunity cost concept is that the concept has to be interpreted in a dynamic way for it to be operative, because it is a relative concept with a flexible instead of an absolute nature. The perception of highest value from a decision maker's view represents a dynamic process of value judgement that is affected by the interactions of many factors. The concept of opportunity cost will no longer be sufficiently interpreted by a simple example such as Smith's beaver and deer quote. Since the opportunity value of each decision alternative is depended on the interactions of different decision factors, a small modification of the factors can render the settled values no more appropriate for decision making purposes, and a new set of settled values has to be calculated again. The relativity of the opportunity cost concept immediately invalidate most of the traditional calculation models, which presume that

opportunity values can be calculated at a particular point, and decision can be made accordingly. Rather, the adoption of certain cost models, in particular the opportunity cost model, in a decision process should be regarded as a processing analysis instead of a static point of time analysis, and a value processing model should be established to identify the realistic application of the cost concept in a decision making process.

The second proposed review of the opportunity cost concept relates to a more technical orientation of the ability in ascertaining alternative values. Disregarding the dynamic process in the value adjustments due to changes of contingency factors, there is always a limitation of the concept in a sense that the opportunity cost concept becomes undefined in a situation when decision alternatives have no defined calculated values. Taking a simple example, if a hiker gets lost of direction in his way, and he does not know which way out of the three ways before him can lead him back to the city, how should the hiker select the way to continue his journey? At the end the hiker must select a way and try, but in doing so he will have no idea of the opportunity costs of taking one way and rejecting the other two. In deciding the way to go, the opportunity cost approach is invalidated because the opportunity values of all alternatives are undefined. In the business context, there are often similar situations where the

opportunity values of alternatives cannot be calculated because of a high degree of decision uncertainty and decision complexity. But there is insufficient volume of literature purporting to solve the operations gap between the theory and practice. Although these limitations do not necessarily debar a person from taking the opportunity cost reasoning approach in making decisions, they have however debarred the application of the opportunity cost model from the accounting perspective. This is perhaps one of the possible reasons why management texts often emphasise management judgement, and accounting texts do not include detailed discussions of the application of the opportunity cost model in decision making processes.

The two identified issues in the process of reviewing the opportunity cost concept have cast doubts on the application of the said concept in business decision practices. To relieve these doubts, rigorous field researches should be carried out in order that a more thorough understanding of the decision cost analysis process performed by managers and accountants can be achieved.

### **Suggestion of the Future Research Directions**

Based on the Expectancy Decision Processing Model (EDPM) as proposed in this thesis, research results obtained hereto have provided some insights of the

decision process carried out by professional accountants in the adoption of the opportunity cost model or other cost models. The EDPM has indicated the relevance of specified decision factors that exert influencing or moderating effects to the decision model selection behaviour of the decision makers, including organisational factors (accounting information system and performance measurement and reward schemes) and decision task characteristics (task complexity and task uncertainty); and provided some insights of how these factors moderate the decision model selection behaviour of the decision makers. However, further researches are proposed to be carried out in the following directions:

**1. Research in the identification of other moderating factors**

Although it is proved that organisational factors and decision tasks characteristics are among others the main determinant factors of decision behaviour, it is not intended to preclude any possibility that other factors might also contribute weights in particular circumstances. For example, in the study of decision behaviour of management of small size firms the cognitive style of the managers may be a contributing factor in addition to the two stipulated factors stated above (Gul 1984). Thus there should be more research purporting to identify the contingent factors applicable in

different circumstances. As argued above the choice of selection of cost models should be viewed as a processing analysis, therefore a more dynamic and situational analysis has to be performed.

## **2. Researches to Actually Identify the Moderation Effects in Detail**

Even though the independent and moderating factors are identified in this research, it is still necessary to have more in depth analysis to actually find out how specific changes among factors affect the actual decision process.

This is a positive direction of research in line with other positive researches. For example, further research can be carried out with some peculiarly designed reward calculation systems fully compatible with the opportunity cost concept and study how managers behave differently according to the revised reward calculation scheme.

Unless the prediction role of decision process can be established, research efforts cannot be said to have sufficiently contributed to this arena of knowledge, and extrinsic validity of the research results would be greatly limited to a more conceptual position. Of course this is not an easy task to accomplish, but further insights may be feasible if an integrated research effort can be formed among current researchers in the arena of behaviour

decision theories, agency theories, and organisational theories.

In conclusion, the concept of opportunity costs is a fascinating decision concept that can explain the basic process of human decision makings. There is little doubt that the ultimate logic of the concept is valid in an abstract conceptual level, as well as on a personal basis. However, a critical review of its application in an evolving business world reveals that at least two issues have to be solved for a functional application of the opportunity cost concept in decision processes within the business context. A framework of analysis proposed as the Expectancy Decision Processing Model is constructed and tested to prove its initial validity in providing insights to the current decision processes performed by professional accountants and business managers in Hong Kong. Results of the research have given initial support to the theory and arguments of the proposed model. However, this is only the starting point, and further research should be directed along the path to identify how managers make business decisions with respect to different situations of the independent variable, so that a more fruitful result could be achieved in the understanding of business decision practices.

**End Of Paper**

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