THE IMPORTANCE OF THE PAYBACK METHOD IN CAPITAL BUDGETING DECISION.

By

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Abstract

Title: The importance of the Payback method in Capital budgeting decision.

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Background and Problem Discussion: The capital budgeting decision has been a very typical issue in the sustenance of a company. Several companies have lost their identity or liquidated due to wrong capital budgeting decision they made at one particular time or the other. Based on these prevalent problems in industries and the effect of globalisation on industries, it is important to use effective method to analyse investment before decision is made. Capital budgeting is extremely important because the decision made involve the direction and opportunity for future growth of the organisation. One of the traditional methods commonly used for capital investment appraisal by some organizations is the payback method, although this method has been criticized by academicians that it does not include the future cash flow and do not measure profitability. The wide acceptance of this method by practicing managers, has called for investigation as why is the method is still popularly used in organizations. In this thesis work, we will examine the reasons major decision makers in organizations still use this method despite its critics’ objections. Could the reason be traced to
the simplicity of this method in capital budgeting than other investment appraisal method or could it be other reasons?

**Purpose:** The specific aim of this thesis is to investigate the importance of the use of the payback method in making capital budget decisions in relation to other appraisal techniques used for capital budgeting decision in organizations. We will also examine the importance of the payback method in relation to simplicity, manager incentive compensation and the size of the company.

**Method:** In this thesis, the method used are the theories on payback period as it affects decision making in the organization and past research work on methods which companies used in appraising investment are used as secondary data in order to have a basic insight into the importance of the payback method in capital budgeting.

**Theory:** The theory section looks at the capital budgeting decision, the methods that are often used in the capital budgeting decision showing the advantages and disadvantages that are associated which each of the method. Finally, the payback method was look at in detailed and the developments in the payback period.

**Research Questions:** In this thesis, we intend to try to answer the following questions:

- Why do companies seem to prefer the use of the payback method when they evaluate investment opportunities?
- Is the payback method a simplified options approach?
- Does the payback method chosen by companies have anything to do with financial flexibility related to the pecking order theory or anything to do with decentralized organizations with departmental capital budgets?
- How does the payback method affect the evaluation of managers?
Is the use of the payback period related to the size of the company?

**Analysis:** Various research works that have been done on the payback period were looked into, and different data of the survey of the research were used as secondary data to show the result obtained. From the analysis, the trend showed that the payback method has been prevalent in appraising capital budget decisions in various organizations.

**Conclusion:** It became evident that the payback method is still often used in organizations all over the world despite its criticism by the academicians, making inference from the analysis of companies in Europe, America and Africa. The importance of the payback method, which includes but not limited to its simplicity, liquidity and risk assessment have made the method to be gaining more awareness in appraising investment opportunity by practicing manager.

**Key words:** Capital Budgeting, Payback Method, Payback Period, Net Present Value, Internal Rate of Return, Real Options Approach.
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<tbody>
<tr>
<td>ARR</td>
<td>Accounting Rate of Return</td>
</tr>
<tr>
<td>CF</td>
<td>Cash Flow</td>
</tr>
<tr>
<td>DCF</td>
<td>Discounted Cash Flows</td>
</tr>
<tr>
<td>DPB</td>
<td>Discounted Payback Period</td>
</tr>
<tr>
<td>ERR</td>
<td>Economic Rate of Return</td>
</tr>
<tr>
<td>IRR</td>
<td>Internal Rate of Return</td>
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<tr>
<td>NPV</td>
<td>Net Present Value</td>
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<tr>
<td>PB</td>
<td>Payback Method</td>
</tr>
<tr>
<td>PP</td>
<td>Payback Period</td>
</tr>
<tr>
<td>WACC</td>
<td>Weighted Average Cost of Capital</td>
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Chapter 1

INTRODUCTION
1.0 Introduction

The payback method is commonly used for appraisal of capital budgeting investments in companies despite its theoretical deficiencies. The payback method is often used when aspects such as project time risk and liquidity are focused and also where pure profit evaluation is used as a single criterion. In practice, the maximum acceptable payback period is often chosen as a fixed value, for instance for a certain number of years, lets say five years. In some cases, the limit value of the payback period could be chosen in relation to the economic life of the investment, for example the payback period could be shorter than half the economic life of the investment. In many companies the payback period is used as a measure of attractiveness of capital budgeting investments. Most often the payback method is used as a first screening device used to sort out the obvious cases of profitable and unprofitable investments, leaving only the middle group to be scrutinized by means of more advanced and more time consuming calculation methods based on discounted cash flows (DCF), such as the internal rate of return (IRR) and net present value (NPV) methods (Statman and Sepe 1984).

However there are various companies of considerable size, where the payback period is used as the single criterion in investment evaluations. Such use of the payback method as the primary or only method used is often common in small and medium-sized companies. However it should be noted that payback method can be developed to handle cases with varying cash flows although some of its simplicity is lost in the process. Due to the fact that the decision situations in the evaluation of capital budgeting investment typically are uncertain concerning the time pattern and the duration of cash flows, the use of the simple and more robust payback method can be justified even if there will be time for more advanced analyses or methods.

Before, we proceed into more details concerning the payback method, lets have a clear understanding of capital budgeting and the techniques involved.
1.1 Research motivation, purpose and justification

The capital budgeting decision has been a very typical issue in the sustenance of a company. Several companies have lost their identity or liquidated due to wrong capital budgeting decision they made at one particular time or the other. Based on these prevalent problems in industries and the effect of globalisation on industries, it is important to use effective method to analyse investment before decision is made. Capital budgeting is extremely important because the decision made involve the direction and opportunity for future growth of the organisation.

One of the traditional methods commonly used for capital investment appraisal by some organisation is the payback method, although this method has been criticized by academician that it does not include the future cash flow. But the widely acceptance of this by practising managers has made it popular in organisation. We will try to examine the reasons major decision makers in organisations still use this method despite its critics objections. Could the reason be traced to the simplicity of this method in capital budgeting than other investment appraisal method or could it be other reasons? Although modification of the payback method to consider the future cash flow which is discounted payback period (DPB) has been able to reduce to some extent the deficiency of the Payback Period, the researchers were laying emphasized on.

The objective of this thesis is to consider the reason for the use of the payback method in making capital budget decision in organisations. This thesis will consider in brief all investment appraisal technique used for capital budgeting decision in organisations with major emphasis on the payback method.

The purpose this thesis is also to investigate the importance of the use of the payback method in making capital budget decisions in relation to other appraisal techniques used for capital budgeting decision in organizations. We will also examine the importance of the payback
method in relation to simplicity, manager incentive compensation and the size of the company.

1.2 Research focus and aims

The thesis will be focusing on the capital budgeting decision making in a corporate organisation. The traditional investment analysis method will be discussed which will include but not limited to payback period, IRR, NPV. Majorly the essence of the payback method will be discussed in detailed and why it is employed by practising managers for investments appraisal, despite its critics.

The main focus of this thesis is to answer the question:

- Why do companies seem to prefer the use of the payback method when they evaluate investment opportunities?
- Is the payback method a simplified options approach?
- Does the payback method chosen by companies have anything to do with financial flexibility related to the pecking order theory or anything to do with decentralized organizations with departmental capital budgets?
- How does the payback method affect the evaluation of managers?
- Is the use of payback period related to the size of the company?

1.3 Research methodology

The method to be used is in this thesis will be theories on payback period as it affects decision making in an organisation. The past research work on methods which companies used in appraising investment will be considered, and this will serve as secondary data to make inference in order to be able to answer the questions raised in the focus and have a basic insight into the importance of the payback method in capital budgeting decisions.
The data that will be as the secondary data will involve data that relate to the size of the company, the data that shows how the payback method is being used in different continents by choosing two countries from each continent of Africa, Europe and North America. The use of the secondary data will involve the extraction of relevant information from the data provided in the various articles considered, which will also consider how different data extracted from the various articles can be analyzed to answer the research questions. Also the data of the selected countries will be analyzed and rated on how often the countries used the payback method and conclusion will made on why the country or the continent used the method which will be based on empirical studies and personal judgment. Further more, the analysis of the data will also show how each continent has favoured the use of the payback method.

1.4 Background of thesis work
The capital budgeting decision has been a very typical issue in the sustenance of a company. Several companies have lost their identity or liquidated due to wrong capital budgeting decision they made at one particular time or the other. Based on these prevalent problems in industries and the effect of globalisation on industries, it is important to use effective method to analyse investment before decision is made. Capital budgeting is extremely important because the decision made involve the direction and opportunity for future growth of the organisation. One of the traditional methods commonly used for capital investment appraisal by some organizations is the payback method, although this method has been criticized by academicians that it does not include the future cash flow and do not measure profitability. The wide acceptance of this method by practicing managers, has called for investigation as why is the method is still popularly used in organizations.

In this thesis work, we will examine the reasons major decision makers in organizations still use this method despite its critics’ objections. Could the reason be traced to the simplicity of
this method in capital budgeting than other investment appraisal method or could it be other reasons?

1.5 Outline of thesis work
This thesis work is divided into five chapters comprising of Introduction, Literature Review, Reasons companies use the payback method, the analysis of companies that use the payback period from various researches that have been conducted and finally the conclusion. These are featured in this report as follows:

Chapter 1 – Introduction.
Chapter 2 – Literature review on capital budgeting with emphasis on the payback method.
Chapter 3 – The reasons companies use the payback method.
Chapter 4 – The analyses of companies that use the payback method.
Chapter 5 – Discussions or results, recommendations and conclusions.

The first chapter provides an introduction and background of the entire research work and states the motivation and purpose of the work and also highlights the focus and aims of the research work. The second chapter provides background explanations of the elements of the research work such as capital budgeting, capital budgeting process, theories of methods of capital budgeting, techniques of capital budgeting with emphasis on the payback method and the payback method in relation to the goal function of the company.

Chapter three describes the reasons companies prefer to use the payback method as their capital budgeting technique while chapter four presents the analysis of companies that use the payback period from various researches that have been conducted. Chapter five describes the conclusions than can be drawn from the results obtained and makes recommendations.
Chapter 2

LITERATURE REVIEW ON CAPITAL BUDGETING WITH EMPHASIS ON THE PAYBACK METHOD.
2.0 Literature review

The literature review provides background explanations of the elements of the research work such as capital budgeting, capital budgeting process, theories of methods of capital budgeting, techniques of capital budgeting with emphasis on the payback method and the payback method in relation to the goal function of the company. This is also an overview of literature and past research work in related areas which provide a setting for this current research.

2.1 Capital budgeting

Capital budgeting could be defined as a process in which a business determines whether projects such as building a new plant or investing in a long-term venture are worth pursuing. Most times, a prospective project’s lifetime cash inflow and outflows are assessed in order to determine whether the returns generated meet a sufficient target benchmark. Capital budgeting is also known as investment appraisal. Ideally, businesses should pursue all projects and opportunities that enhance shareholder value. Generally, businesses prefer to intricately study a project before taking it on, as it has a great impact on the organization’s financial performance. Capital budgeting is an essential managerial tool. One important duty of a financial manager is to choose investments with satisfactory cash flows and rates of return. In essence a financial manager should be able to decide if an investment is worth undertaking and should also have the ability to choose intelligently given other alternatives. Capital budgeting is primarily concerned with sizable investments in long-term assets. These assets can either be tangible items such as property, plant or equipment or intangible ones such as new technology, patents or trademarks. Investments in processes such as research, design and development and testing – through which new technology and new products are created may also be viewed as investments in tangible assets (Don Dayananda et al 2002).
Sizable, long-term investments in tangible or intangible have long-term consequences. An investment today will determine the firm’s strategic position in many years to come. These investments also have a considerable impact on the organization’s future cash flows and risk associated with those cash flows. Thus capital budgeting has a long-range impact on the firm’s performance and it is crucial to the firm’s success or failure. As such, capital budgeting decisions have a major effect on the value of the firm and its shareholder’s wealth as a whole (Don Dayananda et al. 2002).

Financial management is largely concerning with financing, dividend and investment decisions of the firm. Corporate finance theory has developed around a goal of maximizing the market value of the firm to its shareholders, which is also known as shareholder wealth maximization. Financial decisions deal with the firm’s optimal capital structure in terms of debt and equity. Dividend decisions relate to the form in which returns generated by the firm are passed on to equity-holders. Investment decisions deal with the way funds raised in financial markets are employed in productive activities to achieve the firm’s overall goal, in other words, how much should be invested and what assets should be invested in (Don Dayananda et al. 2002).

In reality, many firms have limited borrowing resources that should be allocated among the best investment alternatives. One might argue that a company can issue an almost unlimited amount of common stock to raise capital. Increasing the number of shares of company stock, however, will serve only to distribute the same amount of equity among a greater number of shareholders. In other words, as the number of shares of a company increases, the company ownership of the individual stockholder may proportionally decrease. The argument that capital is a limited resource is true of any form of capital, whether debt or equity (short-term or long-term, common stock) or retained earnings, accounts payable or notes payable, and so on. Even the best-known firm in an industry or a community can
increase its borrowing up to a certain limit. Once this point has been reached, the firm will either be denied more credit or be charged a higher interest rate, making borrowing a less desirable way to raise capital. Faced with limited sources of capital, management should carefully decide whether a particular project is economically acceptable. In the case of more than one project, management must identify the projects that will contribute most to profits and, consequently, to the value (or wealth) of the firm. This, in essence, is the basis of capital budgeting.

### 2.2 The capital budgeting process

There are different sequential stages in the capital budgeting process. The capital budgeting process is a multi-faceted activity. In a typical investment proposal of a large corporation, the sequential stages of the capital budgeting process can be depicted in a simple flow chart below:-
2.2.1 Strategic planning

A strategic plan could be referred to as the actual grand design of the organization which specifies the type of business the organization is involved in and where it intends to position itself in the future. Strategic planning translates the organization’s corporate goal into specific policies and directions, sets priorities, specifies the structural, strategic and tactical areas of
business development and guides the planning process in the pursuit of solid objectives (Drury et al. 1993). An organization’s vision and mission is embedded in its strategic planning framework. It should be noted that the feedback to strategic planning during project evaluation and decision stages is very critical to the future of the organization. The various feedbacks may suggest changes which are likely to affect the future direction of the organization which may cause changes to the organization’s strategic plan.

2.2.2 Identification of investment opportunities

Identification and investment opportunities and generation of investment project proposals are important steps in capital budgeting process. For instance project proposals have to fit into the organization corporate goal, vision and long-term strategic plan. In some cases, there is a two-way traffic between strategic planning and investment opportunities, especially when an excellent investment opportunity presents itself and the corporate vision and strategy have to be adjusted to accommodate it. Some investments are mandatory while others are discretionary and are generated by growth opportunities, competition, and cost reduction and so on. For instance those investments that are mandatory are investments that are required to satisfy particular regulatory, health and safety requirements – they are necessary for the continual existence of the organization in business. The discretionary investment usually form the basis of the business of the organization, it represents the strategic plan of the organization ultimately sets new directions for the organization’s strategic plans. The organization should endeavor to search and identify potential lucrative investment opportunities and proposals because the remaining part of the capital budgeting process can only assure that the best of the proposed investments are evaluated, selected and implemented. It is also essential that a mechanism should be put in place within the organization such that investment suggestions
coming from inside the organization such as the employees, or from outside such as the advisors to the organization are listened to by management. It is also interesting to know that excellent investment suggestions can come through informal meetings such as employee chats in a staff room or during break periods.

2.2.3 Preliminary screening of projects

Most often, there are always many potential investment proposals generated within any organization and obviously they don’t all scale through the rigorous project analysis process. Therefore, the identified and proposed investment opportunities are subjected to further preliminary screening by management to isolate the marginal and unreasonable proposal so that resources will not be wasted evaluating such proposals. At times, the preliminary screening may involve quantitative analysis and judgments based on intuition and experience.

2.2.4 Financial appraisal of projects

Project proposals which scale through the preliminary screening phase are further subjected to rigorous financial appraisal to ascertain if they would add value to the organization. This stage could also be referred to as the quantitative analysis, economic and financial appraisal, project evaluation or simply project analysis. The financial appraisal of the project may predict the expected future cash flows of the project, analyze the risk associated with those cash flows, develop alternative cash flow forecasts, examine the sensitivity of the results to possible changes in the predicted cash flows, subject the cash flows to simulation and prepare alternative estimates of the project’s net present value (Brian Baldwin 1997). The project analysis could also involve the application of forecasting techniques, project evaluation techniques, risk analysis and mathematical programming techniques. The basic concepts,
principles and techniques of project evaluation are the same for different projects while their application to particular types of projects requires special knowledge and expertise. For instance, property investment, forestry investment asset expansion projects, asset replacement projects and international investments have their own special features and peculiarities involved.

It should be noted that if the projects identified within the current strategic framework of the organization repeatedly produce negative NPVs in the analysis stage, these results sends a warning signal to the management to review its strategic plan. Therefore the feedback from project analysis to strategic planning is important in the overall capital budgeting process. The results gotten from the quantitative project analysis goes a long way to influence the final project selection or investment decision which ultimately affect the success or failure of the organization as a whole and its future direction.

### 2.2.5 Qualitative factors in project evaluation

These factors are factors that will have impact on the project but which are virtually impossible or difficult to evaluate in monetary terms.

These factors are as follows:

- the societal impact of an increase or decrease in employee numbers
- the environmental impact of the project
- possible positive or negative governmental political attitudes towards the project
- the strategic consequences of consumption of scarce raw materials
- positive or negative relationships with labor unions about the project
- possible legal difficulties with respect to use of patents, copyrights and trade or brand names
- Impact on the organization’s image if the project is socially questionable.
From the factors listed above, some may affect the value of the organization while others may not. Necessary issues could be addressed by the organization during project analysis by means of discussion and consultation with the various parties although these processes most times could be lengthy and the outcomes usually unpredictable. Management experience and judgmental skills are required to incorporate the outcome of the processes into the project analysis. At times, management may be able to predict the impact of some of these issues through the estimation of monetary cost or benefits of the project and incorporating those values into the appropriate cash flows.

2.2.6 The accept/reject decision

The results of the NPV from the quantitative analysis combined with the qualitative factors form the basis of the decision information. The information is relayed to the management with appropriate recommendation by the analyst. The management then looks into the given information and also brings in other relevant prior knowledge gained through their routine information sources, experience, expertise and judgment to make a major decision to either accept or reject the proposed investment project.

2.2.7 Project implementation and monitoring

Once the management has made a decision to accept a proposed investment project, then the project must be implemented by the management. During the implementation stage, various divisions of the organization are involved. Included in the project implementation phase is the constant monitoring of project progress with a view of identifying potential bottlenecks and thus providing early solutions or alternatives to salvage the situation when needed.
2.2.8 Post-implementation audit

This does not relate to the current decision support process of the project but rather it deals with a post-mortem of the performance of already implemented projects. An evaluation of the performance of past decisions, however, can contribute greatly to the improvement of current investment decision-making by analyzing the past ‘rights’ or ‘wrongs’.

The post-implementation audit therefore provides useful feedback to project appraisal or strategy formulation. For instance, if the projects undertaken in the past within the frame work of the organization’s current strategic plan do not prove to be lucrative as predicted, such information can prompt management to consider a thorough review of the organization’s current strategic plan (Drury et al. 1993).

2.3 Importance of capital budgeting to the organization

- Effective capital budgeting helps to improve the timing of asset acquisitions and the quality of assets purchased.
- When asset acquisition is planned properly, the organization is able to acquire and install in an orderly manner.
- Generally all organizations tend to order capital goods at the same time when sales in a particular industry are increasing strongly, which often times leads to backlogs and undelivered capital items on a timely basis.

2.4 Theories of methods of capital budgeting

Capital budgeting decisions are crucial to an organization’s success for several reasons. First of all, capital expenditures typically require large outlays of funds. Secondly, organizations must ascertain the best way to raise and repay these funds. Thirdly, most capital budgeting
decisions require a long-term commitment and finally, the timing of capital budgeting decisions is important. When large amounts of funds are raised, organizations must pay close attention to the financial markets because the cost of capital is directly related to the current interest rate.

The need for relevant information and analysis of capital budgeting alternatives has inspired the evolution of a series of models to assist organizations in making the "best" allocation of resources. Among the earliest methods available were the payback models, which in simple terms determine the length of time required for the organization to recover its cash outlay, and the return on investment model, which evaluates the project based on standard historical cost accounting estimates.

The next group of models employs the concept of the time value of money to obtain a superior measure of the cost/benefit trade-off of potential projects. More current models attempt to include in the analysis non-quantifiable factors that may be highly significant in the project decision but could not be captured in the earlier models.

Capital budgeting decisions are extremely important and complex and have inspired many research studies in the past. For instance, in an in-depth study of the capital budgeting projects of 12 large manufacturing firms (Ross 1972), that although techniques that incorporated discounted cash flow were used to some extent, firms relied so much on the simplistic payback model, especially for smaller projects. Also, when discounted cash flow techniques were used, they were often simplified. For example, some firms' simplifying assumptions include the use of the same economic life for all projects even though the actual lives of individual projects might be different. Further more, firms often did not adjust their analysis for risk (Ross, 1986).

Also in 1972 Thomas P. Klammer surveyed a sample of 369 firms from the 1969 Compustat listing of manufacturing firms that appeared in significant industry groups and made at least
$1 million of capital expenditures in each of the five years 1963-1967. Respondents were asked to identify the capital budgeting techniques in use in 1959, 1964, and 1970. The results indicated an increased use of techniques that incorporated the present value (Klammer 1984).

In 1973, James Fremgen surveyed a random sample of 250 business firms that were in the 1969 edition of Dun and Bradstreet's Reference Book of Corporate Management. Questionnaires were sent to companies engaged in manufacturing, retailing, mining, transportation, land development, entertainment, public utilities and conglomerates to study the capital budgeting models used, stages of the capital budgeting process, and the methods used to adjust for risk. He discovered that firms considered the internal rate of return model to be the most important model for decision-making. He also found that the majority of firms increased their profitability requirements to adjust for risk and considered defining a project and determining the cash flow projections as the most important and most difficult stage of the capital budgeting process (Fremgen 1973).

In 1965, J William Petty, David P. Scott, and Monroe M. Bird examined responses from 109 controllers of 1971 Fortune 500 (by sales dollars) firms concerning the techniques their companies used to evaluate new and existing products lines. They found that internal rate of return was the method preferred for evaluating all projects. Moreover, they found that present value techniques were used more frequently to evaluate new product lines than existing product lines (Petty 1975).

Laurence G. Gitman and John R. Forrester Jr. analyzed the responses from 110 firms who replied to their 1977 survey of the 600 companies that Forbes reported as having the greatest stock price growth over the 1971-1979 period. The survey containing questions concerning capital budgeting techniques, the division of responsibility for capital budgeting decisions, the most important and most difficult stages of capital budgeting, the cutoff rate and the methods used to assess risk. They found that the discounted cash flow techniques were the most
popular methods for evaluating projects, especially the internal rate of return. However, many firms still used the payback method as a backup or secondary approach. The majority of the companies that responded to the survey indicated that the Finance Department was responsible for analyzing capital budgeting projects. Respondents also indicted that project definition and cash flow estimation was the most difficult and most critical stage of the capital budgeting process. The majority of firms had a cost of capital or cutoff rate between 10% and 15%, and they most often adjusted for risk by increasing the minimum acceptable rate of return on capital projects (Gitman 1977).

In 1981, Suk H. Kim and Edward J. Farrayger surveyed the 1979 Fortune 100 Chief Financial officers about their 1975 and 1979 usage of techniques for evaluating capital budgeting projects. They found that in both years, the majority of the firms relied on a discounted cash flow method (either the internal rate of return or the net present value) as the primary method and the payback as the secondary method (Suk 1981).

2.5 Capital budgeting techniques

The requirement for relevant information and analysis of capital budgeting decisions taken by management has paved way for a series of models to assist the organization in amassing the best of the allocated resources.

Popular methods of capital budgeting techniques include:

- The Payback Period
- Net Present Value (NPV)
- Internal Rate of Return (IRR)
- The Real Options Approach

The above different methods of capital budgeting techniques will be discussed briefly but emphasis will be put on the payback method.
2.5.1 The payback period

The payback period is defined as the time required to recover the initial investment in a project from operations. The payback period method of financial appraisal is used to evaluate capital projects and to calculate the return per year from the start of the project until the accumulated returns are equal to the cost of the investment at which time the investment is said to have been paid back and the time taken to achieve this payback is referred to as the payback period. The payback decision rule states that acceptable projects must have less than some maximum payback period designated by management. Payback is said to emphasize the management’s concern with liquidity and the need to minimize risk through a rapid recovery of the initial investment. It is often used for small expenditures that have obvious benefits that the use of more sophisticated capital budgeting methods is not required or justified (Cooper, William D. Morgan et al. 2001).

It should be noted that the required payback period sets the threshold barrier (hurdle rate) for the project acceptance. It often appears that in many cases that the determination of the required payback period is based on subjective assessments, taking into account past experiences and the perceived level of project risk. The payback period has shown to be an important, popular, primary and traditional method in the developed nations like the UK and the USA (Pike 1985).

Typically, the payback period expected by managers appears to be in the range of two to four years. For instance, (Fotsch 1983) reports from his USA survey that the average hurdle payback period is 2.91 years while Woods et al 1985, stated from their UK survey: “Of the firms using new technology and also using the payback investment appraisal methods for all their investments, we had 31 observations of the standard payback period: the minimum observed was 1 yr and the maximum 5 yr, with a mean of 2.9 yr”. Also Drury et al (1993)
reported that the average payback period for conventional projects was 2.83 yr, while for new
technology projects the period was 3.11 yr.

The payback method by definition, only takes into account project returns up to the payback
period. However, for certain projects which are long term by nature and whose benefits will
accrue some time in the future and well beyond the normal payback may not be accepted
based on the calculation used by the payback method, although such projects may actually be
vital for the long-term success of the business. It is therefore important to use the payback
method more as a measure of project liquidity rather than project profitability.

The payback method (PB) is commonly used for appraisal of capital investments in
companies despite its deficiencies. In many companies, the payback period is used as a
measure of attractiveness of capital investments. Although the use of payback period as a
single criterion has decreased over time, its use as a secondary measure has increased over
time (Segelod 1995). This method is commonly used in pure profit evaluations as a single
criterion and also sometimes used when focusing on aspects such as liquidity and project time
risk. The obvious cases of profitable and unprofitable investments are sorted out, when the
payback method is used as the first screening device, leaving only the investments that have
survived the screening process in the middle group to be scrutinized by means of more
advanced and more time consuming calculation methods based on discounted cash flows
(DCF), such as the Internal Rate of Return (IRR) and Net Present Value (NPV) methods.

However, it should be noted that there are many companies of considerable size, where the
payback period is used as the single criterion in investment evaluations (Blatt 1979).

The use of the payback method as the only or the major method seems to be more commonly
used in small and medium-sized companies (Longmore 1989). Various studies of the use of
the payback method in investment evaluation have been done at different points in time but
some of the recent overviews of various studies are presented by Lefley (1996). Although the
results from different studies at different points in time are not totally consistent, the payback method seems to be more frequently used in Europe than in the United States of America. Most importantly the overall conclusion seems to reveal that the payback method is much in use by companies for investment appraisals and it is therefore necessary to reduce some of its deficiencies.

The major deficiencies of the payback method are that it ignores cash flows after the payback period and that it does not measure the time value of money in correct manner. To help reduce these deficiencies, the maximum acceptable payback period (PP) should be chosen in a somewhat more sophisticated way. For instance, in practice the maximum acceptable payback period is usually chosen as a fixed value, for example, three years and in some cases the limit value of the payback period has been related to the economic life of the investment, for example a payback period that is shorter than half the economic life. When these two rules of thumb are combined, a more theoretically correct evaluation of investments can be achieved and such a combined payback method is based on assumption of constant yearly cash flows. However, the method can be developed to handle cases with varying cash flows, but then some of the simplicity of the payback method is lost in the process. Also with regard to the issue of the payback method ignoring cash flows after the payback period, Pike (1985) argues that in ranking projects using a simple payback method, the error from ignoring the post-payback cash flows is, to some extent, compensated by the error arising from not considering the time value of money in the payback calculations, which supports the earlier findings of Hoskins and Mumey (1979) who argued that where the pre-payback cash flows are a good predictor of the post-payback cash flows then the so-called errors of not using discounted figures and the exclusion of the cash flows after the payback create offsetting biases and they therefore concluded that the payback method ranking of the capital projects is therefore more reliable than the is usually suggested. It should be noted, however, that these
compensation errors only arise where the early cash flows are reasonable predictor of later cash flows. As quoted by Blatt, “The payback time limit has been criticized by theorists because it ignores profits which may accrue during the subsequent life of the project. We now see that this criticism is unjust; the practical men are completely right. In a riskless world future profits are certain. But in the real world, the imposition of a payback time limit is a necessary protection for the survival of the planning manager. A payback time limit is used by nearly every responsible manager, in fact” (Blatt 1979). It is only in very limited circumstances (where for example, the pre-payback cash flows are a predicator of the post-payback cash flows) that ignoring the returns after the payback period may have a minimal effect on the investment decision. In many cases the returns profile from a project will invalidate Pike’s argument.

The second issue that it does not measure the time value of money in correct manner in other words that it ignores the timing of the returns has, to some extent, been addressed by the introduction of the discounted payback methods.

2.5.1.1 The payback method in relation to the goal functions of the company.

In the payback method, like other capital budgeting techniques, companies will only go ahead with an investment if the return of the investment is higher or larger than the capital cost. Generally, most companies go ahead with an investment decision if the following conditions hold true.

1) \( \text{NPV} > 0 \)

This means that for a good investment decision to be made, the net present value must greater than zero.
2) IRR > WACC (i.e. the capital cost)

This explains that the internal rate of return is expected to be greater than the weighted average cost of capital (also known as the capital cost) for executing the capital budget under consideration.

3) NPV + option value (Strategic NPV) > 0

This explains the net present value in addition to the option value (which is the same as the strategic net present value) must be greater than zero to make a good investment decision.

The above conditions are used because they increase the principal’s wealth (i.e. the shareholder’s wealth) and ultimately add value to the company as a whole.

The goal function of the company is defined as the ‘raison d’être’ of the company (i.e. the reason for being of the company) and it is also geared towards maximizing the profit of the company. The goal function of the company is one of the major criteria to be considered when a firm wants to make investment decisions. Investment that will always add value to the company is always chosen, and majorly the investment that maximizes the present future value of cash flow. To find out if the goal function of the company is supported by the payback method, we must assume the goal function of the company in this thesis. It is a known fact that for the goal function to be valuable, it must assist decision makers (majorly the managers) of the company to decide which investment should be undertaken.

In this thesis work, the goal function of the company is focusing on maximizing the long run market value of the firm (cf. Brealey & Meyers, 2003). The company is said to maximize the long run market value of the company by maximizing the net benefits from activities such as investments with positive returns (Numminen, 2008). The goal function of the company is said to maximize the present value of future cash flow which is easily supported by the net present value method and the internal rate of return method. It is noted that the payback
method is majorly used for appraising capital projects which have short term such as three years.

The goal function of the company could also be expressed as the maximum present value plus the option value (as known as the strategic present value). This definition is also supported by the use of the Real Options method of capital budget appraisal.

So, in essence how does the payback method of capital budget appraisal align with the goal function of the company?

The use of the payback method has been criticized often by academicians. The development of the relationship between the internal rate of return and the payback method has shown that the payback method do measure profitability of investment. The literature on investment appraisal methods has shown that the payback period is an approximation of internal rate of returns of infinite life and uniform cash flow see Frank Lefley (1996). In this case the payback period is the reciprocal of the internal rate of return, for example a project with a payback of five years could be equated as having an IRR of 20%. If this assumption holds, then we can show that the payback period also measure the profitability of an investment opportunity. The IRR which considers the present value of future cash flow has been one of the methods that support the goal function of a company. So also the payback can in some cases support the goal function of a company, if the cash flow is constant over time. The simple calculation can show that the investment with higher IRR will have lower payback period and vice-versa. The major constraint to this assumption is that in a situation of non-uniform cash flow, it may not give fair approximation of the IRR.

According to studies, see Frank Lefley (1996), the payback method has been employed because some practicing manager believe that it is the approximation of internal rate of return
and that it also support the goal function of company. This is also one of the reasons the payback method is still relevant in the industries.

2.5.1.2 Discounted payback period method (Payback DCF)

The payback method have gone through various development stages over the years, with the different variations aimed at eliminating some of its disadvantages and at the same time keeping the method as simple as possible. The payback method based on discounted cash flow figures was proposed by Rappaport (1965) which related the opportunity investment rate notion to the payback period measurement. This method attempted to overcome one of the drawbacks of the conventional payback calculation which failed to take into account a company’s cost of capital. The discounted payback period method proposed by Rappaport is an improved measure of liquidity and project time risk over the conventional payback method and not a substitute for profitability measurement because it still ignores the returns after the payback period. He stated that, the proper role for the discounted payback period analysis is as a supplement to profitability measures and thus highlighting the supportive nature of the payback method, whether conventional or discounted payback period.

Longmore (1989) also proposed a generalized time-adjusted payback rule which states that “If the investment proposal’s payback, adjusted for the timing of the net cash flows, is less than or equal to the present value of annuity factor at the firm’s cost of capital for the life of the proposal, the investment should be accepted”. He argues that by adjusting the discount rate, the discounted payback decision rule can be modified to handle risky investments. This method is seen as a modification of the NPV method and will always give the same decision result as the NPV. In practice it appears that the standard payback DCF uses discounted figures in its calculation but allows managers to determine the payback hurdle rate, which in
many cases is based on the subjective judgment. It should however be noted that the payback period is determined from the present value annuity factors used and not predetermined by the managers. If, as Longmore proposed, project risk is taken into account by the adjustment of the discount rate used in the discounted payback period method, this will result in overcompensation of risk if perceived risk is also taken into account in the determination of the required payback period; the discount rate being increased while the required payback period is reduced (Drury et al. 1993). The payback method is simply regarded as the simplest way of looking at one or more major project ideas and simply reveals how long it will take to earn back the money spent on a particular project.

The payback method is computed as follows:

\[
\text{Payback Period} = \frac{\text{Initial Investment}}{\text{Annual Operating Cash Inflows}}
\]

Or

\[
\text{Payback Period} = \frac{\text{Cost of Project}}{\text{Annual Cash Flow}}
\]

It should be noted that under the payback method, projects with shorter payback periods rank higher than those with longer paybacks. The theory behind this is that projects with shorter paybacks are more liquid and thereby less risky i.e. they allow the organizations to recoup their investment sooner, so that the money can be reinvested elsewhere. With shorter payback periods there is little or no chance that market conditions, interest rates, the economy, or other factors affecting the proposed project will drastically change. Most often, a payback period of three years or less is encouraged, since it is believed that if the payback period is less that a year, the project is said to be essential.
It should be noted however that the payback method only indicates how quickly the cost of an investment is recovered but does not measure its profitability. It is therefore not designed to measure or reflect all the dimensions of profitability which are relevant to capital expenditure decisions and it is neither inclusive nor sensitive enough to be used as a company’s general investment worth. It is based on this, that the academic writers have almost unanimously condemned the use of the payback period as a misleading and worthless in making investment decisions (Pike 1985).

2.5.1.3 Advantages of the payback period

- It is widely used and easily understood.
- It favors capital projects that return large early cash flows.
- It allows a financial manager to cope with risk by examining how long it will take to recoup initial investment, although it does not treat risk directly.
- It addresses capital rationing issues easily.
- The ease of use and interpretation permit decentralization of the capital budgeting decision which enhances the chance of only worthwhile items reaching the final budget.
- It contains a built-in safeguard against risk and uncertainty in that the earlier the payback the lower the risk.
- It remains a major supplementary tool in investment analysis.

2.5.1.4 Disadvantages of the payback method

- It ignores any benefits that occur after the payback period i.e. it does not measure total income.
- The time value of money is ignored.
- It is difficult to distinguish between projects of different size when initial investment amounts are vastly divergent.
- It over-emphasizes short run profitability.
- The overall payback periods are shortened by postponing replacement of depreciated plant and equipment. This policy may do more harm than good to the production process.

### 2.5.2 Net present value (NPV)

The Net Present Value is defined as the different between the present value of the cost inflows and the present value of the cash outflows. In other words, a project’s net present value, usually computed as of the time of the initial investment is the present value of the project’s cash flows from operations and disinvestment less the amount of the initial investment. For instance, in computing the projects net present value, the cash flows occurring at different points in time are adjusted for the time value of money using a discount rate that is the minimum rate of return required for the project to be acceptable. Projects with positive net present values (or values at least equal to zero) are acceptable and projects with negative net present values are unacceptable. In case the project is rejected, it is rejected because cash flows will also be negative.

NPV is used in capital budgeting to analyze the profitability of an investment or project and it is sensitive to the reliability of future cash flows that the investment or project will yield. For instance, the NPV compares the value of the dollar today to the value of that same dollar in the future taking inflation and returns into account.
The NPV is computed as follows:

\[
NPV = \sum_{t=1}^{T} \frac{C_t}{(1 + r)^t} - C_0
\]

Where \( C_0 \) is the present value of cash outflows, if cost is incurred over a period of time.

Note that higher NPVs are more desirable. The specific decision rule for NPV is as follows:

\[
\begin{align*}
\text{NPV} \leq 0, & \quad \text{reject project} \\
\text{NPV} > 0, & \quad \text{accept project}
\end{align*}
\]

2.5.2.1 Advantages of net present value (NPV)

- It is considered to be conceptually superior to other methods.
- It does not ignore any period in the project life or any cash flows.
- It is mindful of the time value of money.
- It is easier to apply NPV than IRR.
- It prefers early cash flows compared to other methods.

2.5.2.2 Disadvantages of net present value (NPV)

- The NPV calculations unlike IRR method, expects the management to know the true cost of capital.
- NPV gives distorted comparisons between projects of unequal size or unequal economic life. In other to overcome this limitation, NPV is used with the profitability index.
2.5.3 The internal rate of return (IRR)

The internal rate of return (IRR) is the discount rate often used in capital budgeting that makes the net present value of all cash flows from a certain project equal to zero. This in essence means that IRR is the rate of return that makes the sum of present value of future cash flows and the final market value of a project (or investment) equals its current market value (Stefan Yard 1999). The higher a project’s internal rate of return, the more desirable it is to undertake the project. As a result, it is used to rank several prospective projects a firm is considering. As such the internal rate of return provides a simple hurdle, whereby any project should be avoided if the cost of capital exceeds this rate. IRR is also referred to as economic rate of return (ERR). A simple decision making criteria can be to accept a project if its internal rate of return exceeds the cost of capital and rejected if the IRR is less than the cost of capital. Although it should be noted that the use of IRR could result in a number of complexities such as a project with multiple IRRs or no IRR and also that IRR neglects the size of the project and assumes that cash flows are reinvested at a constant rate. Internal rate of return is the flip side of net present value (NPV), where NPV is discounted value of a stream of cash flows, generated from investment. IRR computes the break-even rate of return showing the discount rate.

IRR can be mathematically calculated using the following formula:

\[ CF_0 + \frac{CF_1}{(1 + x)^1} + \frac{CF_2}{(1 + x)^2} + \frac{CF_3}{(1 + x)^3} + \frac{CF_n}{(1 + x)^n} = 0 \]

In the above formula, CF is the Cash Flow generated in the specific period (the last period being ‘n’). IRR, denoted by ‘r’ is to be calculated by employing trial and error method.
2.5.3.1 Advantages of internal rate of return (IRR)

- It is considered to be straightforward and easy to understand.
- It recognizes the time value of money.
- It uses cash flows.

2.5.3.2 Disadvantages of internal rate of return (IRR)

- It often gives unrealistic rates of return and unless the calculated IRR gives a reasonable rate of reinvestment of future cash flows, it should not be used as a yardstick to accept or reject a project.
- It may give different rates of return; in essence it entails more problems than a practitioner may think.
- It could be quite misleading if there is no large initial cash outflow.

2.5.4 The real options approach

The real options approach applies financial options theory (the best known form is the Black-Scholes model) to real investments, such as manufacturing plants, line extensions and research and development investments. This approach provides important insights about business and strategic investments which are very vital given the rapid pace of economic change. A financial option gives the owner the right, but not the obligation, to buy or sell a security at a given price. Analogously, companies that make strategic investments have the right but not the obligation to exploit these opportunities in the future.

If real options are used as a conceptual tool, it allows management to characterize and communicate the strategic value of an investment project. The real option method represents
the new state-of-the-art technique for the evaluation and management of strategic investments. The real option method enables corporate decision makers to leverage uncertainty and limit downside risk. The Black-Scholes model applies when the limiting distribution is the normal distribution, and it explicitly assumes that the price process is continuous and that there are no jumps in asset prices. The version of the model presented by Black and Scholes was designed to value European options, which were dividend-protected. Thus, neither the possibility of early exercise nor the payment of dividends affects the value of options in this model.

The value of a call option in the Black-Scholes model can be written as a function of the following variables:

\( S \) = Current value of the underlying asset

\( K \) = Strike price of the option

\( t \) = Life to expiration of the option

\( r \) = Riskless interest rate corresponding to the life of the option

\( \sigma^2 \) = Variance in the \( \ln \) (value) of the underlying asset

The model itself can be written as:

\[
\text{Value of call} = S \, N(d_1) - K \, e^{rt} \, N(d_2)
\]

Where

\[
d_1 = \frac{\ln \left( \frac{S}{K} \right) + (r + \frac{\sigma^2}{2}) \, t}{\sigma \, \sqrt{t}}
\]

\[
d_2 = d_1 - \sigma \, \sqrt{t}
\]
The process of valuation of options using the Black-Scholes model involves the following steps below:

*Step 1:* The inputs to the Black-Scholes are used to estimate $d_1$ and $d_2$.

*Step 2:* The cumulative normal distribution functions, $N(d_1)$ and $N(d_2)$, corresponding to these standardized normal variables are estimated.

*Step 3:* The present value of the exercise price is estimated, using the continuous time version of the present value formulation:

$$\text{Present value of exercise price} = K e^{-rt}$$

*Step 4:* The value of the call is estimated from the Black-Scholes model.

### 2.5.4.1 Advantages of real options approach

- Projects can be viewed as real options can be valued using financial option pricing techniques.
- Technically, it allows managers to bundle a number of possible outcomes into a single investment.
- A decision maker has greater flexibility and improved method to value opportunities.

### 2.5.4.2 Disadvantages of real options approach

- When applied to stock evaluation real options technique is complicated.
- While real options have some theoretical validity and can be relatively simple to value in simple situations, the approach is probably better suited to a company deciding on its strategy than to an investor picking stocks.
- The company must have the management skills and the wherewithal to exploit options; moreover, an option doesn't have much value if it cannot be funded effectively.
Chapter 3

THE REASONS COMPANIES USE THE PAYBACK METHOD BASED ON EMPIRICAL STUDIES.
3.0 Reasons companies use the payback method

It was discovered that while the payback method is used extensively by many companies, it is apparently used primarily in conjunction with other appraisal methods. In the survey carried out by Schall et al (1978), it was found that of the 74% of respondent firms that use the PB method, only 2% use PB as their sole technique. A survey of the nation’s leading firms by Gitman and Forrester (1977) shows that while only 8.9% of the firms use the PB method as the primary capital budgeting technique, 44% use it as a secondary capital-budgeting technique. It is therefore generally unlikely that firms use the PB method because they are not familiar with the sophisticated methods of capital budgeting since Schall et al (1978) report that 64% of the firms that use sophisticated capital budgeting methods (i.e. net present value (NPV) or internal rate of return (IRR)) also use the PB method. Capital budgeting decisions require the participation of good number of people within the organization and some maybe either unfamiliar with sophisticated capital budgeting methods or just be more comfortable with the use of PB method (Statman and Sepe 1984). An alternative explanation for the use of the payback method maybe, that it is an outcome of a conflict between the interests of the owners of the companies and those of the managers of the organization. For instance, the owners of the organization would be indifferent between the two investment projects with the same (risk adjusted) NPV even though one has a longer payback period. This is actually because the owners can sell their stock in the capital market at any time and capture the present value of any future cash flows. Putting into considering the position of the managers who are expected to choose between the two projects, and who may not expect to stay with the organization for the economic life of the projects due to one reason or the other such as retirement, a move to another position or a change of company. In a situation where management compensation is expected to be linked to the periodic accounting earnings generated by the project, then they would prefer the project with a shorter PB period since
they cannot partake of the benefits from cash flows which will arrive after they have might left. Although as of today, incentives are more often linked to shareholder value through options on shares and alike. Therefore the implicit assumption of an infinite discount rate or a zero value of cash flows beyond the critical payback period makes perfect sense for managers, and it may induce them to choose a set of projects suboptimal to the shareholders. The hypothesis that the payback method is beneficial to managers but not to owners is discussed also by Weingartner (1969), Brealey and Myers (1981), and Statman (1982).

3.1 Simplicity of the payback period

The payback period as stated earlier is used in many companies as a measure of the attractiveness in capital investments. In spite of its critics, it is commonly used for appraisals of capital investments. The simplicity of the payback period is evidence in that this method is often used as a screening device in which the obvious cases of profitable and unprofitable investments are sorted out, leaving the potential profitable investments to be scrutinized by means of more advanced and more consuming calculation methods based on discounted cash flows (DCF) financial appraisal methods (often referred to as the sophisticated methods), such as the internal rate of return (IRR) and the net present value (NPV) methods. Even if the payback method is most often used as a first sieve or as a restriction, the method is still quite often used as the single or at least the primary method for investment evaluation. The payback period indicates how quickly the cost of investment will be recovered but does not measure its profitability. In essence it is designed to answer the question how soon the original cash outlay will be recovered; and this reveals the simplicity of the payback method (Don Dayananda et al. 2002).
3.2 The payback period in relation to pecking-order theory

The way companies should finance their investment has been very challenging for the managers. In making this decision the managers consider the capital structure and how their decisions will affect it. The issue of pecking-order has been discussed in several articles; this states that in financing an investment, the management will consider the available cash, followed by the debt and finally the equity. In implementing a very capital intensive investment like investments into information system, managers will be left to make decision in the form of way to find the funds. The three options left for the managers, have already been discussed above and following the trends which depend on pecking-order theory. The work of Myers and Majluf (1984) concluded that using asymmetric information the managers have more insider information than the shareholders and they will prefer debt to equity if external finance is required in financing a project. The influence of the payback method can be link with the pecking-order theory, if we look at it is in such a way that the organization will like to embark on investment that will bring back the cost of the outlay. Since the managers are not interested in increasing the debt ratio or diluting the proportion of the shareholder equity, they will then have to use methods that create immediate liquidity for the company. This has therefore contributed to the increased use of the payback period in corporate setting, despite the fact that it is being criticized by many academicians. Also in relation to pecking-order theory, the manager knows that a highly geared company is vulnerable to take over, so pursuing other ways that is contrary to pecking-order theory in other to finance their project will hardly be followed. In addition, when the management aims at pursuing share-holder wealth maximization, they will want to maintain certain equity such that it will not be diluted. Investment that will generate immediate cash flow will be highly favoured in which payback method is the only method that will detect this kind of investment option.
3.3 The payback period as method for risk assessment in capital budgeting.

This is an excellent measurement of risk. The payback period is the amount of time required for cash flows from the implemented solution to equal the original project cost. The payback period is a simple metric that determines when a project breaks even. Some companies use the discounted payback method to determine the amount of time required to recover the original project cost and earn the required rate of return. The payback period represents the risk time of the investment. If the solution fails to deliver the planned cash inflows or fails to function, the capital expenditure will not accomplish its financial goals. A capital expenditure not achieving its financial goals is usually a bad situation in most companies. In general, shorter payback periods are more desirable than longer ones. The payback period is an approximated economic analysis. All economic consequences after the payback period are completely excluded. One may make the wrong decision on a capital expenditure if the payback period is the only decision factor used (Blatt 1979). The managers believe that the cash realized today is more realistic than the cash to be realized in the future, this is one of the idea that the payback method supports which also shows how early an investment will recoup its initial outlay. Many managers are risk averse, so they are more interested in the project that will quickly generate the cash flow. Also the managers are employees of an organization; knowing that, considering an investment that will take a longer time to recoup it outlay will be risky, because the length of the period of their services can not be predicted. The managers might get fired or he gets employment in another company, this reason also motivates the consideration of the risk of their employment, and favours the often use of the payback method in capital investment decision. The risk is paramount in capital budgeting decision and the managers will always work to reduce the risk or make decision that will be able to minimize the risk.
3.4 The payback period in relation to the size of company.

The researchers have been pointing to the fact that companies are bias to the use of investment appraisal in relation to their size. The classification of the size of companies has been based on the turn over, asset base, profit and others. Some of the researches that concluded with the fact that companies size affect the type of the investment method used are John R. Graham (2000) and Gert Sandahl and Stefan Sjogren (2003) in which the data for the survey in which they base their conclusion is presented in chapter four of this thesis. Both of the researchers, who carry out their survey in different continents, conclude that small companies are bias in using the payback method as method for evaluating the investments. The major reason supporting this idea can be traced to the fact that the payback period is simple and has effective communication. Small companies also are more interested in the immediate cash flow because they often lack the requirements to be able to source for fund. It cannot be far from the truth that the complexities that other investment appraisal method involve always scare the small company managers; who sometimes lack the human capacity to carry out the required computation. Also the infrequent of the small companies’ capital project is also a setback that will not allow them to be able to use complicated methods. Basically if the small companies were involved in regular capital project they might have develop familiarity with complex methods.

3.5 Management compensation and the role of the payback method

The managers and shareholder goals has been influencing sometime the goal function that managers pursue. The shareholders are more interested in the profitability and the growth of the company, while in order way round the manager are more interested in what will bring them incentive in form of bonus. Baiman (1990) the agency suggests that management acts in own best interests and respond to the incentives embodied in compensation. The use of the
payback method by company can be traced to management-shareholder conflict, which resulted from their different goals stated above. So the timing of the cash flow was viewed differently, while shareholders are always interested in the net present value of the firm. The managers are interested in the project that will quickly bring cash flow, basically because there are risk averse and sometime might not stay long in the present position either by getting new jobs or some other things, this can be traced to why they prefer to use the payback method, because among the project investment appraisal method it is the cash flow that measure this.

In the pursuance of immediate cash flow, managers always prefer using the payback method, against other methods that can show the profitability of the projects after the payback period. The work of Statman and Sepe (1984) was unable to conclude may be the manager's firm used the payback method more frequently with short term bonus than long-term incentive plan. Pike (1985) try to conduct another survey on the management compensation with respect to firm using the payback method, but because of the difficult in getting data for this in the UK, he framed the research question to investigate firms that are interested in pursuing shareholder interest, the result of the survey shown that firms interested in pursuing shareholder interest not often used payback. It can be inferred from his result since pursuing shareholders interested is the opposite of pursuance management interest, from that we can conclude that managers will always want to use payback period method management interest which is linked to get compensation and incentive. Also Shimin Chen and Ronald L. Clark (1994) carry out a special investigation to establish the relationship between the firms that used the payback method in respect of compensation. The result of their research shows that firm that follow management goal objective against shareholder objective often used the payback method in evaluating their investment.
Chapter 4

THE ANALYSES OF COMPANIES THAT USE THE PAYBACK METHOD FOR APPRAISAL OF CAPITAL BUDGETING DECISION.
4.0 European companies

Research has been conducted on European companies to be able to see the most used capital budgeting methods used by the managers. For the purpose of this thesis, we will limit ourselves to the published papers in United Kingdom and Sweden, which relate to the survey conducted on companies in these two countries.

Franky Lefley (2000) summarized the report of survey conducted on companies in the United Kingdom. The report of the survey is shown below:

<table>
<thead>
<tr>
<th>Year of survey</th>
<th>Researcher(s) and date of report</th>
<th>Response</th>
<th>Response rate (%)</th>
<th>Sample frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973</td>
<td>Carsberg and Hope(1976)</td>
<td>103</td>
<td>31.7</td>
<td>325-Times (Industrial)</td>
</tr>
<tr>
<td>1989</td>
<td>Sangster(1993)</td>
<td>94</td>
<td>21.8</td>
<td>491-large Scottish companies, 303-small Scottish companies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>68</td>
<td>22.4</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.1: Report of survey conducted on companies in the United Kingdom.

The Carberg and Hope (1976) conducted a survey and 59.2% of the respondent used traditional the payback method, among them 18.4% ranked it first; while also 39.8% used the discounted payback period, and 7.8% ranked it first. The survey also showed that for companies that used only one single method, the payback period was the most important method used. Pike (1998) and Pike and Sharp (1989), both reported in the conclusion of their survey that the popularity of the payback period in capital budgeting decision is increasing despite its critics’ objections. It was evidence that 92% of the firms still used the payback method. The report on the survey of Sangster (1993) shows that payback period was most
used in Scotland both by large and small companies. Also Drury et al (1993) showed that PB was the most used capital budgeting technique, with 63% of the respondent using the conventional payback and 4% using the discounted payback. This analysis also shows that the use of the payback method in United Kingdom is important in making capital budgeting decision and the trends has not changed despite the introduction of more complex method like real options by the academicians, the practicing managers still find it comfortable to use the payback method.

In Sweden, Gert Sandahl and Stefan Sjogren (2003) conducted a research on the use of the various capital budgeting techniques in the largest groups of company in Sweden. The extracts from their research is listed in the table below:

<table>
<thead>
<tr>
<th>Capital budgeting techniques</th>
<th>Percentage using the various budgeting techniques (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payback</td>
<td>78.1</td>
</tr>
<tr>
<td>NPV</td>
<td>52.3</td>
</tr>
<tr>
<td>Expenses calculation</td>
<td>30.5</td>
</tr>
<tr>
<td>Costing</td>
<td>27.3</td>
</tr>
<tr>
<td>IRR</td>
<td>22.7</td>
</tr>
<tr>
<td>Accounting rate of returns</td>
<td>21.1</td>
</tr>
<tr>
<td>Annuity</td>
<td>10.2</td>
</tr>
<tr>
<td>VBM</td>
<td>8.6</td>
</tr>
<tr>
<td>Other</td>
<td>6.3</td>
</tr>
<tr>
<td>Relative CF</td>
<td>1.6</td>
</tr>
<tr>
<td>Real options</td>
<td>0</td>
</tr>
<tr>
<td>All DCF</td>
<td>64.8</td>
</tr>
</tbody>
</table>

Table 4.2: Extracts from the research on the use of capital budgeting method in the largest groups of company in Sweden.
The conclusion of the research work by Gert Sandahl and Stefan Sjogren (2003) was that many companies in Sweden use the payback method. The implication of this is that the relevance of the payback method in Sweden is traceable to the fact that shareholder maximization policy was not pursued by the company’s management. The major reason for the high increase in the use of payback period was focused on the liquidity rather than profitability, and also we can conclude that the Sweden’s management companies are risk averse.

4.1 American companies

The following research was conducted by some of the American companies on the development of the payback method and the companies that used this method. The following is the result of some of the survey conducted has reported by Frank Lefley (1996) on the survey of capital investment technique used in the United States of America.

<table>
<thead>
<tr>
<th>Year of survey</th>
<th>Researcher(s) and date of report</th>
<th>Response</th>
<th>Response rate (%)</th>
<th>Sample Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971</td>
<td>Fremgen (1973)</td>
<td>177</td>
<td>70.8</td>
<td>250- Dun &amp; Brads Ref Book Corp</td>
</tr>
<tr>
<td>1985</td>
<td>Kim et. Al (1986)</td>
<td>367</td>
<td>36.7</td>
<td>Fortune 1000</td>
</tr>
<tr>
<td>1988</td>
<td>Hendricks (1988)</td>
<td>85</td>
<td>50.6</td>
<td>168 – fortune 500 industrial( with substantial factor automation)</td>
</tr>
</tbody>
</table>

Table 4.3: Report on the research conducted by some of the American companies on the development of the payback method and the companies that use it.
The analysis of Fremgen (1973) as reported is that 67% of all respondents used the payback method. Also the analysis done by Petty et al (1975) and also reported in Frank Lefley’s (1996) article stated that the payback method was ranked first by 12% of the respondents and second by 44%. The conclusion of the research is that the payback method is often used than any other method. Kim et al (1986) showed that 19% of the firms use the payback method as primary method of evaluation while 35% use it as a secondary method. Hendricks (1988) reported in his analysis that 29% used the payback method as their primary evaluation technique when considering factory automation projects, while 48% used it as their secondary technique, but he concluded that the use of the payback method should be discouraged as primary technique and should only act as a secondary evaluation measure. The report of Chen and Clark (1994) showed that 85% of the American manufacturing firms made use of the payback method while almost 50% indicated that the payback method was relatively important.

Basically, all the survey conducted has shown that the payback method was commonly used in the American companies either as primary method or secondary method. It also shows that the trend of the use of the payback period is growing and a lot of other researchers have pointed to this fact also in their survey.

A research survey was conducted and presented in (2000) by John R. Harvey. The following data was extracted from the survey of the questionnaire that asks the question – ‘How does your firm use the following technique when deciding investment?’
Capital Budgeting techniques | The percentage of how often the method is been used (%) |
--- | --- |
Internal rate of return | 75.61 |
Net present value | 74.93 |
Payback period | 56.74 |
Hurdle rate | 56.94 |
Sensitivity analysis | 51.54 |
Discounted payback period | 29.45 |
We incorporate “real options” of a project when evaluating | 26.59 |
Earning multiple approach | 38.92 |
Accounting rate of return (Book rate of return on Assets) | 20.29 |
Value-at-risk or other simulation analysis | 13.66 |
Adjusted present value | 10.78 |
Profitability index | 11.87 |

Table 4.4: Data extracted from the survey conducted and presented by John R. Harvey (2000)

From the survey, it is evident that majority of the firms used the internal rate of return, while a noticeable percentage of the firms used the payback method. But if the two payback period is combined (i.e. the traditional payback and discounted payback), it will indicate that the number of firm that used the payback method is of the highest in the survey. From this we can conclude that the trend of the popularity of the payback method is still high in American firms, either as primary or secondary tools in evaluating investments.
4.2 African countries

For the purpose of this thesis, we will limit ourselves to the research and published papers in Nigeria and South Africa, which relate to the survey conducted on companies in these two countries.

The use of the investment method in Nigeria has been on the low level compared to other developed country or the western world. The development of several methods for better evaluation of capital budgeting has been low. The reason for this might be due to the gap between the academicians and the practicing managers. A Survey carried out by D. O. Elumiade, T. O Asaolu and A. O. Ologunade (2006) gathered the following information from the questionnaires sent to 94 companies in Nigeria.

<table>
<thead>
<tr>
<th>Model Employed</th>
<th>Frequency</th>
<th>Percentage of company employing the model</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBP, ARR, NPV</td>
<td>27</td>
<td>28.7</td>
</tr>
<tr>
<td>PBP, ARR, IRR</td>
<td>22</td>
<td>23.4</td>
</tr>
<tr>
<td>PBP, IRR</td>
<td>19</td>
<td>20.2</td>
</tr>
<tr>
<td>PBP, NPV,</td>
<td>21</td>
<td>22.3</td>
</tr>
<tr>
<td>PBP, ARR, NPV, IRR</td>
<td>4</td>
<td>4.3</td>
</tr>
<tr>
<td>Mathematical programming</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td>None applicable</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>94</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4.5: Report from survey questionnaire sent to Nigerian companies.

The researchers conducted this survey based on the argument that, in evaluating investment more that one method must be used. Looking at the above data, it is glaring that the use of the payback method is common in Nigeria. The importance of using the payback method in this analysis can be traced to the fact that some companies use it as the first screening method for
investment approval. Also, it should be noted that one of the peculiar problem of most African nations is the lack of funds, which has made liquidity to be the major parameter in evaluating investment. Companies cannot afford to delay or hold investments that will delay the flow of liquidity, which explains why investment is not only measured on profitability.

Also another set of survey was carried out in South Africa by M J Du Toit and A. Pienaar (2005) and the following data was collected and presented in table below and the analysis they made.

The primary capital budgeting methods used in evaluating the investments are as follows:

<table>
<thead>
<tr>
<th>Which capital budgeting methods is used most often by your company?</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal rate of return</td>
<td>37.1</td>
</tr>
<tr>
<td>Net present value</td>
<td>27.4</td>
</tr>
<tr>
<td>Profitability index</td>
<td>0.0</td>
</tr>
<tr>
<td>Accounting payback</td>
<td>8.1</td>
</tr>
<tr>
<td>Present value payback</td>
<td>8.1</td>
</tr>
<tr>
<td>Adjusted internal rate of return</td>
<td>0.0</td>
</tr>
<tr>
<td>Other methods</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4.6: Report from survey questionnaire sent to South African companies.
Basically, finance managers use more than one capital budgeting technique to evaluate their investments and the researchers also reported the percentage of this in the data given below.

<table>
<thead>
<tr>
<th>Identify all capital budgeting methods used</th>
<th>Percentage(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal rate of return</td>
<td>71.9</td>
</tr>
<tr>
<td>Net present value</td>
<td>71.9</td>
</tr>
<tr>
<td>Profitability Index</td>
<td>10.9</td>
</tr>
<tr>
<td>Accounting payback</td>
<td>40.6</td>
</tr>
<tr>
<td>Present value payback</td>
<td>23.4</td>
</tr>
<tr>
<td>Accounting return on investment</td>
<td>35.9</td>
</tr>
<tr>
<td>Adjusted internal rate of return</td>
<td>14.1</td>
</tr>
<tr>
<td>Other methods</td>
<td>17.2</td>
</tr>
</tbody>
</table>

Table 4.7: Report of investment evaluation made by financial managers.

The above analysis of the survey indicates that the payback method is not the most used capital budgeting technique either as the primary method or the secondary method. The major reason for this might have been the fact that the data was conducted only on companies listed on the stock of exchange in South Africa. Most companies listed on the stock exchange use the discount cash flow method, more than companies that are not listed which is risk averse, which will make them to use the payback period as their primary or secondary method.

In general, the comparison of the survey between the Nigerian and South African companies indicate more of the use of the payback method for capital budgeting in Nigerian companies than that of the their counterpart in South Africa, and this can be linked to the fact that most Nigerian companies are more interested in projects with low risk and also access to liquidity.
4.3 Analysis of companies that use the payback period in relation to the size of the company.

John Graham (2000) in his survey on American firms shows how the capital budgeting decision is influenced by the size of the company; the following information was extracted from his article. The ranking of the small and large companies was done by respondents who were asked to score how frequently they used the different capital budgeting techniques on a scale of 0 to 4, ( 0 meaning `never' and 4 meaning `always').

<table>
<thead>
<tr>
<th>Capital budgeting Method</th>
<th>Always or almost always used (%)</th>
<th>Small Companies</th>
<th>Large Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal rate of return</td>
<td>75.61</td>
<td>2.87</td>
<td>3.41</td>
</tr>
<tr>
<td>Net Present Value</td>
<td>74.93</td>
<td>2.83</td>
<td>3.42</td>
</tr>
<tr>
<td>Payback period</td>
<td>56.94</td>
<td>2.72</td>
<td>2.25</td>
</tr>
<tr>
<td>Hurdle Rate</td>
<td>56.94</td>
<td>2.13</td>
<td>2.95</td>
</tr>
<tr>
<td>Sensitivity analysis</td>
<td>51.54</td>
<td>2.13</td>
<td>2.56</td>
</tr>
<tr>
<td>Earning multiple approach</td>
<td>38.92</td>
<td>1.79</td>
<td>2.01</td>
</tr>
<tr>
<td>Discounted payback period</td>
<td>29.45</td>
<td>1.58</td>
<td>1.55</td>
</tr>
<tr>
<td>We incorporate the” real option” of a project when evaluating it</td>
<td>26.59</td>
<td>1.40</td>
<td>1.57</td>
</tr>
<tr>
<td>Accounting Rate of Return(or Book Rate of Return on Assets)</td>
<td>20.29</td>
<td>1.41</td>
<td>1.25</td>
</tr>
<tr>
<td>Value-at-Risk or other simulation analysis</td>
<td>13.66</td>
<td>0.76</td>
<td>1.22</td>
</tr>
<tr>
<td>Adjusted Present Value</td>
<td>10.78</td>
<td>0.93</td>
<td>0.72</td>
</tr>
<tr>
<td>Profitability Index</td>
<td>11.87</td>
<td>0.88</td>
<td>0.75</td>
</tr>
</tbody>
</table>

Table 4.8: Analysis of American companies that use the payback period in relation to the size of the company.

The analysis of the survey showed that small companies used the payback period more than the large companies. Also the discounted payback period follows the same trend. The reason
large companies mostly use NPV and IRR is because large companies always require more time to make investment decisions than small companies and this has made them to get acquitted with using complex method through regular use of the method by embarking on different capital investments at different times while the small companies can only depend mostly on the payback method because of its simplicity and the risk measurement that is incorporated in it. Also Gert Sandahl and Stefan Sjogren (2003) showed in their survey that was conducted on the Swedish companies from the extract below.

<table>
<thead>
<tr>
<th>Method</th>
<th>1, n=31</th>
<th>2, n=23</th>
<th>3, n=22</th>
<th>4, n=14</th>
<th>5, n=23</th>
<th>6, n=15</th>
<th>Total N=128</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payback</td>
<td>80.6</td>
<td>87.0</td>
<td>68.2</td>
<td>85.7</td>
<td>78.3</td>
<td>66.7</td>
<td>78.1</td>
</tr>
<tr>
<td>NPV</td>
<td>64.5</td>
<td>52.2</td>
<td>45.5</td>
<td>42.9</td>
<td>52.2</td>
<td>46.7</td>
<td>52.3</td>
</tr>
<tr>
<td>Expense Calculation</td>
<td>29.0</td>
<td>4.3</td>
<td>36.4</td>
<td>28.6</td>
<td>47.8</td>
<td>40.0</td>
<td>30.5</td>
</tr>
<tr>
<td>Costing</td>
<td>22.6</td>
<td>17.4</td>
<td>22.7</td>
<td>35.7</td>
<td>26.1</td>
<td>53.3</td>
<td>27.3</td>
</tr>
<tr>
<td>IRR</td>
<td>45.2</td>
<td>21.7</td>
<td>9.1</td>
<td>21.4</td>
<td>8.7</td>
<td>20.0</td>
<td>22.7</td>
</tr>
<tr>
<td>Accounting ratios</td>
<td>29.0</td>
<td>30.4</td>
<td>22.7</td>
<td>7.1</td>
<td>17.4</td>
<td>6.7</td>
<td>21.1</td>
</tr>
<tr>
<td>Annuity</td>
<td>9.4</td>
<td>4.3</td>
<td>4.5</td>
<td>28.6</td>
<td>13.0</td>
<td>6.7</td>
<td>10.2</td>
</tr>
<tr>
<td>VBM</td>
<td>19.4</td>
<td>8.7</td>
<td>-</td>
<td>-</td>
<td>4.3</td>
<td>13.3</td>
<td>8.6</td>
</tr>
<tr>
<td>Relative CF</td>
<td>3.2</td>
<td>4.3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>6.3</td>
</tr>
<tr>
<td>Real options</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Other</td>
<td>6.5</td>
<td>8.7</td>
<td>9.1</td>
<td>-</td>
<td>4.3</td>
<td>6.7</td>
<td>6.3</td>
</tr>
<tr>
<td>DCF</td>
<td>87.1</td>
<td>65.2</td>
<td>59.1</td>
<td>57.1</td>
<td>56.5</td>
<td>46.7</td>
<td>64.8</td>
</tr>
<tr>
<td>Accounting measures</td>
<td>54.8</td>
<td>47.8</td>
<td>59.1</td>
<td>64.3</td>
<td>65.2</td>
<td>80.0</td>
<td>59.7</td>
</tr>
</tbody>
</table>

Table 4.9: The use of capital budgeting sorted by company size
The size of the company with the largest represented as column 1, \( n=31 \) and the smallest represented as column 6, \( n=15 \). The combination of all DCF methods into one has made the largest company to use the DCF method more than the regular payback method used in Swedish companies. This follows similar assumption of the research conducted in the United States that large companies often used more sophisticated method than the small companies. So also it can be deduced from the table above that small and medium companies often use the payback period, which can also be argued in the similar way in the survey conducted in United States of America above.

**4.4 Analysis of the data**

The data analysis of the research shows that the prevalent use of the payback period is more pronounced in the Europe, followed by North America and then Africa. The results show that European companies most often use the payback method followed by American companies and lastly the African companies.

The research survey for European companies was chosen from two different countries used as case studies i.e. Sweden and United Kingdom. The data used for the United Kingdom involve the survey on the use of the payback method for different years, which revealed the rate at which the payback method was being used with the highest rate as 92% and the lowest rate as 59%. The lowest rate was recorded in the earliest survey conducted in 1976, so the trend has increased significantly over the years while in 2003 precisely, the survey in Sweden showed that 78.1% of the companies used the payback method. From our case studies in Europe, we can conclude that the rate at which the payback method is used by European companies is high.
For the survey done in North America, the United State of America showed the trend of how the payback method is used over the years, and the rate of the percentage ranges between 54% and 77% in other firms while 85% use the payback method in the manufacturing firms.

For the African companies, similar to that of Europe, we considered two countries for the case study, which are Nigeria and South Africa. The percentage of the companies that used the payback method in South Africa is low (even if the accounting payback and discounted payback are combined which gives the sum total of 16.2%). This survey was conducted to show the primary investment method used in South Africa.

According to the survey conducted in Nigeria, which shows how investment methods are combined together, it was observed that the payback method was often used, which accounted for 98.9%. But it is difficult to come to a general conclusion on how the methods are being used in the African countries since both survey conducted in Africa revealed contradictory rates (i.e. the result of the survey done in Nigeria had a very high rate while that conducted in South Africa had a very low rate).

The evidence from the data gotten from the South Africa survey has only shown when the payback period is used only as an investment appraisal, but we cannot conclude based on that because if the payback period is considered as additional method the percentages would have been higher.

Also evidence from the past report has shown that manufacturing companies in Europe and American companies often used the payback period, compared to other sector of the economy. The issue of the relevance of the use of the payback method is motivated by the importance of the payback method which includes the size of the business, the goal function, the management attitude to the pecking order theory and basis of using simple appraisal method. While the simplicity and the size of the company can be traced to the use of the payback method by the chief financial officers in African companies, which is due to the fact that they
always want to avoid the use of complex method and also lack of sufficient funds for the local companies.

One can trace the paramount use of the payback method in the developed countries to the management relation to pecking order theory, the goal function of the company and also the size of the company.

Specifically, we have been able to establish why payback method is often used in different continents and countries that had been reviewed based on empirical analysis carried out by researchers in that field and also we have been able to trace the reason why some particular continents prefer payback method, which is primarily based on the kind of industry that run the economy of such countries, a common example is the manufacturing industry. It is quite evidence that the manufacturing industries often use the payback period in analyzing their investment opportunities. The major reason for this is that manufacturing companies often embark on capital projects and availability of liquidity is highly important in executing such projects, which have made them to always embark on effective working capital management.

In addition to that, any rational manufacturing company will not want to hold down the capital for long, because a cash gained today is certain than cash expected in the future.

Particularly, if we are to rate the use of the payback method from the different data analysis given, the highest rate will be that of the European companies, follow by American companies and lastly by the African companies. The reason the African companies were rated last is due to the fact that one of the African countries (i.e. Nigeria) showed a high rate in the use of the payback method while the other African country (i.e. South Africa) showed a very low rate in the use of the payback method.

Also if we are to make our judgment based on the countries that the surveys were carried out, we can conclude that the country that used the payback method starting from highest rate is Nigeria, Sweden, United Kingdom, United State of America and lastly South Africa.
Mainly the research has shown the reason the payback period is often used and it has shed light on why it is becoming paramount in making investment decision.

Considering the secondary data that was used, it is evident that the attitude of the finance manager can be traced to pecking order and how they intend to raise money to finance their business. We saw that companies in advanced countries often used the payback method because of the capital structure while companies in Africa mostly tend to use the payback method majorly because of the availability of the internal funding. Considering these two scenarios the managers follow pecking order and believe in using payback period, which supports the liquidity.

Also from the data obtained, the simplicity of the payback period has motivated the use of the method. Managers normally will want to use a very simple formula to make their investment decision. Although developed countries are now more interested in using some complicated formulas like real option, NPV, IRR but the conclusion is that the simplicity of the payback method made it to be easily understood and this has motivated the general use of the payback method. In some situations, the knowledge of the finance manager is also a valuable asset in making decision on the kind of investment appraisal method to be used and this can be traced to the reason the payback method is commonly used in Africa.

The risk taking of the finance manager also indicate why the payback method is often used. The consciousness of recent managers has made payback a better tool for investment appraisal. The manager generally wants to embark on a business opportunity that will generate immediate cash-flow than business opportunity that will generate cash flow in the future. The major reason for this kind of attitude is that most businesses are run on loan and overdraft. The exorbitant interest rate most especially in African (Nigeria) will make managers use appraisal method that consider liquidity first before profit.
The analysis of the data has pointed out that the size of company also motivated the use of the payback method. The companies that are small survive mainly on investment that can generate immediate liquidity and the major investment method that supports this idea is the payback method. The rate at which small companies are being encouraged in both the developed and developing countries is high and this is done through creating conducive environments and encouraging banks to give loans to small companies at reduce interest rate, which has increased the number of small companies. We can conclude based on this that the prevalent use of the payback method has increased over time due to the increase in the small companies in operation.

The valuation of managers has also motivated the use of payback method. From our research and personal judgment, managers are biased on the investments that generate immediate cash flows, because this is what their bonuses are attached to. Every rational human being will naturally work towards what will benefit him or her more, and the finance managers are not an exemption. This can be viewed in the perceptive that despite the awareness of the other appraisal methods that measure profitability after the payback period, managers are still interested in using payback method, because they are more concern about immediate cash flow than future cash flow (which they sometimes believe is a risk that can be avoided).

In conclusion, putting all these analyses together, it is evident that companies prefer the use of payback method and also our empirical analyses indicate how this method has gained patronage among other investment methods in the industry.

4.5 Limitation of the data analysis

Although the data used in this thesis work was extracted from published articles, the limitation of the analysis may be based on some changes that might have occurred over time since the time of the research papers used were different, which might make our judgment
not to be so accurate. Also only few countries were used as case studies from the three
continents discussed and in that case, the general conclusion based on the data provided may
not accurately reflect the behavior of the entire chief finance officers who chose to use the
payback method.

Finally, the limitation inherent in some of the article used, such as low responses from the
questionnaire that were sent to various firms, will also be inherited and which will ultimately
affect our overall judgment.
Chapter 5

CONCLUSION
5.0 Conclusion

The importance of using investment appraisal method in capital budgeting has gained a wide acceptance in the industries and academics. Different method has been employed, but the significant of using the payback method has been increasing every time despite the fact that researchers have advised against using the method. The analysis conducted in the chapter from the survey on Finance Officer of companies, Europe, America and Africa have confirmed the widely acceptance of this method. The reason why many of the managers still prefer using the payback method can be traced to different reasons like the simplicity of the method. Managers try to avoid other appraisal methods majorly because of the complexity that is built in it. The manager's incentives packages has been another reason why managers has retain this old method in practice, managers will always want to use appraisal method that will support their incentive plan which it always link to accounting earning. The managers pursuing of the management objective against the shareholders, has always been traced to employment contract which tied incentive to earning which is also link to the cash flow generated by the type of the investment embark upon. The payback method is the most effective method to decide this type of investment that will generate quick cash flow.

Basically, the idea that the payback method does not measure profitability is far from the truth, the method does measure profitability. The payback method is the reciprocal of internal rate of return(IRR), and IRR is used to measure the profitability of an investment through the decision of higher IRR to cost of capital of the company for single project, or the highest in of the IRR in case of many projects. From this one can conclude that the payback method indirectly can measure the profitability of investment so also its profitability. Also from this thesis work, it was seen that the payback method can in some cases support the goal function of a company, if the cash flow is constant over time while the major constraint to this
assumption is in a situation of non-uniform cash flow in which the payback method may not give fair approximation of the IRR.

The important of risk and the uncertainty that the payback method has included has really been of such a great advantage for the method. Managers will always want to guide against the uncertainty in the future cash flow, which maybe due to new entry into the industry, customer dissatisfaction, government legislature and many unprepared reasons for that can cause this. The lengthy the time to generate the cash flow the risk is the investment. So the managers will prefer to use method like the payback method to select project that will have shorter payback period in order to minimize the risk.

The use of the payback method will always have its relevance in the corporate organization for evaluating of capital project because of it majors advantages that have been shown in the course of discussion of this thesis. Also managers should try to involve the use of another investment method as complementary method in order to make a sound investment decision out of the available options.
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