

Capital Budgeting Techniques Employed By
State Owned Enterprises in Africa

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ABSTRACT

This study researches the capital budgeting techniques employed by decision-makers in state-owned enterprises (SOEs) in Africa. A literature review revealed that limited previous research was performed on the specific topic, although capital budgeting techniques of private companies were extensively researched. Based on these shortcomings, a knowledge gap was identified. The research performed will seek to address this gap to some extent, by collecting and discussing primary data from African SOEs.

The results revealed that a substantial number of African SOEs make use of DCF techniques such as NPV (44 percent) and IRR (33 percent) in investment evaluation. Project implementation was highlighted as being the most important (67 percent) and also the most complex (56 percent) step in the capital budgeting process of African SOEs. The majority of respondents (89 percent) indicated that they do consider the assessment of risk in capital project budgeting and that scenario analyses is preferred by 78 percent of respondents. Qualitative (non-financial) factors are always a consideration in the capital budgeting process of African SOEs with environmental factors and service delivery being rated the highest. It was observed that employment creation was almost never a consideration in 44 percent of responses.

The most important take-away from the study is that decision makers in African SOEs do make use of sophisticated capital budgeting techniques. It is however of concern that non-DCF techniques are used, especially in smaller organisations. For future research, it is recommended that a larger sample number of African SOEs are included. Also consider including the state-owned institutions that provide funding for capital investment in Africa.

DECLARATION

I, Gabriel de Jager, declare that the research conducted and presented in this dissertation is my own work, except where otherwise indicated and referenced accordingly. It is submitted as part of the Masters in Management in Finance and Investments degree through the University of Witwatersrand. This research report has not, either in whole or part, been submitted for a qualification to any other educational institution.

Signature of candidate

Date

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Index of Acronyms and Abbreviations

CA	– Chartered Accountant
CAPM	– Capital Asset Pricing Model
CEO	– Chief Executive Officer
CFO	– Chief Financial Officer
DCF	– Discounted Cash Flow
EDM	– Electricidade de Mozambique
ENH	– Empresa Nacional de Hidrocarbonetos
IRR	– Internal Rate of Return
MIRR	– Modified internal rate of return
NPV	– Net Present Value
PBP	– Payback period
PI	– Profitability index
ROI	– Return on Investment
SOE	– State-owned Enterprise
WACC	– Weighted Average Cost of Capital

Chapter1: Introduction

The capital budgeting process is a step by step procedure undertaken by businesses to establish the value addition potential of capital projects. Accepting and undertaking certain projects consumes resources, are also of a capital nature and have the potential to prevent capital allocation towards other projects (Hillier et al. 2013). It is therefore critical for any organization routinely involved in large capital allocation to go about it in a prudent, efficient and optimal way to ensure investment in value enhancing projects that will secure the long-term sustainability of the organisation.

It is therefore important for state owned enterprises (SOEs) to ensure that capital budgeting and allocation is optimal in their investing of the country's limited capital funds in credible projects. Without understanding the risk and return involved in each capital investment decision, a state owned organisation would more often than not be allocating capital funds irresponsibly and to the disadvantage of the country as a whole.

1.1 Problem Statement and purpose of the study

The purpose of the study is to assess the process and techniques used in capital budgeting, capital allocation and decision making of state owned enterprises on the African continent. Information gathered can be compared to acceptable best practices in the literature and in privately owned companies in Africa.

Very limited previous studies on the capital budgeting processes of SOEs in Africa are available (Hall and Mutshutshu 2013). This study is designed to make a contribution to an important production process by bridging the knowledge gap in the literature and, both motivate and support further studies in this sphere of financial management. An improved understanding of the capital budgeting processes of SOEs in Africa will solve the problem of capital fund investment in projects with suboptimal economic returns, which has been identified as a point of inefficiency characteristic of the SOEs attributable to political influence which is often inconsistent with profit motive (Ashipala 2012).

1.2 Research Objectives

The objective of this research study is largely to gather primary data on the capital budgeting processes employed by selected state owned enterprises on the African continent. The data will be analysed and compared to best practices of capital budgeting by focusing on evaluation techniques, cash flow analysis, risk incorporation into cost of capital and the use of post implementation audit processes.

From the research presented in the thesis potential shortcomings and areas for improvement in the capital budgeting processes of SOEs would be identified, with the hope that this could greatly benefit people working in the area of capital budgeting and capital funds allocation in SOEs.

1.3 Overview of Research Methodology

Due to the limited studies performed on this topic and the apparent lack of literature on the capital budgeting processes of state owned enterprises in Africa, it is logical that we use primary data gathering processes to obtain the relevant data for the research. This will be performed by means of structured questionnaires, surveys and/or telephonic interviews.

Literature review of published works that researched acceptable best practices of capital budgeting techniques will be utilised to design the questionnaire and obtain the relevant data for result analysis and comparison purposes. The focus of the study will be on the overall capital budgeting process and its attendant techniques used by state owned enterprises in Africa. More specific emphases will be placed on the following areas of capital budgeting:

- Capital budgeting techniques used (NPV, IRR, MIRR, PI, PBP, ROI, etc.)
- Treatment of different types of capital projects (expansions, new investments)
- Methods used in the determination and forecasting of project cash flow
- Calculation and use of the discount rate
- Incorporation of risk and risk evaluation techniques
- The use and effectiveness of post implementation audits

1.4 Significance of the Study

Optimal capital budgeting and capital allocation to value enhancing projects is as relevant in state owned enterprises as it is in private companies. This is especially true in developing economies and the African continent because these countries are normally highly constrained by access to capital resources (Elhiraika 2005). Because of limited availability of capital investment, the capital budgeting process needs to be effective and should guide decision makers to invest in projects which will have a positive return on capital over the long term (Chen., et al. 2015).

It is therefore crucial to understand how SOEs go about capital budgeting and capital allocation. An improved understanding of the techniques used and their comparison to best practices will assist SOEs in developing countries to improve capital allocation and increase return on invested capital for the benefit of the African continent. It will also aid institutions and capital markets that provide funding for SOEs in Africa to have an improved view of the internal process and techniques used by SOEs when evaluating funding solutions. This improved understanding would, in turn, facilitate these institutions provisioning of credit for capital projects.

Importantly, the findings and recommendations from this study will expand the literature available on the topic and also support further research and knowledge generation.

1.5 Outline of the Research Report

The remainder of the research report will take the following form:

A literature study performed on theoretical underpinning of capital structure (allocation) and investing, financial planning and the role of capital budgeting in the process, and more specifically focuses on the elements of capital budgeting in organisations. These organisations include both state-owned and private companies but the detailed focus would be on companies in the African context. Information available in the literature will be used as a benchmark to compare the findings from the research.

The literature review is followed by a summary of the research questions this study aims to explore and a detailed description of the research methodology which will apply. Together with the research methodology a description of the data collection process and data analyses techniques is provided, to ensure the research is performed on a reliable and sound basis. Restrictions and shortcomings experienced during the study in terms of the research approach, data gathering and data analyses is included in this section to highlight any potential weakness in the research which could be improved on in future works.

Lastly the collected data is analyzed and its attendant results discussed in different sections relating to the research questions in order to deliver pertinent lessons regarding capital allocation and capital budgeting process in state owned enterprises. Finally, findings-based recommendations are made and areas of possible future research pointed out.

Chapter 2: Literature review

2.1 Introduction

Literature reviewed in this study focus on the capital budgeting techniques, including the acceptable procedures to evaluate project cash flow, risk incorporation, calculation of the appropriate discount rate, investment decision making process and post implementation auditing.

An overview of the published literature reveal vary little previous research on the capital budgeting techniques used by state owned enterprises in Africa. It also suggests that, in general, the literature on the subject of capital budgeting of SOEs, especially in the emerging market context is rather scanty. Only one study on South African state owned enterprises could be obtained. The research by Hall and Mutshutshu (2013) found that NPV and IRR were used by 43% of state owned companies in South Africa and that WACC is preferred as the discount rate. They also recorded that sensitivity analysis is predominantly used as a measure of risk in cash flow analyses. Relatively little research is available on the post implementation and audit process used by private and public organisations to understand the value contribution thereof.

2.2 Theoretical underpinning of capital structure (allocation) and the value of firms.

The value of a firm is determined by its ability to sustainably generate future income by constantly investing capital in economical viable projects. In order to achieve optimal capital allocation to the best options available to the organisation, the firm needs to have a supporting capital structure and capital budgeting process (Hillier, D., et al. 2013).

Theory formation of capital structures and its effect on the value of the owners of an organization was first attempted through work done by Modigliani & Miller (MM) (1958). They indicated specific conditions under which the capital structure of any firm will be relevant or irrelevant to the financial performance of such a firm.

Evaluating the effect that a change in the capital structure has on the efficiency of a firm, Mohammed Omran (2001) evaluated the operating performance of selected Egyptian SOEs after they were privatized between 1994 and 1998. The study revealed a substantial increase in profitability, efficiency and capital expenditure while decreasing employment, leverage and risk.

The capital structure of a firm consists of the amount of equity and debt it can access to invest in future growth project. This ratio of equity to debt funding will also have an effect on the WACC, essentially the cost of the funds the firm is investing. Van Horne and Wachowiz (1989:430) stated, "If the return on a project exceeds what the financial market requires, it is said to earn an excess return. This excess return, as we define it, represents the creation of value. Simply put the project earns more than its economic keep".

Awwal AM (2013) stated, "Virtually, no any business operation can thrives without the basic input of capital financing in the right proportion. It is therefore imperative for mangers of business operations to evolve the right financial plan for their firms in order to avoid too extreme evils, both of which have negative impact on the value creative ability of the firm. Inadequate capital financing may result to loss of good will, decline in sales and curtailment of scale of operation which may erode profitability. Equally, excess capital will lead to idle fund, misplacement of priority, abandonment and selection of unattractive investment opportunity, all these are treat to the growth of the firm. It is therefore important to stress the need for a compromise between these two extremes position such that a firm can confidently attain value enhancement capable of projecting its image."

2.3 Capital budgeting theory and techniques.

The process of planning and managing a firm's long-term investments is called capital budgeting. In capital budgeting, the financial manager tries to identify investment opportunities that are worth more to the firm than they cost to acquire. Regardless of the specific investment under consideration, financial managers must be concerned with how much cash they expect to receive, when they expect to receive it, and how likely they are to receive it. Evaluating the size, timing, and risk of future cash flows is the essence of capital budgeting (Hillier, D., et al. 2013).

Capital budgeting is a multi-faceted activity. There are several sequential stages in the process. For typical investment proposals of a large corporation, the distinctive stages in the capital budgeting process are depicted, in the form of a simplified flow chart, in the figure below by Dayananda, D., et al. (2002).

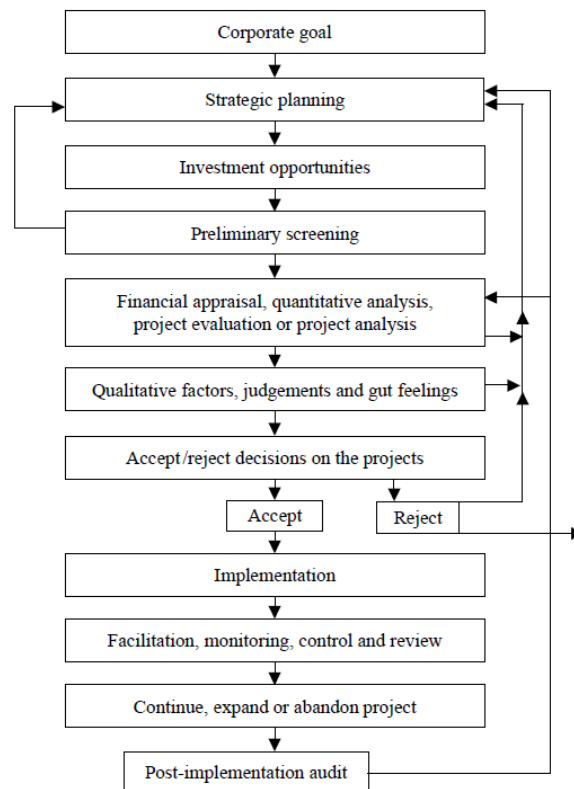


Figure 1 Stages in the capital budgeting process

2.3.1 Discounted cash flow (DCF) techniques – NPV, IRR and PI

Finance theory asserts that NPV is the best method for evaluating capital investment projects. In a normal project, cash outflows are followed by annual cash inflows and under these circumstances, NPV and IRR lead to the same investment decisions (Arshad, 2012).

Problems with the IRR technique occur in two cases and may lead to incorrect capital budgeting decisions. When project cash flows are abnormal this may lead to multiple IRR calculations, affecting both independent and mutually exclusive projects. When investment projects are mutually exclusive, scale and time differences may lead to incorrect investment decisions and this is a problem associated with the reinvestment rate assumption (Brigham and Ehrhardt, 2002).

Because of the problems listed above for the internal rate of return, analysts have developed an alternative evaluation technique that is similar to IRR, but attempts to improve on it. The Modified Internal Rate of Return (MIRR) solves the reinvestment rate assumption problem because all cash flows are compounded at the cost of capital. It also solves the problem of changing cash flow signs resulting in multiple IRRs (Balyeat, et al. (2013), Kierulff (2008)).

The profitability index (PI) uses the same inputs as the NPV, but by converting the results to a ratio, it provides additional information. The PI is the benefit relative to the cost, on a present value basis. Although not superior to the NPV method the profitability index can effectively be used to rank projects when applying capital rationing (Hillier, D., et al. 2013).

2.3.2 Non-discounted cash flow techniques – PBP and ARR

The payback period method is the easiest investment evaluation method to perform, but the theoretically worst method available. The timing and riskiness of the cash flows are ignored. The reason it continues to be used is that it is easy to understand and explain to others (Hillier, D., et al. 2013). Hasan (2013) concluded that small and medium businesses are especially likely to use the payback method if the owners or managers are not well versed in financial principles. The method is also used to supplement more sophisticated techniques.

The Accounting Rate of Return method is also known as the return on investment (ROI) or as the return on capital employed (ROCE) and is using accounting information rather than cash flow. Because it is based on accounting information, which is readily available, it is easy to calculate. A drawback that makes it inferior to other techniques is the fact that it is based on accounting profit and not cash flow. It also does not consider the time value effect of money (Hillier, D., et al. 2013).

2.3.3 Estimating the cash flow

Only incremental cash flows should be used in the evaluation of projects. Cash flows are real and can be used for corporate purposes for example to pay dividends or corporate interest. By contrast earnings are an artificial construct. Although earnings are useful to accountants, they should not be used in capital budgeting because they do not represent cash (Hillier, D., et al. 2013).

A sunk cost is a cost that has already occurred. Because sunk costs are in the past, they cannot be changed by the decision to accept or reject the project. They therefore should be ignored in the capital investment analyses (Hillier, D., et al. 2013).

By undertaking a specific project the firm might forgo the opportunity to invest or generate revenue from other options. This is referred to as an opportunity cost and must be accounted for in the evaluation of a project (Hillier, D., et al. 2013). Another difficulty in determining incremental cash flows, as stated by Hillier, D., et al. 2013, comes from the side effects of the proposed project on other parts of the firm. A side effect is classified as either erosion (cannibalization) or synergy.

2.3.4 Determining the discount rate

The cost of capital is a key parameter of DCF calculation. Firms are expected to use the weighted average cost of funds from various sources including debt, preferred stock and common equity (Brigham and Ehrhardt, 2002). Organisations making use of the cost of only debt or only equity financing to discount cash flows will be making an error.

A firm, when evaluating projects with different risk profiles, should make adjustments to the discount rate (WACC) and not use one standard WACC rate for all projects.

Bennouna et al., (2010) stated, “The WACC is the required rate of return on any investment proposals that carry the same level of risk as the firm’s existing assets. It should be adjusted up or down, depending on the type of project (for example, replacement projects are lower risk, whereas expansion or new ones are higher risk) or for different organisational units of the firm.”

2.3.5 Risk and sensitivities in capital budgeting

Effective capital investment decisions require not only the use of DCF techniques, proper cash flows, and discount rate estimates, but also risk analysis (Brigham and Ehrhardt, 2002).

The discount rate can be adjusted to account for different levels of risk in the evaluation of the cash flows of an investment. To account for higher levels of risk the discount rate can be increased. A higher discount rate reflects a higher rate of return that will be required whenever higher levels of risk are present. Hall (2001) stated that “the risk-adjusted discount rate method for investment projects is relatively simple and consequently widely used. The method is based on the assumption that adjustments for risk can be made by means of altering the cost of capital.”

Another way to adjust for risk is to understand the impact of risk on outcomes. Sensitivity Analysis and Simulation can be used to measure how changes to a project affect the outcome. Sensitivity analysis is used to determine the change in Net Present Value given a change in a specific variable, such as estimated project revenues. Simulation allows us to simulate the results of a project for a given distribution of variables. Methods like scenario, sensitivity, decision tree and Monte Carlo provide additional view on possible variables that have an impact on profitability of projects. Karanovic *et al* (2010) suggested that by using these methods corporate managers can decide with better certainty about acceptance or rejection of a project.

2.3.6 Qualitative factors in project evaluation

When a project is considered for investment it also has to be further evaluated taking into consideration qualitative factors. These are the factors that will have a large impact on the project but are virtually impossible to evaluate accurately in monetary terms. Dayananda, D., et al. (2002) listed the following qualitative factors to consider:

- the societal impact of an increase or decrease in the employment numbers
- the environmental impact of the project
- possible positive or negative governmental political attitudes towards the project
- the strategic consequences of the consumption of scarce raw materials
- positive or negative relationship with labour unions about the project
- possible legal difficulties with respect to the use of patents, copyrights and trade or brand names
- impact on the firm's image if the project is socially questionable

2.3.7 Post-implementation audit

The post-implementation audit is performed on capital projects to evaluate the success of the project scope, implementation and the value realized to the organization through the selection and implementation of the project. It also aims to discover lessons that can be learned from past projects and which can be implemented in the planning of future projects.

Dayananda, D., et al. (2002) suggested that an evaluation of the performance of past decisions can contribute greatly to the improvement of current investment decision-making by analysing the past 'rights' and 'wrongs'. Dayananda, D., et al. (2002) also noted that the post-implementation audit can provide useful feedback to project appraisal or strategy formulation. For example, ex post assessment of the strengths (or accuracies) and weaknesses (or inaccuracies) of cash flow forecasting of past projects can indicate the level of confidence (or otherwise) that can be attached to cash flow forecasting of current investment projects.

2.4 Differences in capital budgeting processes of SOEs and Private Enterprises

Studies on private firms in South Africa by Hall (2000) and Hall and Millard (2010) suggest that cash flow determination is seen as the most challenging, but also the most important part of capital budgeting. Discounted cash flow methods are increasingly preferred as a globally acceptable capital budgeting technique (Kester and Robbins, 2011).

Although the majority of firms in the developed countries are basing their discount rate on weighted average cost of capital (WACC) aided by the Capital Asset Pricing Model (CAPM), techniques used in emerging economies are mixed where listed companies are more likely than non-listed companies to use WACC (Hall and Mutshutshu (2013), Brijlal and Quesada (2009)).

When it comes to the incorporation of risk in the evaluation of capital projects, research by Hall and Mutshutshu (2013) suggests that SOEs in South Africa tend to make use of scenario testing and sensitivity analysis as opposed to more sophisticated simulation analyses techniques. It also pointed to a preference for adjusting cash flows rather than the discount rate when risk gets incorporated in the financial projection of projects.

Limited studies on the capital budgeting processes of listed companies in different African countries are the order of the day. For example, a study of listed companies in Rwanda performed by Mbabazize and Daniel (2014) revealed a preference for NPV and IRR when evaluating capital projects. They caution that in most cases only the cost of equity was used when determining the discount rate even though firms were financed by both debt and equity.

Research by Tufuor and Doku (2013) on listed Ghanaian firms also points to a preference for the use of discounted cash flow techniques. More towards home, a studies on listed South African firms by Hall and Millard (2009) documented support for the use of NPV as the preferred capital budgeting evaluation technique. The incorporation of risk in capital budgeting is also confirmed by them to be increasing in importance.

Chapter 3: Research Questions

African state-owned organisations and especially the ability of these organizations to effectively allocate capital to projects came under the spotlight over the past years (Grootes (2015), Patel (2013)). This is due to concerns about non-optimal capital investment and the larger implication of perceived mismanagement of capital in the countries which they operate.

Under investigation are the processes and techniques used by these SOEs and the capital budgeting techniques they use. Also of importance, is the way in which risk is incorporated in the project evaluation and capital budgeting process of these SOEs. In addition to this, the determination of the discount rate applicable to project cash flows is of significance when calculating required economic return of invested capital. Closing the loop on the capital investment process is the Post Implementation Audit (PIA) on completed capital projects. This step is largely meant to account for how well the project is delivering on its intended value proposition and also how successfully the project was implemented. Apart from the financial aspects of capital budgeting, the study also intends to obtain information on the non-financial or qualitative factors influencing the capital budgeting in SOEs.

The following overarching research questions were developed to obtain an improved understanding of the way in which SOEs in Africa execute capital budgeting and capital investment decisions:

- What are the preferred capital budgeting techniques employed by SOEs in Africa (e.g., NPV, IRR, MIRR, PI, PBP, ROI, etc.)?
- Do different types of capital projects (expansions, new investments, social projects) receive the same treatment from a capital budgeting point of view?
- What are the preferred methods used in the determination of project cash flows?
- How are minimum acceptable investment return (e.g. discount rate) determined?
- What techniques are used to evaluate risk in capital investments and how this risk incorporated into the capital budgeting process?

- How important is post implementation audits and how often are they performed on completed projects?
- To what extent are capital investment decisions being influenced by non-financial factors?

Chapter 4: Methodology and Data Collection

4.1 Research design

Although the capital budgeting techniques of listed companies in Africa has been studied in various research projects, the research topic of capital budgeting techniques used by state-owned enterprises in Africa has not been adequately studied. Due to the limited amount of secondary literature available on the research topic a structured survey was selected as the research approach to gather primary data from African SOEs.

Specific sections of the survey make use of structured questions to quantify the research problem statement by generating quantitative numerical data that can be used to draw conclusions from statistical analyses. The survey also contains qualitative elements from which to gain an understanding of underlying motivation, trends and preferences for certain capital budgeting techniques and factors which influence the capital budgeting process of SOEs.

Bowling (2013) indicated that usually when it is impractical and uneconomical to collect data from every single person in a given population, a sample of the population has to be selected. The survey was focused on a selected sample to obtain information on the larger population of African state-owned enterprises. The reason for this is that given the time available, the large expanse of the African continent and the financial means of the researcher, it was not possible to obtain information directly from each member of the population. The research sample concentrated on specific African state-owned enterprises that will naturally be engaged in substantial capital investment projects.

The survey was sent out to the following state-owned organisations for completion of the questionnaire containing 22 questions.

Table 1: State-owned organisations covered by the study

Denel - South Africa	TANESCO - Tanzania
Transnet - South Africa	NamDeb - Namibia
Eskom - South Africa	NamWater - Namibia
Alexkor - South Africa	NamPower - Namibia
Airports Company - South Africa	National Petroleum Corporation - Nigeria
Petro SA - South Africa	Electrical Generation Company - Kenya
Office National d'Électricité - Morocco	Railways Corporation - Kenya
Office National des - Morocco	ENH - Mozambique
National Oil Corporation - Libya	EDM - Mozambique
Telecom Egypt - Egypt	Endiama - Angola
Egypt Electricity Holding Company - Egypt	Sonangol Group - Angola
GASCO - Egypt	Zambia Railways - Zambia
Sonelgaz - Algeria	Ghana National Petroleum Corp - Ghana
Sonatrach - Algeria	Ghana Airways - Ghana
Telecommunications Corp - Botswana	Swaziland Electricity Company - Swaziland
TAZARA Rail - Tanzania	Sudapet - Sudan

The target respondent population included people knowledgeable about the topic which could provide accurate information to analyze and test the research questions. These individuals included CFOs, financial managers and professionals employed in the departments of state-owned enterprises responsible for capital allocation, investment analyses and capital budgeting. It is therefore assumed/accepted that the data gathered will be personal, self-reported and independent in nature.

All of the data collection interaction was conducted in an ethical way. Care was taken not to misrepresent any question put to the respondents or information received from them. No respondent was forced to take part in the survey and it was clear that participation will be voluntary with the assurance that all the data will be treated with the necessary confidentiality. The information supplied was anonymous with the option to include an email address if the respondent would like to receive feedback from the research.

4.2 Data Collection

Data collection was conducted by means of an online survey created in Google Forms ® which allowed for easier access to the respondents in multiple countries through electronic mail. The platform also had capability to capture and store data online in a structured format from which information was manually extracted. Data was analysed and compiled to reflect information in the form of tables and graphs using Microsoft Excel ®.

The survey design approach and the structure used to compile the questionnaire were based on work done by Hall and Mutshutshu (2013), where the study focused on selected South African SOEs. This approach was slightly adjusted and, where relevant, additional questions were included and selected existing questions expanded to have a more holistic perspective.

The survey questions were structured to obtain information about the capital budgeting techniques employed by state-owned enterprises in the African region. The first section of the survey focused on the industry, size and capital investment structure of each SOE, together with the profile of the individual primarily responsible for capital budgeting decision making. The next section of the survey focused on the preference given to certain budgeting and capital investment evaluation techniques. Also part of this section were questions regarding the cash flow forecasting methods used and the determination of the discount rate for different type of project evaluations. Lastly, the survey questions focused on the process and techniques used to incorporate risk in the capital budgeting decision making process, the effectiveness of post implementation audits and also the influence of non-economic factors on the capital budgeting decisions of SOEs.

To ensure that the survey questionnaire was easily understood and to identify any potential shortcomings; the survey was circulated to individuals employed in the financial and investment departments of different businesses as a pretest to allow them comment on its accessibility. Feedback from the pretest was used to improve the questionnaire, reword unclear questions and to ensure that clear instructions were given in the survey.

The survey was distributed to professionals working in the financial and investment departments of African state-owned enterprises. These included CFOs, financial managers, investment managers and any other individual involved in the process of capital budgeting and capital investment decision making. An introduction note accompanied the electronic mail to participants to explain the purpose, relevance and the requirements of the research and survey. In certain cases the request to partake in the survey was followed up with a telephone call to the respondent to explain the intent of the research (study) and to provide additional clarity on the survey questions.

The full survey and introductory note is attached in Addendum A of this report.

4.3 Analyses of data

The sample of SOEs were selected from a diverse group of African countries which take part in substantial capital investment. The survey questionnaire was distributed to 32 individuals employed by SOEs operating in Africa of which 10 responded and completed the questionnaire. This translates into a fairly modest response rate of 31 percent.

The response rate needs to be seen in the light of the current environment in which the SOEs, especially those in emerging markets like Africa, operate in. Due to the fear of constantly being under investigation by the public and also because of the cross-border information security challenges, the response rate was lower than expected. Furthermore, in some cases, language and communication became a limitation with respondents located in predominantly non-English speaking organisations.

The responses obtained from the survey questionnaire are presented in Chapter 5 of this report. The set of information collected through the survey is summarized and presented in table format with an indication of the percentage of respondents answering each question.

4.4 Restrictions and Constraints

The research population of the study included state-owned enterprises operating in different countries across Africa. During the data gathering stage of the research, which was based on a structured survey, many challenges and limitations were encountered.

Not all organisations labeled as state-owned enterprises execute capital projects in a way that justifies capital budgeting. It was therefore decided to only focus on those SOEs which operate in industries in which typical capital projects execution and capital budgeting would be undertaken. Considering this limitation, the study predominantly gathered information on African SOEs with a substantial need for capital budgeting and mainly operates in the energy, utilities, transportation and mining sectors.

Although it was clear that the data collection process will be anonymous and not be misinterpreted, respondents were still reluctant to take part in the survey indicating a potential leak of information from SOEs as the main reason not to divulge information about their capital budgeting processes. Some respondents were also uncomfortable to supply information about internal budgeting techniques for research conducted in a foreign country. Therefore the largest proportion of responses to the survey originated from Southern African countries. Approximately 40% of responses were obtained from SOEs located outside of South Africa.

Future research on this topic should allow more time and resources (e.g. telephone budget for international calls) for the data collection part of the study in an attempt to increase the response rate to the survey questionnaire. It could also prove helpful to perform the task in conjunction with research institutions located in foreign African countries, which are much closer to the SOEs being researched.

Chapter 5: Empirical Analyses and Results

5.1 Profile of the organisation and the capital budget decision-maker

The state-owned enterprises SOEs researched in this study span different operating sectors in which substantial capital investment and capital budgeting is naturally carried out. Responses received from SOEs were distributed fairly evenly between the sectors of energy, utilities, transportation and mining as shown in Table 2.

Table 2: Sector in which SOEs predominantly operate

Operating sectors	
Energy	33%
Utilities	22%
Transportation	22%
Mining	22%

Although SOEs in the telecommunication environment were also included in the survey sample, no responses to the questionnaire were received from this sector.

Most of the respondents indicated that the size of the capital budgets normally under their control range from US\$ 50 million to US\$ 100 million with 22 percent indicating that they maintain capital budgets that are above US\$ 1 billion.

Table 3: Approximate annual capital expenditure budget of SOEs

Size of capital budget:	
Below US\$50 million	33%
US\$ 50 million to US\$ 100 million	33%
US\$ 500 million to US\$ 1 billion	11%
Above US\$ 1 billion	22%

The capital budget size profile of respondents closely matches the amount of annual turnover when comparing Table 3 and Table 4.

Table 4: Approximate annual turnover of SOEs

Annual Turnover:	
Below US\$50 million	22%
US\$ 50 million to US\$ 100 million	22%
US\$ 500 million to US\$ 1 billion	11%
Above US\$ 1 billion	33%

From the data analysed it can be determined that the SOEs do not necessarily have abnormal capital budget sizes in relation to their annual turnover.

As mentioned in section 4.2, the data collection process was directed at the CFOs or financial managers of the different SOEs. It is to be noted that even with responses obtained from the financial managers in some cases, the CFO still assumes overall accountability for the capital budgeting process. As displayed by the summary in Table 5, of the respondents that participated in the questionnaire, 78 percent indicated that they are qualified Chartered Accounts (CA) whilst the rest indicated that they hold a postgraduate degree.

Table 5: Education profile of CFOs and/or Capital Managers in SOEs

Qualifications	
Chartered Accountant (CA)	78%
Postgraduate degree	22%

5.2 Different stages of the capital budgeting process

This section of the study focused on the different stages of the capital budgeting process, from cash flow analyses to the post implementation audit. Respondents were asked to rank each stage of the budgeting process from least to most important and also from least complex to most complex.

From the data it can be observed that the implementation stage is perceived as the most important stage, with 67 percent of respondents selecting this option. The post implementation stage is considered as the least important stage in the budgeting process with 44 percent of respondents indicating it as such. These findings are consistent with research on selected South African SOEs by Hall and Mutshutshu (2013), which revealed that the implementation stage was selected by 56 percent of respondents as the most important stage. This is however inconsistent with research on South African private companies by Hall and Millard (2010), which revealed that the cash flow estimation stage was reported as the most important stage.

Table 6: The importance of capital budgeting stages in SOEs

Capital budgeting stages				
	Least important	Somewhat important	Very important	Most important
Project cash flow estimation	11%	22%	56%	11%
Analysis and selection of projects	0%	22%	67%	11%
Implementation of projects	11%	0%	22%	67%
Post implementation audit	44%	22%	22%	0%

The project implementation stage was selected by the majority (56 percent) of respondents as the most complex stage of the capital budgeting process and the post implementation audit stage as the least complex. These findings are consistent with research on selected South African SOEs by Hall and Mutshutshu (2013), which revealed that the implementation stage was selected by 60 percent of respondents as the most complex stage. It is also consistent with research on South African private companies by Hall and Millard (2010), which revealed the most complex budgeting stage as the implementation stage.

Table 7: The complexity of capital budgeting stages in SOEs

Capital budgeting stages				
	Least complex	Somewhat complex	Very complex	Most complex
Project cash flow estimation	11%	67%	11%	11%
Analysis and selection of projects	11%	22%	56%	11%
Implementation of projects	0%	22%	22%	56%
Post implementation audit	56%	44%	0%	0%

The reason that the implementation stage was highlighted as the most important as well as the most complex stage of the budgeting process, could be due to the fact that a number of large projects are currently in the implementation stage in various SOEs across Africa. This largely relates to a backlog and shortage of transport infrastructure and electricity supply which places pressure on SOEs to implement and deliver on projects. In most cases the implementation of these projects are facing challenges with budget overruns and schedule slippages. Further pressure is placed on SOEs by governments to expedite the implementation of projects that are crucial for service delivery in communities.

Consistent with findings by Hall and Mutshutshu (2013), the post implementation audit stage was ranked as the least important. This stage is however crucial for continues learning and improvements to the capital budgeting process. An evaluation of the performance of past decisions can contribute greatly to the improvement of current investment decision making by analysing the past rights and wrongs (Dayananda *et al.*, 2002).

5.3 Methods of cash flow estimation

Determining the future cash flows of an investment is an essential part of project evaluation and proper capital budgeting in any organisation. As indicated in the previous section of this report, 56% of respondents ranked cash flow estimation as very important and also very complex.

The largest percentage (44 percent) of respondents reported a preference for quantitative methods to determine the cash flow forecast of potential investments. This is comforting, since this method can be seen as the most sophisticated. Quantitative methods were followed by expert opinion, as a cash flow estimation method, with 33% of respondents selecting this as the preferred method. These findings differ from research by Hall and Mutshutshu (2013) which concluded that cash flow estimations based on previous experience is the most popular method used by South African SOEs.

The preference for quantitative methods is well aligned with results of other research on cash flow estimation methods of listed companies. It is however also evident from the data that a smaller percentage of African SOEs calculate cash flow based on management estimates and previous project experience.

Table 8: Methods to determine the cash flow of capital projects in SOEs

Determining cash flow	
Expert opinion	33%
Quantitative methods	44%
Previous project experience	11%
Management estimates	11%

5.4 Preferred capital budgeting techniques

This section of the study focused on the preference given to each capital budgeting technique in African SOEs. Respondents were asked how often they make use of each of the budgeting technique on a scale from never to always.

It was encouraging to observe that overall DCF techniques were favored by a large percentage of respondents. NPV (44 percent) was selected as the most preferred technique followed by the IRR and Payback Period with 33 percent respectively. The selection of NPV by African SOEs is substantially higher than the 25 percent of South African SOEs which selected this method in a study by Hall and Mutshutshu (2013). The higher uptake of NPV compared to IRR is consistent with financial theory that support NPV as the superior DCF technique. This is due to the deficiencies of the IRR method in mutually exclusive investments with dissimilar cash flow profiles (Arshad, 2012).

Preference for the ROI technique is also relevant from the observed data with a large percentage of respondents stating that they will almost always make use of it. This could be an indication that the ROI is utilised as a supportive or secondary technique in conjunction with the NPV, IRR and PBP.

The least favored evaluations technique observed from the data is the Profitability Index and the Modified IRR with 67 percent and 56 percent of respondents respectively, indicating that it is never preferred. A reason for the low selection of these two techniques could be due to the fact that they are difficult to understand and to interpret in the evaluation process of projects being considered for investment.

Table 9: Preference for different capital budgeting techniques

Techniques used in capital budgeting				
	Never	Almost never	Almost always	Always
Profitability Index (PI)	67%	33%	0%	0%
Net Present Value (NPV)	0%	33%	22%	44%
Return on Investment (ROI)	11%	11%	56%	22%
Internal Rate of Return (IRR)]	0%	33%	33%	33%
Modified Internal Rate of Return (IRR)]	56%	11%	22%	11%
Payback Period (PBP)	11%	22%	33%	33%

When asked to indicate the preference between NPV and IRR as a project evaluation technique the outcome was very much equal. Participants responded with 22 percent selecting either NPV or IRR and 56 percent viewing both techniques as equally important. These two techniques are widely used in conjunction since NPV is accepted as the more accurate of the two. However, since IRR is expressed as a percentage, it is more easily interpreted and compared to other percentage based values such as WACC or the investment hurdle rate.

Table 10: Preference between NPV and IRR

Capital budgeting techniques	
Net Present Value (NPV)	22%
Internal Rate of Return (IRR)	22%
Both equally preferred	56%

A large number of respondents (78 percent) indicated that they make use of cash flow instead of accounting income when calculating the NPV and IRR of projects. After tax cash flows are broadly considered as the correct method to use since accounting income will also include none cash items such as depreciation.

Table 11: The use of cash flow and accounting income in NPV and IRR

Method used in NPV and IRR calculation	
Cash flows	78%
Accounting income	22%

When calculating the NPV and IRR of projects a large number of respondents (67 percent) indicated that they include interest and financing cost in the evaluation of the project cash flow. This practice, sometimes referred to as leverage or financed project economics, can be seen as a finance step and not necessarily as a pure capital budgeting element. Financing cost, according to research by Ardalan, K (2012), should not be deducted when calculating operating cash flows. This is because financing costs are accounted for in the after-tax cost of capital, which is used for discounting the future cash flows when calculating the NPV.

Table 12: Interest and financial cost in the calculation of cash flow

Inclusion of interest and financial cost in the cash flow	
Yes	67%
No	33%

It is concerning that in some cases non-DCF techniques are still used and preferred, as opposed to theoretically more superior methods of project budgeting. Since 78 percent of respondents indicated that they are qualified Chartered Accountants, it is expected of them to have the knowledge and understanding of the latest developments in capital project budgeting.

5.5 Determining the discount rate used in a DCF analyses

In this section of the study respondents from SOEs were asked to report what they use as the minimum investment return or discount rate when performing DCF analysis on investments.

The Weighted Average Cost of Capital (WACC) was selected by 78 percent of respondents as the discount rate. A smaller percentage of respondents (22 percent) indicated that they prefer cost of debt to be used as the discount rate when calculating NPV and IRR. From the data it can also be concluded that cost of equity and obtaining the discount rate from previous experience, is never used in the evaluation and budgeting of capital projects.

WACC is widely accepted as the best approach to set the discount rate in DCF analyses. Research trends suggest that more international companies are basing discount rates on WACC (Bruner *et al.*, 1998; Bennouna *et al.*, 2011). Hall and Mutshutshu (2013) in their study of South African SOEs found that WACC was used by all respondents. It is therefore of some concern to conclude from this data that WACC is not preferred as the discount rate by all respondents from African SOEs.

Table 13: Approaches used to determine the minimum acceptable rate (discount rate)

Calculation of the discount rate	
Weighted average cost of capital	78%
Cost of debt	22%
Cost of equity	0%
Previous experience	0%

When ask how the cost of equity is determined, 56 percent of respondents indicated that they use the Capital Asset Pricing Model (CAPM). A further 33 percent indicated that they use other methods and 11 percent uses an estimated figure. Respondents did not elaborate on the specifics of other approaches used in the calculation of the cost of equity.

Table 14: Approaches used to determine the cost of equity

Calculation of the cost of equity	
Proxy of private listed company	0%
Capital Asset Pricing Model (CAPM)	56%
Estimated figure	11%
Other	33%

The CAPM, although it has some limitations, is broadly considered as the predominant approach to calculate the cost of equity (Jagannathan and Meier, 2002). It can therefore be concluded that although a large percentage of African SOEs make use of WACC as the discount rate, they could be pricing the cost of equity incorrectly in the calculation of WACC.

5.6 Treatment of different type of projects

In practice, some institutions use different discount rates for different type of projects to distinguish between for example growth and sustenance projects.

When asked if they use the same discount rate for all projects, only 33 percent of respondents answered positively. This implies that a large percentage of SOEs adjust the discount rate between projects and that the discount rate might not be centrally set on a portfolio basis. This could jeopardize the consistency and accuracy of DCF results when comparing projects if it is not clearly stated what discount rate was used in the calculation.

Table 15: Treatment of different type of projects

Same discount rate for all the different capital projects and divisions	
No	67%
Yes	33%

5.7 Incorporation of risk in capital budgeting

Majority of research previously performed focused on the importance and the effectiveness of correctly identifying and incorporating risk in project evaluation and capital budgeting.

A substantial number of respondents indicated that they make use of some sort of risk assessment when considering projects for investment. Only 11 percent indicated that they do not perform any form of risk analysis. Scenario analysis was the most popular method to measure risk, with 78 percent of respondents confirming that they make use of this method in capital budgeting. This is consistent with studies by Hall and Mutshutshu (2013) which observed that the scenario and sensitivity analysis is used by the largest number of South African SOEs. Scenario analysis is widely used as a risk measure, because it considers more than one variable at a time and also provides information about the worst possible outcome that can be expected.

More advanced methods of risk assessment like Monte Carlo and Decision-tree analysis were not selected by any of the respondents. This could be due to these methods being more costly and more time consuming with a fair amount of skill required to effectively perform it.

Table 16: Risk assessment techniques in capital projects

Assessment of risk in capital projects	
No risk adjustment and use standard evaluation for all projects	11%
Subjective judgment	11%
Scenario analyses (e.g. base case, best case, worst case)	78%
Simulation analyses (e.g. Monte Carlo)	0%
Decision-tree analyses	0%

When incorporating risk into the project evaluation, the results were mixed with a slight preference for adjusting the discount rate (33 percent) or the cash flows (33 percent). Adjustments to the hurdle rate received a 20 percent rating from respondents. Bruner *et al.*, (1998) concluded that the discount rate (e.g. WACC) should be adjusted to reflect sustentative differences in investments cases.

Table 17: Incorporation of the risk adjustment into the project analyses

Risk adjustment into the project analyses	
Adjustment to cash flows	33%
Adjustment to the hurdle rate	22%
Adjustment to the discount rate	33%
Other	11%

The fact that a large number of respondents indicated that they make use of risk assessment methods in the investment analysis of capital projects can be viewed as a positive factor in the budgeting process of African SOEs.

5.8 Qualitative (non-financial) consideration for capital projects

Since state-owned organisations function under mandates from government it can be expected that qualitative (non-financial) factors could be a priority in the capital budgeting process. It was observed from previous studies by Hall and Mutshutshu (2013) that in some cases the outcome of the quantitative analysis could be completely overridden by statutory or regulatory consideration. They also observed that non-financial factors play a growing and significant role in the capital budgeting process of listed firms.

When questioned about the consideration given to qualitative factors, 56 percent of respondents indicate that qualitative factors is a very important consideration in the decision making process. Only one respondent indicated that quantitative factors are never important.

A more in-depth study of the most important qualitative factors revealed that environmental factors are always a consideration in 67 percent of the responses, followed by government regulation (44 percent) and service delivery (33 percent). These results were consistent with research by Hall and Mutshutshu (2013) which also observed the same qualitative factors as being rated as the most important by South African SOEs.

Table 18: Consideration given to qualitative factors in the assessment of capital projects

Qualitative factors in the assessment of capital projects				
	Never	Almost never	Almost always	Always
Political influence	0%	11%	78%	11%
Environmental factors	0%	22%	11%	67%
Service delivery factors	0%	11%	56%	33%
Employment creation	0%	44%	33%	22%
Government regulation	0%	0%	56%	44%

The high rating on environmental factors is an indication of the global trend, also with governments, to be more conscious about the impact that projects will have on the environment. Although political influence was not always a consideration for most of the respondents, it was rated as a factor that almost always needs to be considered (78 percent). This confirms the intervention of politics in the capital budgeting decision making process of African SOEs. It can be derived from the data that the main qualitative factors listed in the question will be considered to some extent in all capital investment decisions. This confirms that SOEs has to balance qualitative considerations with quantitative financial calculation in all capital investment decisions that they evaluate.

Employment creation received a fairly low ranking compared to the other qualitative factors with 44 percent of respondents indicating that they almost never consider it in the assessment of capital projects. This is consistent with what was observed by Hall and Mutshutshu (2013). They argued that due to the high level of unemployment in African countries, it is expected that governments through SOEs would put more emphasis on employment creation when considering projects for investment.

Chapter 6: Conclusion and Recommendations

This study set out to research the capital budgeting techniques employed by state-owned enterprises in Africa. Despite significant literature available on the capital budgeting processes of listed companies across the world and some research on SOEs in South Africa, there is no evidence of such a study on SOEs in the African context. It was observed that much more future research can be performed on the topic to develop literature on the capital budgeting processes of African SOEs.

With Africa being largely considered as a developing region, state-owned enterprises that do undertake substantial capital investment projects are fairly limited in numbers and tend to be concentrated in the larger African economies. Therefore it was decided to focus the structured survey questionnaire on 32 of the larger SOEs distributed across African countries. Although a high response rate would be preferred to enhance the statistical significance of the research, a response rate of 31 percent was the highest that could be achieved despite many efforts to improve it. Many reasons for the reluctance to divulge information about the capital budgeting processes were observed including concerns about confidentiality and cross country information security.

Respondents to the study included SOEs from diverse sectors and also of different size (measured in terms of the capital budgets under their control and amount of annual turnover). In 78 percent of the responses it was indicated that the person responsible for capital budgeting is qualified as a Chartered Accountant and that they have been with the organisation for less than 5 years.

The implementation stage is reported as the most important and also most complex stage in the capital budgeting process and is largely consistent with other recent research in the context of South African SOEs. These findings can be explained by the large infrastructure and energy projects currently undergoing implementation by SOEs and the increased public focus specifically on cost and schedule overruns.

It was observed from the data that the project post implementation audit (PIA) stage is considered as the least complex and also least important step in the budgeting process. Again, these findings were largely consistent with other recent research in the context of South African SOEs and also private companies. It is concerning that the post implementation audit is not seen as an important step; since it is the only way in which learning from past projects can be captured and build into the evaluation of future projects, thereby enhancing the quality of budgeting decision.

To determine the cash flow for project evaluation the largest number of respondents (44 percent) indicated that they make use of quantitative methods. This was followed by 33 percent which reported that they rely on expert opinion to determine the cash flow. These findings differ from other research which found that previous project experience is the main source of cash flow estimation in South African SOEs.

A substantial preference for DCF techniques could be observed from the data with 44 and 33 percent of respondents indicating that they always make use of NPV and IRR in capital budgeting. It was also concluded that both the NPV and IRR is seen as equally important. The least preferred budgeting techniques were the Probability Index and Modified IRR. This is potentially due to them being considered as difficult to interpret in decision making. A positive observation made, is that the preference for using the more superior NPV technique is substantially higher compared to what other research on South African SOEs indicated. Overall it is of some concern that, given the considerable number decision makers qualified as Chartered Accountants, in some cases non-DCF techniques are still being used on a regular basis.

Another positive finding is the fact that 78 percent of respondents indicated that they consider cash flows instead of accounting income when calculating NPV and IRR. However, a large percentage of respondents confirmed that they incorrectly include interest and financing cost in the cash flow.

The weighted average cost of capital (WACC) was selected as the preferred discount rate by 78% of respondents, which is less than what other research found for South African SOEs. When determining the cost of equity, 44 percent of respondents indicated that they do not make use of the capital asset pricing model (CAPM).

It could therefore be concluded that although a large number of respondents make use of WACC as the discount rate they could be incorrectly calculating the cost of equity. This creates some reason for concern since it would be expected from the qualified decision makers in African SOEs to use WACC as the discount rate in all cases, also to correctly price the cost of equity using the CAPM.

It was found that 89 percent of respondents make use of a method to assess risk in the evaluation of capital projects. Scenario analysis is the most preferred risk assessment option, but more advanced techniques like Monte Carlo simulation and decision tree analysis is never used. When incorporating risk into the investment evaluation the preference is mixed with a slight inclination to make adjustments to the cash flow or discount rate.

Fifty-six percent of respondents confirmed that qualitative (non-financial) factors can be considered as very important in the capital budgeting process of SOEs. It was also concluded that all respondents needed to balance qualitative and quantitative factors in capital budgeting of their respective SOEs. Further investigation found that environmental factors are always a consideration for 67 percent of respondents followed by government regulations and service delivery. What is of interest was the observation that employment creation was ranked as least considered factor. This seems to be in contrast with the constant drive by government to create employment opportunity given the high unemployment rate experienced in the African continent.

A condensed view of the recommendations from the research findings are presented below for the consideration of individuals involved with capital budgeting in African SOEs and also for future research related to this topic.

- Even though encouraging results were recorded for the substantial preference towards DCF techniques to be used in capital budgeting, it is a concern that other inferior and potentially outdated techniques are still in use in African SOEs. It is recommended that continuous learning and education is applied especially through higher education and independent professional qualification institutions.
- It is recommended to emphasise the value of post implementation audits in capital budgeting and to implement a PIA process in each SOE.
- Despite most of the decision makers being qualified CAs and finance graduates, the use of WACC as a discount rate is not preferred by all African SOEs. It was also observed that in some SOEs the calculation of the cost of equity could be incorrect. It is recommended that further focus be placed on keeping abreast of developments and best practices through professional affiliation and learning.
- Although a large percentage of respondents indicated that they make use of scenario analysis it is recommended that, especially for a complex project, more advanced simulations like a Monte Carlo analysis is performed to obtain a wide range of possible risk outcomes.
- The amount of literature available on the capital budgeting techniques employed by African SOEs is very much limited and this can be seen as a knowledge gap that could justify further research on the topic.
- For future research, it is recommended that a larger sample number of African SOEs are included. Also consider including the state-owned institutions that provide funding for capital investment in Africa.
- It is proposed that for future studies more time and funding is allocated to thoroughly engage with SOEs in foreign countries and also to consider partnering with research organisations located in the countries of interest. This should alleviate some of the challenges faced in obtaining a higher and more diverse rate of response to survey questions.

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Addendum A – Survey cover letter

Good day

This is a call for all *CFO's*, *Investment Managers*, *Capital Managers* or any equivalent person involved in the capital budgeting and capital project investment decisions of State-Owned Organisations in the African region, to participate in the survey.

Why participate?

- Your input to this survey will contribute to improved knowledge of capital budgeting techniques of state owned enterprises in the African region.
- Survey results will be made available to all interested parties who successfully complete the survey.
- You would be able to obtain insight on how other organisation go about the capital budgeting and the investment process.

Your participation in this research is completely voluntary and anonymous, and can be completed using a computer or a smart device. It should take approximately 10 minutes.

Please click on the link to the survey provided below.

https://docs.google.com/forms/d/1WVqLPvbGOOclrFu6LiJpnTsmkG-t5vnGtGh2nJW5sOc/viewform?c=0&w=1&usp=mail_form_link

The survey is conducted as part of my masters' degree in Finance and Investment at Wits Business School (University of Witwatersrand, South Africa) and your input will be much appreciated.

Kind Regards,

Gawie de Jager

gawiedejager@gmail.com

Addendum B – Survey questionnaire

Wits Business School - Capital Budgeting Techniques Employed by State Owned Enterprises In Africa

1. Select the area of activity that your company PREDOMINANTLY operate in:

Mining Energy

Finance

Transportation

Healthcare

Utilities

Technology

Retail

2. What is your company's approximate average annual capital expenditure budget?

Below US\$50 million

US\$ 50 million to US\$ 100 million

US\$ 100 million to US\$ 500 million

US\$ 500 million to US\$ 1 billion

Above US\$ 1 billion

3. What is your company's approximate annual sales revenue (or turnover)?

Below US\$ 50 million

US\$ 50 million to US\$ 100 million

US\$ 100 million to US\$ 500 million

US\$ 500 million to US\$ 1 billion

Above US\$ 1 billion

5. Group/Divisional CFO or Investment Manager tenure in current job (years)

Less than 3 years

3 to 5 years

6 to 10 years

More than 10 years

6. Group/Divisional CFO or Investment Manager education

Undergraduate

Postgraduate degree

MBA degree

Non-MBA masters

Chartered Accountant (CA)

Other

7. Please indicate how frequently your company employs each of the following techniques when deciding which investment projects to pursue/fund (never / almost never / almost always / always)

Profitability Index

Net Present Value (NPV)

Return on Investment (ROI)

Internal Rate of Return (IRR)

Modified Internal Rate of Return (MIRR)

Payback Period

Other techniques

8. Between the two, when applied, which technique does your company prefer when deciding which investment projects to pursue/fund (Please select one option only)

Internal Rate of Return (IRR)

Net Present Value (NPV)

Both equally preferred

9. When computing the IRR or NPV where applicable, does your company use: (Please select one option only)

Cash flows

Accounting income

10. When computing the IRR or NPV where applicable, do you deduct interest and other financial cost from revenue to arrive at the cash flow?

Yes

No

11. Please select from the following where applicable to your organisation *Tick all that apply.*

Have at least one member of staff assigned full-time to capital investment analyses

Have a standardised economic model to calculate investment returns on capital projects

Have a capital investment manual (or written capital investment guideline)

Conduct post implementation audits on major capital expenditure

12. Please indicate the importance attached to each stage of the capital budgeting process in your organisation. (least important / somewhat important / very important / most important)

Project cash flow estimation

Analysis and selection of projects

Implementation of projects

Post implementation review

13. Please indicate the complexity of each stage of the capital budgeting process as experienced in your organisation (least complex / somewhat complex / very complex / most complex)

Project cash flow estimation

Analysis and selection of projects

Implementation of projects

Post implementation review

14. Which of the following is mostly used to determine the cash flow of a capital project?

Management estimates

Expert opinion

Quantitative methods

Previous project experience

15. Which of the approaches is used to determine the minimum acceptable rate of return (discount rate) to evaluate proposed capital investments?

Cost of equity

Cost of debt

Previous experience

Weighted average cost of capital

An arbitrarily chosen figure

16. How is the cost of equity estimated / calculated?

Proxy of private listed company

Capital Asset Pricing Model (CAPM)

Estimated figure

Other

17. Where CAPM is used please indicate how the following is estimated (published sources / own determined / government bonds / other)

The beta

The market risk premium

The risk free rate

18. Do your organisation use the same discount rate for all the different capital projects and divisions?

Yes

No

19. On what basis does your organisation assess the riskiness of a capital project?

No risk adjustment and use standard evaluation for all projects

Subjective judgment

Scenario analyses (eg base case, best case, worst case)

Simulation analyses (eg Monte Carlo)

Decision-tree analyses

Other

20. How is the risk adjustment incorporated into the project analyses

Adjustment to the discount rate

Adjustment to cash flows

Adjustment to the hurdle rate

Other

21. How important is the following consideration in capital project investment analyses (not important / important / very important)

Quantitative (Financial)

Qualitative

22. How much consideration is given to the following qualitative factors in the assessment of capital projects? (never / almost never / almost always / always)

Political influence

Environmental factors

Service delivery factors

Employment creation

Government regulation

Other

If you would like to receive the final results from the survey please provide your email address below

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