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ANTON DE KOM UNIVERSITY OF SURINAME
FACULTY OF SOCIAL SCIENCE

Evaluation of the usage of capital budgeting to support investment decisions by listed companies in Suriname

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An empirical analysis of the usage of capital budgeting to support investment decisions by listed companies in Suriname

Thesis to obtain the degree of Master of Science in the Business Management

Field of study: Business Management
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Abstract

This research aims to investigate how capital budgeting techniques are used and can support the effectiveness of investment decisions by listed companies in Suriname.
The main research question is: “To which extent can listed companies in Suriname use capital budgeting to support their investment decisions?” This research is a combination of desk research and field research. One of the bases of the research is literature study to gain insight into what capital budgeting entails and its influence on risk management. Based on the literature study a few hypotheses are formulated, which are processed in the questionnaire for the listed companies.

Budget is a detailed plan which serves as an imperative tool in the stages of planning, execution and control, because more effective decisions can be made on this basis in the planning that can be included in the implementation and then check whether the actual result has been delivered as predicted in the planning. Capital budgeting/ investment appraisal lists the projects and investments that a company plans to undertake during the coming years with the ultimate goal to determine the effect of the decision on the firm’s cash flows, and evaluate the NPV (net present value) of these cash flows to assess the consequences of the decision for the firm’s value.

The techniques used by the listed companies in Suriname are more or less the same as internationally used by other listed and non-listed companies, which is derived from previous studies that are done. The mostly used capital budgeting techniques are NPV (net present value), followed by IRR (internal rate of return), PB (payback period) and PI (profitability index). The vast majority of the listed companies use sensitivity analysis mostly as risk analysis techniques during capital budgeting projects, followed by scenario analysis. The use of these techniques has led overall to effective results for the Surinamese listed companies. But there is a gap between the intended use of investment appraisal techniques and the actual use of those techniques. These techniques must be applied correctly in the analyzes to make a correct decision. All the companies should have a user guideline in which the investment analysis process is described with all the key points and methods in details. The treasury and investment department should have the expertise and experience with the investment appraisal and risk analysis techniques. Enough information should be available to perform exertions. Detailed projections of cash flow should be done for every investment to prevent failed investment. Extra attention should always be spent on the impact to cash flow from changes in working

capital. It should also be recommended to make investment decisions based on the comparison of projects and its risks.

It is advisable to use the capital budgeting techniques more frequently and lovingly for all investments. Findings of the study may be useful to the investment decision makers in order to achieve the shareholders wealth. The theoretical framework developed and used in this study can be used as the fundament for further studies in the field of capital budgeting in Suriname since this study is only based on listed companies. The cause(s) of why NPV (net present value) is the most used capital budgeting technique by listed companies in Suriname and the success factors of capital budgeting can also be an interesting topic for further researches.

1 Introduction

This chapter gives a description of the motive of this research and defines the problem description accordingly. The main research question and the sub questions are worked out. Also, the research method and both social and scientific relevance of the study are described. Chapter 1 is closed with the structure of the remainder of this report.

1.1 Research motive

The inspiration to write my graduation thesis on "The evaluation of the usage of capital budgeting to support investment decisions by listed companies in Suriname" was stimulated during my second year of my master education by the subject "Advanced Corporate Finance and Governance" of which capital budgeting was a part. I was very interested in this part, so I started reading a lot more about it besides the subject matter. By delving into capital budgeting, I have come across many international studies on the influences / impact of capital budgeting for a company. This gave me the impulse to conduct my master thesis research into the use and impact of capital budgeting for Surinamese companies to evaluate if it has the same influences / impact on these companies generally.

1.2 Research background

A budget is a quantitative plan prepared for a specific time period, which is normally expressed in financial terms and prepared for one year. Budgeting serves the following purposes: planning, control, communication, co-ordination, evaluation, motivation, authorization & delegation (Kaplan, 2009). There are numbers of different budgetary systems as: top down vs. bottom-up budgeting, incremental budgeting, zero-based budgeting, rolling budgets, activity-based budgeting, feed-forward control and beyond budgeting (Kaplan, 2009). De Souza & Lunkes (2016) indicate that budgeting has been considered as one of the most important management tools to guide organizations, measure their performance and motivate people. One of the stages of the budgeting process involves the preparation and analysis of capital budgeting, which is the focus of this research. A capital budget lists the projects and investments that a company plans to undertake during the coming year. To determine this list, firms analyze alternative projects and decide which ones to accept through a process called capital budgeting. This process begins with forecasts of the project's future consequences for the firm. Some of these consequences will affect the firm's revenues and others will affect its

costs. The ultimate goal of capital budgeting is to determine the effect of the decision on the firm's cash flows, and evaluate the NPV (net present value) of these cash flows to assess the consequences of the decision for the firm's value. This is the value that a business is worthy of at a particular date; theoretically, it is an amount that one needs to pay to buy/take over a business entity. The capital budgeting decision has its consequences for the firm's available cash and so on the firm's value (Berk & Demarzo, 2014). If a good investment decision is made, the available cash of the firm will increase, also the invested cash will be recouped and thus increases the company value. In case of a bad investment decision, the invested cash will not be recouped, which leads to the decrease of the available cash. This also means that the business value of the company will decrease. According to De Souza & Lunkes (2016) capital budgeting decisions are the fundamentals to the survival and success of the company in the long run, by which the decisions of the investment budget are conceptualized as a difficult type, because the decision frequently must be made among multiple investment options on the basis of multiple criteria with no one option dominating across all criteria. In addition, each option must be evaluated on each criterion and the relative importance of each criterion must be weighted before the final judgment is made (Salvador, Govind, & Philip, 2011). The complexity is justified, because capital expenditures require significant resources. They indicate that companies should determine the best way to get and return these resources and yet most of the capital budgeting decisions require a long-term commitment. De Souza & Lunkes (2016) describe that the relevance of the capital budgeting process for companies lies in the fact that a significant amount of money is committed for a long period. Thus, this means that the company cannot immediately dispose of the committed assets in the short term. The reversal of the invested amount would probably culminate in partial or total loss, once it is decided to start the project (Hall & Millard, 2010). The success or failure of companies highly depends on the investment decisions that are made by the top management of these companies. A study conducted on Jordanian corporations provided empirical evidence on investment decisions based on capital budgeting practices in Jordan. De Souza & Lunkes (2016) have shown in their study that the usage of capital budgeting is increasing for investment decisions by Brazilian companies, because of the positive impact it has on the results. There are several studies which have the same results as the previous mentioned study, such as the studies done by Kester et al (1999) in Australia, Hong Kong, Indonesia, Malaysia and Philippines and Sungun (2015) in Turkey.

1.3 Problem definition

The global financial crisis of 2008 has also affected the business environment in Suriname which has become highly turbulent for the Surinamese companies (Centrale Bank van Suriname, 2019). These companies are exposed to a number of risks such as business cycle risk, slowdown in demand, unanticipated actions of competitors, interest rate risk, inflation rate risk, government policy changes, and especially, exchange rate risks. The economy of Suriname is also pushed into a recession, since the export price of aluminum, gold and oil have undermined the external and fiscal position in 2013. Gross official reserves have declined in 2016 due the fall in net-exports and intervention by the Central Bank of Suriname to support the Surinamese currency. Faced with the run-down of foreign reserves, the authorities devalued the currency by 21%. The exchange rate pressure persisted after the devaluation, with the spread between the parallel and official market rates reaching 50% in March 2015. The authorities achieved a temporary narrowing in the spread by intervening in the unofficial market in January 2016 till February 2016. On March 2016, the authorities floated the currency based on a system of foreign exchange auctions aimed at ensuring a convergence of the official exchange rate with the market rate. Based on the auctions, the spread between the official and parallel market rates has narrowed and the authorities have since taken further steps to allow the official rate to respond to changing market conditions. The official SRD/USD exchange rate has depreciated by some 90% since October 2015. The monetary base has fluctuated since 2015. Consumer prices have increased on the back of the devaluation and utility tariff hikes (inflation). Loan quality has worsened on the back of the weakening economy and currency depreciation (Request for Stand-by arrangement, 2016). This fluctuated economy has caused that companies are facing dwindling profitability, investment insecurities and escalating debts which have made the investment scenario even more risky. Some companies even went bankrupt during this period, because they could not thrive the unstable environment. The only keys to survival and long-term success of Surinamese companies are effective investment decision making and sound financial management practices, which are part of capital budgeting. Considering the wide range of diversity of companies and the duration of this research, the scope of this research is listed companies.

The prime aim of this research is to present evidence on the current Surinamese investment practices and to determine if improvement is needed in the capital budgeting techniques that are used by the Surinamese listed companies.

The main research question is: “To which extent can listed companies in Suriname use capital budgeting to support their investment decisions?”

The following sub questions are formulated to support the main research question:

1. What are listed companies and their characteristics related to investments?
2. What does capital budgeting entail?
3. What are the conditions for a successful application of capital budgeting?
4. Which capital budgeting techniques are generally identified and used by listed companies in Suriname?
5. Is there any improvement required in capital budgeting techniques used by listed companies in Suriname?

1.3 Relevance of research

1.3.1 Academic relevance

This research is academically relevant, as it contributes to the theory of capital budgeting from the point of view of listed companies in a developing country. This research contributes by looking at how the listed companies deal with capital budgeting techniques worldwide compared with Suriname and if improvement is required of in techniques used in Suriname. Furthermore, this study can be a start for further studies in the field of capital budgeting in Suriname since this study is only based on listed companies.

1.3.2 Social relevance

The highly turbulent economy since 2008 which have affected the business practices in Suriname have led to the need to examine the extent to which the newer theoretical developments have affected Suriname’s Corporate Capital Budgeting practices. Besides, it may be useful for companies to assess their own capital budgeting practices in light of the latest advanced investment methodologies (such as MIRR (modified internal rate of return) and DPB (discounted payback period)) being followed by the more efficient and innovative companies and can adopt techniques that deliver more effective results. The result of a company’s capital budgeting practices can differ, since each company is unique and the result of its capital budgeting practices can be influenced by the company’s environment and policies.

1.4 Research method

One of the bases of the research is literature study to gain insight into what capital budgeting entails and its influence on the investment decision. Based on the literature study a few hypotheses and propositions are formulated. To get a clear insight into the current usage of capital budgeting by listed companies in Suriname, questionnaires have been filled out by management of these companies. The formulated hypotheses and propositions are processed in these questionnaires.

1.5 Reading guide

The remainder of this thesis is structured as follows:

Chapter 2 contains the complete theoretical framework, in which listed companies and capital budgeting are described. Relevant theoretical models on capital budgeting have also been described, with an emphasis of the influence on investment decision. Furthermore, it is also indicated on the basis of which criteria listed companies are defined and what the most commonly used capital budgeting techniques are internationally. In chapter 3 the method of the research is discussed. This chapter contains the research method and method of data collection. The research results are presented in chapter 4. After collecting the theoretical and practical data in chapters 2 to 4, the discussion and conclusion are incorporated in chapter 5. This chapter answers the main research question. This chapter has been concluded with the recommendations made on the basis of the conclusions drawn.

2. Literature Review

The meaning of listed companies is described in this chapter, which is the answer of the first sub question. In this chapter it is also described what capital budgeting entailed, by which the second sub question is answered. The conditions for a successful application of capital budgeting are also discussed here. This chapter will be closed with a summary.

2.1 Listed Companies

A company is listed on the stock exchange when its shares are traded on a stock exchange. The company can increase its loan capital, sell shares from an existing major shareholder and transfer from a private company to a listed company by issuing its shares on the stock exchange. A company has a large number of reasons to decide to go public and offer its stock in an initial public, but the main reason is to raise money and spread the risk of ownership among a large group of shareholders. Spreading the risk of ownership is especially important when a company grows, with the original shareholders wanting to cash in some of their profits while still retaining a percentage of the company. Other reasons which a company has to go public are obtaining financing outside of the banking system, reducing debt and the overall cost of capital. Going public gives the company also a more solid standing when negotiating interest rates with banks. This would reduce interest costs on existing debt the company might has.

Several studies on listed companies from/in different countries have presented empirical evidence of the characteristics of companies going public (Ghonyan, 2017). Colgate (2010) indicates that listed companies are easily able to raise additional funds through the issuance of more stock and have additional leverage when obtaining loans from financial institutions. On the other hand, Barden, Copeland, Hermanson, & Wat (1984) have stated that firm set a higher price for its securities by going public than through private placement. This statement has also been powered by Colgate (2010). Firms enhance ability to borrow by going public, because its net value improves its debt-to-equity ratio. This means the lower debt-to-equity ratio gives a chance to the firm to borrow money on more favorable terms in the future (Barden e.a., 1984; Colgate, 2010). According to Barden e.a. (1984) listed companies enhance the ability to raise equity. They have stated that when a firm’s stock is famous and performs well, the company can sell additional stock on favorable terms in the future. Colgate (2010) also supports this statement by explaining that the submission and registration fee for most major exchanges includes some form of free advertising because the company's stock will be associated with the

exchange on which their shares are traded. The corporate prestige of listed companies increases, stimulates market exposure and enhance more interest in the firm from customers, suppliers, prospective investors, mutual and hedge funds, market makers and institutional traders (Barden e.a., 1984; Colgate, 2010). One of the most important characteristics are liquidity and valuation, because a stock market will be established and for investors and management this will be an optimal way to evaluate that stock (Barden e.a., 1984).

Based on the previous studies it can be stated that a listed company is a company of which the shares of a company are traded on a stock exchange for which the most important reason is to raise money and spread the risk of ownership among a large group of shareholders. The next paragraph describes capital budgeting, by which the second sub question is answered.

2.2 Capital Budgeting

2.2.1 Definition and overview of capital budgeting

A budget is a detailed plan for acquiring and using financial and other resources over a specified period of time, which is required for the efficiency and effectiveness in the allocation of the resources of an organization. Adebayo e.a. (2014) have stated that a budget can be defined as a qualitative statement prepared and approved prior to the period of time of the policy to be pursued for the purpose of achieving a given objective. An organization uses budget as an instrument in the achievement of its purpose of matching the plans with the available resources. Budget is an instrument used by an organization in the achievement of its purpose of matching future plans with the available resources in formal quantitative terms (Elumilade e.a., 2006). The primary function of a budget is to provide the management of an organization with a projection of the activities necessary to reach the established goals. The act of preparing a budget is called budgeting (Berk & Demarzo, 2014). According to De Souza & Lunkes (2016) budgeting has been considered as one of the main management tools to guide organizations measure their performance and motivate people. It also serves as an imperative tool in the stages of planning, execution and control, because more effective decisions can be made on this basis in the planning that can be included in the implementation and then check whether the actual result has been delivered as predicted in the planning. The preparation and analysis of capital budgeting is one of the stages of the budgeting process. On the other hand, Kaplan

(2009) has described that a budget includes a job/task with a particular amount of money to deliver a particular performance/result.

On the bases of the definitions explained by several researchers, it can be stated that a budget is a detailed plan which serves as an imperative tool in the stages of planning, execution and control, because more effective decisions can be made on this basis in the planning that can be included in the implementation and then check whether the actual result has been delivered as predicted in the planning.

A capital budget system lists the projects and investments that a company plans to undertake during the coming years. To determine this list, firms analyze alternative projects and decide which ones to accept through a process called capital budgeting (Berk & Demarzo, 2014). Ekeha (2011) has explained that capital budgeting is an integral part of the corporate plan of an organization. According to Berk & Demarzo (2014) the capital budgeting process begins with forecasts of the project's future consequences for the firm. Some of these consequences will affect the firm's revenues; others will affect its costs. Capital budgeting is the process of investment opportunities analysis in long-term assets, which are expected to produce benefits for more than a year (Peterson & Fabozzi, 2002). According to Kengatharan & Diluxshan (2017) capital budgeting is also known as investment appraisal in the finance literature, because a project is mainly assessed whether or not to invest in it. This is supported by Arslan e.a. (2014). According to Van Horne and Wachowicz (2008) capital budgeting contains a set of processes to identify, scrutinize, and choose the specific project for investment in long-lived assets that will provide benefits beyond at least one year. Gitman (1988) has stated that capital budgeting can be defined as 'the process of evaluating and selecting long-term investment consistent with the firm owners goal of wealth maximization'. Capital budgeting is described by Welch (2004) as the process of accepting and rejecting the project. Capital budgeting is one of the most important decision making processes of determing best investment projects which generate higher yielding in order to maximize shareholder value (Dayananda e.a., 2002). Berk & Demarzo (2014) have stated that the ultimate goal of capital budgeting is to determine the effect of the decision on the firm's cash flows, and evaluate the NPV (net present value) of these cash flows to assess the consequences of the decision for the firm's value. Capital investment decision can cause drastic change in firms as well as in the whole economy, because it deals with large sum of fund. Therefore, capital investment decision is one of the most critical

and crucial decisions that needs to be taken carefully to achieve organizational growth as well as economic development (Kengatharan & Diluxshan, 2017).

Different researchers have studied capital budgeting and have formulated their definitions according it. Based on those studies it can be understood that capital budgeting/ investment appraisal lists the projects and investments that a company plans to undertake during the coming years with the ultimate goal to determine the effect of the decision on the firm's cash flows, and evaluate the NPV (net present value) of these cash flows to assess the consequences of the decision for the firm's value. This point of view will be used for capital budgeting in this further research. The next sub paragraph illustrates the various capital budgeting techniques and its characteristics.

2.2.2 Decision criteria of capital budgeting

Kengatharan & Diluxshan (2017) have stated that seven investment appraisal techniques are more prevalent in today business world:

- net present value (Elumilade e.a., 2006; Ryan & Ryan, 2002; Graham & Harvey, 2001; Brounen e.a., 2004; Mao, 1970)
- profitability index (Mao, 1970; Elumilade e.a., 2006; Ryan & Ryan, 2002)
- internal rate of return (Mao, 1970; Elumilade e.a. 2006; Ryan & Ryan, 2002; Brounen e.a., 2004; Graham & Harvey, 2001)
- modified internal rate of return (Ryan & Ryan, 2002)
- payback (Ryan & Ryan, 2002)
- discounted payback (Ryan & Ryan, 2002)
- accounting rate of return (Ryan & Ryan, 2002)

According to Kengatharan & Diluxshan (2017) investment appraisal can be taken either by DCF (discounted cash flow) methods or non-DCF (non-discounted cash flow) methods. The main DCF (discounted cash flow) methods are NPV (net present value) and IRR (internal rate of return), while the main non-DCF (non-discounted cash flow) methods include PB (payback) and ARR (accounting rate of return). DCF (discounted cash flow) is a valuation method that is used to estimate the value of an investment based on its future cash flows. DCF (discounted cash flow) analysis attempts to figure out the value of an investment today, based on projections of how much money it will generate in the future. On the contrary, a non-discount method does

not explicitly consider the time value of money. In other words, each dollar earned in the future is assumed to have the same value as each dollar that was invested many years earlier. According to Haka e.a. (1985) there are two basic classes of financial methods: the sophisticated and naïve selection techniques. DCF (discounted cash flow) methods known as sophisticated techniques consider the risk adjusted DCF (discounted net cash flows) expected from a project. It thus considers risk, cash flows and the time value of money. Non-DCF (non-discounted cash flow) methods known as naïve method does not use cash flow approach in contrast consider present value or incorporate risk in systematic way. Hermes e.a. (2005) have indicated the NPV (net present value) as the most accurate and sophiscated technique on the bases of pure theoretical point of view. The IRR (internal rate of return) is typically seen as the next best method. The non-DCF (non-discounted cash flow) methods are considered to be less accurate and, of which the PB (payback method) is typically seen as the least sophisticated (Robinson & Burnett, 2016). The next paragraphs give a description of each capital budgeting technique and its merits and demerits.

2.2.2.1 Net Present Value

Elumilade e.a. (2006) have stated that NPV (net present value) of an investment is the aggregation of the present values of all cash benefits throughout the investment deducing the present value of all cash. The NPV (net present value) is a DCF (discounted cash flow) technique which takes into account both the time value of money and so total profitability over a project's life (Imegi & Nwokoye, 2015). The NPV (net present value) is the most known and used robust technique of investment analysis (De Souza & Lunkes, 2016). The NPV (net present value) function is defined as:

$$NPV = \left[\sum \frac{Cf}{(1+r)^n}\right] - I$$

Cf: Cash flows

n: Duration of the project

r: Rate of discount or cost of capital

I: Initial Investment or Cash Outflows

Several researchers have mentioned the merits and demerits of this method. Peterson & Fabozzi (2002) have stated the NPV (net present value) as the decision criteria that tells us whether the investment will increase the firm's value or not. Their research has also described that NPV

(net present value) considers all cash flows and the riskiness of future cash flows. According Imegi & Nwokoye (2015) this is a clear-cut method of either accepting or rejecting the project and is consistent with the theory of wealth maximization. Further NPV (net present value) makes use of all the project cash flows throughout the duration of the project's life (Imegi & Nwokoye, 2015). The most important merit is that this method considers the time value of money (Peterson & Fabozzi, 2002; Imegi & Nwokoye, 2015). Beside these merits, there are some important demerits described by these researchers. Peterson & Fabozzi (2002) have revealed that NPV (net present value) requires a cost of capital for calculation and that the value of this method is expressed in terms of dollars, not as a percentage. Imegi & Nwokoye (2015) have claimed that the NPV (net present value) over-relies on the accurate estimation of the market determined cost of capital. The impact of risk on project evaluation is ignored by this method (Imegi & Nwokoye, 2015). They have also stated that a divisional manager may not be comfortable by relying on the method for performance evaluation, because it is not a rate of return method. The NPV (net present value) does not represent the actual returns associated with the project, which may mislead the investor or firm (Imegi & Nwokoye, 2015).

The NPV (net present value) lays emphasis on time value of money and is consistent with the objective of wealth maximization. On the other hand, this method is difficult to compute and can mislead the investor or firm since it does not represent the actual project returns.

Based on the theory, the following proposition can be formulated: NPV (net present value) is the most known and used robust technique of investment analysis

2.2.2.2 Internal Rate of Return

The Internal Rate of Return (IRR) is the rate of interest at which the present value of expected capital investment outlays is exactly equivalent to the present value of expected cash earning on investment (De Souza & Lunkes, 2016) & (Elumilade e.a., 2006). The IRR (internal rate of return) is the maximum rate of interest a firm can afford to pay if a project is financed with borrowed funds and the project cash inflows are to be used to liquidate the loan. It is equally the minimum rate of interest a lender is willing to accept for releasing fund to the borrower. Conventionally, if the IRR (internal rate of return) exceeds the prevailing rate, the project is considered viable (Imegi & Nwokoye, 2015). The formula for the internal rate of return is:

$$IRR: \left[\sum \frac{Cf}{(1+r)^n}\right] - I = 0$$

Cf: Cash flows

n: Duration of the project

r: Rate of discount or cost of capital

I: Initial Investment or Cash Outflows

As the NPV (net present value) method, the IRR (internal rate of return) method has also merits and demerits according studies that are done. IRR (internal rate of return) considers the time value of money, all cash flows and the riskiness of future cash flows as NPV (net present value) (Peterson & Fabozzi, 2002). The IRR (internal rate of return) is easy to adopt in accepting or rejecting a project by merely comparing the rate of return with the cost of capital (Imegi & Nwokoye, 2015). Peterson & Fabozzi (2002) have mentioned that this decision criteria tell us whether the investment will increase the firm's value. According to Imegi & Nwokoye (2015) IRR (internal rate of return) makes use of all cash flows associated with the entire life of the project. It is a rate of return method, which is considered to be appropriate for performance evaluation under a divisionalized structure (Imegi & Nwokoye, 2015). Peterson & Fabozzi (2002) have stated that IRR (internal rate of return) requires a cost of capital for decision, which is one of the demerits of this method. The IRR (internal rate of return) may not give value maximizing decision when comparing mutually exclusive projects and it may also not give value maximizing decision when choosing projects with capital rationing (Peterson & Fabozzi, 2002).

Based on the literature studies it can be stated that IRR (internal rate of return) is the discount rate that makes the present value of its inflows equal to its cost. Although IRR (internal rate of return) has basically the same advantages for using it as NPV (net present value), studies have shown that the demerits are not equal. The IRR (internal rate of return) is difficult to calculate, unrealistic assumption for reinvestment and negative or multiple results.

Based on the theory, the following proposition can be formulated: IRR (internal rate of return) is difficult to calculate, unrealistic assumption for reinvestment and negative or multiple results

2.2.2.3 Modified Internal Rate of Return

MIRR (modified Internal Rate of Return) was introduced to cope with the constraints of multiple IRRs (internal rate of returns) with the consistence of NPV (net present value). It is the discount rate that equates the NPV (net present value) to zero and present value of investment to future cash flows. MIRR (modified internal rate of returns) has prominent differences from IRR (internal rate of return) as MIRR (modified internal rate of return) bases on the project cost of capital and IRR (internal rate of return) accounts for project's IRR (internal rate of return). Therefore, reinvestment on the cost of capital is most reliable method to calculate the project profitability (Hussain & Shafique, 2013). MIRR (modified internal rate of return) is used by firms to rank investments or projects they may undertake.

$$MIRR = \left[\frac{PV_R}{PV_1}\right]^{\frac{1}{n}} (1 + r_e) - 1$$

PV_R: Present value of cash inflows

PV_I: Present value of cash outflows

r_e: Rate of return or weighted average cost of capital

n: Duration of the project

Peterson & Fabozzi (2002) have described that MIRR (modified internal rate of return) has the same basic advantages as the above-mentioned methods NPV (net present value) and IRR (internal rate of return). The MIRR (modified internal rate of returns) decision criteria tell us whether the investment will increase the firm's value. This method also considers the time value of money, all cash flows and the riskiness of future cash flows (Peterson & Fabozzi, 2002). On the other hand, the study of Peterson & Fabozzi (2002) have also found that the MIRR (modified internal rate of return) method may not give value maximizing decision when comparing mutually exclusive projects with different scales or different risks and it may also not give value maximizing decision when choosing projects with capital rationing (Peterson & Fabozzi, 2002).

MIRR (modified internal rate of return) was introduced to overcome the limitations of multiple IRRs (internal rate of returns) with the consistency of NPV (net present value) and has the same basic advantages as NPV (net present value) and IRR (internal rate of returns). But this method has literally less disadvantages than IRR (internal rate of returns).

Based on the theory, the following proposition can be formulated: Firms used MIRR (modified internal rate of return) to rank multiple investments or projects they undertake.

2.2.2.4 Profitability Index

Profitability index (PI) is also known as benefit-cost ratio of a project (Van Horne & Wachowicz, 2008). According to Elumilade e.a. (2006) is PI (profitability index) the ration of the present value of future cash benefits at the required rate of return to the initial cash outlay. A project is said to be viable if the PI (profitability index) is greater than one (Imegi & Nwokoye, 2015). This method is consider as a measure of a project's or investment's attractiveness. PI (profitablity index) is defined as:

$$PI = \sum \frac{[Cf(1+r) - n]}{I}$$

Cf: Cash flows

r: Discount rate

n: Duration of the project

I: Initial Investment or Cash Outflows

The PI (profitability index) is the decision criteria that tell us whether an investment increases the firm's value as the methods NPV (net present value), IRR (internal rate of return) and MIRR (modified internal rate of return) (Peterson & Fabozzi, 2002). As the other methods, PI (profitability index) also considers all cash flows, the time value of money and the riskiness of future cash flows. Imegi & Nwokoye (2015) have stated that the PI (profitability index) method is similar to the NPV (net present value) method, usually giving the same result on individual projects.This method can be used to rank divisible projects in conditions of capital rationing (Imegi & Nwokoye, 2015; Peterson & Fabozzi, 2002). This method also has demerits like the previous described methods. PI (profitability index) requires a cost of capital for calculation (Peterson & Fabozzi, 2002). The study of Imegi & Nwokoye (2015) have shown that PI (profitability index) indicates relative returns and is not an absolute measure (Imegi & Nwokoye, 2015). Peterson & Fabozzi (2002) have concluded that PI (profitability index) method may rank projects incorrectly when comparing mutually exclusive projects, which is also supported by the study of Imegi & Nwokoye (2015). The method works better only if the project has an outflow of cash at time zero, followed by cash inflows, which be at various times (Imegi & Nwokoye, 2015).

It is stated that in PI (profitability index), the ratio of present value of cash inflows to present value of cash outflow is calculated and the decision is taken on the basis of this. The merits of this method are the same as the merits mentioned in the previous methods, but it is also shown that PI (profitability index) method may rank projects incorrectly when comparing mutually exclusive projects.

Based on the theory, the following proposition can be formulated: The PI (profitability index) is a measure of a project's or investment's attractiveness.

2.2.2.5 Payback Period

Payback Period (PB) describes how many years will be taken for the future net cash flows on a capital investment to pay back initial cash outlay (Elumilade e.a., 2006; De Souza & Lunkes, 2016 & Hussain & Shafique, 2013). Firms use the PB (payback period) to determine whether to go through with an investment. The specific approach to be adopted in the process of identifying the actual PB (payback period) will depend on the nature of the cash flow; whether the cash flow is constant or unequal throughout the duration of the project (Imegi & Nwokoye, 2015). Where the cash flow is evenly, the formula approach for PB (payback period) is appropriated and it is defined as:

$$PB = \frac{Cash\ flow}{Average\ Annual\ Earnings}$$

According Peterson & Fabozzi (2002) PB (payback period) provides some information on the risk of the investment. The study of Imegi & Nwokoye (2015) have also identified the same merit. It is also simple to calculate and understand and this method also represents a quick screening device for an investor facing liquidity problem by relying on the actual cash flows (Peterson & Fabozzi, 2002; Imegi & Nwokoye, 2015). Imegi & Nwokoye (2015) have indicated that PB (payback period) represents an objective measure of evaluating projects. This method can be used to identify the project breakeven period or the margin of safety (Imegi & Nwokoye, 2015). Beside all these merits, there are also the demerits of the PB (payback period) method. First of all, Peterson & Fabozzi (2002) and Imegi & Nwokoye (2015) have noticed that the time value of money and cash flows immediately after the PB (payback period) are ignored by this method. Beside these demerits, Peterson & Fabozzi (2002) have claimed that PB (payback period) ignores the riskiness of future cash flows. On the other hand, Imegi & Nwokoye (2015) have stated the impact of risk on project evaluation is ignored by this method.

According the studies of Peterson & Fabozzi (2002) and Imegi & Nwokoye (2015), there is no concrete decision criteria to tell us whether an investment increases the firm's value. Also, the choice of cut-off payback period is arbitrary and it may lead to excessive investment in short-term projects (Imegi & Nwokoye, 2015).

Different researchers have described PB (payback period) in their studies, but from my point of view PB (payback period) is the time period required to recover the original cost of investment. This method is easy to use, but ignores the time factor and time value of money.

Based on the theory, the following proposition can be formulated: PB (payback period) is used to determine whether to go through with an investment.

2.2.2.6 Discounted Payback Period

Discounted Payback (DPB) concerns the time required for the project to recover the investment made, including the minimum return set by the investor, that is, investments and returns are considered in present value (De Souza & Lunkes, 2016) , (Arslan, Zaman, & Sidiqui, 2014) & (Hussain & Shafique, 2013). The formula is:

$$DPB = I_n \left(\frac{1}{1 - \frac{I \times r}{CF}} \right) \div I_n(1 + r)$$

CF: Periodic Cash flows

r: Discount rate

n: Duration of the project

I: Initial Investment or Cash Outflows

Peterson & Fabozzi (2002) have addressed the two most important merits of DPB (discounted payback period) method in their study, which is that this method considers the time value of money and the riskiness of the cash flows involved in the payback. The most important demerits are also explained by Peterson & Fabozzi (2002) in their study. DPB (discounted payback period) ignores cash flows beyond the PB (payback period) and has no concrete decision criteria that tell us whether the investment increases the firm's value (Peterson & Fabozzi, 2002). This method calls for a cost of capital (Peterson & Fabozzi, 2002).

Based on the results of previous researchers, it is stated that DPB (discounted payback period) method gives the number of years as result that takes to break even from undertaking the initial expenditure, by discounting future cash flows and recognizing the time value of money. The merits and demerits of DPB (discounted payback period) are the same as of PB (payback period), but are less then it.

Based on the theory, the following proposition can be formulated: DPB (discounted payback period) has no concrete decision criteria that tells firms whether the investment increases the firm's value.

2.2.2.7 Accounting Rate of Return

Accounting Rate of Return (ARR) is the annual accounting profits from an investment, divided by annual average capital investment outlay over a project's life span (De Souza & Lunkes, 2016) & (Elumilade e.a., 2006). It is advisable to undertake the project, if the computed value of return on investment exceeds a target rate of return (Imegi & Nwokoye, 2015). The formula is:

$$ARR = \frac{Estimated\ average\ annual\ earning}{Estimated\ average\ capital} \times 100\%$$

The most important merit which is identified by Imegi & Nwokoye (2015) is that the ARR (accounting rate of return) method is simple to calculate and understand. It also considers all the cash flows associated with the entire life of the project. ARR (accounting rate of return) method is comfortable for managers in a divisionalized structure because it is a rate of returns approach and project viability or otherwise is easy to identify (Imegi & Nwokoye, 2015). But as the other methods, ARR (accounting rate of return) ignores the time value of money by assuming that N10,000 in one year for instance, will have the same value even in the years' time (Imegi & Nwokoye, 2015). Further, the impact of risks on project viability, the actual size of the cash flow and the effect of working capital on the project viability are also ignored. This method uses accounting depreciation rather than capital allowances (Imegi & Nwokoye, 2015).

It can be stated that ARR (accounting rate of return) is based on accounting profits and is one of the simplest methods for the evaluation of capital projects. But on the other side, no consideration of the time factor is the greatest demerit of this method.

Based on the theory, the following proposition can be formulated: ARR (accounting rate of return) is simple to calculate and understand.

2.2.2.8 Summary

In the previous sub paragraphs, each of the capital budgeting techniques have been explained with its merits and demerits for use. Furthermore, one proposition has been formulated for each capital budgeting technique based on the literature that will be investigated in the field research. The upcoming sub paragraph describes the risk analysis techniques, since risk analysis is a critical aspect of the capital budgeting process.

2.2.3 Risk analysis techniques

Risk analysis involves the assessment of risk and the adjustment for risk (Correia, 2012). There are various supplementary capital budgeting tools available in making and supporting investment decision besides the investment appraisal techniques (Kengatharan & Diluxshan, 2017). Ryan and Ryan (2002) have listed the followings as major tools of risk analysis:

- Sensitivity analysis

  Sensitivity analysis allows to assess changes provided that one variable input change at a time for example to assess the change in NPV (net present value) if sales change (Ryan & Ryan, 2002). Sensitivity analysis allows us to explore the effects of errors in our NPV (net present value) estimates for the project (Berk & Demarzo, 2014).
- Scenario analysis

  Scenario analysis is similar to sensitivity analysis however, more than one variable changes at a time for scenario analysis (Berk & Demarzo, 2014) & (Ryan & Ryan, 2002).
- Inflation adjusted cash flows

  Inflation adjusted cash flows adjusts expected future cash flows by an estimated inflation factor. Economic value added describes managerial effectiveness in a given year, often calculated in terms of net profit after tax that support operations of a firm (Ryan & Ryan, 2002).
- Incremental Internal Rate of Return

  Incremental Internal Rate of Return is the difference in cash flows of two comparison projects, commonly used in replacement decisions (Ryan & Ryan, 2002).

- Simulation

  Simulation is a method for calculating the probability distribution of the possible outcome (Ryan & Ryan, 2002) & (Correia, 2012).
- PERT/CPM

  PERT/CPM is the analysis and mapping most efficient duration based financial decision (Ryan & Ryan, 2002).
- Decision tree

  Decision tree is a decision-making tool showing sequential outcomes, associated with their probabilities (Berk & Demarzo, 2014) & (Ryan & Ryan, 2002).
- Complex mathematical model

  Complex mathematical model deals with various option pricing model techniques, complex, real option, and firm specific proprietary models and methods (Ryan & Ryan, 2002).
- Linear programming

  Linear programming is the mathematical solution that identifies a set of projects and works to maximize NPV subject to constraints (Ryan & Ryan, 2002).
- Option pricing model

  Option pricing model takes either binomial option pricing model or the Black-Scholes option pricing model. The Black-Scholes option pricing model used by firms like Merck with high research and development expenditures, although large positive NPV investments (Berk & Demarzo, 2014) & (Ryan & Ryan, 2002)
- Real options

  Real Options discuss the opportunity for expansion, contraction or abandonment of a capital project before the project life span (Berk & Demarzo, 2014) & (Ryan & Ryan, 2002).

Risk analysis is a part of capital budgeting which involves the assessment of risks and the adjustment for risks and has capital budgeting tools available in making and supporting investment decision which support the capital budgeting techniques. The next sub paragraph illustrates the usage of capital budgeting internationally based on the studies that are done to be able to make a comparison between the usage internationally and the usage in Suriname.

2.2.4 Empirical review (Internationally)

In recent decades a lot of studies has been done on capital budgeting practices in different continents, regions and countries across the world. The use of questionnaires and interviews is the most used methodology for these researches. Appendix 1 and appendix 2 show studies of capital budgeting that were conducted from 1999 to 2017, covering some of the practices addressed, namely, for investment analysis and risk analysis.

With regard to practices for investment analysis found in the studies, PB (payback period) is noticed as the most used (Kester e.a, 1999; Brounen e.a., 2004; Lazaridis, 2004; Leon e.a., 2008; Abdullah & Nordin, 2008; Batra e.a., 2009; Hasan, 2013; Sungun, 2015; Al Haddidi, 2016; De Souza & Lunkes, 2016; Robinson & Burnett, 2016). The NPV (net present value) is also quite usual for companies to practice their investment analysis (Arslan e.a., 2014; Wnuk-Pel, 2014; Munyao e.a., 2014; Imegi & Nwokoye , 2015; AlKulaib, e.a., 2016; Kengatharan & Diluxshan, 2017).

Appendix 1 indicates the NPV (net present value) as the most used capital budgeting technique on the ranking list (Kester, et al., 1999; Ryan & Ryan, 2002; Brounen e.a., 2004; Hermes e.a., 2005; Correia & Cramer, 2008; Truong e.a., 2008; Batra e.a., 2009; Hall & Millard, 2010; Hall & Mutshutshu, 2013; Hussain & Shafique, 2013) followed up with the PB (payback period) and IRR (internal rate of return) methodology (Graham & Harvey, 2001; Hermes e.a., 2005; De Andres e.a., 2016; Batra & Verma, 2017). On the other hand, the MIRR (modified internal rate of return) is the less used capital budgeting technique (Ryan & Ryan, 2002; Hall & Mutshutshu, 2013; Arslan e.a., 2014; AlKulaib e.a., 2016; De Souza & Lunkes, 2016; Batra & Verma, 2017; Kengatharan & Diluxshan, 2017).

A study based on 133 large Canadian companies provides direct empirical evidence that IRR (internal rate of return) is used more frequently than NPV (net present value) in most cases (Jog & Srivastava, 1995).

A literature study in 2017 presents that PB (payback technique), NPV (net present value), IRR (internal rate of return) and PI (profitability index) are widely used techniques by a majority of the companies across the world (Rani & Mahammoud, 2017).

Sophisticated capital budgeting practices have become increasingly accepted and prevalent in the assessment of capital investment projects, however there are still managers who adopt

practices that do not consider the amount of money over time in the assessment of investment projects (De Souza & Lunkes, 2016).

Previous studies assessed that the sensitivity analysis and scenario analysis are the most exploited risk analysis in companies (Kester, et al., 1999; Graham & Harvey, 2001; Ryan & Ryan, 2002; Brounen e.a., 2004; Lazaridis, 2004; Leon e.a., 2008; Correia & Cramer, 2008; Batra e.a., 2009; Hall & Millard, 2010; Hasan , 2013; Hall & Mutshutshu, 2013; Wnuk-Pel, 2014; Munyao e.a., 2014; De Andres e.a., 2016; AlKulaib e.a., 2016; Al Haddidi, 2016; De Souza & Lunkes, 2016; Batra & Verma, 2017; Kengatharan & Diluxshan, 2017). Appendix 2 presents a ranking overview of the results of previous studies for risk analysis techniques.

This paragraph has presented an overview of the results of previous studies. Those results have indicated that NPV (net present value), PB (payback) and IRR (internal rate of return) are the most used capital budgeting techniques and sensitivity analysis and scenario analysis are the most used risk analysis techniques. But a capital budgeting technique and risk analysis technique do no lead automatically to a successful capital budgeting decision if it is not used correctly. Therefore, it is important to know what conditions lead to a successful capital budgeting decision, which is explained in the next paragraph.

2.3 Conditions for successful application of capital budgeting

There are no specific scientific studies found in which the conditions for a successful application of capital budgeting are described. But there are some experts who have mentioned which are the conditions that leads to success of capital budgeting. Bradshaw (2020) has mentioned a few key points that can lead to a successful capital budgeting decision. Accuracy of the projected cash flows is one of them. The total investment is often easy, but it can be all-encompassing for making sure to account for all sources of cash flow. In addition to revenues and expenses, large projects may impact cash flows from changes in working capital, such as accounts receivable, accounts payable and inventory. It is also important to calculate a meaningful and accurate residual or terminal value. Lack of not using detailed projections of cash flow can lead to a failed investment. Net income should in no way used as cash flow to evaluate a project. Further, the impact to cash flow from changes in working capital should never be ignored. Firms should also be careful not to overestimate a residual or terminal value. If the IPO (Initial Public Offering) value is far above a reasonable amount and without the high

residual value the net present value would be negative, it can be a mistake to place too much of the NPV (net present value) in the residual. The greater the amount of an investment, the greater the risk of error. That's why finding someone with the expertise and experience to calculate accurate and reasonable cash flows is the key to preparing a successful capital budgeting analysis. Accurate forecasting of the business activities is also one of the keys for a successful use of capital budgeting techniques.

The know-how about capital budgeting techniques and the impact each technique has on an investment decision is one of the conditions for a successful application of capital budgeting. Another condition is to continuously enrich knowledge about capital budgeting and investment decisions. It is also important to spend enough time in the analyzing of each capital budgeting project before an investment decision is taken. It should be recommended that for every project a pre-calculation and re-calculation should be made. Capital budgeting requires further discipline, periodic internal management reports, timely availability of the company figures and good accountability in order to be able to make timely adjustments.

2.4 Conceptual framework

According to the previous studies, investment appraisal techniques and risk analysis techniques have been included under capital investment appraisal practices. Based on literature review following hypotheses have been formulated to conduct the study.

H_1: There is significant relationship between the use of investment appraisal techniques and the effectiveness of investment decisions

H_2: There is a significant relationship between the use risk analysis techniques and the effectiveness of investment decisions

H_3: There is a significant relationship between the use of investment appraisal techniques and the use of the associated risk analysis techniques

Further, following conceptual framework was formulated to examine the relationship between capital investment appraisal practices and effectiveness of investment decisions with support of literature review and empirical review.

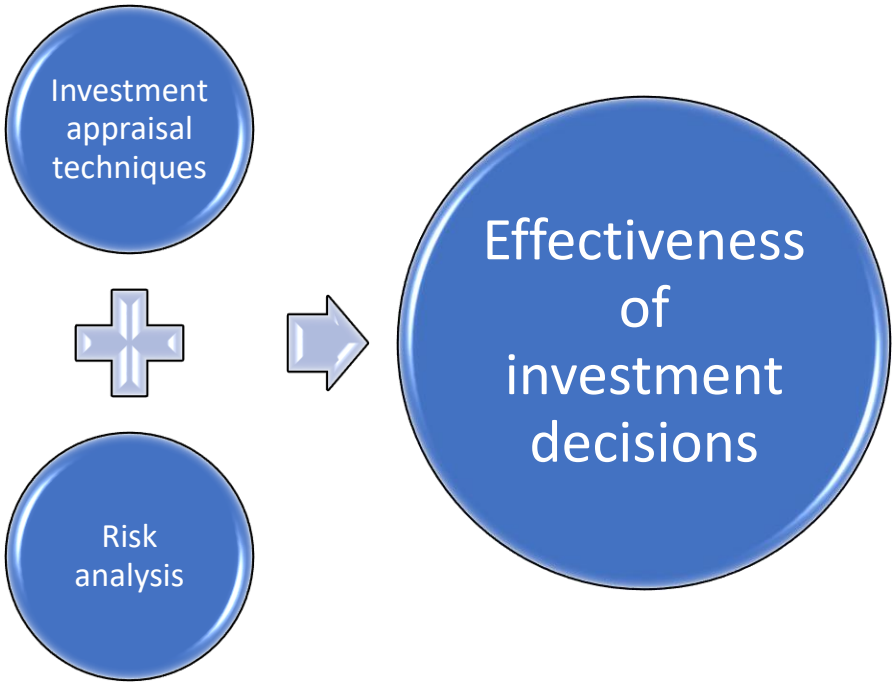

Figure 1 Conceptual framework

2.5 Conclusion

A listed company is a company of which the shares are traded on a stock exchange for which the most important reason is to raise money and spread the risk of ownership among a large group of shareholders. On the other hand, a budget is defined as a detailed plan which serves as an imperative tool in the stages of planning, execution and control, because more effective decisions can be made on this basis in the planning that can be included in the implementation and then check whether the actual result has been delivered as predicted in the planning. Based on the different studies that are done on capital budgeting, the point of view that will be used in this research is that capital budgeting/ investment appraisal lists the projects and investments that the company plans to undertake during the coming years with the ultimate goal to determine the effect of the decision(s) on the firm's cash flows, and evaluate the NPV (net present value) of these cash flows to assess the consequences of the decision(s) for the firm's value. The capital budgeting techniques that are more prevalent in today business world: NPV (net present value), PI (profitability index), IRR (internal rate of return), MIRR (modified internal rate of return), PB (payback), DPB (discounted payback) and ARR (accounting rate of return). Risk analysis is a critical aspect of the capital budgeting process, which involves the assessment of risks and the adjustment for risks and has capital budgeting tools available in making and supporting investment decision which support the capital budgeting techniques.

The risk analysis techniques that are prevalent are sensitivity analysis, scenario analysis, inflation adjusted cash flows, incremental internal rate of return, simulation, PERT/CPM, decision tree, complex mathematical model, linear programming, option pricing model and real options. The results of previous studies have indicated that NPV (net present value), PB (payback) and IRR (internal rate of return) are the most used capital budgeting techniques and sensitivity analysis and scenario analysis are the most used risk analysis techniques across the world. But a capital budgeting technique and the related risk analysis technique do no lead automatically to a successful capital budgeting decision. The conditions that lead to a successful capital budgeting decision are:

- the know-how about capital budgeting techniques and the impact each technique has on an investment decision;
- to continuously enrich knowledge about capital budgeting and investment decisions;
- to spend enough time in the analyzing of each capital budgeting project before an investment decision is taken;
- pre-calculation and re-calculation for every project should be made.

Hypotheses and propositions were formulated on the aforementioned theories. The following chapter presents the research framework of this study.

3. Methodology

This study focuses to examine the relationship between the use of capital budgeting practices and the effectiveness of investment decision making in Surinamese listed companies. Since the population only counts 12 listed companies, the whole population will be surveyed instead of a sample of the population. The data was collected in the months September 2020 till November 2020 by which the questionnaire was used as a survey instrument.

3.1 Research Approach

The approach to a research can be carried out by using the research process "onion" (Saunders e.a., 2008).

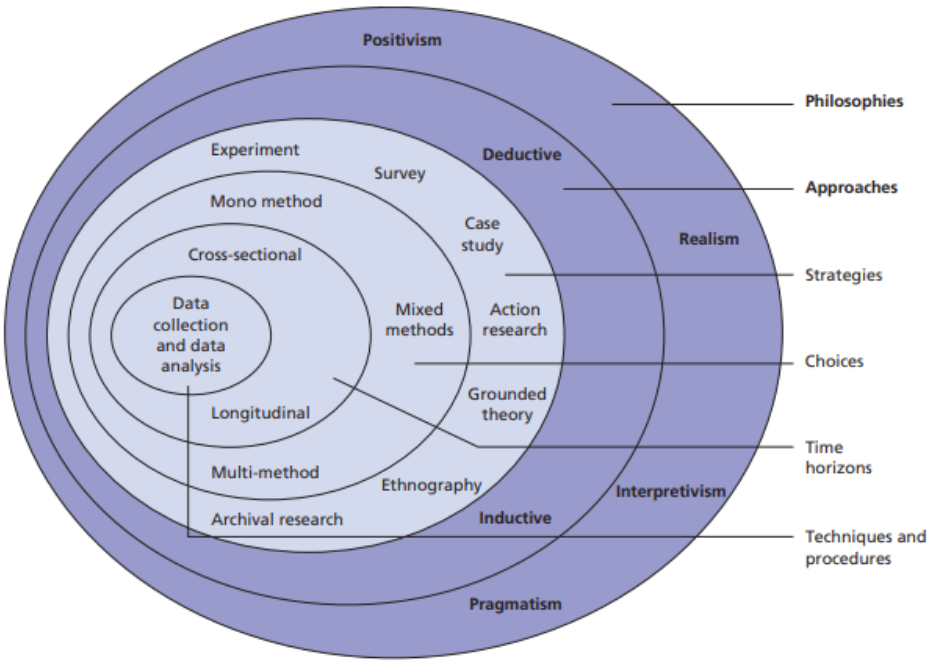

Figure 2 The research onion

Source: Mark Saunders, Philip Lewis and Adrian Thornhill 2008

The research approach has the inductive and deductive method on the bases of which a research should be done. The inductive method involves collecting data and developing a theory based on the collected data (Saunders e.a., 2008). The inductive research method can be defined as a logical process to arrive at the problem, based on previous observation of concrete

circumstances. The deductive method is a logical process for deriving a conclusion from previous assumptions (Zikmund e.a., 2013). The choice between deductive and inductive research can be determined on the basis of the problem definition (Zikmund e.a., 2013). Saunders ea. (2008) provide a number of criteria to determine which approach is applicable. One of the criteria indicates that when there is enough literature available on the topic; the deductive approach can be used. On the contrary, the inductive method can be used when the topic is new and there is still little literature for it.

This research is deductive in nature, because a lot of literature exist about this topic. Another reason for choosing the deductive way is that there is already existing researches and empirical evidence, with regard to the specific problem definition of this research.

3.2 Research Strategy

Yin (2003) has once said that each strategy can be used for empirical, exploratory, descriptive and explanatory research. There are many strategies of which some clearly belong to the deductive or inductive approach. Based on the explanation by Saunders e.a. (2008) the best strategy for this research is the questionnaire. The questionnaire strategy is associated with the deductive approach. This is also a popular and common strategy in business and management research and is most frequently used to answer who, what, where, how much, how many questions. It therefore tends to be used for exploratory and descriptive research. With this strategy quantitative data can be analyzed quantitatively using descriptive and inferential statistics.

3.3 Research Type

As the literature have explained, there are two basic research types, namely quantitative and qualitative. Quantitative is predominantly used as a synonym for any data collection technique (such as a questionnaire) or data analysis procedure (such as graphs or statistics) that generates or uses numerical data (Saunders e.a. 2008). In contrast, qualitative is used predominantly as a synonym for any data collection technique (such as an interview) or data analysis procedure (such as categorizing data) that generates or uses non-numerical data (Saunders e.a. 2008). They have also stated that a combination of quantitative and qualitative techniques (mixed method) can be used for the collection of primary and secondary data for a single research.

This research is based on mixed method, since this research is a combination of desk research, interview and survey. The qualitative part of this research is the desk research and the interviews and the quantitative part is the questionnaire. The CFOs of the listed companies were interviewed and surveyed. These details are presented in chapter 4.

3.4 Time horizons

Time horizon is divided in cross-sectional and longitudinal studies (Saunders e.a. 2008). A research is cross-sectional when the study is based on a particular phenomenon or phenomena at a particular time. Longitudinal research is observing people or events over time by which the researcher is able to exercise a measure of control over variables being studied, provided that they are not affected by the research process itself (Saunders e.a. 2008). According the literature, this research is a cross-sectional study.

3.5 Data collection and data analysis

This research uses secondary and primary data. Secondary data refers to data obtained from scientific articles, books and/ or internet resources. Primary data is mentioned when the data is collected through the questionnaires filled out by the Surinamese listed companies. The data collected from this study was analyzed by comparing the existing literature on this subject with the data gathered from the questionnaires.

3.6 Reliability and validity

The reliability of the study refers to whether the results will be the same if the research is repeated in exactly the same way. Because not all companies responded to the questionnaire, it is unlikely that the same results will be achieved when the survey is repeated. The primary purpose of reliability analysis is to analyze the internal consistency and reliability of each factor. The standard estimation of alpha coefficient is 0.70 (Hair e.a., 2010). Nunnally and Bernstein (1994) suggest that alpha coefficient of 0.50 or greater is adequate to conclude internal consistency. This study considered the alpha coefficient of 0.758, which means that this research is reliable (Appendix 4).

In case of validity, it is checked which instrument(s) is (are) used in the performance of the research. For this study, a questionnaire and interviews were used to collect data. A questionnaire is a tool for collecting data (Baarda, 2014). For the sake of clarity, it was

suggested to the respondents to conduct the interview from which angles the concepts of the research have been approached.

3.7 Research Methodology

This research is a combination of desk research and field research namely, questionnaire (that is included in appendix 3). One of the bases of the research is literature study to gain insight into what capital budgeting entail. Based on the literature study a few hypotheses and propositions are formulated. To get a clear insight into the current usage of capital budgeting by listed companies in Suriname, interviews are filled out by top-management of these companies. The formulated hypotheses are processed in these interviews. This section presents the conceptual model of this study, which is also a summary of the research methodology.

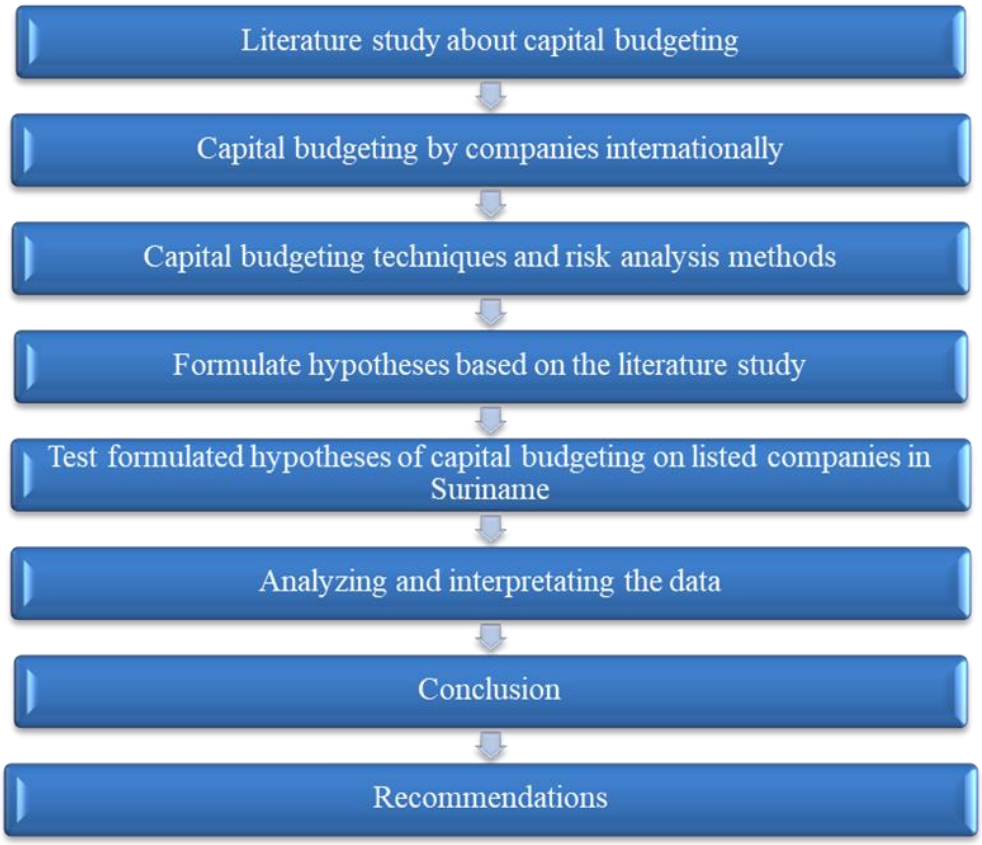

Figure 3 Framework research methodology

3.8 Conclusion

This chapter has described the study's methodology through discussing why certain data was collected, who the samples are, how the samples were chosen, what data was collected, when, from where, and how it was collected and analyzed. The research design incorporates methodological triangulation by using more than one method in collecting and analyzing the data. The study adopts a survey methodology combined with interviews. The following chapter provides a description of the gathered data and the analysis of it to test the propositions and hypotheses mentioned in the previous chapter.

4. Results

In this chapter, the Surinamese listed companies are presented. The data of the questionnaire and the interviews (appendix 3) are also analyzed and presented, by which the fourth and fifth sub questions are answered.

4.1 Surinamese listed companies

In listed companies there is a division of responsibility between the CEO and CFO. Based on the governance code, the CFO is responsible for internal business operations and information provision. The CFO coordinates the provision of financial and non-financial information, especially regarding financial accounting. The survey must be completed by the CFOs, because that capital budgeting is an internal business process for which the CFOs are responsible even though the CEOs are ultimately responsible.

There are 12 companies listed on the Surinamese stock exchange, which are:

- Assuria N.V.
- N.V. Consolidated Industries Corporation
- De Surinaamsche Bank N.V.
- N.V. Elgawa
- Hakrinbank N.V.
- N.V. VSH FOODS
- N.V. Surinaamse Assurantie Maatschappij Self Reliance
- Staatsolie Suriname N.V.
- Surinaamse Brouwerij N.V.
- N.V. Hotelmaatschappij Torarica
- Varossieau Suriname N.V.
- N.V. Verenigde Surinaamse Holdingmij

Of these companies, seven companies responded to the application for participation in this study, which is 58.33%. Four of the companies did not respond to the request to participate in this survey, despite attempts to contact them through various channels. One company indicated that it did not wish to participate in this survey. The percentage of 58.33 indicates that the validity of this research is adequate, which means that there are enough responses to make a responsible conclusion.

4.2 Quantitative data

The data of the questionnaire is described per section based on the frequency tables.

4.2.1 Information on the top management

Indicate your age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	35-44 years	2	25.0	28.6	28.6
	45-54 years	4	50.0	57.1	85.7
	55 years or above	1	12.5	14.3	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 1 Age

Source: SPPS data analysis

The vast majority of the respondents are in the age range of 45 – 54 years. This forms 57.1% of the total. 2 of the respondents are in the age range of 35 – 44 years, which is 28.6% and 14.3% is in the range of 55 years or above.

What is the highest level of academic qualification obtained by the top management (CFO)?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Professional qualification	1	12.5	14.3	14.3
	Undergraduate degree	2	25.0	28.6	42.9
	Postgraduate degree/Doctorate	3	37.5	42.9	85.7
	Other, please specify	1	12.5	14.3	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 2 Academic qualification

Source: SPPS data analysis

42.9% has obtained postgraduate degree or Doctorate, while 28.6% of the respondents have obtained undergraduate degree as academic qualification. 14.3% has stated to have a postdoctoral qualification and another 14.3% has professional qualification.

For how long did you work before you started up in this position?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3-5 years	1	12.5	14.3	14.3
	6-10 years	1	12.5	14.3	28.6
	More than 10 years	5	62.5	71.4	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 3 Work experience

Source: SPPS data analysis

5 of the respondents are working for more than 10 years, which forms 71.4%. On the other hand, 14.3% has a work experience of 3 – 5 years and the other 14.3% has been working for 6 – 10 years.

For how long are you in this position in this company?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2 years or less	2	25.0	28.6	28.6
	3-5 years	1	12.5	14.3	42.9
	6-10 years	3	37.5	42.9	85.7
	More than 15 years	1	12.5	14.3	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 4 Position experience

Source: SPPS data analysis

Only 28.6% has indicated to work 2 years or less in the top management position. 14.3% works 3 – 5 years in this position for the company, while 42.9% say that they work already 6 – 10 years in its positions. There is 14.3% of the respondents that has a work experience of more than 15 years in this position.

Relevant work experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	6	75.0	85.7	85.7
	No	1	12.5	14.3	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 5 Relevant work experience

Source: SPPS data analysis

85.7% indicate relevant work experience as the best area which represents their positions in these companies.

Trial and Error					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	7	87.5	100.0	100.0
Missing	System	1	12.5		
Total		8	100.0		

Table 6 Trial and Error

Source: SPPS data analysis

None of the respondents have indicated that trial and error is the best area to represents their positions in these companies.

Related educational background					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	4	50.0	57.1	57.1
	No	3	37.5	42.9	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 7 Related educational background

Source: SPPS data analysis

57.1% indicate related educational background as the best area which represents their positions in these companies.

Life experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	7	87.5	100.0	100.0
Missing	System	1	12.5		
Total		8	100.0		

Table 8 Life experience

Source: SPPS data analysis

None of the respondents have indicated that life experience is the best area to represents their positions in these companies.

This indicates that life experience or trial and error does not have a relevant added value in the representation of their positions in these companies, while related educational background and relevant work experience have.

4.2.2 Information of the company

Can you please indicate how many years this company is operating?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More than 10 years	7	87.5	100.0	100.0
Missing	System	1	12.5		
Total		8	100.0		

Table 9 Company operational time

Source: SPPS data analysis

All the surveyed companies are already operating more than 10 years.

What is the main activity of this company?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Hospitality	1	12.5	14.3	14.3
	Insurance	2	25.0	28.6	42.9
	Manufacturing	2	25.0	28.6	71.4
	Utility and Energy	1	12.5	14.3	85.7
	Other, please specify	1	12.5	14.3	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 10 Core business

Source: SPPS data analysis

These companies are in the following core businesses: 14.3% in hospitality, 28.6% in insurance, 28.6% in manufacturing, 14.3% in utility and energy and 14.3% in logistics and investment.

What is the total number of employees in this company?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	50-250 employees	4	50.0	57.1	57.1
	More than 250 employees	3	37.5	42.9	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 11 Number of employees

Source: SPPS data analysis

57.1% of the companies have indicated to have 50 – 250 employees in their companies, while 42.9% have more than 250 employees. This indicates that these listed companies belong to the categories of large and medium sized companies.

4.2.3 Use of capital budgeting techniques

How regular are investment decisions made within your company?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-2 times per year	3	37.5	42.9	42.9
	5-10 times per year	1	12.5	14.3	57.1
	More than 10 times per year	3	37.5	42.9	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 12 Number of employees

Source: SPPS data analysis

No less than 42.9% have indicated that 1 – 2 times per year investment decisions are made within the companies. In 14.3% of the company's investment decisions are made 5 – 10 times per year within the companies, while another 42.9% stated to have investment decisions more than 10 times per year.

What is the main goal with financial investments?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Maximize shareholders wealth	3	37.5	42.9	42.9
	Long term operational security	1	12.5	14.3	57.1
	Other, please specify	3	37.5	42.9	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 13 Main goal with financial investments

Source: SPPS data analysis

According the data maximizing shareholders wealth with a percentage of 42.9 is the main goal of financial investments. 14.3% have indicated long term operational security as main goal with financial investments. One of the respondents has indicated value creation for the company on the mid-long term as the main goal, while the main goal by the other 2 companies were innovation, efficiency, sustainability of the company and maximizing the return on invested capital.

Do you measure the success of the investment by tracking on the results e.g. return on invested capital?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	5	62.5	71.4	71.4
	No	2	25.0	28.6	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 14 Measurement the success of the investment

Source: SPPS data analysis

71.4% have said that they measure the success of the investment by tracking on the results of return on invested capital, while 28.6% have indicated that they did not measure this way.

Do you compare the results of the investment with the original plan/budget?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	7	87.5	100.0	100.0
Missing	System	1	12.5		
Total		8	100.0		

Table 15 Comparison of the results of the investment

Source: SPPS data analysis

All the companies compare the results of the investment with the original plan/budget.

Is there any specific stakeholder that pressures for the use of capital budgeting tools in decision making?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Board of directors	3	37.5	42.9	42.9
	Management	1	12.5	14.3	57.1
	Other, please specify	3	37.5	42.9	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 16 Stakeholder Pressure

Source: SPPS data analysis

42.9% indicated that the board of director pressurized the use of capital budgeting tools in decision making, while 14.3% indicated to been pressurized by management for it. 14.3% have indicated that for not being pressurized by anyone to use capital budgeting tools, while the other 2 companies indicated to be pressurized the shareholders, board of directors, management, authorities and the holding company.

Does your company use calculations to support decision-making?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	7	87.5	100.0	100.0
Missing	System	1	12.5		
Total		8	100.0		

Table 17 Calculations to support decision-making

Source: SPPS data analysis

100% of the respondents have agreed that their companies use calculations to support the decision making.

How often do you reject investment opportunities based on calculated results?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Sometimes	6	75.0	85.7	85.7
	Rarely	1	12.5	14.3	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 18 Frequency of rejections of investment opportunities

Source: SPPS data analysis

14.3% say that they rarely reject investment opportunities based on the calculated results. On the contrary 85.7% say that sometimes they reject investment opportunities based on the calculated results.

Does your firm have a capital investment manual guideline (written and clear policies/processes regarding decision-making)?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	5	62.5	71.4	71.4
	No	2	25.0	28.6	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 19 Capital investment manual guideline

Source: SPPS data analysis

71.4% of the companies has a capital investment manual guideline, while 28.6% not.

Does your company use capital budgeting techniques to make investment decisions?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	6	75.0	85.7	85.7
	No	1	12.5	14.3	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 20 Use of capital budgeting techniques to make investment decisions

Source: SPPS data analysis

Almost 85.7% of the companies use capital budgeting techniques to make investment decisions. This makes it clear that the listed companies in Suriname nevertheless apply capital budgeting techniques to a certain extent before an investment decision is made.

4.2.4 Capital budgeting techniques

Net Present Value					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	3	37.5	42.9	42.9
	Often	1	12.5	14.3	57.2
	Sometimes	1	12.5	14.3	71.5
	Rarely	1	12.5	14.3	85.7
	Never	1	12.5	14.3	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 21 Use of NPV (net present value)

Source: SPPS data analysis

42.9% of the companies indicate that they always use net present value, while 57.1% proportionally indicate that they use net present value from often to never.

Profitability index					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	1	12.5	14.3	14.3
	Rarely	2	25.0	28.6	42.9
	Never	4	50.0	57.1	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 22 Use of PI (profitability index)

Source: SPPS data analysis

57.1% have indicated that their companies never used profitability index for investment decisions, followed by 28.6% that use this method rarely. Only 14.3% have stated to use this method always for their capital budgeting decisions.

Internal rate of return					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	1	12.5	14.3	14.3
	Often	2	25.0	28.6	42.9
	Sometimes	1	12.5	14.3	57.1
	Never	3	37.5	42.9	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 23 Use of IRR (internal rate of return)

Source: SPPS data analysis

Internal rate of return is never used by 42.9% of the companies. 14.3% of the surveyed companies have indicated that this method is used sometimes by them, followed by 28.6% that use it often and 14.3% that use this method always.

Modified internal rate of return					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	7	87.5	100.0	100.0
Missing	System	1	12.5		
Total		8	100.0		

Table 24 Use of MIRR (modified internal rate of return)

Source: SPPS data analysis

None of the companies that participated in this survey has ever used modified internal rate of return as a technique to make investment decisions.

Payback period					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	1	12.5	14.3	14.3
	Often	2	25.0	28.6	42.9
	Sometimes	1	12.5	14.3	57.1
	Never	3	37.5	42.9	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 25 Use of PB (payback period)

Source: SPPS data analysis

Only 14.3% use payback period always for their investment decisions, while the use of the others is divided as follow: 28.6% often, 14.3% sometimes and 42.9% never.

Discounted payback period					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Rarely	1	12.5	14.3	14.3
	Never	6	75.0	85.7	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 26 Use of DPB (discounted payback period)

Source: SPPS data analysis

A small group of the companies have indicated that they use discounted payback period rarely, which is 14.3%. The remaining 85.7% say that they never use the discounted payback period as capital budgeting technique.

Accounting rate of return					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Often	2	25.0	28.6	28.6
	Never	5	62.5	71.4	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 27 Use of ARR (accounting rate of return)

Source: SPPS data analysis

The vast majority of 71.4% have never use the accounting rate of return, while only 28.6% have indicated that they use it often for their investment decisions.

Is there at least one employee assigned full time to capital investment analysis?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	1	12.5	14.3	14.3
	No	6	75.0	85.7	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 28 Full time employee for capital investment analysis

Source: SPPS data analysis

14.3% of the surveyed companies have a full-time employee who is assigned for capital investment analysis, while the other 85.7% do not have employees who are specific assigned for these types of analysis.

Is risk consideration always vital, when your company makes a decision on an investment opportunity?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	6	75.0	85.7	85.7
	No	1	12.5	14.3	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 29 Vital risk consideration

Source: SPPS data analysis

85.7% of the companies experience that risk consideration is always vital, when their companies make a decision on an investment opportunity. On the contrary, 14.3% stated to not experience this. This indicates that the companies know what the impact of an incorrect investment decision could be on the company.

4.2.5 Risk analysis Techniques

Sensitivity analysis					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	1	12.5	14.3	14.3
	Often	4	50.0	57.1	71.4
	Never	2	25.0	28.6	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 30 Use of Sensitivity analysis

Source: SPPS data analysis

14.3% of the companies are always using sensitivity analysis for their risk consideration for every investment decision, while 57.1% use this method often followed by 28.6% that never used this method.

Scenario analysis					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	2	25.0	28.6	28.6
	Often	3	37.5	42.9	71.4
	Sometimes	1	12.5	14.3	85.7
	Never	1	12.5	14.3	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 31 Use of Scenario analysis

Source: SPPS data analysis

Scenario analysis is always used by 28.6% of the surveyed companies, followed by 42.9% often, 14.3% sometimes and 14.3% never.

Inflation adjusted cash flows					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Often	1	12.5	14.3	14.3
	Never	6	75.0	85.7	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 32 Use of Inflation adjusted cash flows

Source: SPPS data analysis

The vast majority of the companies have never used inflation adjusted cash flows for risk analysis, which is 85.7%. Only 14.3% have indicated that this method is used often by them.

Incremental internal rate of return					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Often	1	12.5	14.3	14.3
	Rarely	1	12.5	14.3	28.6
	Never	5	62.5	71.4	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 33 Use of Incremental internal rate of return

Source: SPPS data analysis

71.4% have stated that their companies never used incremental internal rate of return, while 14.3% have indicated to use this method often and rarely.

Simulation					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Often	1	12.5	14.3	14.3
	Sometimes	1	12.5	14.3	28.6
	Never	5	62.5	71.4	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 34 Use of Simulation

Source: SPPS data analysis

14.3% of the companies have often or sometimes used the simulation while 71.4% never used it.

PERT/CPM					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	7	87.5	100.0	100.0
Missing	System	1	12.5		
Total		8	100.0		

Table 35 Use of PERT/CPM

Source: SPPS data analysis

All the surveyed companies have indicated that they never used the PERT/CPM.

Decision Tree					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Rarely	1	12.5	14.3	14.3
	Never	6	75.0	85.7	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 36 Use of Decision Tree

Source: SPPS data analysis

14.3% of the companies have stated that decision tree is rarely used by them, while 85.7% have stated that they have never used this method.

Complex mathematical model					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	7	87.5	100.0	100.0
Missing	System	1	12.5		
Total		8	100.0		

Table 37 Use of Complex mathematical model

Source: SPPS data analysis

All the surveyed companies have indicated that they never used complex mathematical model.

Linear programming					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	7	87.5	100.0	100.0
Missing	System	1	12.5		
Total		8	100.0		

Table 38 Use of Linear programming

Source: SPPS data analysis

All the surveyed companies have indicated that they never used linear programming.

Option pricing model					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Often	1	12.5	14.3	14.3
	Never	6	75.0	85.7	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 39 Use of Option pricing model

Source: SPPS data analysis

85.7% have never used the option pricing model for their risk analysis, but 14.3% have mentioned to use this method often.

Real options					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	7	87.5	100.0	100.0
Missing	System	1	12.5		
Total		8	100.0		

Table 40 Use of Real options

Source: SPPS data analysis

All the surveyed companies have indicated that they never used real options.

Does your company conduct post audit of major capital expenditure					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	5	62.5	71.4	71.4
	No	2	25.0	28.6	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 41 Post audit of major capital expenditure

Source: SPPS data analysis

From all the respondents 71.4% have claimed that their companies conduct post audit of major capital expenditure, while 28.6% have said not to do this. The conduction of post audit of major expenditure is considered as a condition for successful usage of capital budgeting.

4.2.6 Views on capital budgeting techniques

Which capital budgeting technique(s) does your company use mostly during capital budgeting projects?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Net Present Value	3	37.5	42.9	42.9
	Profitability index	1	12.5	14.3	57.1
	Internal rate of return	2	25.0	28.6	85.7
	Payback period	1	12.5	14.3	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 42 Mostly used capital budgeting technique(s)

Source: SPPS data analysis

42.9% of the respondents have indicated net present value as the capital budgeting technique that is used mostly during capital budgeting projects, followed by internal rate of return for 28.6% and profitability index and payback period for 14.3% each. The reasons why companies use these methods is the fit of the purpose, but also the lack of information for adequate methods that makes it impossible to use other methods.

Which risk analysis technique(s) does your company use mostly during capital budgeting projects?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Sensitivity analysis	4	50.0	57.1	57.1
	Scenario analysis	2	25.0	28.6	85.7
	Other, please specify	1	12.5	14.3	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 43 Mostly used risk analysis technique(s)

Source: SPPS data analysis

Besides this, the surveyors have stated sensitivity analysis as the mostly used risk analysis techniques during capital budgeting projects, followed by scenario analysis for 28.6%. The lack of experience and information in the other risk analysis techniques are the reasons for the usage of sensitivity analysis and scenario analysis.

Effectiveness of the investment decision					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	4	50.0	57.1	57.1
	Often	2	25.0	28.6	85.7
	Sometimes	1	12.5	14.3	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Table 44 Effectiveness of the investment decision

Source: SPPS data analysis

Further it has been indicated by 57.1% of the surveyed companies that their investment decisions are always effective, followed by 28.6% which have often effective investment decisions. 14.3% of these companies have said that their investment decisions are sometimes effective. The effectiveness of the investment decisions is measured on the bases of the success of these projects. However, the quantitative data for calculating the effectiveness ratio is not included in this study.

4.3 Qualitative data

The qualitative data collected from these seven companies is described below to have a better picture of capital budgeting in Suriname.

The table below presents an overview of the big investments by the Surinamese listed companies, which is between SRD 11,000,000.00 and SRD 200,000,000.00 approximately. Most of these investments are done for the construction of building, factory, equipment, industry, etc.

Companies	Biggest Investment	Reason of investment
A	SRD 11,000,000.00	Construction of new factory
B	SRD 15,000,000.00	Construction of new building and repurchase of production equipment
C	SRD 83,200,000.00	Equipment
D	SRD 330,000,000.00	Industry
E	USD 12,000,000.00*	Construction of building
F	Not given	Building and acquisitions of companies
G	Not given	Not given

**: Due to the fluctuating exchange rate, this investment has not been converted into Surinamese dollars*

Table 45 Biggest Investment Projects

The annual reports of these surveyed listed companies are available on their website, which should be a trigger for other companies to improve in the availability of their annual reports in Suriname. It can be hoped that the implementation of the law on the annual accounts will have a positive impact on this.

According these companies, investment decision is based on criteria established by the management and supervisory board and fits within the strategic, tactical and operational business goals. It is the decision to commit or to not commit for a relatively large expenditure with the aim of achieving a positive return in the medium to long term. In short, it is a decision on the outflow of cash against which future cash flow is income that must achieve a predetermined return. The Surinamese listed companies evaluate investment projects based upon the expected value a capital project brings for the company and the risks the capital project brings. As the ROI (return on investment), expressed in money, as other qualitative aspects can

play a role (e.g., employee satisfaction, security, brand awareness) in the evaluation of an investment project. Investment trajectory is assessed on the return and must have added value in realizing the strategic objectives. It has turned out that the companies in Suriname usually use NPV (net present value) and IRR (internal rate of return) as capital budgeting techniques and sensitivity analysis and scenario analysis as risk analysis tools. The reason to use these types of techniques are the fit of the purpose, the business environment and be mastered by the staff who's responsible for the capital budgeting. Most of the companies tries to keep it simple and use the technique in which they have the most experience, because of the lack of expertise and experience. Apart from the utility company, all companies indicate that they do not apply any other method in their investment decision besides the capital budgeting technique they have indicated. This company has its dedicated techniques to support decisions to be made on where, how, when, who (what contractor) and how its core business will invest. *Inflation adjusted cash flow* is a method that some of the listed companies wants to use for investment decisions, but the lack of information makes this impossible. The rest of the companies stated that adequate methods are available, but it is more a matter of sticking to the method. The 2 companies that do not use sensitivity analysis are interested to use this method to obtain a better picture and estimate risks in different situations. One of the companies is interested in the use of complex mathematical model, real options, but the lack of expertise and information is an obstacle for this. The factors that Surinamese listed companies take into consideration when selecting capital budgeting projects are macro-economic development; liquidity; development of the sector; long-term strategic plans; value and risk; amount to be invested; positive net present value; payback period; internal rate of return; alternative options; incremental income and cash flow. These companies also observe if the outcome for the capital budgeting practice can be either positive or negative. It is also mentioned by these companies that payback period method is used sometimes for an estimation in the early process to decide if the analysis of the investment will be worth it. They have stated that capital expenditure is easy to budget, but there are often uncertainties / risks with the return on investment. A few of the involved companies also make a ranked list of capital projects with allocated budgets and see whether the project meets the return they have set. Beside the outcome of the use of the capital budgeting method other observations can be made about the capital budgeting practices in the company. Capital budgeting decisions are not primarily based on capital budgeting techniques, but relies heavily on the non-quantitative aspects such as risks; alternative solutions and management's judgement. These are theoretical methods useful for preliminary assessment. This should assess projects afterwards more often and analyze whether the targets set in advance have been

achieved. Also due to rapidly changing market conditions (covid-19 and the financial and political situation in particular) it is not easy to determine what budget levels are available, so difficult decisions are to be made, and have to be re-considered when conditions change. A shortfall in the use of capital budgeting technique could be the currency troubles around the Surinamese dollars. The lack of information available to perform exertions is also a major shortfall in the usage of capital budgeting. The size of most companies in Suriname and the investments values do not require complex techniques to evaluate investment decisions. That is why simpler techniques like payback period or net present value should be encouraged to adopt to at least quantify the investment decision. Companies should just apply the techniques as intended and stick to them. Table 4 presents a list of opportunities, challenges and hindrances for evaluating and making investment decisions in Suriname.

Opportunities	• For listed companies which are internationally operating, they can use their experience abroad and achieve returns that are higher than abroad.
Challenges	• Analysis must always be done in USD due to hyperinflation situation • The political situation and thus the economic climate • Coming period is crucial to bend the curve in the right direction
Hindrances	• The interest rate on loans in Suriname is very high • The fluctuating exchange rate of the Surinamese dollars

Table 46 Opportunities, Challenges and Hindrances

4.4 Discussion of the propositions and hypothesis tests

This section presents a discussion of the study. The discussion of results is classified into two groups according sub and main hypotheses. Existing literature and questionnaire result, which were conducted in the 7 companies, will be used to support the discussion.

4.4.1 Propositions

The propositions which are formulated based on the literature studies are evaluated and described through the gathered data.

Proposition 1: NPV (net present value) is the most known and used robust technique of investment analysis.

As the frequency tables have shown (appendix 2), the NPV (net present value) is the most used capital budgeting technique by the surveyed companies. This is for 42.9% of the total. This result explains also that the net present value is the most known technique, which substantiated by the frequency tables. In short, this proposition is correct.

Proposition 2: IRR (internal rate of return) is difficult to calculate, unrealistic assumption for reinvestment and negative or multiple results.

IRR (internal rate of return) is used as the second mostly used capital budgeting technique by the listed companies in Suriname (appendix 2), by which companies have stated that they are trying to use simple capital budgeting techniques, which they understand easily and have the most experience in it. The first part of the proposition that says *"IRR (internal rate of return) is difficult to calculate"* is not common for the Surinamese situation by the statements of the surveyed companies. There is no information given by these companies to do statement on the second part of the proposition.

Proposition 3: Firms used MIRR (modified internal rate of return) to rank multiple investments or projects they undertake.

According the frequency tables of appendix 2 none of the listed companies included in this research have ever used the MIRR (modified internal rate of return) for their investment decisions, which makes it more than logical that they do not use this technique, although a few of the involved companies also indicated to make a ranked list of capital projects with allocated budgets to see whether the project meets the return they have set.

Proposition 4: The PI (profitability index) is a measure of a project's or investment's attractiveness.

The vast majority of the surveyed companies do not use the PI (profitability index) technique for their investment decisions and they do not even have mentioned how the attractiveness of a project or investment is measured. So, a statement for this proposition cannot be made for the Surinamese companies on the stock market.

Proposition 5: PB (payback period) is used to determine whether to go through with an investment.

The Surinamese listed companies have indicated that they use PB (payback period) method in some cases for an estimation to decide if the analysis of the investment will be worth it. This means that PB (payback period) determine if they should work their analysis out to make a decision for that specific investment. Thus, this proposition also applies to Suriname.

Proposition 6: DPB (discounted payback period) has no concrete decision criteria that tell firms whether the investment increases the firm's value.

Since 85.7% of the surveyed companies have never used the DPB (discounted payback period) method for their investment decision, in contrary with 14.3% (appendix 2) that have used this method rarely, no statement can be made on this proposition.

Proposition 7: ARR (accounting rate of return) is simple to calculate and understand.

The ARR (accounting rate of return) method is not used for the vast majority by the listed companies in Suriname and these companies even have indicated that they are trying to use simple capital budgeting techniques, which they understand easily and have the most experience in it. This means that this proposition is not common for Surinamese listed companies.

4.4.2 Hypothesis

The hypotheses are tested and described based on the gathered data by using regression, that are presented.

H_1: There is a significant relationship between the use of investment appraisal techniques and effectiveness of investment decisions.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.971[a]	.943	.931	.392

a. Predictors: (Constant), Effectiveness of the investment decision

Table 47 Model Summary of hypothesis 1

Source: SPPS data analysis

The correlation coefficient (R) is very high, namely, 0.971 and the R square is also high, which is 0.943. The used investment appraisal techniques explain for 94.3% the effectiveness of the investment decisions.

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.659	1	12.659	82.286	.000[b]
	Residual	.769	5	.154		
	Total	13.429	6			
a. Dependent Variable: Which capital budgeting technique(s) does your company use mostly during capital budgeting projects?						
b. Predictors: (Constant), Effectiveness of the investment decision						

Table 48 ANOVA of hypothesis 1

Source: SPPS data analysis

The ANOVA (Analysis of variance), tests the significance of the regression model and the probability of observing a value of 82.286 or greater with these degrees of freedom is less than 0.001. Therefore, we can conclude that this regression model contains significant explanatory variables.

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.615	.353		-1.746	.141
	Effectiveness of the investment decision	1.846	.204	.971	9.071	.000
a. Dependent Variable: Which capital budgeting technique(s) does your company use mostly during capital budgeting projects?						

Table 49 Coefficients of hypothesis 1

Source: SPPS data analysis

The probability of observing a value of 9.071 or greater is less than 0.0001 in the coefficients table, which means that the effect of the capital budgeting technique on the effectiveness of the investment decisions is significant. Thus, H_1 is correct. There is a significant relationship between the use of investment appraisal techniques and effectiveness of investment decisions. In short, the used capital budgeting technique determines the effectiveness of the investment decision.

H_2: There is a significant relationship between use risk analysis techniques and effectiveness of investment decisions.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.592[a]	.350	.221	3.584
a. Predictors: (Constant), Effectiveness of the investment decision				

Table 50 Model Summary of hypothesis 2

Source: SPPS data analysis

The correlation coefficient (R) is 0.592 and the R square is 0.350. This means that the used risk analysis techniques explain for 35% the effectiveness of the investment decisions, which is very weak.

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.647	1	34.647	2.698	.161[b]
	Residual	64.211	5	12.842		
	Total	98.857	6			
a. Dependent Variable: Which risk analysis technique(s) does your company use mostly during capital budgeting projects?						
b. Predictors: (Constant), Effectiveness of the investment decision						

Table 51 ANOVA of hypothesis 2

Source: SPPS data analysis

The ANOVA (Analysis of variance), tests the significance of the regression model and the probability of observing a value of 2.698 or greater with these degrees of freedom is greater than 0.001. Thus, this regression model does not contain significant explanatory variables.

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.474	2.964		-.497	.640
	Effectiveness of the investment decision	2.526	1.538	.592	1.643	.161
a. Dependent Variable: Which risk analysis technique(s) does your company use mostly during capital budgeting projects?						

Table 52 Coefficients of hypothesis 2

Source: SPPS data analysis

The probability of observing a value of 1.643 or greater is greater than 0.0001 in the coefficients table, which means that the effect of the risk analysis technique on the effectiveness of the investment decisions is not significant. Thus, H_2 is not correct. There is no significant relationship between the use of risk analysis techniques and effectiveness of investment decisions. In short, the used risk analysis technique does not determine the effectiveness of the investment decision.

H_3: There is a significant relationship between the use of investment appraisal techniques and the use of the risk analysis techniques.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.804[a]	.646	.575	.975
a. Predictors: (Constant), Which risk analysis technique(s) does your company use mostly during capital budgeting projects?				

Table 53 Model summary of hypothesis 3

Source: SPPS data analysis

The correlation coefficient (R) is high, namely 0.894 and the R square is 0.646. This means that the used investment appraisal techniques explain for 64.6% the effectiveness of the investment decisions, which is mediocre.

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.676	1	8.676	9.127	.029[b]
	Residual	4.753	5	.951		
	Total	13.429	6			
a. Dependent Variable: Which capital budgeting technique(s) does your company use mostly during capital budgeting projects?						
b. Predictors: (Constant), Which risk analysis technique(s) does your company use mostly during capital budgeting projects?						

Table 54 ANOVA of hypothesis 3

Source: SPPS data analysis

The ANOVA (Analysis of variance), tests the significance of the regression model and the probability of observing a value of 9.127 or greater with these degrees of freedom is greater than 0.001. Thus, this regression model does not contain significant explanatory variables.

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.439	.463		3.109	.027
	Which risk analysis technique(s) does your company use mostly during capital budgeting projects?	.296	.098	.804	3.021	.029
a. Dependent Variable: Which capital budgeting technique(s) does your company use mostly during capital budgeting projects?						

Table 55 Coefficients of hypothesis 3

Source: SPPS data analysis

The probability of observing a value of 3.021 or greater is greater than 0.0001 in the coefficients table, which means that the effect of the investment appraisal techniques on the risk analysis technique is not significant. Thus, H_3 is not correct. There is no significant relationship between the use of investment appraisal techniques and risk analysis techniques. In short, the used investment appraisal techniques do not determine the risk analysis techniques.

4.5 Conclusion

The vast majority of the respondents have indicated NPV (net present value) as the capital budgeting technique that is used mostly for investment decisions, followed by IRR (internal rate of return), PI (profitability index) and PB (payback period). The sensitivity analysis is the mostly used risk analysis techniques during capital budgeting projects. Scenario analysis is the second mostly used risk analysis technique for capital budgeting projects. More than half of the respondents have been indicated that their investment decisions are always effective, followed by often effective and sometimes effective.

The NPV (net present value) is in among the Surinamese listed companies also the most known and used robust technique of investment analysis. These companies are also not experiencing IRR (internal rate of return) as a difficult technique. No statement can be made on the

proposition regarding the MIRR (modified internal rate of return) method, since none of the surveyed companies have ever used this. This also applies to the PI (profitability index) method. The research has presented evidence that the listed companies in Suriname use PB (payback period) to decide whether to go through with an investment. Since all the surveyed companies have rarely to never used the DPB (discounted payback period) technique, no statement can be made on the proposition regarding this technique. The ARR (accounting rate of return) is not simple to calculate and understand according the surveyed companies, since they have stated to prefer simple techniques which are easy to understand.

There is a significant relation between the used investment appraisal technique and the effectiveness of the investment, which means that the effectiveness of an investment decisions is determined by the used investment appraisal techniques. The significant relation between the used risk analysis technique and the effectiveness of the investment decisions is not supported by the gathered data, which means that the effectiveness of an investment decisions is not determined by the used risk analysis techniques. The relation between the used investment appraisal technique and the used risk analysis technique is also not proved, which means that the used investment appraisal technique does not determine the used risk analysis technique.

The following also the final chapter presents a summary of the answers of all the sub questions followed by the research question, by which the conclusions, recommendations, limitations and further will be described.

5. Conclusion

This chapter draws conclusions of the study. It reviews the results of the study and its contribution to the literature by summarizing the answers of the sub questions which should lead to the answer of the main research question. The final sections discuss the limitations of the study and offer suggestions for future research.

5.1 Sub questions

In this section, the answers of each sub question are summarized to have an overall overview of this study.

What are listed companies and their characteristics related to investments?

A listed company is a company of which the shares are traded on a stock exchange for which the most important reason is to raise money and spread the risk of ownership among a large group of shareholders. There is also empirical evidence of all the characteristics of going public for those companies. The characteristics of these companies which are related to investments are:

- To easily be able to raise additional funds through the issuance of more stock and have additional leverage when obtaining loans from financial institutions
- To set a higher price for its securities by going public than through private placement
- To enhance the ability to borrow
- To enhance the ability to raise equity
- To evaluate liquidity and valuation

What does capital budgeting entail?

A budget is a detailed plan which serves as an imperative tool in the stages of planning, execution and control, because more effective decisions can be made on its basis in the planning that can be included in the implementation and then check whether the actual result has been delivered as predicted in the planning. Capital budgeting/ investment appraisal lists the projects and investments that a company plans to undertake during the coming years with the ultimate goal to determine the effect of the decision on the firm's cash flows, and evaluate the net present value of these cash flows to assess the consequences of the decision for the firm's value. There are 7 investment appraisal techniques that are more prevalent in today's business world. NPV

(net present value) lays emphasis on time value of money and is consistent with the objective of wealth maximization. On the other hand, this method is difficult to compute and can mislead the investor or firm since it does not represent the actual project returns. IRR (internal rate of return) is the discount rate that makes the present value of its inflows equal to its cost. IRR (internal rate of return) has basically the same advantages for using it as NPV (net present value), but this is difficult to calculate, unrealistic assumption for reinvestment and negative or multiple results. MIRR (modified internal rate of return) was introduced to overcome the limitations of multiple IRRs (internal rate of returns) with the consistency of NPV (net present value) and has the same basic advantages as NPV (net present value) and IRR (internal rate of return). But this method has literally less disadvantages than IRR (internal rate of return). In PI (profitability index), the ratio of present value of cash inflows to present value of cash outflow is calculated and the decision is taken on the basis of this. The merits of this method are the same as the merits mentioned in the previous methods, but it is also shown that PI (profitability index) method may rank projects incorrectly when comparing mutually exclusive projects. PB (payback period) is the time period required to recover the original cost of investment. This method is easy to use, but ignores the time factor and time value of money. DPB (discounted payback period) method gives the number of years as result that takes to break even from undertaking the initial expenditure, by discounting future cash flows and recognizing the time value of money. The merits and demerits of DPB (discounted payback period) are the same as of PB (payback period), but are less then it. ARR (accounting rate of return) is based on accounting profits and is one of the simplest methods for the evaluation of capital projects. But on the other side, no consideration of the time factor is the greatest demerit of this method. The main DCF (discounted cash flow) methods are NPV (net present value) and IRR (internal rate of return), while the main non-DCF (non-discounted cash flow) methods include PB (payback) and ARR (accounting rate of return). DCF (discounted cash flow) is a valuation method that is used to estimate the value of an investment based on its future cash flows. DCF (discounted cash flow) analysis attempts to figure out the value of an investment today, based on projections of how much money it will generate in the future. On the contrary, a non-discounted method does not explicitly consider the time value of money. In other words, each dollar earned in the future is assumed to have the same value as each dollar that was invested many years earlier. DCF (discounted cash flow) methods known as sophisticated techniques consider the risk adjusted discounted net cash flows expected from a project. Non-DCF (non-discounted cash flow) methods known as naïve method does not use cash flow approach in contrast consider present value or incorporate risk in systematic way. The NPV (net present value) is the most

accurate and sophisticated technique on the bases of pure theoretical point of view. The IRR (internal rate of return) is typically seen as the next best method. The non-DCF (non-discounted cash flow) methods are considered to be less accurate and, of which the PB (payback period) method is typically seen as the least sophisticated. Furthermore, risk analysis is a critical aspect of the capital budgeting process. Risk analysis involves the assessment of risk and the adjustment for risk. There are various supplementary capital budgeting tools available in making and supporting investment decision besides the investment appraisal techniques, namely sensitivity analysis, scenario analysis, inflation adjusted cash flows, incremental internal rate of return, simulation, PERT/CPM, decision tree, complex mathematical model, linear programming, option pricing model and real options

What are the conditions for a successful application of capital budgeting?

The key points that can lead to a successful capital budgeting decision, are:

- Accuracy of the projected cash flows
- Meaningful and accurate residual or terminal value
- Consciousness of the impact to cash flow from changes in working capital
- Caution not to overestimate a residual or terminal value
- Expertise and experienced employee to calculate accurate and reasonable cash flows
- Accurate forecasting of the business activities

Which capital budgeting techniques are generally identified and used by listed companies in Suriname?

The NPV (net present value) is generally identified and used by listed companies in Suriname, followed by the IRR (internal rate of return), PI (profitability index) and PB (payback period). The vast majority of the listed companies use sensitivity analysis mostly as risk analysis techniques during capital budgeting projects, followed by scenario analysis. Further it has been indicated that the investment decisions of these companies are overall always effective, followed by often or sometimes effective. The reason to use these techniques are the fit of the purpose, the business environment and be mastered by the staff who's responsible for the capital budgeting. Most of the companies tries to keep it simple and use the technique in which they have the most experience. All of the companies indicate that they do not apply any other method in their investment decision besides the capital budgeting technique they have indicated, except the utility company. The factors that these companies take into consideration

when selecting capital budgeting projects are macro-economic development; liquidity; development of the sector; long-term strategic plans; value and risk; amount to be invested; positive NPV (net present value); PB (payback period); IRR (internal rate of return); alternative options; incremental income and cash flow. They also observe if the outcome for the capital budgeting practice can be either positive or negative. A few of the involved companies also make a ranking list of capital projects with allocated budgets and see whether the project meets the return they have set. Beside the outcome of the usage of capital budgeting method other observations can be made about the capital budgeting practices in the company. Capital budgeting decisions are not primarily based on capital budgeting techniques, but relies heavily on the non-quantitative aspects such as risks; alternative solutions and management's judgement. A shortfall in the use of capital budgeting technique could be the currency troubles around the Surinamese dollars. The lack of information available to perform exertions is also a major shortfall in the usage of capital budgeting. The size of most companies in Suriname and the investments values do not require complex techniques to evaluate investment decisions.

Is there any improvement required in capital budgeting techniques used by listed companies in Suriname?

The techniques used by the listed companies in Suriname are more or less the same as internationally used by other listed and non-listed companies, which is derived from previous studies that are done. The mostly used capital budgeting techniques are NPV (net present value), followed by IRR (internal rate of return), PB (payback period) and PI (profitability index). But there is a gap between the intended use of investment appraisal techniques and the actual use of those techniques, which is derived from the number of investment decisions that are taken based on the use of the capital budgeting technique and risk analysis technique. It has turned out that these capital budgeting tools are only used for large investments. Since the used capital budgeting technique determines the effectiveness of the investment decisions, the use of those techniques should be stimulated for every investment decision of the company. The results have shown that not all the companies are using risk analysis methods before they make an investment decision. This can have consequences for the specific investment project and/or the company, since every investment can be accompanied by one or more risks. Therefore, for each investment, both an investment appraisal and a risk analysis must be performed on the basis of which the final decision must be made.

5.2 Research question

How can listed companies in Suriname use capital budgeting to support their investment decisions?

The use of capital budgeting techniques for investments gives certainty on the decisions that are taken. These techniques must be applied correctly in the analyzes to make a correct decision. The most common capital budgeting technique that can be used by these companies is NPV (net present value) and/or IRR (internal rate of return) in combination with sensitivity or scenario analysis. The capital budgeting process should be documented. All the companies should have a user guideline how to analyze an investment, in which the investment analysis process is described with all the key points and methods in details. The treasury and investment department employees should have the expertise and experience with the investment appraisal and risk analysis techniques. They should also be able to calculate and propose whether an investment should be done or not. Enough information should be available to perform exertions. The total investment is often easy, but it can be all-encompassing for making sure to account for all sources of cash flow. In addition to revenues and expenses, large projects may impact cash flows from changes in working capital, such as accounts receivable, accounts payable and inventory. Detailed projections of cashflow should be done for every investment to prevent failed investment. Net income should never be used as cash flow to evaluate a project. Extra attention should always be spent on the impact to cash flow from changes in working capital. Companies should also be careful not to overestimate a residual or terminal value. Accurate forecasting of the business activities is also one of the keys for a successful use of capital budgeting techniques. It should also be recommended to make investment decisions based on the comparison of projects and its risks. Capital budgeting requires also discipline, periodic internal reports, timely availability of the company figures and good accountability in order to be able to make timely adjustments.

5.3 Implications and recommendations

It is advisable to use the capital budgeting techniques more frequently and lovingly for all investments, since the used capital budgeting technique determines the effectiveness of the investment decision. As a result, there should be an employee who specifically deals with analyzing all investments before making an investment decision. Findings of the study may useful to the investment decision makers in order to achieve the shareholders wealth.

5.4 Limitations of the study and generalizability

One of the challenges for this research was the research scope. It was difficult to limit this research to a specific group of companies. At the end, the listed companies were chosen as the target group. There were additional topics that would have been interesting to study as well. And along the way, new questions have been raised, that can justify additional researches. Another challenge was to not be able to reach/convince all the Surinamese listed companies to participate in this research, which has caused a delay in this research. One of the limitations is also that the quantitative data for calculating the effectiveness ratio is not included in this study. Another limitation is that this research is done only for the listed companies in Suriname, which means that it would be misleading and inappropriate to make a claim that the findings of this research are applicable across a wide range of the Surinamese companies. However, the limitations and generalizability issues do not minimize the significance of the findings. Alternatively, these limitations provide scope for other studies to further test and extend the theoretical framework developed in this study.

5.5 Future research

The theoretical framework developed and used in this study can be used as the fundament for further studies in the field of capital budgeting in Suriname since this study is only based on listed companies. Another consideration that should be noted is that the future research could look in more detail at the impact of each capital budgeting technique and risk analysis technique on the investment decisions. The cause(s) of why NPV (net present value) is the most used capital budgeting technique by listed companies in Suriname can also be an interesting topic for further researches. Research can also be done into the success factors of capital budgeting, because no academic studies were found about it, however some leading people have written a few things about it. But not much can be deduced from that.

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Appendix:

Appendix 1 Use of Capital Budgeting Practices in percentages

	Practices for investment analysis								
Authors	**NPV**	**PI**	**IRR**	**MIRR**	**PB**	**DPB**	**ARR**	**Other**	**Location**
(Kester, et al., 1999)	96.0	-	96.0	-	93.0	-	73.0	21.0	AUSTRALIA
(Kester, et al., 1999)	88.0	-	86.0	-	100.0	-	80.0	8.0	HONG KONG
(Kester, et al., 1999)	94.0	-	94.0	-	81.0	-	56.0	19.0	INDONESIA
(Kester, et al., 1999)	91.0	-	89.0	-	94.0	-	69.0	9.0	MALAYSIA
(Kester, et al., 1999)	81.0	56.0	94.0	-	100.0	-	78.0	43.0	PHILIPPINES
(Kester, et al., 1999)	86.0	-	88.0	-	98.0	-	80.0	6.0	SINGAPORE
(Graham & Harvey, 2001)	74.9	11.9	75.6	-	56.7	29.5	20.3	-	USA
(Ryan & Ryan, 2002)	96.0	43.9	92.1	21.9	74.5	56.7	33.3	-	USA
(Brounen, de Jong, & Koedijk, 2004)	47.0	-	53.1	-	69.2	-	-	-	UK
(Brounen, de Jong, & Koedijk, 2004)	70.0	-	56.0	-	64.7	-	-	-	NETHERLANDS
(Brounen, de Jong, & Koedijk, 2004)	47.6	-	42.2	-	50.0	-	-	-	GERMANY
(Brounen, de Jong, & Koedijk, 2004)	35.1	-	44.1	-	50.9	-	-	-	FRANCE
(Lazaridis, 2004)	11.3	2.6	8.9	-	36.7	-	-	21.5	CYPRUS
(Hermes, Smid, & Yao, 2005)	89.0	-	74.0	-	79.0	-	2.0	-	NETHERLANDS
(Hermes, Smid, & Yao, 2005)	49.0	-	89.0	-	84.0	-	9.0	-	CHINA
(Leon, Isa, & Kester, 2008)	63.6	42.1	63.6	-	86.4	-	40.9	-	INDONESIA

Authors	NPV	PI	IRR	MIRR	PB	DPB	ARR	Other	Location
(Correia & Cramer, 2008)	82.0	-	79.0	-	54.0	-	14.0	-	SOUTH AFRICA
(Truong, Partington, & Pea, 2008)	94.0	-	80.0	-	91.0	-	57.0	13.0	AUSTRALIA
(Abdullah & Nordin, 2008)	51.6	-	47.4	-	69.5	-	59.0	16.8	MALAYSIA
(Batra, Gupta, & Verma, 2009)	40.0	-	10.0	-	40.0	-	-	10.0	INDIA
(Hall & Millard, 2010)	28.6	4.8	23.7	-	4.8	4.8	-	38.1	SOUTH AFRICA
(Hasan, 2013)	25.7	12.9	27.6	-	48.4	4.8	4.8	-	AUSTRALIA
(Hall & Mutshutshu , 2013)	25.0	17.0	17.0	8.0	17.0	-	-	16.0	SOUTH AFRICA
(Hussain & Shafique, 2013)	94.2	-	87.7	-	78.5	-	-	-	PAKISTAN
(Arslan, Zaman, & Sidiqui, 2014)	65.2	8.7	17.4	4.3	4.3	-	-	8.7	PAKISTAN
(Wnuk-Pel, 2014)	53.0	-	47.0	-	35.0	32.0	15.0	-	POLAND
(Munyao, Kalui, & Ngeta, 2014)	43.6	-	41.0	-	7.7	-	7.7	-	KENYA
(Imegi & Nwokoye, 2015)	28.6	8.2	14.3	-	-	20.4	18.4	10.2	NIGERIA
(Sungun, 2015)	8.0	-	1.0	-	74.0	6.0	-	10.0	TURKEY
(de Andres, de Fuente, & San Martin, 2015)	48.6	-	54.7	-	50.7	-	-	62.5	SPAIN
(AlKulaib, Al-Jassar, & Al-Saad, 2016)	70.6	-	44.7	32.5	53.8	30.9	-	-	KUWEIT
(Al Haddidi, 2016)	68.2	65.9	56.8	-	70.5	-	56.8	75.0	JORDAN
(De Souza & Lunkes, 2016)	64.7	35.2	60.8	11.8	70.6	2.0	33.3	-	BRASILIA
(Batra & Verma, 2017)	67.6	16.9	68.9	13.0	68.9	19.5	18.2	42.9	INDIA
(Kengatharan & Diluxshan, 2017)	80.0	30.0	60.0	15.0	45.0	40.0	15.0	30.0	SRI LANKA
(Robinson & Burnett, 2016)	23.2	11.6	28.4	-	54.7	-	-	13.7	CARIBBEAN

Appendix 2 Practices for Risk Analysis in percentages

Authors	Sensitivity Analysis	Scenario Analysis	Inflation Adjusted Cashflow	Incremental Rate of Return	Simulation	PERT/ CPM	Decision Tree	Complex Mathematical model	Linear Programming	Option Pricing Model	Real options	Other	Location
(Kester, et al., 1999)	100.0	96.0	-	-	38.0	-	44.0	-	-	-	-	2.0	AUSTRALIA
(Kester, et al., 1999)	100.0	100.0	-	-	35.0	-	58.0	-	-	-	-	4.0	HONG KONG
(Kester, et al., 1999)	88.0	94.0	-	-	25.0	-	50.0	-	-	-	-	-	INDONESIA
(Kester, et al., 1999)	83.0	80.0	-	-	9.0	-	37.0	-	-	-	-	-	MALAYSIA
(Kester, et al., 1999)	94.0	97.0	-	-	24.0	-	33.0	-	-	-	-	-	PHILIPPINES
(Kester, et al., 1999)	79.0	90.0	-	-	35.0	-	46.0	-	-	-	-	-	SINGAPORE
(Ryan & Ryan, 2002)	85.1	66.9	46.6	47.3	37.2	31.0	31.1	21.1	16.8	20.9	11.4	-	USA
(Brounen, de Jong, & Koedijk, 2004)	42.9	-	-	-	-	-	-	-	-	-	29.0	-	UK
(Brounen, de Jong, & Koedijk, 2004)	36.7	-	-	-	-	-	-	-	-	-	34.7	-	NETHERLAN
(Brounen, de Jong, & Koedijk, 2004)	28.0	-	-	-	-	-	-	-	-	-	44.0	-	GERMANY
(Brounen, de Jong, & Koedijk, 2004)	10.4	-	-	-	-	-	-	-	-	-	53.1	-	FRANCE
(Lazaridis, 2004)	28.3	30.0	-	-	-	-	10.0	-	-	-	-	-	CYPRUS
(Hermes, Smid, & Yao, 2005)	-	-	-	-	-	-	-	-	-	-	-	-	NETHERLAN
(Hermes, Smid, & Yao, 2005)	-	-	-	-	-	-	-	-	-	-	-	-	CHINA
(Leon, Isa, & Kester, 2008)	43.5	67.5	-	-	29.7	-	43.5	-	-	-	-	14.9	INDONESIA
(Correia & Cramer, 2008)	67.9	71.4	-	-	14.3	-	10.7	-	-	-	-	3.6	SOUTH
(Truong, Partington, & Pea, 2008)	-	-	-	-	-	-	-	-	-	-	-	-	AUSTRALIA
(Abdullah & Nordin, 2008)	-	-	-	-	-	-	-	-	-	-	-	-	MALAYSIA
(Batra, Gupta, & Verma, 2009)	86.7	-	-	-	26.7	-	-	-	-	-	30.0	-	INDIA
(Hall & Millard, 2010)	29.2	13.9	12.5	22.2	4.2	-	2.8	4.2	-	-	-	4.1	SOUTH
(Hasan, 2013)	17.7	33.8	-	-	6.4	-	-	-	-	-	-	32.2	AUSTRALIA
(Hall & Mutshutshu , 2013)	38.0	38.0	-	-	12.0	-	12.0	-	-	-	-	-	SOUTH
(Hussain & Shafique, 2013)	-	-	-	-	-	-	-	-	-	-	-	-	PAKISTAN
(Arslan, Zaman, & Sidiqui, 2014)	-	-	-	-	-	-	-	-	-	-	-	-	PAKISTAN
(Wnuk-Pel, 2014)	54.0	61.0	-	-	-	-	-	-	-	-	-	68.0	POLAND
(Munyao, Kalui, & Ngeta, 2014)	Ranking												KENYA
(Imegi & Nwokoye, 2015)	-	-	-	-	-	-	-	-	-	-	-	-	NIGERIA
(Sungun, 2015)	-	-	-	-	-	-	-	-	-	-	-	-	TURKEY
(de Andres, de Fuente, & San Martin, 2015)	54.4	-	-	-	47.5	-	-	-	-	-	14.3	-	SPAIN
(AlKulaib, Al-Jassar, & Al-Saad, 2016)	22.9	43.9	-	-	-	-	-	-	-	-	54.3	-	KUWEIT
(Al Haddidi, 2016)	63.6	-	-	-	-	-	-	-	-	-	-	-	JORDAN
(De Souza & Lunkes, 2016)	54.9	68.6	-	-	23.5	-	23.5	-	-	-	-	-	BRASILIA
(Batra & Verma, 2017)	56.0	44.0	40.0	-	-	-	-	-	-	-	-	46.7	INDIA
(Kengatharan & Diluxshan, 2017)	70.0	65.0	75.0		-	-	40.0	-	-	-	-	-	SRI LANKA
(Robinson & Burnett, 2016)	-	-	-	-	-	-	-	-	-	-	-	-	CARIBBEAN

Appendix 3 Questionnaire

To Whom It May Concern:

RE: "An empirical analysis of the usage of capital budgeting to support investment decisions by listed companies in Suriname"

Dear management,

As part of my graduation from the Anton de Kom University of Suriname, Master phase Business Management, I conduct the aforementioned research. Below I will discuss the research and why I need your cooperation.

Budget and capital budgeting
A budget is a quantitative plan prepared for a specific time period, which is normally expressed in financial terms and prepared for one year.

Budgeting serves the following purposes: planning, control, communication, co-ordination, evaluation, motivation, authorization & delegation.
Budgeting has been considered as one of the most important management tools to guide organizations, measure their performance and motivate people. One of the stages of the budgeting process involves the preparation and analysis of capital budgeting, which is the focus of this research.
A capital budget lists the projects and investments that a company plans to undertake during the coming years. To determine this list, firms analyze alternative projects and decide which ones to accept through a process called capital budgeting. This process begins with forecasts of the project's future consequences for the firm. Some of these consequences will affect the firm's revenues and others will affect its costs. The ultimate goal is to determine the effect of the decision on the firm's cash flows, and evaluate the net present value of these cash flows to assess the consequences of the decision for the firm's value.
Capital budgeting decisions are the fundamentals to the survival and success of the company in the long run, by which the decisions of the investment budget are conceptualized as a difficult type.

The fluctuated economy has caused that companies are facing dwindling profitability, investment insecurities and escalating debts which have made the investment scenario even more risky. Some companies even went bankrupt during this period, because they could not thrive the unstable environment. The only keys to survival and long-term success of Surinamese companies are effective investment decision making and sound financial management practices, which are part of capital budgeting. In particular, I'm conducting a survey on the capital budgeting decisions among listed companies in Suriname with the support of the Anton de Kom University of Suriname. The purpose of this research is to present evidence on the current Surinam investment practices and to determine if improvement is needed in the capital budgeting techniques that are used by the Surinamese listed companies.

Research Scope
This research is based on listed companies in Suriname, of which your organization is also a part according to The Suriname Stock Exchange market.

Your co-operation is critical to the success of the project; therefore, I would be very grateful if you could complete the questionnaire and/or answer those questions in a zoom meeting (date and time of zoom meeting can be scheduled based on your available time). Please note that there is no **"right"** or **"wrong"** answer to any of these questions. If you have any comments about the capital budgeting techniques and/or risk analysis techniques that you would like to include, please do so in the space provided at the end of the survey. The time that is needed to answer those questions fully is approximately 45 minutes.

Confidentiality
This research is **STRICTLY CONFIDENTIAL** and is being carried out for academic purposes only. Your company and your name will not be identified as all questionnaires will be coded upon receipt; so that no links are possible between the data and the identity of the enterprise or yourself. The findings of this research project will be reported in the thesis that will be submitted to the Anton de Kom University of Suriname, as required for the degree of Master in Science in Business Management with Finance as specialism.

In return for your cooperation, a summary of the findings will be provided to you after the project is finalized (upon request). In addition, I will be delighted to discuss my findings with you if this could be beneficial to your company.

I thank you for your time and co-operation.

Yours sincerely,
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Anton de Kom University of Suriname
Paramaribo
Suriname, S.A.
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Section A: Information on the top management (CFO)

In this section, please provide us with some information regarding your personal demographic characteristics.

1. Please indicate your gender:
   - ☐ Female
   - ☐ Male

2. Please, indicate your racial background:
   - ☐ Chinese
   - ☐ Javanese
   - ☐ Indian
   - ☐ African
   - ☐ Native
   - ☐ Mixed

3. Please, indicate your age:
   - ☐ 24 years or younger
   - ☐ 25-34 years
   - ☐ 35-44 years
   - ☐ 45-54 years
   - ☐ 55 years or above

4. What is the highest level of academic qualification obtained by the top management (CFO)?
   - ☐ No academic qualifications
   - ☐ Professional qualification
   - ☐ Undergraduate degree
   - ☐ Postgraduate degree/Doctorate
   - ☐ On-the-job training
   - ☐ Other, please specify _____

5. For how long did you work before you started up in this position?
   - ☐ 2 years or less
   - ☐ 3-5 years
   - ☐ 6-10 years
   - ☐ More than 10 years
   - ☐ Not applicable

6. For how long are you in this position in this company?
    - ☐ 2 years or less
    - ☐ 3-5 years
    - ☐ 6-10 years
    - ☐ 11-15 years
    - ☐ More than 15 years

7. Please indicate the area which best represents your position in this business
    - ☐ Life experience
    - ☐ Trial and Error
    - ☐ Relevant work experience
    - ☐ Related educational background
    - ☐ Other, please specify _____

Section B: Information on the company

In this section, please provide us with background information regarding your company.

8. Can you please indicate how many years this company is operating?
    - ☐ Less than 2 years
    - ☐ 2 years or less
    - ☐ 3-5 years
    - ☐ 6-10 years
    - ☐ More than 10 years

9. What is the main activity of this company?
    - ☐ Hospitality
    - ☐ Banking
    - ☐ Insurance
    - ☐ Education
    - ☐ Agriculture, hunting and forestry, fishing
    - ☐ Construction
    - ☐ Foods and beverages
    - ☐ Health
    - ☐ Manufacturing
    - ☐ Utility and Energy
    - ☐ Technology
    - ☐ Industrial
    - ☐ Real estate, renting and housing development
    - ☐ Retail and wholesale
    - ☐ Other, please specify _____

10. What is the total number of employees in this company?
    - ☐ 1-20 employees
    - ☐ 21-50 employees
    - ☐ 50-250 employees
    - ☐ More than 250 employees

11. What is the largest capital budgeting project that you have done? State in Surinamese dollars and briefly describe.

    _____
    _____
    _____
    _____
    _____

Section C: Use of capital budgeting techniques

In this section, please provide us the information regarding the use of capital budgeting in your company.

12. How do you define an investment decision?

    _____
    _____
    _____
    _____
    _____

13. How does your company evaluate an investment project?

    _____
    _____
    _____
    _____
    _____

14. How regular are investment decisions made within your company?
    - ☐ 1-2 times per year
    - ☐ 3-5 times per year
    - ☐ 5-10 times per year
    - ☐ More than 10 times per year

15. What is the main goal with financial investments?
    - ☐ Maximize shareholders wealth
    - ☐ Long term operational security
    - ☐ Quick cashflow
    - ☐ Liquidity life/death
    - ☐ Other, please specify _____

16. Do you measure the success of the investment by tracking on the results e.g. return on invested capital?
    - ☐ Yes
    - ☐ No

17. Do you compare the results of the investment with the original plan/budget?
    - ☐ Yes
    - ☐ No

18. Is there any specific stakeholder that pressures for the use of capital budgeting tools in decision making?
    - ☐ Shareholders
    - ☐ Board of directors
    - ☐ Management
    - ☐ Authorities
    - ☐ Other, please specify _____

19. Does your company use calculations to support decision-making?
    - ☐ Yes
    - ☐ No
    - ☐ Other, please specify _____

20. How often do you reject investment opportunities based on calculated results?
    - ☐ Always
    - ☐ Often
    - ☐ Sometimes
    - ☐ Rarely
    - ☐ Never

21. Does your firm have a capital investment manual guideline (written and clear policies/processes regarding decision-making)?
    - ☐ Yes
    - ☐ No

22. Does your company use capital budgeting techniques to make investment decisions?
    - ☐ Yes
    - ☐ No
    - ☐ Not sure

23. Kindly indicate how often your firms uses the capital investment evaluation techniques.

Technique	**Frequency of use**				
	Always	**Often**	**Sometimes**	**Rarely**	**Never**
Net present value					
Profitability index					
Internal rate of return					
Modified internal rate of return					
Payback period					
Discounted payback period					
Accounting rate of return					

24. Is there at least one employee assigned full time to capital investment analysis?
    - ☐ Yes
    - ☐ No

25. Is risk consideration always vital, when your company makes a decision on an investment opportunity?
    - ☐ Yes
    - ☐ No
    - ☐ Not sure
    - ☐ Other, please specify _____

26. Kindly indicate how often your firms uses the risk analysis techniques to measure a project's risk.

Technique	**Frequency of use**				
	Always	**Often**	**Sometimes**	**Rarely**	**Never**
Sensitivity analysis					
Scenario analysis					
Inflation adjusted cash flows					
Incremental internal rate of return					
Simulation					
PERT/CPM					
Decision tree					

Complex mathematical model					
Linear programming					
Option pricing model					
Real options					

27. Does your company conduct post audit of major capital expenditure?
    - ☐ Yes
    - ☐ No

Section D: Views on capital budgeting techniques

In this section, please provide us the information regarding your perspective on capital budgeting in your company.

28. Which capital budgeting technique(s) does your company use mostly during capital budgeting projects?
    - ☐ Net present value
    - ☐ Profitability index
    - ☐ Internal rate of return
    - ☐ Modified internal rate of return
    - ☐ Payback period
    - ☐ Discounted payback period
    - ☐ Accounting rate of return
    - ☐ Other, please specify _____

29. Which risk analysis technique(s) does your company use mostly during capital budgeting projects?
    - ☐ Sensitivity analysis
    - ☐ Scenario analysis
    - ☐ Inflation adjusted cash flows
    - ☐ Incremental internal rate of return
    - ☐ Simulation
    - ☐ PERT/CPM
    - ☐ Decision tree
    - ☐ Complex mathematical model
    - ☐ Linear programming
    - ☐ Option pricing model
    - ☐ Real options
    - ☐ Other, please specify _____

30. How often have your investment decisions been effective?
    - ☐ Always
    - ☐ Often

- ☐ Sometimes
- ☐ Rarely
- ☐ Never

31. Why does your company use this technique? Are there any specific reasons or hindrances that guide/force you to use those techniques instead of some other?

_____
_____
_____
_____
_____

32. Are there additional methods (not of the list) that you are using? Please describe which this.

_____
_____
_____
_____
_____

33. Are there any methods on the list that you would like to use more than you do? Please describe which one.

_____
_____
_____
_____
_____

34. Are there any methods on the list that you don’t want to use, or cannot use, due to some hindrances? Please describe

_____
_____
_____
_____
_____

35. What factors do you take into consideration when selecting capital budgeting projects?

_____
_____
_____
_____
_____

36. What outcome do you observe by using capital budgeting techniques?

37. What other observations can be made about the capital budgeting practices in your company?

38. What shortfalls have you encountered in using capital budgeting techniques?

39. Are there any specific opportunities, challenges or hindrances of evaluating and taking investment decisions in a Surinamese business environment? Please explain.

40. Can you make any recommendations for improvements to the capital budgeting practices in Suriname?

_____
_____
_____
_____
_____

If you would like to make any comments regarding any of the items included in the questionnaire, please write them in the space provided below.

THIS SURVEY ENDS HERE

THANK YOU FOR YOUR PARTICIPATION IN THIS STUDY

Appendix 4 Cronbach's Alpha Test

Reliability Statistics

Cronbach's Alpha	N of Items
.758	19

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
How often do you reject investment opportunities based on calculated results?	76.00	78.333	.498	.749
Net Present Value	75.57	63.619	.603	.719
Profitability index	75.00	81.000	-.051	.786
Internal rate of return	75.86	62.143	.624	.716
Modified internal rate of return	74.14	81.810	.000	.761
Payback period	75.86	86.143	-.229	.811
Discounted payback period	74.29	77.905	.564	.748
Accounting rate of return	75.00	62.667	.734	.706
Sensitivity analysis	76.43	63.286	.625	.716
Scenario analysis	76.86	65.810	.629	.719
Inflation adjusted cash flows	74.57	70.952	.501	.734
Incremental internal rate of return	74.71	69.905	.560	.729
Simulation	74.86	71.143	.430	.739
PERT/CPM	74.14	81.810	.000	.761
Decision Tree	74.29	77.905	.564	.748
Complex mathematical model	74.14	81.810	.000	.761
Linear programming	74.14	81.810	.000	.761
Option pricing model	74.57	73.952	.337	.747
Real options	74.14	81.810	.000	.761