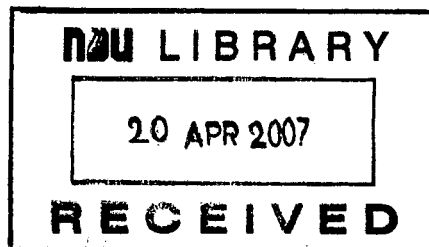NOTRE DAME UNIVERSITY

CAPITAL BUDGETING DECISION: EVIDENCE FROM THE LEBANESE MARKET

BY
MICHEL S.HAYECK

A Thesis Submitted in partial fulfillment of the requirements
For the degree of Master in Business Administration
With Finance concentration

NOTRE DAME UNIVERSITY
LOUAIZE-LEBANON
FEBRUARY 2007

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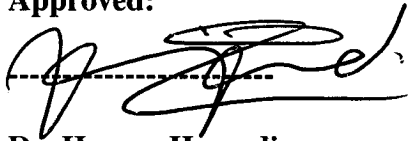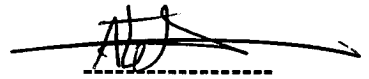For the degree of Master in Business Administration
With Finance concentration**

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Abstract

This study explores techniques used by Lebanese financial managers to evaluate capital budgeting projects. This study investigates whether Lebanese managers use sophisticated and efficient capital budgeting techniques when making their decision to either accept or reject projects. The main hypothesis states that Lebanese managers are using sophisticated and efficient capital budgeting techniques.

Data was collected through a questionnaire distributed to 45 Lebanese firms. Only 30 firms were taken into consideration since the other questionnaires were not completed. A frequency analysis was performed on the sample to observe the rate of recurrence of the capital budgeting technique used. In addition, a regression analysis was performed to test whether Lebanese managers are using sophisticated and efficient capital budgeting techniques.

The results led to the rejection of the main null hypothesis and to accept the alternative which states that Lebanese managers are using sophisticated and efficient capital budgeting techniques when making their decisions. This result is consistent with main theories which states that decisions should be based on sophisticated capital budgeting techniques in addition to many recent results such as Ryan (2002) survey on 1000 American firms.

Acknowledgements

This thesis could never have been written without the major contributions of several people. The work of this study was inspiring and interesting.

I would like to express my gratitude to my advisor Dr Hassan Hamadi for his valuable support, encouragement and guidance in completion of this thesis.

I am also grateful to Dr Atef Harb for his review and for his advices.

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Chapter 1: Introduction

1.1 General Background

Capital budgeting involves the study of long term financial and investment project. Many methods exist to evaluate if a project could increase the firm value or decrease it. This capital budgeting method will have a great **influence** on the company's future and on the competitive advantage of the firm. Some of these methods are the payback period, discounted payback period, net present value, internal rate of return and other. Even though all these methods are correct, still **many** argues on what is the best method or on what is the most suitable one.

Many surveys tried to answer the above questions. In 1989, a study by Pike, was developed to look at the most commonly used method. As a result he found out that most of the companies from 1975 till 1986, switched from unsophisticated method like payback period to sophisticated[1] ones like Net Present Value. Also Petty and Bowlin 1976 have noticed that most academicians have advocated the use of the sophisticated capital budgeting method which can be adjusted for risk change (ie cost of capital).In addition, today academicians and practitioners are becoming more susceptible to the decision making method, Seitz, Ellison (2003).

As we will notice in the literature review, the Net Present Value is considered the best capital budgeting method. Taking this fact into consideration we need to find out

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[1] The sophisticated methods are the ones that take into consideration the time value of money such as NPV and IRR. Unsophisticated method do not take into consideration time value of money such as PB and ARR.

if the Lebanese firms are using this capital budgeting method or an unsophisticated one like payback period as a primary method for capital budgeting decision making. Therefore the question to be asked: Is NPV the most used method by Lebanese managers? In other words, do the Lebanese managers use sophisticated method in assessing their capital budgeting decision? In order to perform this empirical research, a questionnaire was distributed to 45 managers working in Lebanese firms. Not all the firms have responded to this questionnaire, nevertheless 30 of them replied.

The hypothesis H1 predicts that the primary method used in the Lebanese firms is the NPV.

1.2 Importance and Aims of this study

Funds are invested in both short-term and long-term projects. These projects may be tangible such as equipments, property or plant or intangible such as patents, trademarks or new technology. Capital budgeting is concerned with long term projects both tangible and intangible. These long term projects have long-term consequences. Making a wrong choice when acquiring capital assets could influence the company finances over a period of time. This choice will affect the economy as a whole since the economy is founded on the efficient use of resources of these firms. For that reason capital budgeting techniques investigates if a project should be accepted or rejected. However, there are many approaches that can be used to evaluate any given project, and each technique has its own distinct advantages and disadvantages. This suggests that a search for the best capital budgeting is important for the decision making in the firms.

1.3 Contribution of the study

A search has been performed through the years to determine the best capital budgeting method. This thesis explores the advantages and disadvantages of each method in order to highlight the best technique both theoretically and empirically. In addition it uses a sample of the Lebanese firms and investigates methods used by financial managers. Moreover this thesis explores the relationship between the choice of the capital budgeting techniques and the educational background of the Lebanese managers. To my knowledge, this study is done for the first time in Lebanon since I have not found any paper considering the capital budgeting techniques used by Lebanese managers.

1.4 Overview of Chapters

Chapter 2 begins with an overview on capital budgeting, then it discusses the advantages and disadvantages of each method of capital budgeting. In addition this chapter shed the light on the impact of inflation, the problems facing capital budgeting and the role of technology for example Monte Carlo simulator. Moreover, a summary of the studies done through the years by researchers on capital budgeting techniques and their uses will be introduced.

Chapter 3 discusses the research methodology starting with the purpose of this study. Then, the null hypotheses and alternatives will be stated as well as the dependent and independent variables will be defined. The last section gives an overview on the statistical package to be used (SPSS) and the type of analysis that will be done in the next chapter.

Chapter 4 discusses the results through the output of SPSS. First a descriptive statistics of the variables and interpretation is carried out. Then a frequencies analysis is performed and analysed. Finally a regression analysis is performed to test to test the hypotheses and the relationship between the variables.

In chapter 5, a summary is given on the whole study. This chapter discusses the results from chapter 4 and compares the findings with the recent literature and empirical work. The limitations of this study are presented. Finally this chapter ends with the conclusion.

Chapter 2: Literature review

2.1 Introduction

Capital budgeting is the decision process that managers use to identify those projects that leads to increase firm's value, and is thus the most important task faced by financial managers and their staff, Brigham and Daves (2004). Capital budgeting requires management to adopt the below listed measures:

a) The formulation of long-term goals;

b) The creative search for and identification of new investment opportunities;

c) Classification of projects and recognition of economically and/or statistically dependent proposals;

d) The estimation and forecasting of current and future cash flows;

e) A suitable administrative framework capable of transferring the required information to the decision level;

f) The controlling of expenditures and careful monitoring of crucial aspects of project execution; and

g) A set of decision rules which can differentiate acceptable from unacceptable alternatives is required.

Financial managers and academics have not been in full agreement over the years as to the best capital budgeting method to be adopted. Miller et al (1960;1978); financial academics, report that the "payback" technique is the most desired method, because of the unavailability of low-cost computer technology and the simplicity of the calculation of the "payback" techniques, while Istvan (1961)reports a preference for "accounting rate of return". Early studies generally report "discounted cash flow models" to be the least popular capital budgeting methods. This might be related to the fact that financial calculators or computers where not commonly used in the 60's.

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Mao (1970), Schall, Sundam, and Geijsbeek (1978) specifically point to "net present value" (NPV) as the least popular capital budgeting tool; a result in contrast to modern financial theory where NPV is considered the most desired capital budgeting technique Ryan (2002) . Klammer (1972) reports a preference for general discounted cash flow models[2], and subsequently, the overwhelming majority of published research indicates that management prefers the use of internal rate of return (IRR) over all other capital budgeting methods. These researches were written by Williams, (1970); Fremgen, (1973); Brigham, (1975); Petry, (1975); Petty, Scott, and Bird, (1975); Gitman and Forrester, (1977); Oblak and Helm, Jr., (1980); Hendricks, (1983); Ross, (1986.)

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The purpose of this chapter is to present the above mentioned methods used in capital budgeting and to highlight their advantages and disadvantages in order to draw a conclusion about the superior method among them.

Section 2.2 will presents payback period and why payback period is popular, section 2.3 looks at discounted payback period, section 2.4 explore the use of the accounting rate of return, section 2.5 discuss the net present value, section 2.6 looks at the profitability index, section 2.7 presents the internal rate of return, and section 2.8 explores the modified internal rate of return. In this chapter, we will explore the drawback and advantages of each method and find why they are popular.

In addition section 2.9 discusses the repercussion of inflation in evaluating a project, section 2.10 highlights other techniques used in capital budgeting, and section 2.11 looks at the problems facing capital budgeting. The last 2 sections before the

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[2] DCF models: NPV, IRR, Discounted Payback...

empirical research explores difficulties facing today's firms and the role of technology in the capital budgeting process.

2.2 Payback period (PB)

The payback period is the measure of the time needed from a project to cover its initial investment through its generated cash flow. Projects with a smaller payback period are better since they regain their initial investment sooner, Brigham (2004). Managers often use this method because of its simplicity and because a shorter payback period is a good indicator of a good investment in a society subject to never ending technological breakthroughs, and in need of new equipments to respond to these changes. Moreover, managers are rewarded with fast return, and it is easier to explain the "payback period" for employees with no background in finance.(Seitz, Ellison, 2003)

According to Damodaran (2001), "The payback rule is a simple and intuitively appealing decision rule, but it does not use a significant proportion of the information that is available on a project." (e.g the cost of capital[3]). In addition, the payback rule restricts decision makers too much by preventing them from bringing into the decision their assessment of what might happen after the initial investment is recovered. Eugene F. Brigham & Phillip R. Daves (2004), find that the "payback" rule as a type of breakeven method where cash flow subsequent to the breakeven are not considered. Furthermore the payback does not consider the cost of capital which should be reflected in the cash flow of the project. However, cash flows expected in the distant future are considered riskier than near cash flow, this is why sometimes

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[3] Cost of Capital: Required rate of return of different type of capital (equity, debt).

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payback is an indicator for project risk. Today payback period method is used as a supplementary method for assessing projects, Seitz Ellison (2003).

Pike and Neale (2003), agree with Damodaran (2001), Brigham and Davis(2004) over the fact that the "payback" method generates a number of problems. It ignores the cash flow after the payback period as mentioned above, in addition it ignores the time value of money (TVM) also known as the discounted present value which is one of the basic concepts of finance, developed by Leonardo Fibonacci .

The importance of TVM lays in the fact that money value depends on the time during which you acquire it. The sooner you get the money, the sooner you earn interest on it, and the more you earn. For example, assuming a 5% interest rate, $100 invested today will be worth $105 in one year ($100 multiplied by 1.05). Conversely, $100 received one year from now is only worth $95.24 today ($100 divided by 1.05), assuming a 5% interest rate[4]. For that reason, one hundred dollars earned today are more valuable than one hundred earned the next year. This coming section (2.3) discusses one method which takes TVM into consideration as opposed to the previously discussed technique. However, the problem in the payback method is the fact of arbitrary. In other words, there is no fix rule to tell the financial analyst which value or number of years to the breakeven point is correct, since each project has its own value.

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[4] http://www.investopedia.com/terms/t/timevalueofmoney.asp

2.3 Discounted payback period (DPB)

Because of the problems inherited in payback period method, many researchers and academic worked toward enhancing the model.

Identical to payback period, discounted payback period is calculated through discounted cash flow. This discount consists of the cost of capital or Weighted average cost of capital (WACC) of the project. The WACC represents the investors' opportunity cost of taking on the risk of putting money into a company. It is an improved method of payback where the cost of capital is taken into consideration. This has led Peterson and Fabozzi (2002) to reflect that this method takes into consideration the risk incorporated in a project. In addition to that, Brigham and Davis (2004) suggest that discounted payback does not take into consideration the cash flow after the breakeven point of the project, same as payback. Also, like the payback method, the discounted payback technique is easy to use and understand. Companies with liquidity problems and which are obliged to use fast returning project appraise the discounted payback method.

Because of the large similitude between the two methods (i.e. payback, discounted payback period), there is no point in discussing the discounted payback method any further.

2.4 Accounting rate of return (ARR)

The accounting rate of return is the percentage that occurs when dividing the profits [EBIT*(1-T)] by the initial capital cost of a project, Seitz and Ellison (2003).The profit is calculated after-tax since it provides benefit to the owners and tax should be

deducted. Referring to books reflecting on the ARR method, we deduct that it is possible, when using the ARR method, to sometimes disregard the depreciation. According to Seitz and Ellison (2003), ARR has two advantages: first it is simple to calculate it without worrying about the time value of money; Second ARR is consistent with the management reward system that focuses on return on investment. Pike and Neale (2003), find that ARR is a simple method for managers given that the Average Rate of Return is similar to the Return on Capital Employed. Alternatively, ARR calculation is based on profit rather then cash flow and ignores the time value of money. We should pay attention that ARR which sometimes *overstates* and at others *understates* the internal rate of return (IRR), which we will be discussing later.

Because time value of money is ignored in ARR, some projects are accepted. However if the time value is taken into consideration, the same projects are rejected due to the discounting factor. In this way, ARR could overstate the IRR or in other words the discounted capital budgeting method.

Brigham and Davis (2004) argue that ARR is the second oldest evaluation technique. Further, they argue that ARR suffers from a number of defects.

- It ignores the time value of money

- Focus on accounting rate of return rather than cash flow

- Ignores the assets life

The ARR calculation can be very subjective in view of the fact that different outcomes could be given for the same project. "For managers to make an investment decision using ARR, this ARR should be compared to a standard, such as the existing ARR of the company. If the ARR of the project is higher than the company ARR the project should be accepted. Seitz and Ellison (2003)" Moreover, ARR is not a method

that managers can fully rely on to make an investment oriented decision-making since it does not take into consideration the time value of money. Next we will introduce Net Present Value which is a method that takes into consideration the time value of money.

2.5 Net present value (NPV)

The net present value of a project is the sum of its discounted cash flow – positive or negative – that occurs over the life of the project (Damodaran 2001). A positive value of the sum implies that the project is a good investment and should be accepted. This value is a measure of dollar surplus value on the project. Thus investing in projects with positive net present value will increase the value of the firm. Since this excess cash will service debt and provide the required return to shareholders and accrues the firm's stockholders.

Damodaran (2001) reveals the number of advantages characterizing NPV method. NPV is first of all additive, which means that an expected future project could be easily added to a project already in place. If these projects have positive NPV they will add value to the company. On the other hand, a project with negative NPV should be terminated since the project will not generate enough money to repay debtors and shareholders.

In addition NPV gives a direct measure of the dollar benefit of the project to shareholders.

Returning to NPV, Brigham and Daves (2004) consider NPV to be equal to the present value of the project Economic Value Added (EVA). Since EVA represents

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the income remaining after the cost of all capital has been subtracted, a positive value implies a positive value for NPV and an increase in shareholder value.

Pike and Neale (2003), highlight that when a project is risky (high cost of capital) the cash flow of the project decreases consequently lowering NPV.

Despite the many advantages that this method brings some disadvantages. According to Peterson and Fabozzi (2002), agreeing on a cost of capital is not an uncomplicated task, since the cost of capital should reflect the time value of money and the risk that the project may not do well. The right compensation for the money suppliers is, thus, not an easy task.

However, when comparing two mutually exclusive projects with different maturities each, simple NPV rule may lead to a wrong decision. In line with that, when comparing two projects with different life spans, Equivalent Annuity (EA) should be employed using the following formula with (k) for discount rate and (n) for the number of years:

EA = NPV / [1-1/ ((1+k)^n)]/k.

For example project A with a life span of 2 years, with a cost of capital of 10% and an NPV of $5000 will have according to the above formula an EA of $2881. On the other hand project B with a life span of 4 years, with cost of capital of 10% and an NPV of $8000 will have an EA of $2523. Despite the fact that project B has a larger NPV, project A is superior to project B, since it has a larger EA.

The EA technique is also referred to as annualized net present value. Seiz, Ellison (2003). The EA technique allows us to compare two projects with different maturities as it represents each of these projects' annual NPV.

Another method for comparing projects with different life-spans each is to use the replacement chain approach. The replacement chain approach also referred to as Matching Cycles of Replacement, simply assumes that a project will be repeated indefinitely to fit into the investment horizon of the other project. [Timothy R. Mayes] CH10.

The NPV method has many advantages:
1) This method involves the discounting of cash flow
2) This discounting is the minimum acceptable return rate
3) It is easy to increase the discount rate if the project is riskier
4) Combination of project including low return project can be evaluated all together.
5) Easy to understand

Some managers prefer a percentage measure rather than an absolute one with regards to the return. They consider that it is easier to compare two percentages (Return, Cost of capital) when evaluating their projects, rather than having the absolute number of the NPV. This rate of return is the internal rate of return (IRR) which we will discuss in a later stage. However, in the next paragraph will discuss the Profitability index, which is a capital budgeting method that gives for each dollar invested the value gained in the project.

2.6 Profitability index (PI):

Instead of the difference between PV of Future Cash Flows and Initial investment, as in NPV, PI calculates the ratio by dividing the two values.

The Profitability index attempts to identify the relationship between the costs and benefits of a proposed project through the use of a ratio calculated as follows[5]:

$$= \frac{PV \ of \ Future \ Cash \ Flows}{Initial \ Investment}$$

PI or benefit cost ratio give us an idea of how much we get for each dollar invested in a project. According to Peterson and Fabozzi (2002), PI takes into consideration all the cash flows, time value of money, and riskness of the cash flows. Nevertheless PI has the problem of reinvestment. For instance, when undertaking a project and a cash outflow occurs subsequent to the initial investment, the PI should be changed to "modified PI". Modified PI discounts this amount (cash outflow) to its present value and adds it to the denominator. As a result the denominator will be as follows:

$$= \frac{PV \ of \ Future \ Cash \ Flows}{Initial \ Investment \ + \ PV \ of \ future \ commitments} \quad {}_{6}$$

Nevertheless, when managers have mutually exclusive projects with different scale, the use of PI may not provide the best answer for the owners' wealth maximization. Peterson and Fabozzi (2002). For example project A needs an investment of $10000 and its NPV is $5000, and project B needs an investment of $20000 and its NPV is $8000. The PI of the project A(1.5) is Higher then PI of project B(1.4), however project B gives higher wealth maximization since its NPV is higher.

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[5] www.investopedia.com
[6] Neil Seitz and Mitch Ellison. Capital Budgeting and Long Term Financing Decisions, third edition, Harcourt Brace College Publishers

Nevertheless, PI is a difficult method to explain to non-experts, unlike payback period method which is simpler.

However, NPV is a better method that PI in considering the wealth maximization of the owner, since it gives the return in amount of money rather then the ratio.

2.7 Internal Rate of Return (IRR)

The IRR is the discount rate that makes the present value of a project equal to zero. Brigham and Davis (2004).

Like NPV, IRR is used for assessing projects. Relations are as follows:

If IRR > cost of capital ➜ Accept the project

If IRR < cost of capital ➜ Reject the project

If the internal rate of return is higher than the cost of capital, an excess will remain after paying for the capital and this surplus will give the firm more value. However, if the internal rate of return is less then the cost of capital, then accepting this project will lead to a decrease in firm's value.

Moreover IRR is a significant measure when there is a significant restriction on capital, same as the Profitability Index. The project with higher return with respect to the money invested will be chosen. In addition, IRR does take into consideration all the cash flows, their timing and their riskiness. IRR is often an easier method to explain to employees as like mortgages and bank accounts it is expressed in percentage.

However IRR is not always consistent to evaluate a project, because some projects with IRR = 30% for an investment of $ 1 million, can give less value to a firm than a project with IRR = 20% for an investment of $ 10 millions, Peterson & Fabozzi

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(2002). Another disadvantage for IRR is that some projects have more than one IRR, in which case it is not clear which IRR should be used while assessing the project. IRR also does not take the project life into consideration. We could have multiple IRR if a project has a fluctuating (from positive to negative and vice versa) cash flow, especially very large projects that need reinvestment every period this will create a multiple IRR ,Brigham & Davis (2004). Also IRR could not be calculated if a project does not have an initial investment cost. In addition, IRR considers that the cash inflow of a project is reinvested at the IRR rate which is sometimes an overvaluation of the project especially when it is a long term project (Aswath 2001). For that reason, an improved method of IRR was developed: the Modified IRR. We will discuss this method in the following section.

2.8 Modified Internal Rate of Return (MIRR)

As the name implies, MIRR (also named MRIC = Marginal Return on invested capital) is an improved method of IRR, where the reinvestment of cash inflow is modified so that no over evaluation occurs, bearing in mind that the reinvestment rate is the cost of capital. Worth noting too is the fact that there is no risk in having multiple IRR because it is possible for a project to only has one MIRR. "The MIRR does suffer from some of the other drawbacks of IRR. Most important, is that relying on it will lead to an incorrect choice between mutually exclusive investments"[7]. On the other hand, some consider that this technique is consistent with NPV wealth maximization because it provides a unique value and eliminates the ranking problem caused by two unequal lives of a project, Mc Daniel, Mc Carty and Jessell, (1988). Some consider that MIRR is a mix of NPV and IRR, since the cash inflow is reinvested at the cost of capital rate. Despite the improvement over IRR, when

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[7] http://moneyterms.co.uk/mirr/

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considering two mutually exclusive project NPV is still a better method for evaluation.

2.9 Impact of inflation

Inflation doesn't only affect macro economy but also micro economy. As a consequence, some managers consider both the real and nominal rate. However there are several methods for adjusting the inflation in the cost of capital. Examples of methods for adjusting the inflation in the cost of capital are: the GNP implicit price deflator, the Consumer price index (CPI) and the industry index. Also, our economics courses taught us that governments could increase the interest rate to slow the expansion in the economy thus slowing the inflation. As a result, when the interest rate increases, the cost of capital also increases. For that reason, some managers consider that the inflation is incorporated in the cost of capital.

On the other hand, when evaluating a project, some managers take into consideration the inflation factor since inflation affects the cost and return of a project. Inflation is added to the discount rate used for calculating the cost of capital. Since inflation is a positive number, we can conclude that a project in an economy with high inflation will cost more and return less cash flow. In addition, many firms can not increase the prices of their product with a rise in inflation since some of their customers could not absorb such increase. This is called the elasticity of demand for their product, Reilly, Brown (2006). As a consequence, most firms will be negatively affected by inflation. Also as evidence from 1977 till 2002 the correlation between profit margin and inflation was consistently negative, Reilly, Brown (2006). Assume that you require a 10% return on an investment but you expect cost prices to increase by 3%. So you have to increase your rate of return to 13% (10+3) to include the rise of cost price

which is correlated to inflation. In this case your nominal rate is 10%. However the real rate is 13%, since

$$Real\ rate = Nominal\ Rate + Inflation$$

On the other hand, in some cases inflation could have a positive impact on the NPV of a project. An increase in inflation is correlated with an increase in labour expense, thus buying a machine that could reduce labour expense undeniably leads to a reduction in the production cost. Nevertheless the exact rate of inflation is not easily calculated. For that reason inflation could be forecasted rather than accurately calculated.

2.10 Other Techniques:

Despite the fact that many capital budgeting techniques exist, some companies in the US use non financial techniques of investment projects such as strategy linkage considerations, quality implications, future flexibility and growth potential, and current and future competition. [Chen[8]] These methods identified some competitive advantages which were not revealed by financial-based techniques.

In addition to these previously stated methods, there exists a number of supplementary methods for capital budgeting which we will discuss briefly in the upcoming section.

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[8] **Engineering Economist, The**, Winter 1995 by Chen, Shimin

• Sensitivity analysis allows the change in one input variable at a time. Sensitivity analysis affects sales or cost of capital. When affecting these two variables we can identify the change in NPV. Sensitivity analysis provide answer to decision-maker for a range 'of what if' questions. For example, if there is an increase in the cost, the NPV will decrease causing the project to be less profitable. On the other hand if the sales increase, the NPV will increase making the project more profitable (Pike, Neal 2003). These changes in costs and sales lead to many possible scenarios for the project.

• Scenario analysis allows for the change in more than one variable at a time, including probabilities of such changes, to see the change in NPV. Monte Carlo simulator is a software that generates hundreds of possible combinations of variable according to a pre-defined probability distribution. It involves showing the possible results for a project if many variables like sales cost and other changes, making it easier for managers to decide if such project should be implemented.

• Inflation Adjusted Cash Flows adjusts expected future cash flows by an estimated inflation factor.

• Economic Value Added (EVA) measures managerial effectiveness in a given year or period (net operating profit after taxes – after tax cost of capital required to support operations). Moreover EVA estimates the true economic value for the year since it takes the cost of capital into consideration, making EVA more accurate than accounting profit. The cost of capital is an important factor for the reason that sometimes even tough the return on a project is high its cost of capital is even higher. In addition EVA subtracts the depreciation, even though it is not a cash expense.

However, the depreciation is a cost since the equipments and assets wore out through time and EVA takes that into consideration. (Brigham, Daves 2004).

• Incremental IRR is the IRR of the difference in cash flows of two comparison projects; commonly used in replacement decisions

• Simulation is a method for calculating the probability distribution of possible outcomes.

• Market Value Added (MVA) is the market value of equity – equity capital supplied by shareholders. The higher this value is, the better the managers are doing in this firm.

• PERT/CPM (Program Evaluation and Review Technique/Critical Path Method) is the analysis and mapping of the most efficient financial decision.

• Decision trees are graphical illustrations used to model a series of sequential outcomes, along with their associated probabilities.

• Complex mathematical models a general term inclusive of various option pricing model techniques, complex real options, and firm specific proprietary models and methods.

• Linear programming identifies a set of projects that maximizes NPV subject to constraints (such as maximum available resources)

• Real options include the opportunity for expansion, contraction, or abandonment of a capital project before the end of its life." Ryan (2002)

2.11 Problems facing capital budgeting decision

Revisiting the problems facing the initial capital budgeting methods, we realize that most authors prefer the Discounted Cash Flow (DCF) methods (NPV, IRR, MIRR...) since they take into consideration the time value of money. However, when uncertainty in future cash flow exists (depending on types on projects) the exclusive and unconditional reliance on DCF techniques in evaluating competing projects is criticized. [Haka, S.F 1987[9], Proctor, M.D. and J.R. Canada 1992 [10]] . In contrast with the negative relation between DCF and uncertainty on cash flow, a positive relation exists between the payback period method and the uncertainty on cash flow. [Chaney, P.K ,1989[11], Kee, R.K., and B. Bublitz, 1988[12], Weingartner, H.M 1969[13]]. The reason behind this advantage lays in the fact that the payback period method concentrates on the early cash flows of the project, which are more certain. In "Evaluating Capital Budgeting Models in Simulated Environments", Sundem demonstrates in a simulation study that the payback technique outperforms net present value technique in a highly uncertain environment.

Uncertainty in cash flow is not the only problem in capital budgeting. Beside the fact that CAPM (Capital Asset Pricing Model) is sometimes used for the calculation of

[9] Haka, S.F., "Capital Budgeting Techniques and Firm Specific Contingencies: A Correlation Analysis," Accounting, Organization and Society, Vol.12, No.1, 1987, pp.31-48.

[10] Proctor, M.D. and J.R. Canada, "Past and Present Methods of Manufacturing Investment Evaluation: A Review of the Empirical and Theoretical Literature," The Engineering Economist, Fall, 1992, pp.45-58.

[11] Chaney, P.K., "Moral Hazard and Capital Budgeting," The Journal of Financial Research, Summer, 1989, pp.296-325.

[12] Kee, R.K., and B. Bublitz, "The Role of Payback in the Investment Process," Accounting and Business Research, Vol.18, No.70, 1988, pp.149-156.

[13] Weingartner, H.M., "Some New Views on the Payback Period and Capital Budgeting Decisions," Management Science, August, 1969, pp.594-607.

cost of capital, this CAPM has many defects. As reported by Brigham, and Davis, the below listed assumptions lead to these defects:

- All investors focus on a single holding period and wish to maximize their wealth based on the expected return.

- All investors can borrow or lend an unlimited amount at a given risk free of interest.

- All investors have identical estimates of the expected returns, variances, and covariances among all assets; that is, investors have homogenous expectations.

- All assets are perfectly divisible and perfectly liquid (that is, marketable at the going price).

- There are no transaction costs.

- There are no taxes.

- All investors are price takers.

- The quantities of all assets are given and fixed. [Brigham, Davis, 2004].

CAPM has faced many academic challenges. Banz (1981) provided evidence that stock of small firms earned higher return than expected by CAPM. However small firms constituted only 5% of the US market which is why Banz' evidence was not considered important. Fama and French (1992) found that the size of the company and the book-to-market ratio are most suitable in explaining cross-sectional variation in the cost of equity capital across firms than beta. In addition, Fama and French found no systematic relation between return and risk as measured by beta.

CAPM also uses the historical value for the US equity premium as the market risk premium. How can we measure the market risk premium?

The market risk premium is the average return of the market portfolio over a period of time in the past.

Siegel, 1992, calculated the return of short-term risk-free investment and real return from equity, from 1800-1888 and from 1889-1978. As a result, he found that a large gap in risk premium (= real return from equity - short-term risk-free investment) exits between the two periods. This indicated that there is no constant value for the premium. In addition, Dimson, Marsh and Staunton (2002) gathered data of 16 countries and estimated a historical equity premium of 6.2% relative to Treasury bills. However, this data is biased since it encompassed the 1920 great depression and World War II, two periods for which data collection does not go uncomplicated.

Moreover industry has changed. In 1900, railroad stocks accounted for 63% of the total market value of the traded stocks, whereas in 2000 this industry accounted for only 0.2%. Also the consumption basket has substantially changed overtime. For instance, UK's Cost of Living Index in 1914 contained just 14 items including candles and corset lacing indicating that a larger fraction of the services and goods consumed was home produced in the early part of the century."[14]

As a result we can observe that risk premium has changed over the years since the market, the industry and consumption have evolved. This risk premium was used to estimate the capital budgeting of a project. It was based on varying data which has resulted in a non accurate value.

Campbell, Lo, and MacKinlay (1997, p. 217) said: "There is some statistical evidence against the CAPM in the past 30 years of US stock-market data. Despite this evidence, the CAPM remains a widely used tool in finance."

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2.12 Difficulties facing today's firms

One of the problems facing today's firms is that in large firms, many managers in different departments compete with one another for scarce resources-mainly capital available for investment. Hence, managers sometimes inflate the real number of a project's cash flow in order to have their project accepted.

In this situation, the liquidation of a non or low profitable division will be in the best interest of the shareholders of the firm. However this strategy is not often used since the dissmissal of employees will be considered as a disgracefull activity. In addition, salaries of managers in the company will be affected since managers are responsible for the success of the firm. In most firms, a capital budgeting method is not the real problem but managers, knowing they can manipulate the cash flow to fit their goal.

An "ethics" culture highlighting the financial implications of the managers' actions must be instilled in the firm to help them overcome their personal interest in the capital budgeting process.

Another solution could be to tie the compensation of the managers with the financial performance of the firm or the project. Then, if the cash flow of a project is inflated and the project income goes into trouble, the compensation of managers will also be affected.

Finally post-auditing and internal controls to monitor the accuracy of the capital budget and forecasts calculated by the managers are also suggested. Monitoring allows the firms to strengthen future forecasts by avoiding mistakes detected in previous years.

2.13 The role of technology in the capital budgeting process

How can technology help manager calculate their forecasts and capital budgeting?

Managers computed capital budgeting using pen and paper. Later, calculators and financial calculators were introduced to facilitate their job. Today, many soft wares (Ex: Monte Carlo simulator) can compute forecasted cash flows and cost of capital for a project based on inputs entered by the user . Unlike the traditional capital budgeting method, where the forecast are only point estimates of an uncertain future, these soft wares can explore a large range of possible outcomes with the need of simple inputs. For example Monte Carlo can evaluate over 1000 possible NPV, and create probability distribution for the forecast, based on the input information. (Try to do that using a calculator!) [Nancy Beneda, Ph.D.,Petter Gokstad][15].Monte Carlo simulator is taught today in many MBA programs.[16] Monte Carlo simulation software is sold by AnalyCorp (www.analycorp.com), Palisade (www.palisade.com), and Crystal Ball (www.crystalball.com).

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16*Anonymous*. IOMA's Report on Financial Analysis, Planning & Reporting. New York: Feb 2004.Vol.04, Iss. 2; pg. 3, 3 pgs

2.14 Empirical Evidence

Finance experts and academics have long searched for the best method that could be used to evaluate a project, hence the best capital budgeting method.

Generally, NPV is regarded as being the best technique in the theoretical sense, whereas IRR is regarded to be the second best, Ryan (2002). On the other hand, Payback Period and ARR are considered to be less suitable for assessment purposes than to the methods mentioned above.

In the early 1960's, few firms employed the DCF techniques. [Istvan, Pflomn] However the latter part of the 1960's indicated an increase in the use of DCF methods. [Christy, Terborgh]. In the 1970's most of the firms (about 43%) began to use the DCF method, Klammer (1972).

Gitman, Forrecter Jr 1977, completed a survey on capital budgeting techniques used by major U.S firms. In their survey they found that the most used capital budgeting method was the IRR followed by ARR as primary method. As for the secondary method Payback technique was the most used followed by NPV. Besides the search on primary and secondary method, they also investigated the division responsibility (60% financial division), the most difficult stages of capital budgeting process (64% for project definition and cash flow estimation), causes of capital rationing (65% limit on borrowing placed by internal management) and the method used to adjust for risk (44% increase the minimum rate of return or the cost of capital.)

Although this study was written in 1977, and advanced calculators were not invented yet, the authors concluded that U.S firms are utilizing many of the theoretical tools and firms are moving towards sophisticated tools (NPV, IRR) for capital budgeting analysis.

However choice of the best method differs because of the firm size, the department, type of business and country. For example, managers of R&D departments in the US firms use Payback more than NPV and IRR despite payback's many weaknesses. [Brigham, Pettway]. According to their survey 67.1% of managers used Payback method in comparison to 65.5% for IRR and 48.8% for NPV[17], [Cook, Rizzto, 1989]. Also, this same study shows that 60.3% of those managers have capital constraints, which means that there is an increase in the use of capital rationing. However this paper (Cook, Rizzto, 1989) concluded that NPV and PI are the more frequently used and are further appropriate in evaluating mutually exclusive projects.

In 1989, a study was developed to evaluate if sophisticated capital budgeting approaches improve the effectiveness of an investment. [Pike, 1989]. The use of sophisticated capital budgeting method was increasing due to an increase in the use of computer applications in the capital budgeting area. The use of NPV and IRR methods has increased throughout the years as compared to the remaining methods.

Figure 2.1 Increased use of NPV and IRR
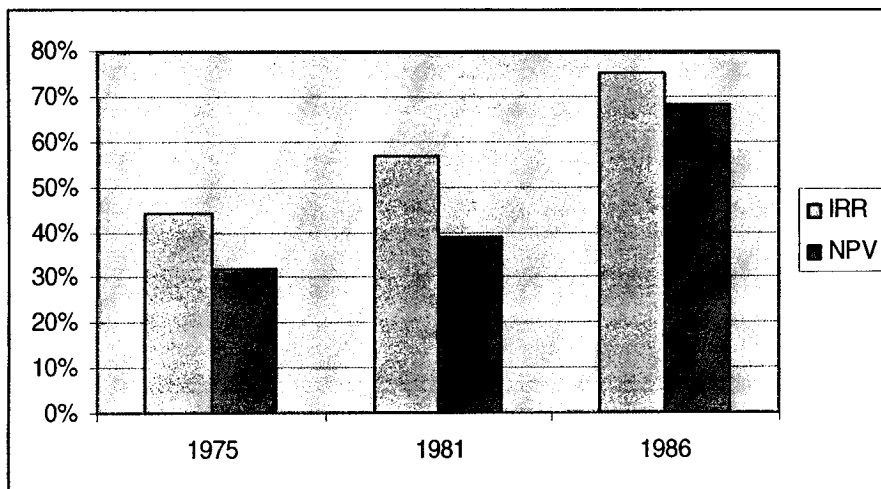
Adopted from Pike 1989

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[17] The sum of the percentages is more than 100% because in this survey managers had to rank these methods.

As a result, the author found that the sophisticated investment techniques which we owe to the rapid growth of relatively inexpensive computer investment softwares have improved the capital budgeting effectiveness over the period of study. This study is based on the survey of 100 firms in the United Kingdom from 1975 till 1986.

In 1992, a survey has been made by Ravindra on capital budgeting practices in large hospitals, since very little has been stated on this matter. The results came as follows, 42% reported to use NPV, IRR and PI as primary method. On the other hand, 41% reported to use PP, DPP and ARR as primary method. As for secondary method 54% relied on sophisticated methods (Probability analysis, Computer simulation...), a percentage that has increased between 1972 and 1989. Another important remark mentioned in this paper is the fact that hospitals not using any one of the six capital budgeting methods mentioned above, have suffered a general downward trend. According to this study naïve and spreadsheet method have been equally used as primary method, and the medical staff has participated in major capital investment decisions by providing the subjective input and objective patient data.

2.15 Conclusion

These articles have presented the findings of a survey of capital budgeting techniques. Many of the result have focussed on the fact that companies through the years have been using more sophisticated method to make their capital budgeting decision. In addition companies not using sophisticated capital budgeting method have suffered a downward trend, Ravindra 1992.

Capital budgeting constraints and problems

-Governments survey and protect the economy through regulations and laws. These constraints (regulations and laws) affect a firm's new projects as well as sets project limitations. However, there are times when these regulations provide the firms with advantages like lower cost of electricity, lower tax and for some factories an inferior price on the raw material.

- As mentioned in the CAPM section, cost of capital is another constraint facing the managers. Moreover, Lebanon with few companies registered in the Beirut Stock Exchange (BSE) cannot give a true indication of the CAPM.

-The life span of a project is also a limitation of a project since it is not always accurately calculated. The major reasons for this miscalculation are:
The technological advances affect a project since a new and more advanced product could replace an old one. It is harder to predict distant cash flows, leading to an uncertain life of a project. In addition, trend change and the market of the product disappear [Anonymous, 2005].

-Other dilemmas facing managers are: when should a plant or building be put in service upon termination of construction considering the time needed for construction, furniture and equipment placement, before the project can have a positive return; and how to choose a profitable project. This last decision is particularly hard especially in Lebanon since the latter is a very small market. The project should be appealing to most customers which have low average income.

Risk adjustment

In general, it is difficult to measure the difference in risk among projects, leading firms to selecting a single weighted average cost of capital for all their projects. In addition, firms revise their discount rates on a yearly basis, despite the fact that a changing in cost of fund occurs more often then it used to. [Brooks, Ferreira, 1988].

Nevertheless the economy is not stable and changing, implying that adjustment for risk in a project should be taken into consideration. Some supplementary methods like sensitivity analysis, computer simulation, linear programming and beta will be used to adjust for the new risk. On the other hand the Lebanese economy is weak and we are not sure if managers find these methods efficient in this environment.

Chapter 3: Research Methodology

3.1 Objective

In this research, we will investigate methods of capital budgeting used in the Lebanese market. We will look at the primary method used by Lebanese managers, then we will analyse the reason (s) behind using these methods. Furthermore, we will study how efficient is the selected method with respect to other methods. In addition, we will test the relationship between general variables such as educational background, experience and the primary method of capital budgeting used. Also, we will look at constraints and problems facing today's managers in Lebanon, and the techniques used for adjusting risk if a new event was to occur in the Lebanese economy.

3.2 Hypotheses

The above stated questions can be translated into the following hypotheses.

The (H1) hypothesis will be:

H0: Lebanese managers are not using efficient and sophisticated capital budgeting method.

H1: Lebanese managers are using efficient and sophisticated capital budgeting method.

The (H2) hypotheses will be:

H0: There is no relationship between the primary method used and the educational background of the Lebanese managers.

H1: There is a relationship between the primary method used and the educational background of the Lebanese managers.

The (H3) hypotheses will be:

H0: There is no relationship between the primary method used by managers and what is considered for them to be the most difficult stage.

H1: There is a positive relationship between the primary method used by managers and what is considered for them to be the most difficult stage.

The (H4) hypotheses will be:

H0: There is no relationship between the primary method used and the training and experience received from abroad.

H1: There is a relationship between the primary method used and the training and experience received from abroad.

The (H5) hypotheses will be:

H0: There is no relationship between the primary method used by managers and their internet search in the field of capital budgeting.

H1: There is a relationship between the primary method used by managers and their internet search in the field of capital budgeting.

The (H6) hypotheses will be:

H0: There is no relationship between the primary method used by managers and the cost of capital.

H1: There is a relationship between the primary method used by managers and the cost of capital.

In this paper, we will test the relationship between method used in capital budgeting and the manager experience, field of expertise and other variables that we will discuss in the following section.

3.3 Definition of Variables

Methods used by managers to evaluate their projects, will take into consideration the status of the employee, field of expertise experience, in other words descriptive information of the manager. In addition, the cost of capital, most difficult stages, method change with respect to market change, government help, training abroad, internet search, foreign influence and the percentage of time that capital budgeting requires in the decision making which will are the independent variable. While primary and secondary techniques for decision making will be the dependent variables.

3.3.1 Dependent Variables

The dependent variable in the above hypotheses is the primary method used in capital budgeting. There are some studies that show IRR as the most used primary method, Ferreira and Brooks (1988). Also Forrester and Gitman (1986) in there paper, showed that there is an increase in the use of sophisticated technique for the capital budgeting. On the other hand, some results show payback period as the most used primary method, Miller et al (1960, 1978, 1996).[18] As for other, NPV is the most used method. Ryan (2002)

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18 Capital Budgeting Practices of the Fortune 1000:
How Have Things Changed?
Patricia A. Ryan 2002.

In our study we will try to find if the Lebanese managers are up to date with the improvement in capital budgeting, or in other words, do they use sophisticated methods in capital budgeting.

3.3.1.1 The primary technique

This technique is the most frequently used method by managers. For that reason, we can notice that these methods are more beneficial and most resorted to by managers. In the USA, most managers use the NPV technique[19]; nonetheless no data is available with respect to methods used by Lebanese managers. In line with that, this survey will shed light on means used for capital budgeting in Lebanon.

3.3.1.2 Secondary techniques

This technique is a backup for the primary method. It is used when there is uncertainty in the finding of the primary method and when managers need to double check their method. In their paper, Ferreira and Brooks (1988), have found that payback period method is the most used one by companies listed on New-York Stock Exchange (NYSE). Nevertheless, no information is found with respect to Lebanese market.

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[19] http://en.wikipedia.org/wiki/Capital_budgeting

3.3.2 Independent Variable

The independent variables for the above hypotheses are the descriptive information of the manager, cost of capital, training abroad, difficult stages in capital budgeting decisions, internet search, foreign influence and the percentage of time that capital budgeting requires in the decision making which are the independent variable.

3.3.2.1 Descriptive information

These independent variables will give a full description of the person in charge in the company.

The first variable is the status of the person. This person could be a junior employee, senior employee, shareholder, Co-owner or a sole owner. This variable will show how important this person is to the company or how much he has influence in the company.

The second variable is the field of expertise of the individual. Finance, accounting, management, economy and others could be the field of expertise of the person in charge. This variable shows the background of the people who works in capital budgeting decision.

The last variable in the descriptive information will measure how long this individual has been working in this field.

3.3.2.2 Cost of capital

It should be noted that this is an important variable since it will be the rate at which the cash flow will discounted. The cost of capital is the weighted average cost of debt

and cost of equity. This cost of capital depends on many factors in the company. First the cost of debt is how much you pay interest on the money you have borrowed from the bank. On the other hand, the cost of equity depends on the market risk, risk free and the beta of the company. The riskier the company, the higher its beta is. In his paper, Eugene R. et al (1992) found that the average cost of capital of 67 hospitals is approximately 10%. On the other hand, Gitman and Forrester (1977) in their paper found that the 60% of their respondents consider the cost of capital to be between 10% to 15%.

In addition, the higher the cost of capital, the more the company is affected by long term projects. This variable is very important to the dependent variable since it directly affects it.

3.3.2.3 Most difficult stage

This variable will explore the 4 stages of a project.

First: Project Definition and Cash Flow Estimation

Second: Financial Analysis and Project Selection

Third: Project Implementation

Fourth: Project Review.

The first stage will define what the project is all about and estimate the cash outflow and inflow of money. The second stage will asses if the project is viable, stable and profitable using some ratios like current ratio, debt to equity ratio etc... According to these ratios and cash flow, the project is selected. The implementation of the project will be the third stage. In this stage, the project should be well executed and

monitored for it to give the results expected. Finally the last stage will verify if the project was well chosen and implemented.

These stages were studied by Gitman and Forrester (1986) based on major US firms. In their paper, Gitman and Forrester have found that most of the manager found the Project Definition and Cash Flow Estimation to be the most difficult stage in the capital budgeting process. Also, Fremgen (1973) in his study found that the Project Definition and Cash Flow Estimation is the most important and difficult stage.
In addition, in his book Brigham (2004) state that the cash flow estimation is the most difficult step in capital budgeting.

3.3.2.4 Government Help

The variable will explore if the Lebanese government offer any help, through Published studies, investment in research, granting free consultation, published relevant and up-to-date material on the website and if the government organizes and invites company representatives to a workshop.

3.4 Population of the study

In the Middle East, sociology and anthropology have affected the culture of management of businesses since the importance of the family is inherited in the tribal history. For example in Kuwait, Al-Sabah family has been in power since the 18th century. Moreover, 98% of businesses in the gulf council were family owned businesses, Welsh, Raven (2003). In addition, there is a tendency toward fatalism[20] where employees tend to blame factors other than themselves like bureaucracy for example [Rice, 1999][21]. This causes the firms to be less efficient then the western firms, where the performance is the employee responsibility.

Lebanon, being an inherent part of this geographic area has been affected by this feudal system and most of its firms are family owned firms. These families have control over key positions within the company even though they sometimes lack the skills needed for their position. Some of the causes of this system are:

1) The size of most Lebanese companies is small and can only be owned by one family. In figures, 85% of industrial companies have less then 10 employees and 90% are family owned businesses. [Saidi, 2004] 2) Owing it to its feudal culture, feudalism is reflected in contemporary Lebanese market with family owned businesses. 3) Educated people are leaving the country because of the small market opportunities..

This paper will study the financial technique for evaluating capital budgeting used by executives in Lebanese companies, and compare it to the theoretical method used in books. In other word, is NPV the most widely used method in Lebanon? In addition,

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[20] The doctrine that all events are predetermined by fate and are therefore unalterable.
[21] Rice,G. (1999). Islamic ethics and implications for business. Journal of Business Ethics, 4(2), 345–358.

we will investigate if the Lebanese government offers any help to the Lebanese companies. Moreover, we wish to study if the educational background has any effect on the method used for the study on capital budgeting. We wish to shed light on the most used technique in Lebanon for the calculation of the capital budgeting and find, if applicable, a better technique that could be used in this country.

3.5 Data Collection

A questionnaire was distributed to managers of Lebanese firms. The study was done since not many research or projects were done in the field of capital budgeting for the Lebanese companies. This primary data was gathered from 30 companies. Some questionnaires were excluded since not all responses were available. As for the secondary data, we have found some papers considering capital budgeting in the USA, however we have not found any paper considering the techniques of capital budgeting in Lebanon.

3.6 Regression analysis

SPSS program will be used to test the data and variables to give the regression analysis and descriptive analysis. Data will be tested to see whether it is normal or not. Based on the descriptive statistic if the data is normal parametric tests can be used hence regression analysis. However if data is not normal then Chi-square a non parametric test is be used.

Regression analysis is a statistical technique used to explain or predict the behaviour of a dependent variable. In general, a regression equation takes the form of

Y=a+bX+c. It states that the dependent variable Y, is equal to a constant a, plus b times X, where b is the slope coefficient and X is the independent variable plus an error c. [22]

This paper explores the financial technique for evaluating capital budgeting used by executives in Lebanese companies, and compare it to the theoretical method used in books. In other word, is NPV the most widely used method in Lebanon? In addition, we will investigate if the Lebanese government offers any help to the Lebanese companies. Moreover, we wish to study if the educational background has any effect on the method used for the study on capital budgeting.

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[22] http://www.investorwords.com/4137/regression_equation.html

Chapter 4: Findings and Analysis

The data from chapter 3 are primary taken for a questionnaire distributed to Lebanese company. The number of fully answered questionnaire is 30. The dependent variables are: which primary and secondary methods are used by manager in Lebanese company. The independent variable are the descriptive information of the manager, cost of capital help, difficult stages in capital budgeting decisions, training abroad, internet search, foreign influence and the percentage of time that capital budgeting requires in the decision making which are the independent variable.

4.1 Descriptive Statistics

On the next page.

Table 4.1: Descriptive Statistics of Variable.

	N	Minimum	Maximum	Mean	Median	Mode	Std. Deviation
Current status	30	1	4	2.4	1	1	1.522
Field of expertise	30	1	5	2.2	1	1	1.690
Interval of time of work in this field	30	1	6	1.67	1	1	1.516
Interval of time in current position	30	1	2	1.17	1	1	0.379
Primary method	30	1	5	3.27	4	4	1.015
Secondary method	28	1	6	2.68	2	1	1.722
The discounting rate	29	1	3	2.69	3	3	0.541
Value of the discounting rate	28	1	5	2.39	2	2	1.1
Most difficult stage	30	1	3	1.5	1	1	0.731
Change methods with major changes in the market	30	1	2	1.63	2	2	0.49
Best method used	30	1	2	1.1	1	1	0.305
Government help in the capital budgeting	29	1	2	1.86	2	2	0.351
How the government help?	4	1	3	1.5	1	1	1
Training abroad and other countries' experience	29	1	2	1.66	2	2	0.484
Internet search (in the field of capital budgeting)	29	1	2	1.31	1	1	0.471
Funds from foreign counterparts and influence	28	1	2	1.82	2	2	0.39
Alternative methods	29	1	2	1.34	1	1	0.484
Decision-making time of capital budgeting	28	1	7	4.96	5	7	2.081

The descriptive statistics are shown in table 4.1, for all the variables. Using SPSS this table shows the minimum, maximum, mean, median, mode and standard deviation. Looking at the dependent variable i.e. educational background, most difficult stage, training received from abroad, internet search and the cost of capital we can realize that the mean and medium for these variables are close which means that the variables are normally distributed. This normality of the variables is shown graphically in the next section.

4.2 Frequencies Analysis

Frequency Table

Table 4.2.1: Frequency analysis of the status of the employee.

What is your current status in the company you are working for?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Junior employee	16	53.3	53.3	53.3
	Senior employee	14	46.7	46.7	100.0
	Total	30	100.0	100.0	

From our sample of 30 observations, we can see that most of our respondents are Junior or Senior employees. They are approximately equally divided. In addition none of the respondents are shareholders or co-owners or even sole owners. Figure 4.1 display the histogram and normal curve for current status. We can notice that this variable is normally distributed which means that it is a powerful variable. The next variable will explore the field of expertise.
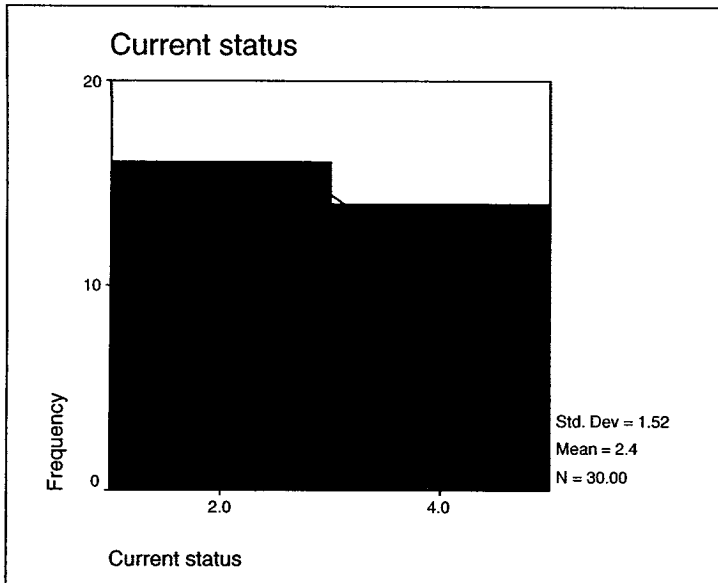
Figure 4.1: Normality distribution of Current Status

4.2.2 : Frequency analysis on the field of expertise

What is your field fo expertise?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Finance	18	60.0	60.0	60.0
	Management	3	10.0	10.0	70.0
	Accounting	3	10.0	10.0	80.0
	Other	6	20.0	20.0	100.0
	Total	30	100.0	100.0	

This variable proves that most of the persons that have responded to this questionnaire have a financial background. This is why, most of the result are from persons practised in capital budgeting. In addition looking at figure 4.2 we can observe that is variable is powerful since it is normally distributed.
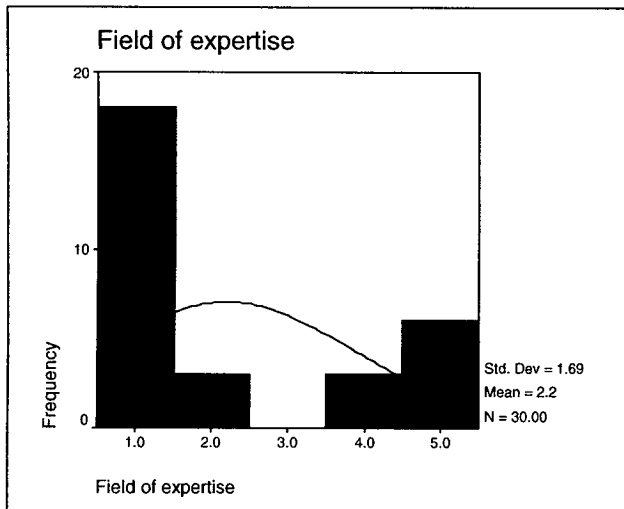
Figure 4.2 Normality distribution of Field of expertise

4.2.3: Frequency analysis on the primary method

Which methods does your company use as a primary method?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Payback Period	1	3.3	3.3	3.3
	Discounted Payback	8	26.7	26.7	30.0
	Profitability Index	4	13.3	13.3	43.3
	Net Present Value	16	53.3	53.3	96.7
	Internal Rate of Return	1	3.3	3.3	100.0
	Total	30	100.0	100.0	

This variable is the most important one in our study since it will show the primary method used by Lebanese companies in the field of capital budgeting. The above table shows that NPV is the most used technique and discounted payback as the second best method. With respect to the hypotheses H1 "Is NPV the primary method used by Lebanese managers?", these results shows that H1 is correct.

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Figure 4.3 Normality distribution of Primary method

Figure 4.3 displays the histogram as well as the normal curve for primary method. The primary method is the most used capital budgeting method by Lebanese managers. The curve for this variable indicates that data are normal.

4.2.4: Frequency analysis on the secondary method

Which methods does your company use as a secondary method?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Payback Period	9	30.0	32.1	32.1
	Discounted Payback	7	23.3	25.0	57.1
	Profitability Index	5	16.7	17.9	75.0
	Net Present Value	1	3.3	3.6	78.6
	Internal Rate of Return	3	10.0	10.7	89.3
	Modified IRR	3	10.0	10.7	100.0
	Total	28	93.3	100.0	
Missing	System	2	6.7		
Total		30	100.0		

With respect to the table shown above, there is no major agreement on the secondary method. 9 of the respondent have agreed that payback period in the best secondary method, 7 on discounted payback, and on profitability index. No exact conclusion

could be given on this secondary method. In addition these results will not affect our study since this is a backup technique.
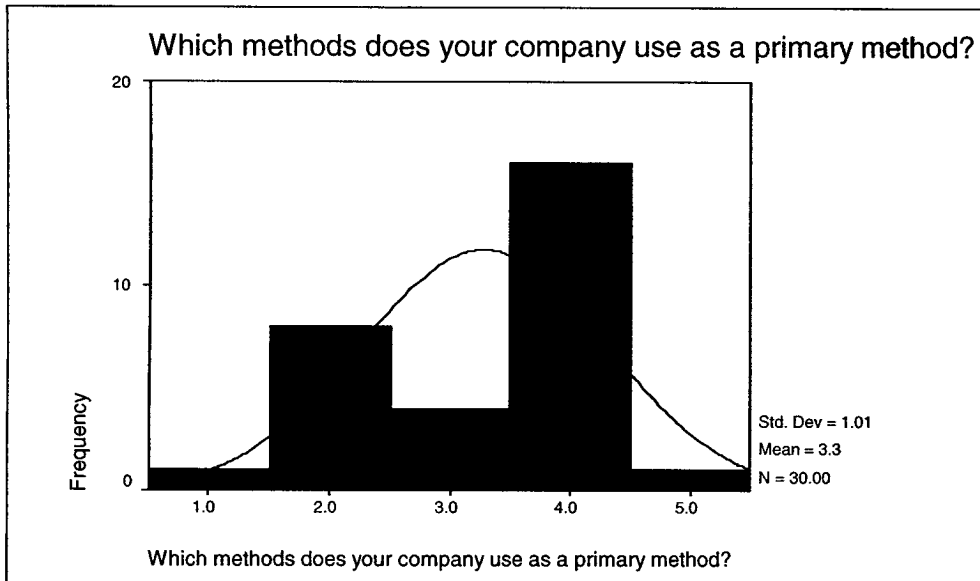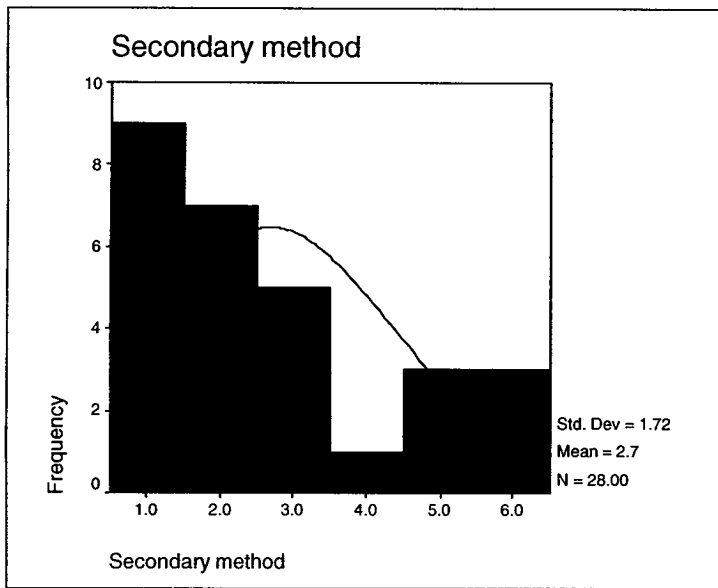

Figure 4.4 Normality distribution of Secondary method

Figure 4.4 displays the histogram as well as the normal curve for secondary method. This is the backup method for managers in assessing projects. From the figure, we can observe that the data is close to normality.

4.2.5: Frequency analysis on the discounting rate

When evaluating a project, what is the discounting rate that you use?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	cost of equity	1	3.3	3.4	3.4
	cost of debt	7	23.3	24.1	27.6
	cost of capital	21	70.0	72.4	100.0
	Total	29	96.7	100.0	
Missing	System	1	3.3		
Total		30	100.0		

The above figure demonstrates the cost of capital elements used by our correspondents to determine their cut-off rate. According to our survey, the WACC is

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the most used technique by the Lebanese companies, moreover Ferreira and Brooks (1988), found also that the WACC is mostly used in determining the cost of capital.
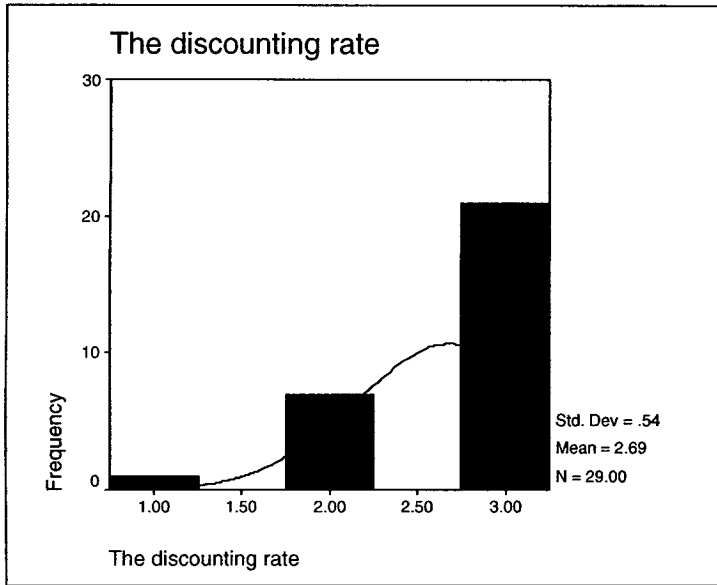
Figure 4.5 Normality distribution of the discounting rate

Figure 4.5 shows the histogram for the discounting rate. The discounting rate is the rate used to discount the project cash flow given its riskness. This discounting rate could into consideration the cost of debt, equity or both of them. From the figure above we notice that the discounting rate is close to normality.

4.2.6: Frequency analysis on the discounting rate value

And at which value?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5%	6	20.0	21.4	21.4
	8%	10	33.3	35.7	57.1
	10%	9	30.0	32.1	89.3
	12%	1	3.3	3.6	92.9
	15%	2	6.7	7.1	100.0
	Total	28	93.3	100.0	
Missing	System	2	6.7		
Total		30	100.0		

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This value is critical to the decision making of the project since it is the rate at which the cash flow of the project will be discounted. According to our survey, most of the Lebanese firms consider the cost of capital to range between 8 to 10%. We can observe that projects with a return higher than 10% are accepted.
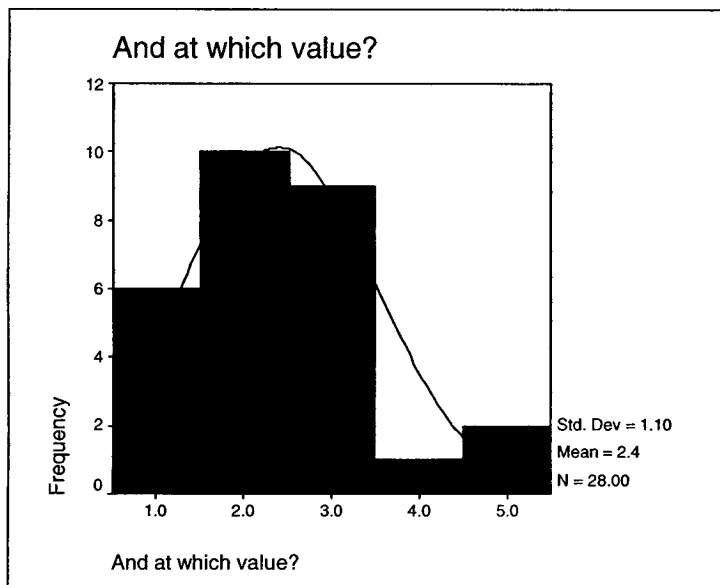
Figure 4.6 Normality distribution of Value of the discounting rate

Figure 4.6 shows the histogram and normal curve for the value of the discounting rate. This is the value of the cost of capital to execute a project. The curve for this variable implies that the data are normally distributed.

4.2.7: Frequency analysis on the most difficult stage

What is the most difficult stage you face while evaluating a project?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Project Definition and CF Estimation	19	63.3	63.3	63.3
	Financial Analysis and Project Selection	7	23.3	23.3	86.7
	Project Implementation	4	13.3	13.3	100.0
	Total	30	100.0	100.0	

Fremgen (1973), observed that most firms believed that the definition and estimation of project cash flows were the most difficult parts of the capital budgeting process. It

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is not surprising that he has found these results since cash flows estimation involves

numerous forecasts. In our study, we have found the same results.
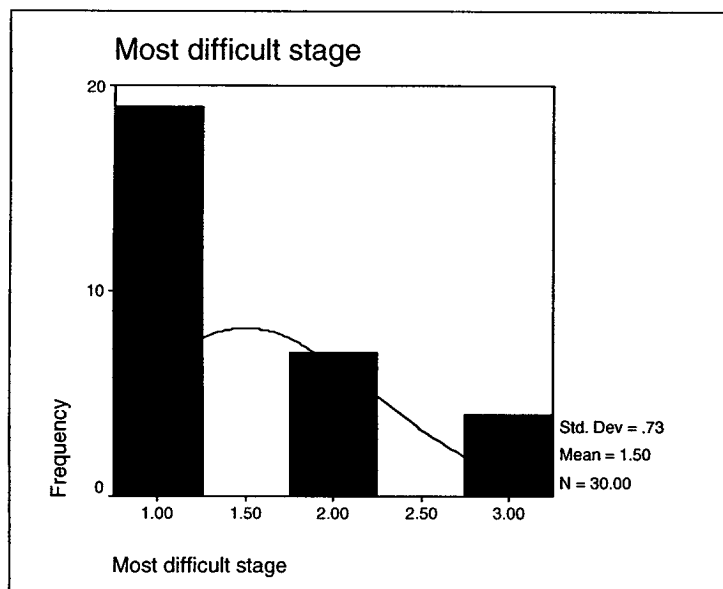
Figure 4.7 Normality distribution of Most difficult stage

This variable is also normally distributed according to figure 4.7.

As for the rest of the table they are found in the appendix at the end of the paper.

In general, we can observe that all the variables are normally distributed. Some closer

to normality than others; The primary method which is the depend variable is

normally distributed which indicates that it is a powerful variable. Moreover, the

independent variables are also normally distributes or close to normality. Since either

dependent and independent variable are normal or close to normality the parametric

test will be used in the regression analysis, which provides more powerful results.

4.3 Regression Analysis

The following section illustrates the results of the regression analysis performed on SPSS between the dependent and independent variable.

The regression below is between the dependent variable (Primary method used) and the independent variable (Field of expertise of the person).

4.3.1: Regression analysis between the primary method and the field of expertise

Regression

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	What is your field fo expertise?[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Which methods does your company use as a primary method?

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.595[a]	.354	.331	.830

a. Predictors: (Constant), What is your field fo expertise?

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.582	1	10.582	15.364	.001[a]
	Residual	19.285	28	.689		
	Total	29.867	29			

a. Predictors: (Constant), What is your field fo expertise?

b. Dependent Variable: Which methods does your company use as a primary method?

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.053	.251		16.120	.000
	What is your field fo expertise?	-.357	.091	-.595	-3.920	.001

a. Dependent Variable: Which methods does your company use as a primary method?

This regression gives an R Square of 0.354 indicating that there is a strong relationship between the primary method used and the field of expertise. The significance of the model is 0.001 meaning that the selected variables contributes strongly in the choice of the primary method used. These results lead us to accept the hypothesis which predicts that there is a relationship between the field of expertise and the primary method used by managers.

The next regression will investigate the relationship between the primary method used by managers and between what they consider to be the most difficult stage in their capital budgeting decision.

4.3.2: Regression analysis between the primary method and the most difficult stages

Regression

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	What is the most difficult stage you face while evaluating a project?[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Which methods does your company use as a primary method?

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.325[a]	.106	.074	.977

a. Predictors: (Constant), What is the most difficult stage you face while evaluating a project?

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.161	1	3.161	3.315	.079[a]
	Residual	26.705	28	.954		
	Total	29.867	29			

a. Predictors: (Constant), What is the most difficult stage you face while evaluating a project?

b. Dependent Variable: Which methods does your company use as a primary method?

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.944	.413		9.559	.000
	What is the most difficult stage you face while evaluating a project?	-.452	.248	-.325	-1.821	.079

a. Dependent Variable: Which methods does your company use as a primary method?

This regression has an R Square of 0.106 relatively low. This indicates a weak relationship between the primary method used by managers with respect to what is considered from them to be the most difficult stage. The significance of the model is $0.079 > 0.05$ showing that the selected variable does not contribute to the decision making in choosing the primary capital budgeting method.

4.3.3: Regression analysis between the primary method and the training abroad

Regression

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Do you receive training abroad and benefit from other countries' experienc e?[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Which methods does your company use as a primary method?

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.187[a]	.035	-.001	1.024

a. Predictors: (Constant), Do you receive training abroad and benefit from other countries' experience?

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.021	1	1.021	.974	.332[a]
	Residual	28.289	27	1.048		
	Total	29.310	28			

a. Predictors: (Constant), Do you receive training abroad and benefit from other countries' experience?

b. Dependent Variable: Which methods does your company use as a primary method?

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.895	.689		5.656	.000
	Do you receive training abroad and benefit from other countries' experience?	-.395	.400	-.187	-.987	.332

a. Dependent Variable: Which methods does your company use as a primary method?

This regression has an R Square of 0.035, a value that is relatively low. This indicates a weak relationship between the primary method used by managers with respect to the training and benefits from other countries to there company. The significance of the model is 0.332 > 0.05 showing that the selected variable does not contribute to the decision making in choosing the primary capital budgeting method.

4.3.4: Regression analysis between the primary method and the internet search in capital budgeting

Regression

Variables Entered/Removed [b]

Model	Variables Entered	Variables Removed	Method
1	Do you perform Internet search to keep up with lessons learnt (in the field of capital budgeting) in other companie s in the world? [a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Which methods does your company use as a primary method?

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.235[a]	.055	.020	1.013

a. Predictors: (Constant), Do you perform Internet search to keep up with lessons learnt (in the field of capital budgeting) in other companies in the world?

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.621	1	1.621	1.581	.219[a]
	Residual	27.689	27	1.026		
	Total	29.310	28			

a. Predictors: (Constant), Do you perform Internet search to keep up with lessons learnt (in the field of capital budgeting) in other companies in the world?

b. Dependent Variable: Which methods does your company use as a primary method?

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.911	.565		6.924	.000
	Do you perform Internet search to keep up with lessons learnt (in the field of capital budgeting) in other companies in the world?	-.511	.406	-.235	-1.257	.219

a. Dependent Variable: Which methods does your company use as a primary method?

The above regression has an R Square of 0.055, a value that is relatively low. This indicates a weak relationship between our dependent variable (primary method used by managers) with respect to the internet search in the field of capital budgeting. The significance of the model is 0.219 > 0.05 showing that the selected variable does not contribute to the decision making in choosing the primary capital budgeting method.

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4.3.5: Regression analysis between the primary method and the value of discounting rate

Regression

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	And at which value?[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Which methods does your company use as a primary method?

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.282[a]	.080	.044	1.008

a. Predictors: (Constant), And at which value?

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.286	1	2.286	2.249	.146[a]
	Residual	26.428	26	1.016		
	Total	28.714	27			

a. Predictors: (Constant), And at which value?

b. Dependent Variable: Which methods does your company use as a primary method?

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.581	.463		5.575	.000
	And at which value?	.264	.176	.282	1.500	.146

a. Dependent Variable: Which methods does your company use as a primary method?

The above tables show the relationship between the primary method and the value of the cost of capital. R Square 0.08 point to a weak correlation between the primary method and the cost of capital or in other words the discount rate. The significance of

the model is 0.146 > 0.05 showing that the selected variable does not contribute to the decision making in choosing the primary capital budgeting method.

In addition, a multiple regression was tested between the dependent variable (Primary Method) and the independent variable (Field of Expertise and Value of discounting rate). This regression gave an R Square of 0.45, showing a high correlation between the dependent and the independent variables. For more information please refer to the appendix B.

4.4 Conclusions

We can conclude from the above frequencies simulated on SPSS that most of the Lebanese firms use NPV as a primary method. This result is in accordance with the Hypotheses H1 :(Lebanese managers are using efficient and sophisticated capital budgeting method). In our empirical evidence, the NPV is regarded as the best capital budgeting techniques in the theoretical sense, Ryan (2002). We can notice that Lebanese managers are using one of the best capital budgeting techniques and a sophisticated one too, since NPV is considered a sophisticated method, Gitman, Forrecter Jr (1977). Even though in section of "the population of the study" in chapter 3, it was stated that the person in charge lack the skills needed, our study shows that most of the managers are using a good capital budgeting technique.

In addition, 80% of the respondents have a business background and the remaining 20% have engineering and insurance background.

As for the discounting rate, most of the managers (70%) use the WACC and only 23.3% use the cost of debt. Ryan (2002) is her paper has found that 83% of the respondents from her survey used the WACC in accordance with the academia.

Moreover, 63% of the managers in our study, state this discount rate to be between 8 and 10%, a different result from our empirical evidence where it is stated that most of the managers find the right value of the discount rate to be between 10 to 15%, Gitman, Forrecter Jr (1977).

Additionally, 63% of our respondents have stated that the most difficult part in capital budgeting in the project definition and cash flow estimation. On the other hand, only 23% state that financial analysis and project selection is the most difficult stage in capital budgeting.

With respect to the government help, 83% from our survey declare that they do not receive any government help to decide on the capital budgeting technique to be used.

We have observed from the regression a correlation between the primary method used and the field of expertise, evidence that the educational and experience background has an effect on the capital budgeting decision making.

We can conclude that the Lebanese managers are using a good capital budgeting techniques because of there educational and experience background.

Chapter 5: Conclusion and Recommendations

5.1 Conclusion and recommendations

Capital budgeting is one of the most important decisions that face the financial manager. And for managers to take this decision they use many techniques. One of these techniques is the payback period which is the simplest among the other. However, payback period does not take into consideration the time value of money. Another method is the discounted payback period. This method takes into consideration the time value of money; however it could reject a positive NPV project if it is not well interpreted. Also IRR and MIRR are 2 methods that are used for assessing a project, yet they have many disadvantages. For example, if a project has fluctuating cash flow, IRR will have multiple values and the manager will not be able to do the decision about the project. On the other hand MIRR have relatively no problem, nevertheless is it a difficult method.

A different method is NPV, which according to our Literature Review, is regarded as the best capital budgeting techniques, because of its many advantages. In addition, in our empirical research section we have found the same results.

Many studies have been made to search for the best and most used capital budgeting techniques, however not all of them agreed on one method. In 1960, payback period method was the most popular, in 1970 IRR, 1972 DCF. However, the recent studies show that NPV is regarded to be the best method in capital budgeting and the most used. Ryan (2002)

In this paper we have made a survey on the Lebanese firms to see which method they have used. The results acknowledged the H1 Hypotheses which state: Lebanese

managers are using efficient and sophisticated capital budgeting method. In other words: What is the best method of capital budgeting and are Lebanese managers using it? Form our results we can observe, even though the number of respondent was limited most of the persons in charge have a good knowledge on the capital budgeting methods.

5.2 Managerial implications:

Finance experts and academics have long searched for the best capital budgeting method. In our empirical evidence we have noticed a changing in the capital budgeting method through the years. In the early 1960's few firms used the DCF techniques, Istvan (1961). Nevertheless the latter part of the 1960's showed an increase in the use of DCF methods. In the 1970's the majority of the companies began to use the DCF methods Klammer (1972). In 1989, the use of sophisticated capital budgeting has increased, and most firms began to use NPV and IRR techniques, Pike (1989). As for the most recent studies, Ryan (2002) found that NPV is the most efficient and most used capital budgeting method. Our literature review support that NPV is the most efficient method used in capital budgeting and our finding and analysis showed that most Lebanese managers are using NPV as their primary method for assessing a project. Also in our findings and analysis, the use of this method was in relation with the manager's educational background.

Managers should use sophisticated capital budgeting method in assessing their projects since these methods take into consideration the time value of money and as a result, a more accurate estimation of the project performance. Moreover, the right choice of capital will influence the company financials for a long period of time and consequently the whole economy.

5.3 Limitation of the project:

This study was made in Lebanon through a questionnaire that was distributed to some firms. One of the limitations of this study was the small number of the respondent. Primary data was the only source of information available since no secondary data was available on the capital budgeting in Lebanon.

Despite the fact that, this survey was distributed to many firms only 30 of them have replied. This number of respondents is due to the fact that some of the persons in charge did not even accept to read the questionnaire since they considered that their capital budgeting method must not be revealed. Others have read the questionnaire, however they were not able to respond to it.

5.4 Future Consideration

The right choice of capital budgeting technique has a great influence on the firms' financial future. Moreover, the affected firms influence the economy as a whole since it is a part of that economy.

A larger sample of Lebanese firms should be analyzed since this study was prepared based on a small sample. In addition the questionnaire distributed should be more detailed. This questionnaire should include a question about the use of financial software (i.e. Monte Carlo simulator) by Lebanese managers and also some other details like the Asset size, Industry classification, and size of Annual Capital Budget of the company. As a result a better set of interpretations and conclusions could be derived since more research is required on the field of capital budgeting techniques in the Lebanese market.

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Appendices

Appendix A: Data and Questionnaires

Methods used in capital budgeting in Lebanon

This survey is being conducted as part of a thesis project. Kindly complete the questionnaire by double clicking the empty box facing the corresponding answer (s). After duly completing the questionnaire please return by email to **michel_hayeck@hotmail.com** .

A. Descriptive Information

1. **What is your current status in the company you are working for?**

☐ Junior employee   ☐ Shareholder   ☐ Sole owner
☐ Senior employee   ☐ Co-owner

2. **What is your field of expertise?**

☐ Finance   ☐ Management   ☐ Economy

☐ Accounting   ☐ Other (Please specify_____)

3. **How long has it been you are working in this field?**

☐ 1 – 5 years   ☐ 6 – 10 Years   ☐ 11 – 15 Years
☐ 16 – 20 years   ☐ 21- 25 Years   ☐ 26 and more.

4. **How long has it been you are occupying your current position?**

☐ 1 – 5 years   ☐ 6 – 10 Years   ☐ 11 – 15 Years
☐ 16 – 20 years   ☐ 21- 25 Years   ☐ 26 and more.

B. Decision-Making Methods

5. Which methods does your company use as a primary method?

☐ Payback Period   PP   ☐ Discounted Payback   ☐ Profitability Index PI

☐ Net Present Value   NPV   ☐ Internal Rate of Return   IRR☐ Modified IRR MIRR

Please Explain why:

_____

_____

_____

6. Which methods does your company use as a secondary method?

☐ Payback Period   PP   ☐ Discounted Payback   ☐ Profitability Index PI

☐ Net Present Value   NPV   ☐ Internal Rate of Return   IRR☐ Modified IRR MIRR

Please Explain why:

_____

_____

_____

7. When evaluating a project, what is the discounting rate that you use [cost of equity, cost of debt or cost of capital(WACC)]?

☐ cost of equity   ☐ cost of debt   ☐ cost of capital(WACC)

and at which value?

☐   5%   ☐ 10%   ☐ 15%

☐   8%   ☐ 12%   ☐ 20%

Please Explain why:

_____

_____

_____

8. What is the most difficult stage you face while evaluating a project?

☐ 1) Project Definition and Cash Flow Estimation   ☐ 2) Financial Analysis and Project Selection

☐ 3) Project Implementation   ☐ 4) Project Review

9. Does your company change methods with major changes in the market?

☐   Yes   ☐   No

10. If your answer to the previous question was "Yes", please indicate from which and to which methods did you shift and if possible please state a market condition which has led you to switch methods:

_____

_____

_____

_____

_____

11. In your opinion, is the method employed by your company the best choice there is given your company's conditions?

☐   Yes   ☐   No

12. If your answer to the previous question was "No" kindly indicate reasons why you feel compelled to resort to that method anyway:

_____

_____

_____

_____

13. Does the government help you make the best capital budgeting decisions?

☐   Yes   ☐   No

14. If you answer to the previous question was "yes", please tick the corresponding medium:

☐   Publishes studies   ☐   Publishes relevant and up-to-date material on the website
☐   Invests in research   ☐   Organizes and invites company representatives to a workshop
☐   Grants you free consultation

15. Do you receive trainings abroad and benefit from other countries' experience?

☐   Yes   ☐   No

16. Do you perform Internet search to keep up with lessons learnt (in the field of capital budgeting) in other companies in the world?

☐   Yes   ☐   No

17. In case your company is totally or partially foreign owned or that you receive funds from foreign counterparts do they influence your capital budgeting method?

☐   Yes   ☐   No

18. If your answer to the previous question was "Yes", please indicate why:

_____
_____
_____
_____
_____

19. Is it easy for you to alter a capital budgeting method once you had established an earlier method? How much does would this change affect your work plan?

Please explain:

_____
_____
_____
_____
_____

20. Do u have any alternative methods in case this one fails you?

☐   Yes   ☐   No

21. How much of your decision-making time does capital budgeting requires?

☐   5-10%   ☐   11-15%   ☐   16-20%   ☐   21-25%
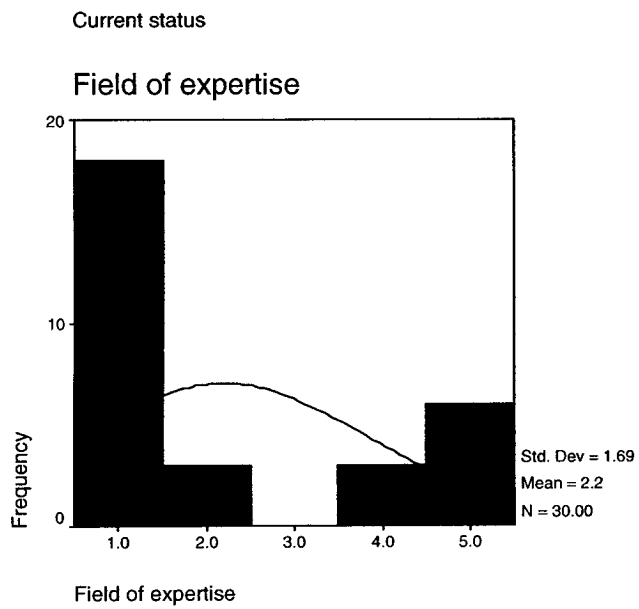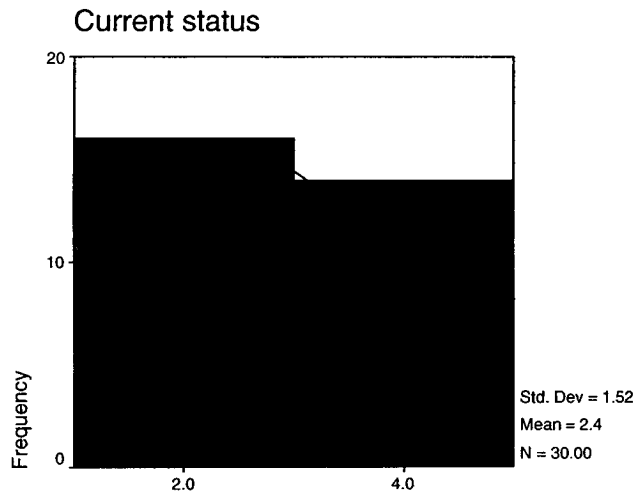
☐   26-35%   ☐   36-50%   ☐   51-70%   ☐   71-85%

                    ☐   86-100%

C. Comments

22. Please identify two major difficulties when deciding on a capital budgeting method:

_____
_____
_____
_____
_____
_____

23. Any other comments:
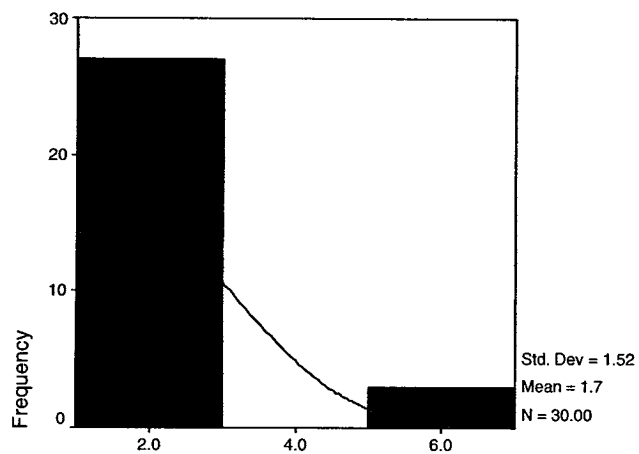
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Please return by email to michel_hayeck@hotmail.com.

If you have any inquiries please do not hesitate to contact me on _03-212184 or 04-980601._
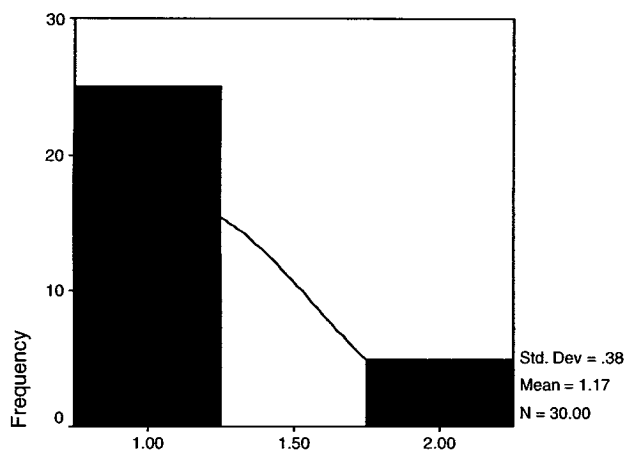
Appendix B: Results and Structures

Current status

Std. Dev = 1.52
Mean = 2.4
N = 30.00

Current status

Field of expertise

Std. Dev = 1.69
Mean = 2.2
N = 30.00

Field of expertise

Interval of time of work in this field

Std. Dev = 1.52
Mean = 1.7
N = 30.00

Interval of time of work in this field

Interval of time in current position

Std. Dev = .38
Mean = 1.17
N = 30.00

Interval of time in current position

Primary method

Std. Dev = 1.01
Mean = 3.3
N = 30.00
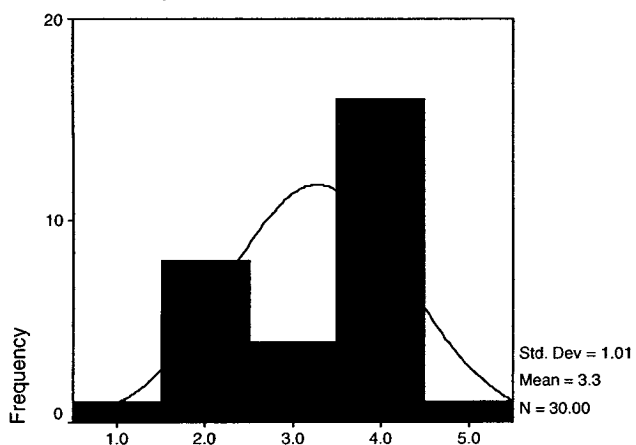
Primary method

Secondary method

Std. Dev = 1.72
Mean = 2.7
N = 28.00
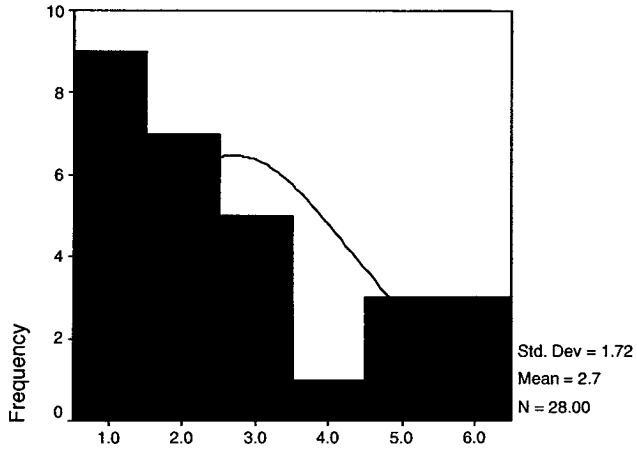
Secondary method

The discounting rate

Std. Dev = .54
Mean = 2.69
N = 29.00
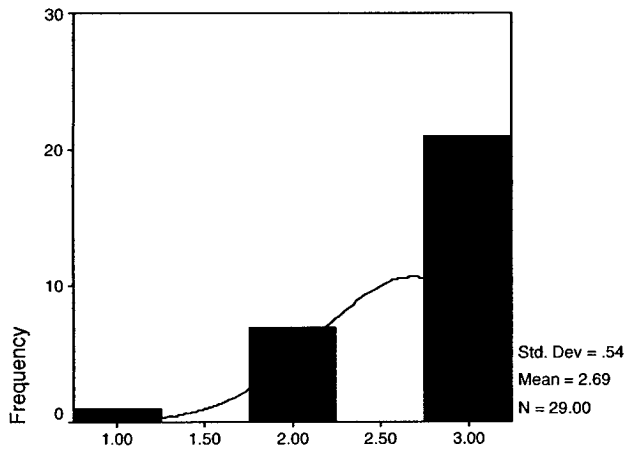
The discounting rate

Value of the discounting rate

Std. Dev = 1.10
Mean = 2.4
N = 28.00
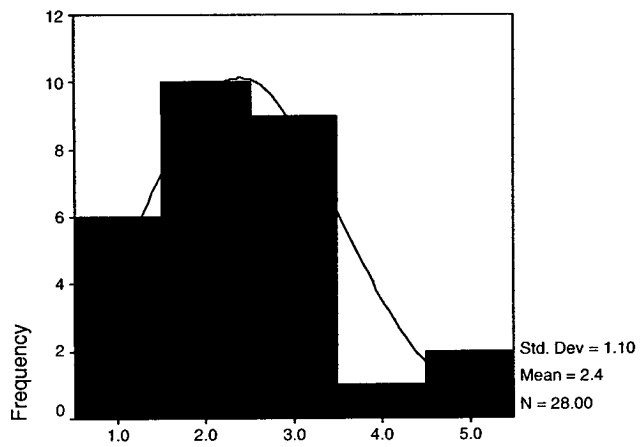
Value of the discounting rate

Most difficult stage

Std. Dev = .73
Mean = 1.50
N = 30.00
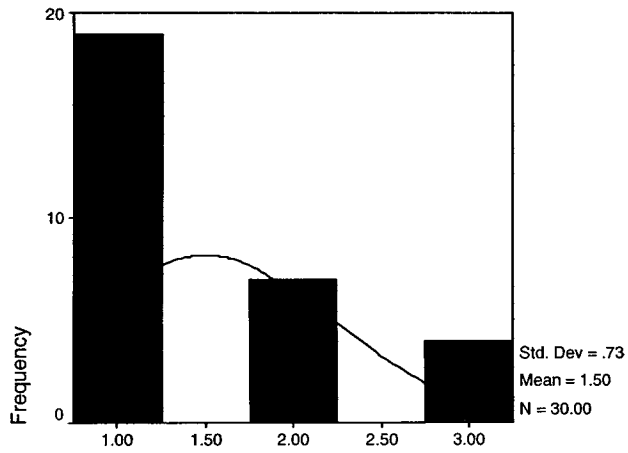
Most difficult stage

Change methods with major changes in the ma

Std. Dev = .49
Mean = 1.63
N = 30.00
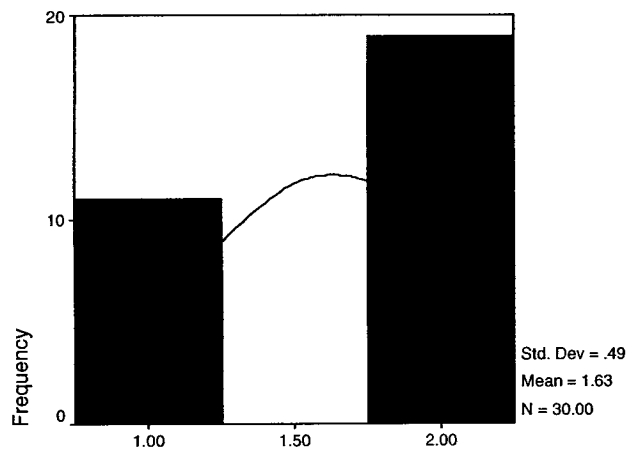
Change methods with major changes in the market

Best method used
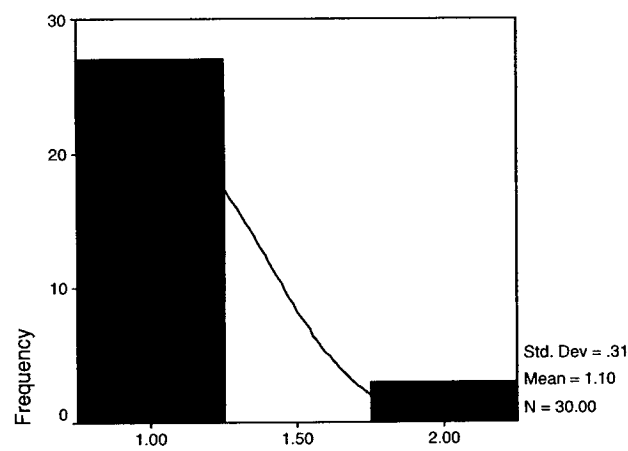
Std. Dev = .31
Mean = 1.10
N = 30.00

Best method used

75

Government help in the capital budgeting

Std. Dev = .35
Mean = 1.86
N = 29.00
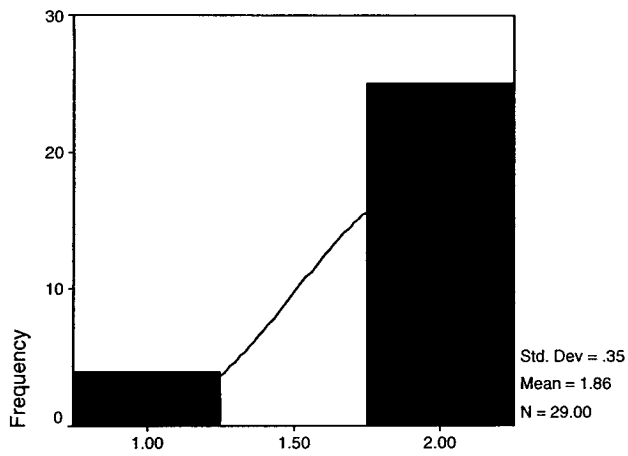
Government help in the capital budgeting

How the government help?

Std. Dev = 1.00
Mean = 1.5
N = 4.00
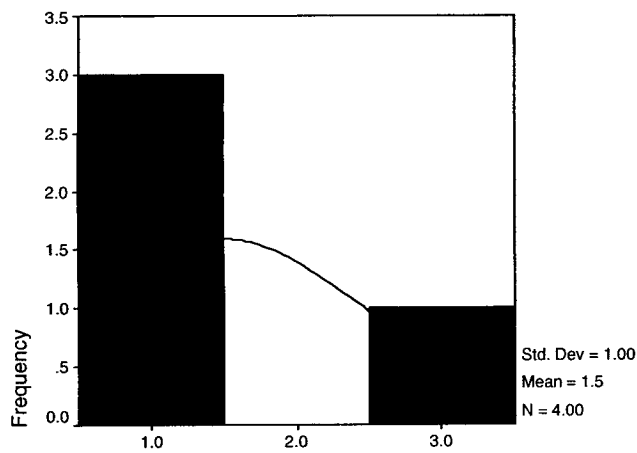
How the government help?

Training abroad and other countries' experienc

Std. Dev = .48
Mean = 1.66
N = 29.00
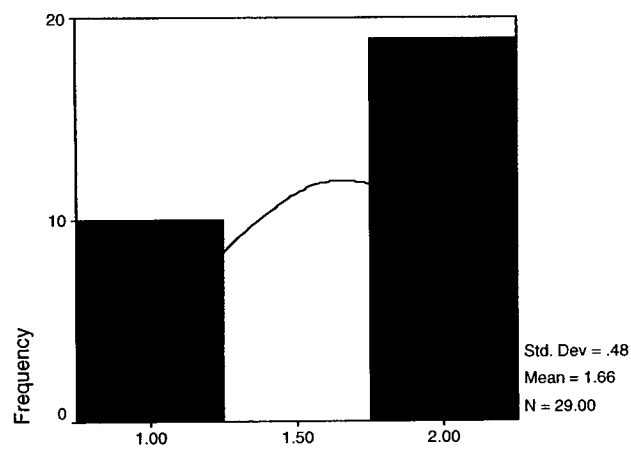
Training abroad and other countries' experience

Internet search (in the field of capital budgeting

Std. Dev = .47
Mean = 1.31
N = 29.00
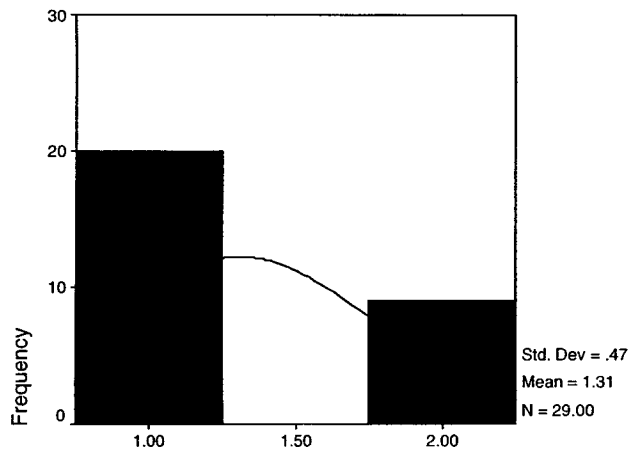
Internet search (in the field of capital budgeting)

Funds from foreign counterparts and influence

Std. Dev = .39
Mean = 1.82
N = 28.00
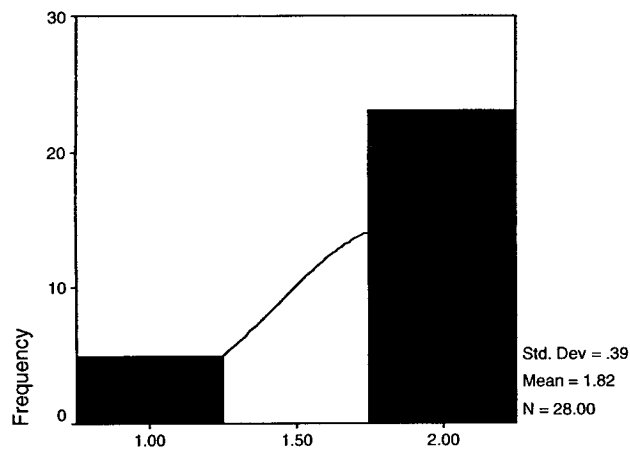
Funds from foreign counterparts and influence

Alternative methods
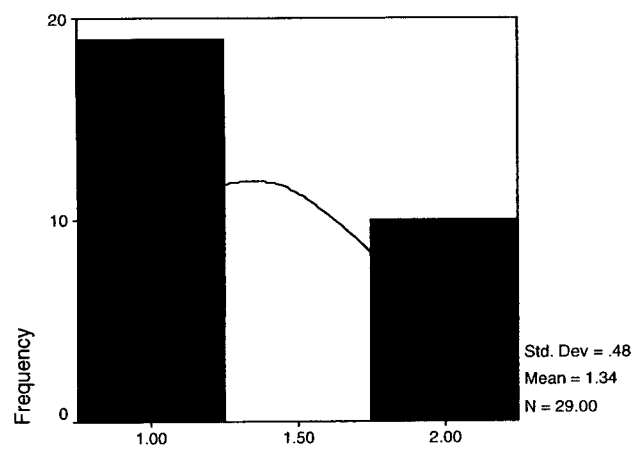
Std. Dev = .48
Mean = 1.34
N = 29.00

Alternative methods

77

Desicion-making time of capital budgeting

Std. Dev = 2.08
Mean = 5.0
N = 28.00
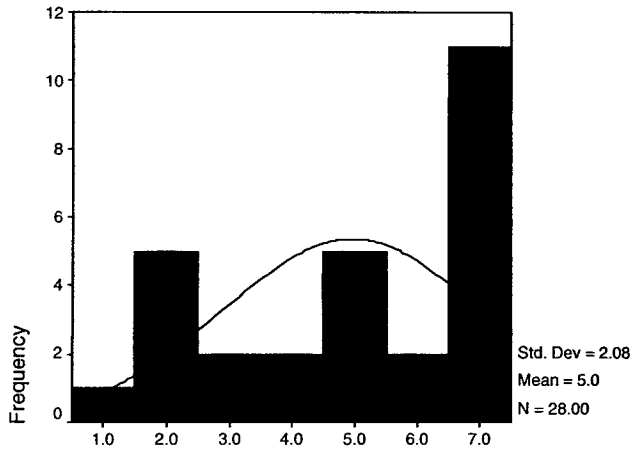
Desicion-making time of capital budgeting

Current status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Junior employee	16	53.3	53.3	53.3
	Senior employee	14	46.7	46.7	100.0
	Total	30	100.0	100.0	

Field of expertise

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Finance	18	60.0	60.0	60.0
	Management	3	10.0	10.0	70.0
	Accounting	3	10.0	10.0	80.0
	Other	6	20.0	20.0	100.0
	Total	30	100.0	100.0	

Interval of time of work in this field

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5 years	22	73.3	73.3	73.3
	6-10 years	5	16.7	16.7	90.0
	26 and more	3	10.0	10.0	100.0
	Total	30	100.0	100.0	

Interval of time in current position

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5 years	25	83.3	83.3	83.3
	6-10 years	5	16.7	16.7	100.0
	Total	30	100.0	100.0	

Primary method

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Payback Period	1	3.3	3.3	3.3
	Discounted Payback	8	26.7	26.7	30.0
	Profitability Index	4	13.3	13.3	43.3
	Net Present Value	16	53.3	53.3	96.7
	Internal Rate of Return	1	3.3	3.3	100.0
	Total	30	100.0	100.0	

Secondary method

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Payback Period	9	30.0	32.1	32.1
	Discounted Payback	7	23.3	25.0	57.1
	Profitability Index	5	16.7	17.9	75.0
	Net Present Value	1	3.3	3.6	78.6
	Internal Rate of Return	3	10.0	10.7	89.3
	Modified IRR	3	10.0	10.7	100.0
	Total	28	93.3	100.0	
Missing	System	2	6.7		
Total		30	100.0		

The discounting rate

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	cost of equity	1	3.3	3.4	3.4
	cost of debt	7	23.3	24.1	27.6
	cost of capital	21	70.0	72.4	100.0
	Total	29	96.7	100.0	
Missing	System	1	3.3		
Total		30	100.0		

Value of the discounting rate

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5%	6	20.0	21.4	21.4
	8%	10	33.3	35.7	57.1
	10%	9	30.0	32.1	89.3
	12%	1	3.3	3.6	92.9
	15%	2	6.7	7.1	100.0
	Total	28	93.3	100.0	
Missing	System	2	6.7		
Total		30	100.0		

Most difficult stage

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Project Definition and CF Estimation	19	63.3	63.3	63.3
	Financial Analysis and Project Selection	7	23.3	23.3	86.7
	Project Implementation	4	13.3	13.3	100.0
	Total	30	100.0	100.0	

Change methods with major changes in the market

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	11	36.7	36.7	36.7
	No	19	63.3	63.3	100.0
	Total	30	100.0	100.0	

Best method used

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	27	90.0	90.0	90.0
	No	3	10.0	10.0	100.0
	Total	30	100.0	100.0	

Government help in the capital budgeting

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	4	13.3	13.8	13.8
	No	25	83.3	86.2	100.0
	Total	29	96.7	100.0	
Missing	System	1	3.3		
Total		30	100.0		

How the government help?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Publishes studies	3	10.0	75.0	75.0
	Grants you free consultation	1	3.3	25.0	100.0
	Total	4	13.3	100.0	
Missing	System	26	86.7		
Total		30	100.0		

Training abroad and other countries' experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	10	33.3	34.5	34.5
	No	19	63.3	65.5	100.0
	Total	29	96.7	100.0	
Missing	System	1	3.3		
Total		30	100.0		

Internet search (in the field of capital budgeting)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	20	66.7	69.0	69.0
	No	9	30.0	31.0	100.0
	Total	29	96.7	100.0	
Missing	System	1	3.3		
Total		30	100.0		

Funds from foreign counterparts and influence

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	5	16.7	17.9	17.9
	No	23	76.7	82.1	100.0
	Total	28	93.3	100.0	
Missing	System	2	6.7		
Total		30	100.0		

Alternative methods

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	19	63.3	65.5	65.5
	No	10	33.3	34.5	100.0
	Total	29	96.7	100.0	
Missing	System	1	3.3		
Total		30	100.0		

Regression

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Value of the discounting rate, Field of expertise[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Primary method

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.671[a]	.450	.406	.795

a. Predictors: (Constant), Value of the discounting rate, Field of expertise

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.932	2	6.466	10.242	.001[a]
	Residual	15.783	25	.631		
	Total	28.714	27			

a. Predictors: (Constant), Value of the discounting rate, Field of expertise

b. Dependent Variable: Primary method

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.290	.404		8.151	.000
	Field of expertise	-.367	.089	-.612	-4.106	.000
	Value of the discounting rate	.319	.140	.340	2.285	.031

a. Dependent Variable: Primary method