

# Investment and Financing Decisions Criteria in Ethiopia: Under Condition of Uncertainty

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## Abstract

This article assesses and investigates the Criteria being used by Ethiopian Companies for accepting or rejecting investment or financing alternatives under the condition of uncertainty. To achieve this objective, a sample of respondents from 40 corporates was selected to obtain wide range of investment and financing decisions' experiences in the country. Both Survey and in-depth interview techniques were employed. The findings of the study indicated that Ethiopian corporates use investment and financing decisions criteria only at the time of initial investment when they are forced by other bodies such as banks that extend loans to them. In such case, it was found that they use NPV, IRR, PI or PBP or their combination. The study revealed that companies in Ethiopia evaluate their projects almost entirely on the basis of the pure rate of return. However, the study also found that risk assessment and adjustment techniques such as sensitivity analysis, simulation analysis and decision tree analysis are rarely used in Ethiopia. Accordingly, the most and widely employed risk assessment technique was sensitivity analysis and the most common methods for risk adjustment are shortening of the payback period.

**Keywords:** Ethiopia, Investment Decision, Financing Decision, Decisions Criteria, Uncertainty.

## 1. Introduction

The complexity and variety of business activities are constantly increasing at rapid pace throughout the globe and results in different investment alternatives which have different benefits and level of risks. Selecting among these great numbers of investment alternatives with different kind and level of risk requires maximum cares as the right investment decision increases the wealth of the firms and leads them to prosperity in their life in the future. Wrong investment decision, on the other hand, may lead to bankruptcy and finally end up with termination of the firm as a going concern assumption. Certain procedures or criteria should be used while choosing among this available great deal of investment alternatives. That means, a firm that desires to invest its resources on a project which maximize its future wealth and increase its prosperity should search for potential projects, gather much information, both qualitative and quantitative, about the projects, evaluate them and select one that will yield the higher promising benefits. This process is commonly known as Capital budgeting<sup>1</sup>. According to Maness (1988), Capital budgeting is the process of seeking potential projects, data gathering, project evaluation and project selection.

In order to select a project for implementation, companies are assisted by various models. Some of these models are quantitative while others are qualitative in nature. The quantitative models can be grouped into two. The first grouping based on the type of input that a model uses. Under this group, income, cash, return or value based metrics are commonly known. The second group is based on whether a model is guided by the principle of time value of money or not. In this case, the discounted cash flow (time value of money based), and non-discounted (non-time value of money based) models are practiced in business enterprise (Mehari Mekonnen, 2003, p.3-4).

Parallel to project selection, project financing and risk analysis are parts of the package in every project. The challenge for project managers, today, is the search for adequate project finance (Ibid, 2003, p.4). Firms can finance the selected project with different sources. Chambers and Lacey (1998) stated financing decision as making the decision as to which securities the firm will issue to raise money to finance the firm's assets. They also added that firm often choose to finance their assets with many different types of securities appear to indicate that how a firm is financed is very important. In other words, they explained, observation might suggest that wealth can be created or lost by making good or bad financing decisions. Chandra (1980) explained that the choice of specific instruments of financing is, among others, influenced by risk or uncertainty<sup>2</sup>.

The methodology and application of project appraisal techniques in the Ethiopian context has grown in importance since the planning Commission office initiated the practice of project appraisal in Ethiopian public sector in the late 1960s. This practice was not applied systematically until 1986 when the development project studies Authority (DPSA) took the responsibility for project appraisal. Repeated institutional restructuring meant that these efforts were largely unsustainable and ineffective. Following the 1991 reform and consequent

<sup>1</sup> Many scholars use the term **investment decision** and **capital budgeting decision** interchangeably.

<sup>2</sup> In this study, uncertainty and risk will be used interchangeably.

institutional restructuring the Ministry of planning and Economic Development (MOPED) was mandated to appraise development projects. This mandate was then transferred to the Ministry of Economic Development and cooperation (MEDaC) which becomes the present day Ministry of Finance and Economic Development (MoFED). Increasingly, project appraisal is being decentralized with the result that responsibility for appraisal decisions is being transferred to regional and district levels (MoFED, 2004, p.6).

According to UN and International Chamber of Commerce (2004), following the downfall of Derg in 1991, Ethiopia launched an economic reform programme, in 1992, which aimed at achieving economic growth through private sector participation. The Ethiopian government is now also committed to promoting Ethiopia as a destination for foreign direct investment (FDI). As a result of this, at moment, there are numerous numbers of domestic and foreign investors (from Turkish, India, Egypt, Sudan, Saudi Arabia, Iran, Europe, Israel, America and so on), engaging in different investment activities by investing large amounts of money, which is raised from different sources, in different sectors in different regions throughout the country. Hence, assessing and analysing how the investment and financing decisions are made in Ethiopia<sup>1</sup> by these investors is very important.

## 2. Statement of the problems

In Ethiopia, there are a lot of areas in which firms and individuals can invest and raise capital. They can invest in different sectors such as: Manufacturing, Construction, Mining and quarrying, Real estate development, agriculture, floriculture and Horticulture, Hunting and forestry, Fishing, Hotel and Restaurant services, Education, Transport and communication, Health and social works etc. Even within a sector there are great deals of options. The basic issue is, however, what is their base for these investors and others to select the project they are operating in and the financing sources they have used. Each investment options have different types of risks. Risks are inevitable and associated with all investment alternatives even if their types and degrees are different. These risks are usual phenomenon in real world in general and prevalent in developing countries like Ethiopia in particular.

There have been a number of researches focusing on various aspects of capital budgeting theory and practice [Stanley and Block, 1984; graham and Harvey, 2001; Harris and Raviv, 1996 (as cited by Mehari Mekonnen, 2006)]. These researches have been conducted to investigate the investment and financing decisions criteria both under the condition of certainty<sup>2</sup> and uncertainty<sup>3</sup> in developed countries. In Ethiopia, however, no research<sup>4</sup> is, to the knowledge of the researcher, conducted to assess and analyse the criteria for investment and financing decisions under the condition of uncertainty. Therefore, making an effort to study how this real world problem has been incorporated in making both investment and financing decisions is a crucial issue. In developed countries where technology is highly developed and past data are safely stored in well organized data warehouse, different software and programs are being used to forecast the future cash flows, both cash inflows and outflows, and to estimate the level of risks or uncertainty. In our country, Ethiopia where this is not the case, making investment and financing decisions looks like a little bit difficult.

## 3. Objective of the study

The general objective of this study is to investigate the Criteria used for accepting or rejecting investment or financing alternatives available to Ethiopian companies under the condition of risk or uncertainty via achieving the following specific objectives:.

1. Empirically to investigate, assess and analyse the criteria that the investment and financing decision-makers are using to accept or reject the alternatives under the condition of uncertainty;
2. To investigate the acceptability and applicability of the theoretical techniques of project appraisal in Ethiopian firms;
3. To evaluate in light of practical experience of other country(s) in the world.

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<sup>1</sup> Ethiopia is a country occupying an area of 1,133,380 square kilometres and has a total population of 73.9 million (2007/08 Census) (Ethiopian Investment Agency, 2009). It has nine Autonomous States and two chartered Cities (Addis Ababa and Dire Dawa).

<sup>2</sup> In 1965, Daniel Teichroew, Alexander A. Robichek and Michael Montalbano had jointly analysed the criteria for investment and financing decisions under certainty and published on the journal of management science (for further reading, refer the journal of management science vol.12, No.3, November, 1965), Mehari Mekonnen (2006) has conducted a research to investigate the impact of Appraisal method selection on shareholder value, and so on.

<sup>3</sup> Athansis Rentizelas and georgios tziralis (2007) had also jointly proposed an innovative approaches that merges optimization and risk analysis in a single method (for further reading, refer the journal of world review of Entrepreneurship, Management and Sus. Development, Vol.3, Nos. 3/4, 2007) (on-line)

<sup>4</sup> Hassen Nasser (2005), unpublished, has conducted a research on "Lease Financing and Capital Investment Decisions on selected Ethiopian companies". But in his study, he concentrated only on lease financing and ignored other means of financing and failed to consider the prevailing of risk and he did not incorporate the condition of risk in investment decisions in his study.

4. To assess whether Ethiopian investment and financing decision makers are familiar with these project appraisal techniques especially under a condition of an uncertainty;
5. To investigate that whether risks are incorporated in the investment and financing decision or not;
6. To assess how risks are measured and incorporated in the investment-decision making if they are taken into consideration while making the decision; and
7. To demonstrate the impact of financing decisions on the project selection or investment decision.

#### 4. Research Methodology

The data were collected from both Primary and secondary sources. Primary sources were collected through structured questionnaire and unstructured interviews which were administered with same selected samples respondents from 40 corporates. The samples were selected from heterogeneous business enterprise to obtain wide range of investment and financing decisions experiences. These companies have been operating in different kinds of industries such as horticultural and floricultural, Banking and finance, Manufacturing, Chemicals, etc. Secondary sources such as Journals, Books, Articles, websites, firm's business plan, conference papers, Annual Reports, and archival materials were also used. Both Survey and in-depth interview techniques were employed. Descriptive statistics were used to present, analyse and describe the results.

#### 5. Literature Review

Various previous studies related to the topic under discussion have been assessed, studied and presented in summarized manner in this section as follows.

Brigham (1995) argued that in order to grow, companies must continually invest in projects. They invest in variety of real assets which include, inter alia, investing in tangible assets such as plants and machinery, and intangible assets such as management contracts and patents (Brealey and et al., 1984). Investment, or capital budgeting, can be defined as follows: Investment is the out flow of expenditure of capital by an investor to establish a new enterprise or to expand or upgrade<sup>1</sup> one that already exists (Ethiopian Proclamation No. 280/2002, p. 1769). According to Maness (1988), Capital budgeting is the process of seeking potential projects, data gathering, project evaluation and project selection. Chandra P. Gupta, (1996) has also stated that capital budgeting decisions of a firm are strategic importance for the overall growth of the economy as such decisions commit its limited productive resources to its production system and also for the firms as it strengthen and renew their resources with plans for recouping the initial Investment plus adequate profits (or other returns) from cash flows (or other benefits) generated during the economic life of an investment.

An investment is any vehicle into which funds can be placed with the expectation that will generate positive income and/or their value will be preserved or increased ( Gitman and Joehnk, 1996). It is a present sacrifice for future benefit. Individuals, firms and governments all are regularly in the position of deciding whether or not to invest, and how to choose among the options available. An individual might have to decide whether to buy a bond, plant a seed, or undertake a course of training; a firm whether to purchase a machine or construct a building; a government whether or not to erect a dam. Under the heading of investment decision criteria, Economists have addressed the problem of how to rationally choose in such situations involving a trade off between present and future (Hishleifer, 1985).

Different scholars in the field of corporate finance, Operation management, economics, etc, divide investment decisions into many types. Some scholars divide into two, others into three and so on. For example, according to (Mauer and Ott, 1995, p.581), managers of firms and public institutions make two types of investment decisions: expansion investment in new plant or equipment; and replacement of assets in place with new ones. Expansion investments are typically characterized by a large initial outlay followed by a stream of uncertain future benefits. In contrast, replacement investment decisions usually entail determining the best time to replace a deteriorating asset with a new one that will produce the same product or service. Examples of such decisions abound in every organization and industry, including replacement of computers, aircraft, automobiles, trucks, photocopiers, and a large variety of other assets. And according to Brigham (1995), firms generally categorize projects into: replacement to maintain business, replacement to reduce cost, expanding the existing market or product, expansion into new products or markets, safety and environmental, and others like Seitz (1990), however, has classified capital investment into: (1) Physical, (2) monetary or financial, or (3) Intangible. According to him, physical assets such as factories, machineries, computers, airplanes and airways are physical assets that qualify as capital investments. Monetary assets are claims against some other party for monetary payments such as saving accounts, bonds, and stocks. Intangible investments are neither physical nor claims for payment by some other party and include a training program given to employees, and franchise.

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<sup>1</sup> According to proclamation No. 375/2003, a proclamation to amend the investment re-enactment proclamation No. 280/2002, in Ethiopia a given "expansion/upgrading" is considered as an investment if this expansion/upgrading increase in value, by more than 25%, the full production or service capacity of an existing enterprise, be it in variety, volume or both.

Capital investments are carried out to achieve different objectives. Seitz (1990) has identified the following objectives: (1) to improve efficiency (i.e. reduce cost), (2) to increase production capacity in the existing product line, and (3) to result in a new product line. Bearely and et al. (1984) stated that the object of investment, or capital budgeting, decision is to find real assets that are worth more than they cost. Whatever the type and objectives of investment, Gitman, and Joehnk (1996) explained that investment made by both individual investors and business firms provide the mechanism needed to allow our economy to grow and develop.

The tern uncertainty and risk are used interchangeably to describe an investment whose profit is not known in advance with absolute certainty, but for which an array of alternative outcomes and their probabilities are known (Levy and Sarnat, 1993, p.216)<sup>1</sup>. Each investment options have different types of risks. Risks are inevitable and associated with all investment alternatives even if their types and degrees are different. Investment alternatives (usually called Projects) might be exposed to business<sup>2</sup>, and financial<sup>3</sup> risks at different degrees. Some investment alternatives are highly exposed to business risk while others to financial risks or to both at the same time.

Risk is inherent in almost every business decisions. More so in capital budgeting decisions as they involve costs and benefits extending over a long period of time during which many things can change in unanticipated ways (Chandra, 1980). Risks arise from different sources such as the demand for the firm's products might decline; the selling price might decrease, the price of the inputs might increase and inputs like raw materials might be exhausted, fixed costs might increase, the environmental control standards may be tightened, change in exchange rate and inflation may adversely influences the firm.

With uncertainty<sup>4</sup>, many alternative sequences of cash flows could occur if an investment were accepted. The decision maker does not know in advance which sequence will actually occur. The goals, both under certainty and uncertainty, are the same; the investor would like to know the amount by which the market value of the firm would change if the investment were accepted. However, the estimation process is much more complex under uncertainty than under certainty (Bierman and Smids, 1988, p.387). Theoretically, most of the time, it is assumed that the acceptance of any investment proposal would not alter the business-risk complexion of the firm as perceived by suppliers of capital and this assumption allows to use a single required rate of return in deciding which capital projects a firm should select. Many scholars like Horne and Wacho (1995), however, realized that this is not the case in real world. According to them, different investment projects often have different degrees of risk. They state that the project that is expected to provide a high return may so risky that it causes a decrease in firms value, despite the project's considerable potential. Companies employ different types of risk analytical methods: (1) Sensitivity Analysis; (2) Scenario Analysis; and (3) Simulation analysis. A survey conducted by corporate finance practices in India found that the relative importance of various methods of assessing project risk to be as follows:

Methods	% of companies rating it as Very important or important
• Sensitivity Analysis	90.10
• Scenario analysis	61.60
• Risk-adjusted discount rate	31.70
• Decision tree analysis	12.20
• Monte Carlo simulation	8.20

**Source:** Manoj Anand "Corporate Finance Practices in India: A survey », Vikalpa, October-December 2000 (As cited by Prasanna Chandra, 1980, p.11.40)

As we can see from the finding summary that 90.10 % companies in India rates sensitivity analysis as very important or important while only 8.20% companies rate Monte Carlo simulation as very important or important.

Once the issues of on what to invest is solved or settled, the next issue is what are the sources of funds?

<sup>1</sup> Levy and Sarnat (1993) foot noted that even though Frank Knight distinguishes between 'risk' as an option for which both an array of possible outcomes and their probabilities are known and 'uncertainty' as an option for which only the array of possible outcomes but not their probabilities is known, the significant distinction between risk and uncertainty has been greatly diminished with the introduction of subjective probability. By assigning subjective probabilities to decisions, an inherent uncertain situation can be transformed into risky choice.

<sup>2</sup> Business risk is defined as the uncertainty inherent in projections of future operating income, or earnings before interest and taxes (EBIT). For detail read Eugene F. Brigham(1982, p 596-598).

<sup>3</sup> Financial risk is defined as the risk that arises due to using fixed income financing sources such as debts and preferred stocks. For detail read *ibid* (p602-606).

<sup>4</sup> Under the condition of uncertainty, Bierman and Smids (1988, p.390) pointed out that there may be more than one possible cash flow that can be produced by a given asset at a future time. The difficulty of specifying unique cash flows drives from the fact that will occur on a future date will depend on which state occurs at that time.

Firms can finance the selected project with different sources. They can take loans from financial institutions, issues short and/or long term-bonds, issues preferred and common stocks and so forth. Deciding which source to use is not an easy task as each of them has associated risks and costs. Chambers and Lacey (1998) defined financing decision as making the decision as to which securities the firm will issue to raise money to finance the firm's assets. They also added that firm often choose to finance their assets with many different types of securities appear to indicate that how a firm is financed is very important. In other words, they explained, observation might suggest that wealth can be created or lost by making good or bad financing decisions. Chandra (1980), for instance, explained that the choice of specific instruments of financing is, among others, influenced by risk or uncertainty.

Capital structure policy involves a choice between risk and expected returns. Using more debt raises the riskiness of the firm's earnings stream, but more debt generally means a higher cost of capital. A higher risk tends to reduce the price of the stocks, but a higher rate of return raises it. The optimal capital structure strikes a balance between these risks and returns and thus maximizes the price of the stock and the wealth of the shareholders (Brigham, 1982). Elsas et al. (2006) stated that major investments are mostly externally financed with new debt providing at least half the required funds in the year of the investment. According to their finding, only about 15 - 20% of the typical investment is financed by the sale of equity, with internal funds supplying most of the remainder. In the event year, firm financing choices reflect some pecking order and market timing effects, but firms systematically revise their initial financing decisions in subsequent years. Retained earnings and new equity issues pay down debt. Ultimately, these financing decisions are consistent with the trade-off hypothesis about capital structure: a firm's external securities issuance reflects its position vis-à-vis a firm-specific, target debt ratio computed from the usual combination of firm features. They also found that financing proportions vary with firm size: smaller firms rely more on external equity funds, which seems inconsistent with the pecking order theory of capital structure (Frank and Goyal, 2003; Fama and French, 2003).

The investment and financing decisions are independent in the world with no taxes and perfect capital market, where both debt policy and dividend policy are irrelevant. Since there is no world with no taxes and perfect market, in principle corporate investment and financing decisions should be made simultaneously as these decisions interact in important ways (Myers, 1974)

Theoretically, different types of criteria (appraisal models) are employed or used to select among these investment alternatives and financing sources. The investment's problem is as old as the economy itself. In order to succeed in optimum utilisation of the limited available investment resources, each decision should take into consideration a huge set of factors, which are either defined by the investor, or can be affected only by external factors. The decision to proceed or not to an investment is most often based upon the outcome of the dominant economic criteria, such as the Net Present Value (NPV), the Internal Rate of Return (IRR) and the Payback period (Groenendaal and Kleijnen, 2002; Biezma and Cristobal, 2006) (as cited by *Rentizelas et al., 2007*).

Chandra (1980) in his famous book titled *Projects: Planning, Analysis, Selection, Financing, Implementation, and Review* has also indicated that a wide range of appraisal criteria have been used to judge the worthwhileness of a given project. He divided these criteria into two broad categories: Non-discount criteria and discount criteria. According to him, the principal non-discounting criteria are the payback period and the accounting rate of return, and the key discounting criteria are: the net present value (NPV), Internal Rate of Return (IRR), and the benefit cost ratio or Profitability Index (PI).

The Appraisal techniques can be grouped into two broad categories: the non-time value based (traditional) and the time value based (discounted cash flow) methods. Although traditional methods are still practiced, they are not widely appreciated and do not have as much attention as in the second group of methods (Mehari, 2003). Seitz (1990) has defined these and other investment and financing decision criteria as follows: The non- discounted criteria, sometimes called traditional methods, of investment evaluation are, perhaps, the first group of appraisal techniques applied to assess the value of the project. A survey of corporate finance practices in India by Manoj Anand, according to Chandra(1980), reported in the October-December 2002 issue of *Vikalpa* revealed that the following methods (in order of decreasing importance) are followed by companies to evaluate investment proposals.

<u>Method</u>	<u>% of companies Considering as very Important or important</u>
• Internal rate of return	85.00
• Payback period	67.50
• Net present value	66.30
• Break-even analysis	58.00
• Profitability Index	35.10

A finding of the study conducted by William Petty and David Scott to assess the methods of evaluation used by business firms in U.S.A. is reviewed and presented as follow by Chandra (1980, p.8.29). The level of

importance assigned to the five basic evaluation techniques: Accounting return on investment (ARR), payback back period (PBP), Net present Value (NPV), internal rate of return (IRR), and profitability index (PI) are presented below:

**Table 1: Level of importance of Investment evaluation techniques in U.S.A**

Technique	Level of Importance					
	None	Slight	Moderate	Fair	High	No Response
ARR	12.35%	5.29%	17.06%	8.82%	3.53%	2.94%
PBP	1.76	12.35	25.29	28.82	30.00	1.76
NPV	8.82	16.47	20.59	15.29	33.20	5.29
IRR	7.65	9.41	4.71	14.71	59.41	4.12
PI	31.17	18.82	15.29	7.65	11.18	15.88

**Source:** Chandra (1980, p. 8.29), Projects: planning, Analysis, Selection, Financing, Implementation and Review

A business firm faces difficulties in making capital budgeting decisions under uncertainty. There has been no theoretically acceptable method proposed for a businessman to apply in determining the amount by which the time value of money should be adjusted for risk or the size of the dollar risk premium that should be deducted from the net value of an investment that has been computed using a default free discount rate as the time value of money (Bierman and Hass, 1973, p.119)

According to Bierman and Hass (1973), Litzenberger and Budd (1970) and Hamada (1968) had attempted to formulate rules for capital budgeting under the conditions of uncertainty using a required rate of return and the basic Sharpe (1964) model. They developed a risk-adjusted required rate of return, but this rate, according to them, was a combination of a time value factor and a risk adjustment. The risk-adjusted discount rate method calls for adjusting the discount rate to reflect project risk. If the risk of the project is equal to the risk of existing investment of the firm, the discount rate used is the average-cost-of-capital of the firm; if the risk of the project is greater than the risk of the existing investments of the firm, the discount rate used is higher than the average-cost-of-capital of the firm; if the risk of the project is less than the risk of the existing investments of the firm, the discount rate used is less than the average-cost-of-capital of the firm.

Levy and Sarnat (1993) have identified two ways of incorporating risks or uncertainty into investment decision-making procedures: (1) the direct method, and (2) the indirect methods. Under the first method, the direct method, they implicitly assumed that each investment project could be characterized by two indices: one which measures the investment's profitability and a second which reflects its risk. It is called direct method of incorporating risk into the decision-making process since it attempts to measure directly the risk of each investment proposal or combination of proposals and the second alternative is to incorporate risk into the investment decision making procedure is to include it indirectly in the discount rate used in calculating NPV. They discussed the two indirect methods for adjusting the NPV calculations for risk. That is, (a) the adjusted discount method, and (b) the certainty equivalent method.

## 6. Results and Discussions

The sampled organizations were selected from each of the following sectors: Manufacturing, Financing and Banking and Finance, Transport and Communications, and others. About 14% of the sampled firms have engaged in Education sector, 8.57% of the organizations are from agriculture and 5.71% are from floriculture and Horticulture sectors (the organizations sampled from agriculture, floriculture and Horticulture operate out of Addis Ababa but have offices in Addis). As far as the form of the organizations were concerned about 26% of the respondents are from the Share companies, 23% of them were from private Limited Companies, 20% of them were from the public enterprise, 11.43% were from Sole proprietorship and 14.29% were from Partnership business entities.

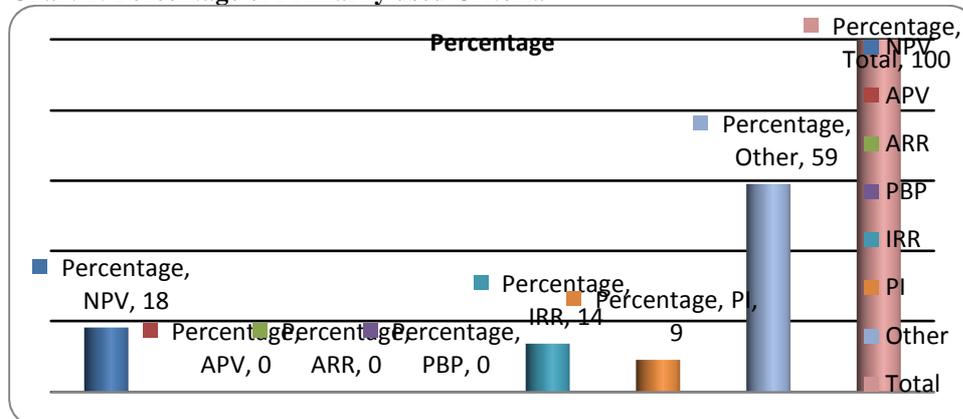
The analysis of survey<sup>1</sup> revealed that about 61% of the sampled companies said they incorporate risk(s) associated with the project in making investment decisions while the remaining 39% of the sampled companies do not incorporate risks. The interview conducted with the respondents revealed that Ethiopian companies, among the two methods suggested by Levy and Sarnat (1993), use the direct method to incorporate risks and they are not familiar with the method of incorporating risk into the investment decision making procedure which involves the including of risk indirectly in the discount rate used in calculating NPV, IRR or PI.

The summary of survey indicated that about 59% of the Ethiopian companies have practiced the combination of project appraisal methods as pointed out by Chandra (1980). The interview conducted with the

<sup>1</sup> The gender composition of the respondents is 80% male and 20% Female and regarding their educational background, majority of (about 63%) the respondents are BA degree holder, about 31% of second degree and the remaining 6% are Diploma holder who are selected from Share Companies Partnership and Sole Proprietorship Organizations in Addis Ababa and around .

respondents also revealed that as investors lack confidence on a single criterion they prefer to use a combination of the criteria as indicated by Mehari Mekonnen (2003). From the study it was found that NPV, IRR, PI, PBP, personal judgement, combination of them and WACC are the widely used investment financing decisions criteria by Ethiopian companies to accept or reject investment and financing alternatives. About 59% of them use a combination of NPV, IRR, and PI. In Ethiopia, too, weighted average cost of capital is the most commonly used discount rate though it is criticized by scholars like Myers (see chart 1). The most often used discounting rate in Ethiopia is 10 per cent.

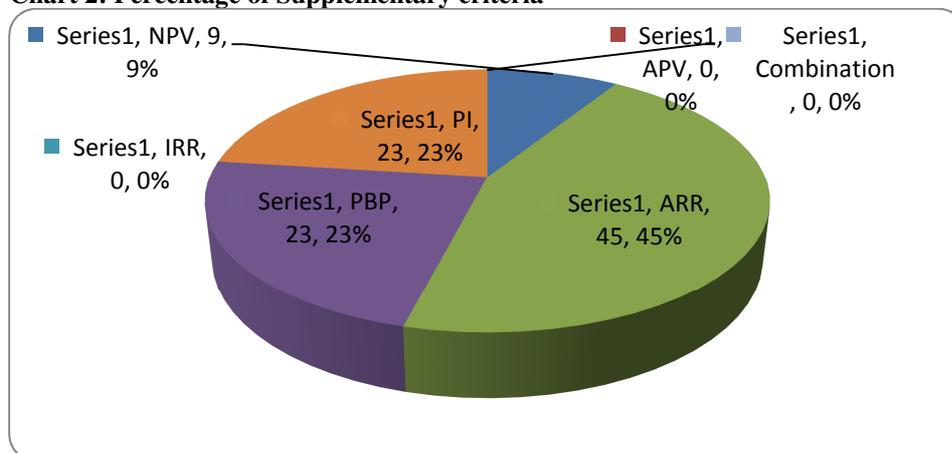
**Chart 1: Percentage of Primarily used Criteria**



**Source:** Survey data

In previous studies (e.g. Chandra, 1980, p.8.28-8.29), it was stated that accounting rate of return and payback period are widely employed as supplementary evaluation methods. In line with these arguments, 45% of the respondents indicate that their company employs ARR and 23% of them implied they use payback period as supplementary information (see chart 2). Hence, accounting rate of return and payback period are the widely employed as supplementary evaluation methods in the country.

**Chart 2: Percentage of Supplementary criteria**



**Source:** Survey data

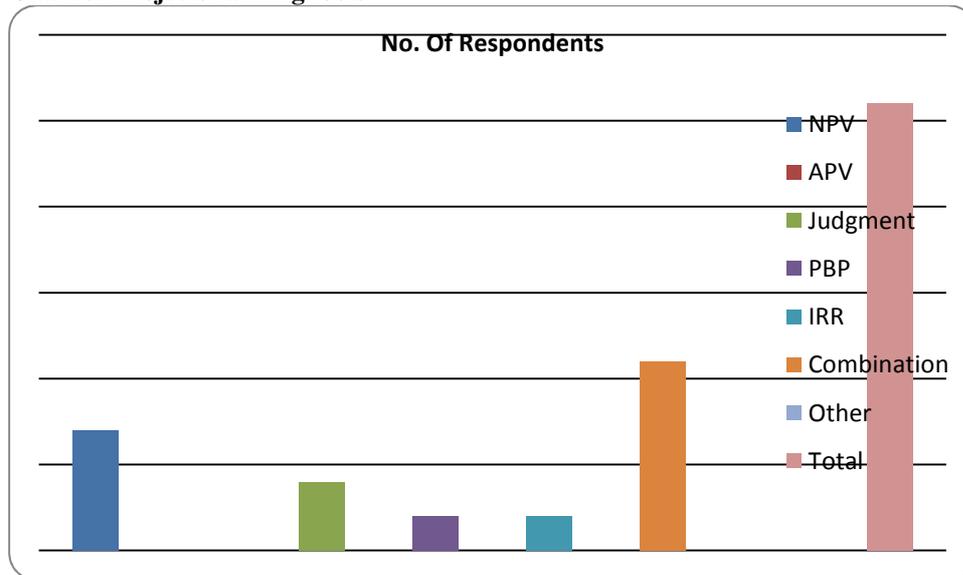
However, the result of the survey shown that companies that engage in sectors such as real estate, education, Health, etc., do not use the investment and financing decisions criteria believing that there is high profit from these sectors as the demand of their product or services is higher than the supply. Moreover, all companies that invest in financial assets do not use criteria that are well known to evaluate the profitability of those assets in developed countries and known theoretically.

The results of the study revealed that personal judgement is common as the company is privately owned and financed from own money than those that are financed through borrowing from banks and public owned Enterprises. It was also concluded that regardless of the owners of the investments alternative they are going to finance, banks require a business plan that reveals the profitability of the project(s) while public owned Enterprises, in addition to the profitability of the prospective investment alternatives, take into account the economic, social and political conditions to accept or reject a proposed project(s). According to respondents, those investors who are going to engage in the investment activities for the first time look into the following while they are attempting to identify a sector in which they invest. Respondents also pointed out that investors prefer the sector for which there is: (1) prevalence of tax exemption, (2) existence of duty free on goods and

materials required for the project and (3) availability of easy finance credit particularly bank loans. As a result investment decisions are affected by sources of finance.

The study found that companies in Ethiopia have been using criteria such NPV, IRR and PI, and a combination of them that are discounted either by using WACC or at borrowing rate which are formulated under the assumptions of certainty. According to the respondents, the only model that they use to reduce the risks associated with the investment alternative(s) under consideration is Payback period (PBP). Other models (such as Risk-adjusted discounting rate, etc.) that incorporate uncertainty related to the projects are not totally used by these companies. Although, among other criteria, the profitability index is usually presented in textbooks as a criterion used to rank projects when investment funds are limited, the result of this study revealed that about 27% of the Ethiopian companies employed NPV and none of them used PI as a ranking tool of competing investments (see chart 3). Hence, Ethiopian companies use NPV as ranking tools in contrary to what was suggested by the literature.

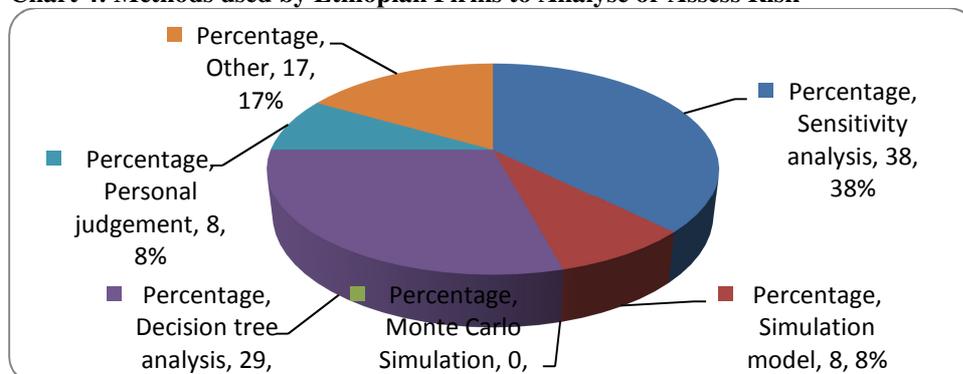
**Chart 3: Projects ranking tools**



**Source:** Survey data

As far as incorporating risk is concerned, the results of the survey revealed that about 61% of the respondents replied that their companies incorporate risk(s) associated with the project in making investment decisions while the remaining 39% of the sampled companies do not incorporate risks. Among the models used to incorporate risk, the study showed that risk assessment and adjustment techniques such Sensitivity analysis, Simulation analysis and decision tree analysis are used in Ethiopia. The most and widely employed risk assessment technique is sensitivity analysis and the most common methods for risk adjustment were shortening of the payback period. As indicated in chart 4 below, 38% of the respondents replied that their company has used sensitivity analysis in making analysis of the risks.

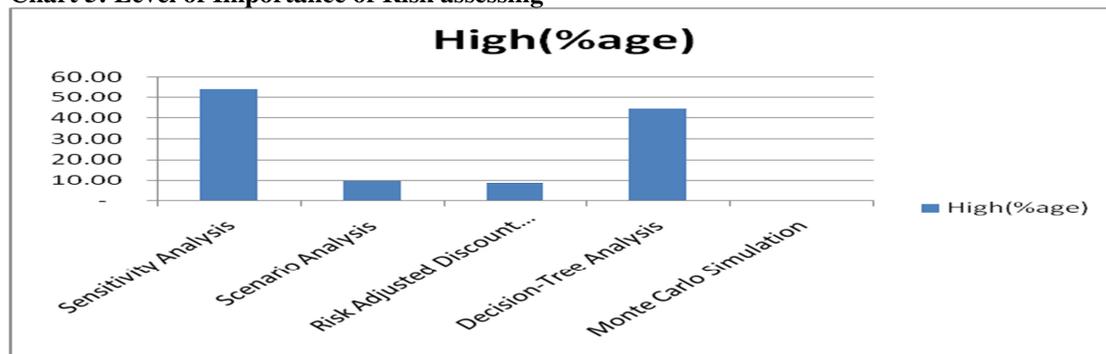
**Chart 4: Methods used by Ethiopian Firms to Analyse or Assess Risk**



**Source:** Survey data

Regarding the importance of these models, as indicated in chart 5, about 55% and 45% of the respondents assigned the importance of sensitivity analysis, and decision tree analysis high, respectively.

**Chart 5: Level of Importance of Risk assessing**



**Source:** Survey data

All respondent; however, replied that Adjusted Present Value (APV) model is not known in Ethiopia and not used as an investment alternative evaluation method by Ethiopian companies. Therefore, the study found that companies in Ethiopia evaluate their projects almost entirely on the basis of the pure rate of return (10%). Of course, it was realized that the interviewees were aware of the concept of uncertainty or risk but do not know how to quantify or measure and incorporate risk indirectly in the discount rate used in calculating NPV and fail to use both the adjusted discount method and the certainty equivalent method which have been suggested to be used under the condition of uncertainty. Moreover, respondents indicated that; (i) the usage of judgement has been decreasing from period of period even if it is in use even nowadays; (ii) since the awareness of companies increase from time to time, the emphasis given to these criteria also proportionally increase. Companies give more emphasis today than before; (iii) lending companies such as banks force the borrowers to use them to determine the profitability of the investment alternative for which they are going to extend loans; (iv) as there is high level of improvement in technology, calculations that were difficult in the past are getting simple nowadays. Hence, determination of NPV and IRR is getting simple than any time ever; and (v) the number of professionals in the area has been increasing from time to time and hence no shortage of experts to hired or contracted, but this was a problem in earlier period.

## 7. Conclusions and Recommendations

Contemporary financial literatures recommended that companies should use the investment and financing decisions criteria whether the decisions are made for the first time, for expansion or for replacement of the deteriorated asset(s). In contrary to these recommendations, the study found that some Ethiopian companies have been using these criteria only at the time of initial investment and even that might be employed if they are forced by other bodies such as banks who extends loans to them.

The study also revealed that the time of purchase of vehicles, construction of building, expansion of the existing business and replacement of the machineries, factories, etc, Ethiopian companies do not use criteria such NPV, IRR, PI, ARR, or PBP or a combination of them and instead they use their personal judgments which is highly influenced by the importance of the assets to be acquired or constructed. That is, once the assets to be invested are found very important, they acquire or construct it whether the future benefits over weigh its costs or not. Others totally ignore and do not employ the investment and financing decisions criteria while they make the investment and financing decisions and instead they use their own personal judgements.

Based on the findings of the study, the author recommend that all Ethiopian companies should use the investment and financing decisions criteria for all types of investments in order to minimize the loss that they might incur because of selection of unsuccessful investment alternatives; the uncertainties for which investors are exposed are changing at great pace due to Technological, Political, social and economical changes. Hence to cope with this ever changing world, Ethiopian companies should be equipped with competent person in using these investment and financing decisions and give regular training to these employees or owners; Since Ethiopian companies exposed to different risks such as project-specific risks, market risks and so forth as they have indicated in their responses to the questionnaire and interview, instead of using criteria that were developed under the condition of certainty and discounted by using WACC or fixed rate., they should use Risk-Adjusted Discounting Rate (RADR) that can be determined by using different models such CAPM, APT, etc discounting future cash flows from the proposed project to compute NPV, IRR, and PI. So they can explicitly consider or incorporate risk in their required rate of return, Ethiopian companies should try to use Adjusted-present Value (APV) (which considers the present value of cash flows, tax shields, etc and has a lot of advantages over WACC as stated by Myers) to evaluate the profitability of the prospective Investment alternative.

The concerned departments of Ethiopian universities and colleges should consider it in their course outlines and teach to their students who are going to be Project manager or expert, CEO, CFO, and/or investors in the future, and Universities and scholars who have been taking part and or will take part in the area should

work hard to contribute toward convincing the existing and potential investors about the advantages and disadvantages of these criteria and to make them familiar with the prevailing ones and the newly introduced models to evaluate investment and financing alternatives; the required level of emphasis should be given to these criteria and further comprehensive research should be carried out to assess and investigate the awareness of investors toward these criteria and their usage having this study as starting point.

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