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**Capital Investment Decisions on IT and Its Impact on
Corporate value maximization the case of Ethiopian
Financial Institutions**

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ACCOUNTING AND FINANCE

Advisor: Ato Gebremedhin G/hiwot

Submitted By: Eyob Dagne

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Statement Of Declaration

I declare that this project work is my original work. It has not been submitted for any Degree/Diploma in any University. I have undertaken it independently with the advice and suggestions of my advisor for the project, Ato Gebre medihin G/ Hiwot. In

Carrying out of the project work I have different sources and materials, which have been appropriately acknowledged.

Signature _____

Eyob Dagne

Name of Advisor _____

Signature_____

Acknowledgment

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Abstract

This study entitled “Capital Investment Decisions On IT And Its Impact On Corporate Value Maximization” has investigated the impact of IT on profitability and cost efficiency in six private commercial banks.

The overall objectives of the study was to evaluate the general trend of using project appraisal tools, the rationale to invest on IT and the impact of IT on profitability and cost efficiency. In order to evaluate these objectives five years of data has been collected from six private banks. The data has been collected from two sources: the primary data has been gathered through questionnaire and the secondary data has been obtained from the banks’ published audited financial statements. In order to further strengthen the findings of this study the results has been tested by using t-test

The findings of this study has revealed that with the exception of one bank all the remaining banks included in the survey have not used project appraisal tools to have an ex ante knowledge of the benefits and costs of IT investments. More over the rationale behind investing on IT was found to be strategic requirement (75%) and to be a leader in use of technology (50%)

Evaluation of IT on the profitability and cost efficiency of high IT capital banks and the relatively low IT capital banks has been made by using key profit and cost ratios. The result of the study and the hypothesis testing have shown that high IT capital did not result in a significantly better profit and cost performance compared to the relatively low IT capital banks.

Chapter One

1.1 Back Ground Of The Study

One of the general beliefs in the business organizations is that investment on IT will add value to the firm (Adewoye 2007). Most businesses under took IT investment projects without evaluating the project by known project evaluation techniques, this in part is because the intangible costs and benefits involved are significant (Powell 1992). But every business decision has to be made by considering its impact on the goal of the firm; in this regard the investment on IT has to be seen in terms of its likely contribution to the goal of the firm. (Jensen 2001)

A company may pursue different goal, but for a business whose main objective is generating profit from its operations maximizing the value of the firm is by far an appropriate goal to pursue. In this regard (Baye 2001) stated that one of the widely accepted goals of a corporation is corporate value maximization. If firm value maximization is accepted as the corporate goal, then the investment on IT should be seen by its impact on this value creation goal of the firm.

Since IT is an investment that requires a lot of money and time, the decision to invest or not to invest has to be critically evaluated and the decision to invest has to be clearly justified by the anticipated benefit from the IT investment. Doing this may require to use project evaluation techniques. The available project evaluation techniques may help to foresee the likely contribution of IT towards value maximization. Unfortunately evaluating IT investment proposals is difficult due to the intangible costs and benefits involved in this regard (Powell 1992) pointed out the following; Information technology investment is more difficult than many other investment decisions because the costs and benefits are hard to identify and quantify and the intangible factors present are likely to be significant.

As the above discussion points out the traditional investment appraisal tools have no use in evaluating the investment on IT, because they assume a static future and depend on quantifiable variables.

The results of studies done in this area have found considerably different outcomes in this regard (Brynjolfsson and Hitt 1993) have associated IT with higher profit, but other scholars (Strassman 1997) argues that there is no discernible relationship between IT investments and any measure of firm profitability including return on assets, return on equity, and economic value added. This debate whether investment on IT is associated with high payoffs dubbed the “productivity paradox” the controversy over the business value of computer investments continues to rage even in the face of more encouraging evidence about payoffs from IT.

This study was conducted on Ethiopian financial service firms specifically on commercial banks. This sector was selected because of its high reliance on IT and the currently perceived high investment of the firms in this industry on IT. Currently to the best of the researcher’s knowledge, such type of study have not been conducted by other researchers and this has given an opportunity to assess the impact that IT has created on the performance of Ethiopian financial service firms specially those in the banking industry.

The study was conducted by using the published financial statements of all commercial banks in Ethiopia. The financial statements were audited and covered a time period of five consecutive years. Those banks that are established after the year 2005 were not included in this research for the purpose of analyzing five consecutive full year data.

1.2 Statement Of The Problem

IT investments carry significant long term business implications. Assessing IT investments is thus difficult; both before the investment is undertaken, and after the new (or enhanced) systems have been acquired and implemented. Bacon (1992) emphasizes the importance of selecting appropriate criteria for IT investment decision making, as they significantly impact the effectiveness of decision making and have a consequence on projects' return on investment. In addition, the criteria used indicate whether there is an appropriate balance in utilizing both quantitative and qualitative forms of appraisal in selecting IT investments. Therefore, the development and use of appropriate justification approaches and techniques is crucial to ensuring that IT projects are evaluated for all the strategic, operational and economic benefits they can provide and for all the costs that are associated with their acquisition and operation.

In our country a full-fledged research on the issue raised has not been materialized to the best knowledge of the researcher. The researcher believes that the current trend of financial institutions and their large sum of money invested in IT facilities should be investigated for how much the investment has paid off? And the money invested there does it worth, compared to the benefit (financial) gained? Are the formal investment appraisal tools discussed above, used to evaluate the investments potential to future cash flows?

IT capabilities were found to be an important differentiator of banks (Bharadwaj 2000) according to (Bharadwaj 2000) performance of banks tends to differ by their efficient and effective utilization of IT and it is not just by acquiring IT facilities. Therefore it is imperative to evaluate what significant benefit IT has conferred to the banks and to what extent the financial success of the banks can be attributed to their IT capability needs to be investigated. In this regard currently IT spending by Ethiopian banks has been dramatically increasing from year to year, leaving the question what significant correlation is there between IT investment spending and organizational financial success.

These and other related issues have triggered the researcher to investigate the area and to shade some light on the issue, which is not been given proper attention.

1.3 Objective Of The Study

1.3.1 General Objective

Despite the fact that investment and returns have always been the core issue of business, the overall issue of investment on IT by Ethiopian financial service firms specifically in the banking industry and its impact on their profit have not been assessed and related research works in the area have not been done in our country prior to this paper. As a result the general objective of this study is to assess the impact of investment on IT in the financial performance of Ethiopian financial service firms namely in the banking industry.

1.3.2 Specific Objectives:

This research paper has also the following specific objectives that are designed to answer the major research questions in collaboration with the general objectives which is outlined above.

- 1) To evaluate whether the decision to invest on IT was made by evaluating the pros and cons of the investment through the formal investment appraisal tools.**
- 2) To determine the most widely used investment appraisal tool used by financial institutions in Ethiopia.**
- 3) To assess the impact of investment on IT in the profitability of Ethiopian financial service firms specifically in the banking industry.**
- 4) To assess the impact of investment on IT in minimizing operational as well as administrative costs.**

1.4 Significance of the study

As discussed in the previous sections, research on this issue has never been done in Ethiopia. As a result, it was vague whether the financial institutions in Ethiopia really maximized their profit due to their investment on IT.

It is known that the costs incurred for the investment on IT is huge, as a result a careful look at the result of the investment has to be made. In this regard this research paper has offered outcomes that may answer the question whether the investment on IT by Ethiopian financial service firms particularly in the banking industry has really paid off.

This research paper has also shade some light on the IT investment appraisal techniques used, so that the industry practice in this area has been revealed. The researcher believes that this will help the financial institutions to re-assess their investment appraisal procedures and enabling them to make more informed decisions.

This study will be helpful for other researchers in such a way that it signaled the depth of the problem and by indicating the potential of this area for more in-depth academic research.

The researcher has come across so many well documented researches on the issue in other parts of the world, including our neighboring countries (for example: Kenya) but the issue has been given little attention here in Ethiopia, the researcher believes that the outcome of this research may motivate other researchers to undertake an in-depth and all rounded research.

Since the issue raised in this paper is not well explored, the insights obtained from it may have the following significant value for future decision making in areas of IT investment

- ❖ It will deliver insights as to what relationship exists between company profits and IT capital**
- ❖ It will reflect on the general experience of using investment proposal evaluation techniques by Ethiopian financial service firms namely in the banking industry concerning investment on IT**

- ❖ It will provide useful insight as to the potential of this issue for future studies

1.5 Methodology

1.5.1 Data Used In The Research

In this research paper data collected from both categories that is primary data and secondary data has been used. The primary data has been collected through questionnaire and the secondary data has been collected from published and audited financial statements of the banks that covered a period of five consecutive years starting from the year 2005.

1.5.2 Target Population

In this study the target population is defined as financial service firms in Ethiopia specifically the banking industry who have invested on computer, software, hardware and networking equipments and that has been in operation since the year 2005.

1.5.3 Sample design

Since the population under investigation here is limited in number the researcher has opted to deal with the entire population who have invested on computer software, hardware and networking equipments and that has been in operation since the year 2005.

1.5.4 Data analysis

After the data has been gathered both descriptive and analytical procedures have been performed. To measure the impact of IT on the firms performance appropriate statistical tools have been used. The "matched sample comparison group" methodology was employed to empirically assess the relationship between higher IT capital and firm performance. This is a popular methodology that has been used in several research studies in the accounting, finance, and marketing literatures (c.f. Balakrishanan et al. 1996; Jain and Kini 1995; Kalwani and Narayandas 1995) to compare the levels of interest variables

across two samples: the treatment sample, in this case, a sample of firms with high IT capital, and a carefully selected control sample of firms matched to the treatment sample with low IT capital by size and type. The performance of the matched control sample of firms serves as a benchmark and helps to remove the distortive effects of extraneous variables and market forces that could influence firm performance. A variety of profit and cost measures are used to compare the financial performance of the two groups.

The analysis was done by defining the independent variable to be IT capital and the dependent variables are various profit and cost ratios. In this way it was believed that the IT contribution to profit maximization and to cost minimization can be measured.

The banks average investment on IT was used to classify the banks in to the treatment sample and the control sample. The average IT investment was taken for five consecutive years and the top three high It capital banks are included in the treatment sample and the next three with relatively lower IT capital banks are included in the control sample. To control the impact of size and type on the analysis and recommendation banks of similar size have been selected and the two samples were drawn from the same industry, which is the banking industry of Ethiopia. The banks size in this case was measured in terms of the size of their total asset.

1.6 Scope And Limitation

The scope of this study was to investigate the impact of IT capital on the profitability and cost efficiency of Ethiopian financial service firms as a whole. The study was conducted on the data covering the period 2005 to 2009 on all of Ethiopian financial service firms. But due to the methodology selected it was impossible to include some financial service firms such as Commercial bank of Ethiopia and Ethiopian Insurance Corporation. Because these organizations are so large and the conclusion drawn from the analysis by employing the methodology selected will be affected by size differences. As a result to control the distortion that might have occurred due to the inclusion of the above mentioned organizations the researcher was forced to exclude these organizations from this study. Two governmentally owned banks namely Development Bank of Ethiopia and

Construction and Business Bank have not yet published their audited financial statements for the years 2008, 2009; and 2009 respectively. As a result, this paper has been limited to six private banks. The other limitation was insurance companies and micro finance institutions are not included in this paper due to time constraints.

1.7 Organization Of The Paper

This paper is organized in such a manner that the first chapter presents the back ground of the study, statement of the problem, objectives of the study, significance of the study, methodology and scope and limitation. The second chapter presents the review of related literature. The third chapter presents the discussion and analysis of the data gathered. The final chapter provides the conclusion and recommendations.

Chapter Two

2. Review Of Related Literature

2.1 Goal Of The Firm

Organizations run to achieve different goals, some are engaged in a not for profit operation, some are engaged to derive profit from their operations, others are engaged to protect and safe guard the interest of their members with no financial interest, government is engaged to enhance the wealth of the nation and to equitably distribute the wealth of the nation. In all of these cases there is a goal to be attained at the end; this end can be taken as a long run goal or a short run goal. One of the widely accepted goals of a corporation is corporate value maximization (Baye 2001). In its simplest version value maximization refers to maximizing the present value of the firm's future cash inflows. This is equivalent with profit maximization, and this theory appears to be one of the widely accepted propositions, in this regard it is generally assumed in the literature on industrial organization that share holders want their firms to maximize expected profits(Egbert and Grodal 1996). Even if the trend is accepting corporate value maximization as a major goal, still other well known scholars contend that accepting this theory as a general rule is much questionable and arguable due to the fact that this theory by itself is vague in the sense that it is almost impossible to tell the maximum point at which value is maximized (Anthony and Govindarajan 2001). This implies that to maximize the value of the firm every business decision has to be made in light of its impact on the value creation process of the firm (Jensen, 2000). To do this management has to deal with identifying all possible alternative ways of accomplishing a given task and select the best alternative, as it is obvious doing this is almost impossible. (Egbert and Grodal 1996) argued that the fundamental problem of profit maximization hypothesis is in general not well-defined if it is introduced into the

framework of imperfect competition. They found that profit maximization will lead to less price competition than utility maximization since profit maximization tends to raise prices it may be regarded as beneficial for the owners as a whole. This dilemma has led to the development of alternative theories of firm behavior. Some of the more prominent ones are models in which size or growth maximization is the assumed primary objective of management, models that argue that managers are most concerned with their own personal utility or welfare maximization, and models that treat the firm as a collection of individuals with widely divergent goals rather than as a single unit (Baye 2001).

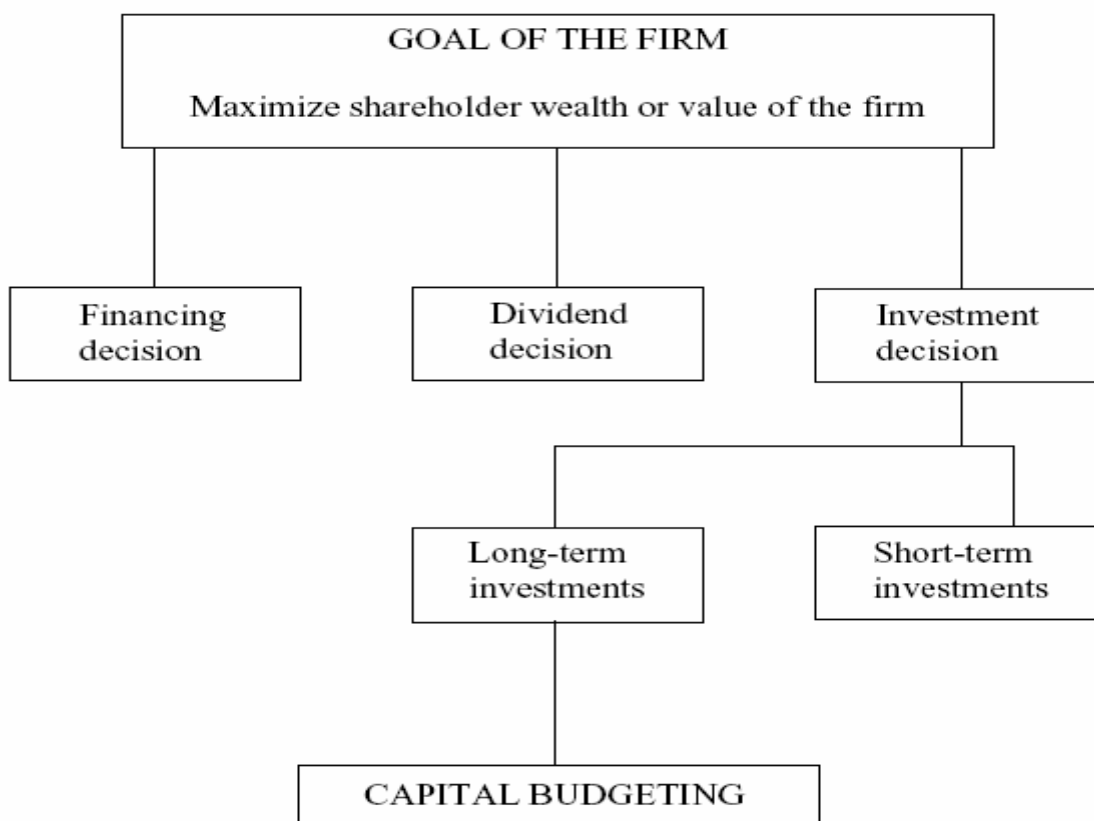
One of the areas that is likely to determine the success or failure of a firm is its investment decision on long lived assets, in this regard (Dayananda, Irons, Harrison, Herbohn and Rowland 2002) noted that Sizable, long-term investments in tangible or intangible assets have long-term consequences. An investment today will determine the firm's strategic position many years hence. These investments also have a considerable impact on the organization's future cash flows and the risk associated with those cash flows. Capital budgeting decisions thus have a long range impact on the firm's performance and they are critical to the firm's success or failure.

Since the firm's investment decision will have a long lasting effect on its cash flow the value maximizing process will be affected either positively or negatively.

Among the various investment decisions one of it is investment on information technology (IT). Most organizations see investment on IT as a means of profitability and success; in this regard (Divarag & Kohli 2003) noted that Organizations view investments in information technology (IT) as a way to combat competition by improving productivity, profitability, and quality of operations. In fact the issue around investment on IT and firm performance is much of a debate. According to (Powell 1992) Information technology investment is more difficult than many other investment decisions because the costs and benefits are hard to identify and quantify and the intangible factors present are likely to be significant. Despite the fact that many companies are increasing their expenditure on information technology (IT) to obtain or even sustain a competitive advantage in their respective marketplaces, many studies show that the benefits from IT systems have been considerably less than expected (Alshawi, Irani and Baldwin 2003).

This paper specifically focuses on what should be the goal of a corporation as a going concern; should the goal be short run or long run and how should corporations develop sustainable competitive advantage and create value to owners. These and other pertinent questions are addressed. Before proceeding to the discussion of capital budgeting techniques it is important to see how the goal of the firm is linked with investment decisions.

Figure 2.1 Goal of The Firm And The Capital Budgeting Process



Source: Dayananda, irons, Harrison, Herbohn and Rowland 2002

2.2 Capital budgeting techniques for capital investment decisions

It is very important to start with the definition of capital budgeting, different authors have given their own definitions, one of the widely used definition for capital budgeting reads as “capital budgeting is the process of identifying and selecting investments in long-lived

assets, or assets expected to produce benefits over more than one year.”(Fabozzi & Peterson 2003).

There is general agreement that investment decisions are the most important decisions made by corporations. The choice of projects and the level of investment are critical not just for stakeholders of the firm but also for the economic well-being of society as a whole (Harris And Raviv 1996).

The traditional investment appraisal techniques have been useful in the past, when the business environment was easily predictable and stable but with the today’s business environment where things are more and more unpredictable and unstable the utility of the traditional investment appraisal techniques have been questioned greatly, in this regard (Ashford, Dyson & Hodges 1988) noted that the traditional appraisal methods of payback, discounted net present value (NPV) and internal rate of return (IRR) undervalues the long-term benefits; that traditional financial appraisals assume a far too static view of future industrial activity, under-rating the effects and pace of technological change; that there are many benefits from investments in new technology which are difficult to quantify and are often ignored in the appraisal process.

The following table shows the most widely used investment appraisal tools and following the table a discussion on the merits and drawbacks of some of the most widely accepted and applied techniques is presented.

Table 2.1 Project Appraisal Techniques

Classification	Appraisal techniques
Economic Approach	Gut feeling
	Payback
	Return on investment (ROI)

(Ratio based)	cost benefit analysis (CBA)
Economic Approach (discounting technique)	Net Present Value (NPV)
	Internal Rate of Return (IRR)
Economic Approach (future value technique)	Real option pricing theory
Strategic Approaches	Technical Importance
	Competitive Advantage
	Critical Success Factors
	Application Portfolio Approach
Analytical Approaches (portfolio)	Non numeric
	Scoring models
	Computer based techniques
	Fuzzy logic
Analytical Approaches (other)	Risk analysis
	Value analysis
Integrated Approaches	Multi-attribute utility theory
	scenario planning and screening
	Information Economics
	Balanced scorecard

Source: Adapted from Irani *et al.* (1997)

2.2.1 Payback method

This is the simplest and widely used technique of investment appraisal (Ashford, Dyson and Hodges 1988). A survey conducted on the use investment appraisal techniques for IT investment by banks in our neighboring country Kenya has found that 60% of the respondents use the payback period as their investment appraisal tool (Khakasa 2009). Despite the wide spread use, this technique ignores almost all important variables that an investment appraisal tool has to encompass. The major weaknesses of this method are it ignores all future cash flows after the desired payback period (Ashford, Dyson and Hodges 1988). Perhaps the biggest problem with the payback period rule is coming up with the

right cutoff period, because we don't really have an objective basis for choosing a particular number. Put another way, there is no economic rationale for looking at payback in the first place, so we have no guide as to how to pick the cutoff. As a result, we end up using a number that is arbitrarily chosen. (Ross, Westerfield and Jordan 2001)

2.2.2 Net Present Value (NPV) And Internal Rate Of Return (IRR)

A similar objection that is raised for payback method can be raised to NPV and IRR, in that these methods assume a far too static view of future industrial activity, under-rating the effects and pace of technological change; that there are many benefits from investments in new technology which are difficult to quantify and are often ignored in the appraisal process. The claim is that discounting future cash benefits under-emphasizes the future benefits of new technology. This problem may be exacerbated by the application of risk premium to the discount rate. New technology is assumed to be riskier than that which has been well established, in that the usual market risks are compounded by uncertainties in installation, throughput, performance and the like. Hence high discount rates are employed which severely diminish the impact of future cash benefits on the appraisal. (Ashford, Dyson and Hodges 1988).

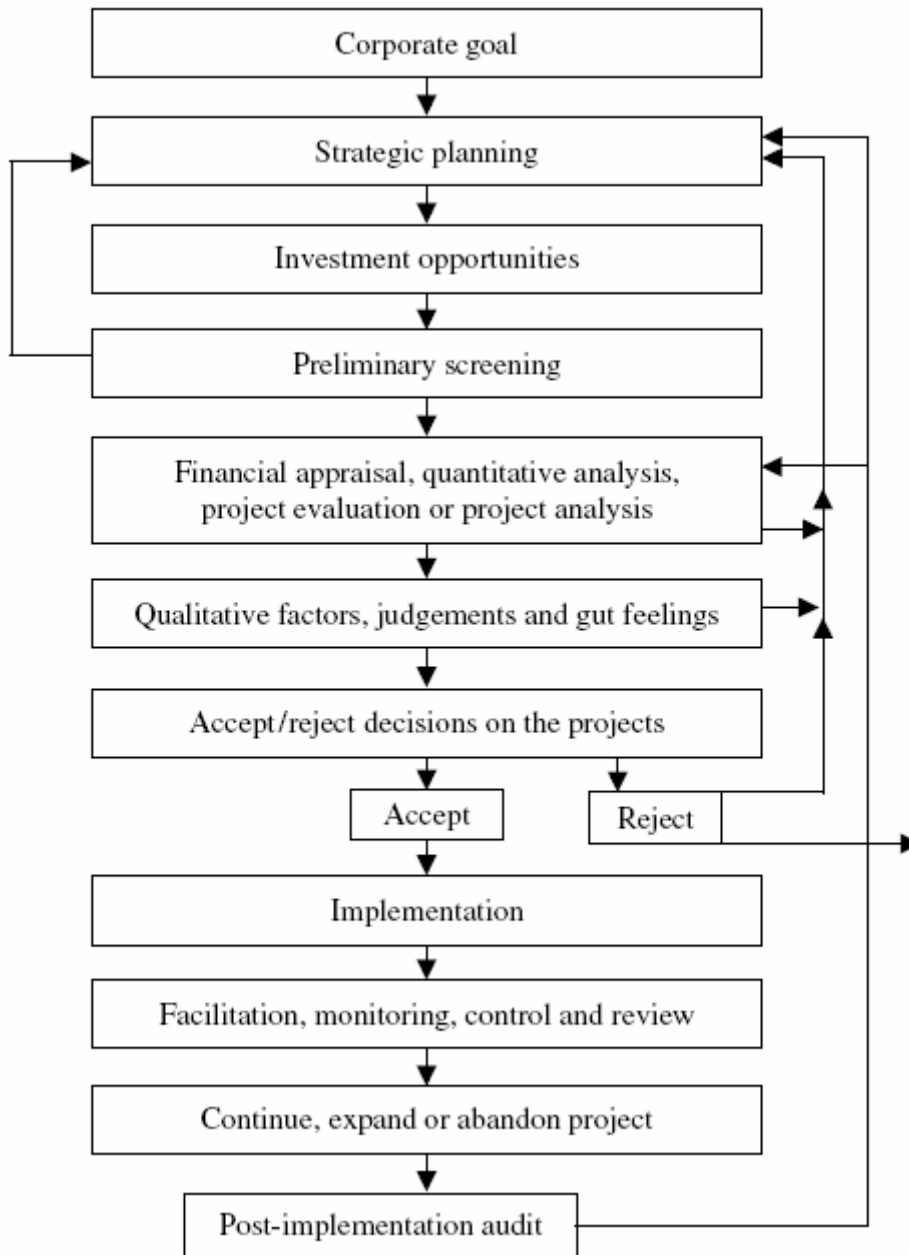
As it is mentioned above the traditional investment appraisal tools fail to recognize future Uncertainties or assume that the future is static and under values the future benefits of new technology investments. On top of these the traditional investments appraisal tools ignore the intangible benefits and costs of investments. These intangible factors are called qualitative factors, may include the following :(Dayananda, irons, Harrison, Herbohn and Rowland 2002)

- The societal impact of an increase or decrease in employee numbers
- The environmental impact of the project
- Possible positive or negative governmental political attitudes towards the project
- The strategic consequences of consumption of scarce raw materials
- Positive or negative relationships with labor unions about the project
- Possible legal difficulties with respect to the use of patents, copyrights and trade or brand names

- Impact on the firm's image if the project is socially questionable.

By taking the above discussions in to consideration (Dayananda, irons, Harrison, Herbohn and Rowland 2002) have developed a typical capital budgeting process that is depicted in the figure shown below.

Figure 2:2 The Capital Budgeting Process.



Source: Dayananda, irons, Harrison, Herbohn and Rowland 2002

2.3 From NPV to an Expanded (Strategic) NPV Criterion.

One of the widely used investment appraisal tool is the net present value (NPV) method as per this method the projects discounted future cash flow is compared with the present value of the initial investment. This can be computed by using the following equation.

$$V_0 = \sum_{t=1}^T \frac{E(CF_t)}{(1 + k)^t}$$

where :

$E(CF_t)$ = the projects expected cash flow

t = time period

k = cost of capital

The *net* present value (NPV) is the above gross present value of discounted cash flows, V_0 , minus the present value of the necessary investment cost outlay, I_0 . If positive, it represents the value creation for the shareholders undertaking this project. (Smit & Trigeorgis 2004)

(Simit and trigeorgis 2004) suggested a model that will overcome most of the problems of the traditional NPV, which is called the expanded or strategic NPV, mathematically this model, can be represented as below.

**Expanded (strategic) NPV = passive NPV + flexibility (option) value +
Strategic (game-theoretic) value**

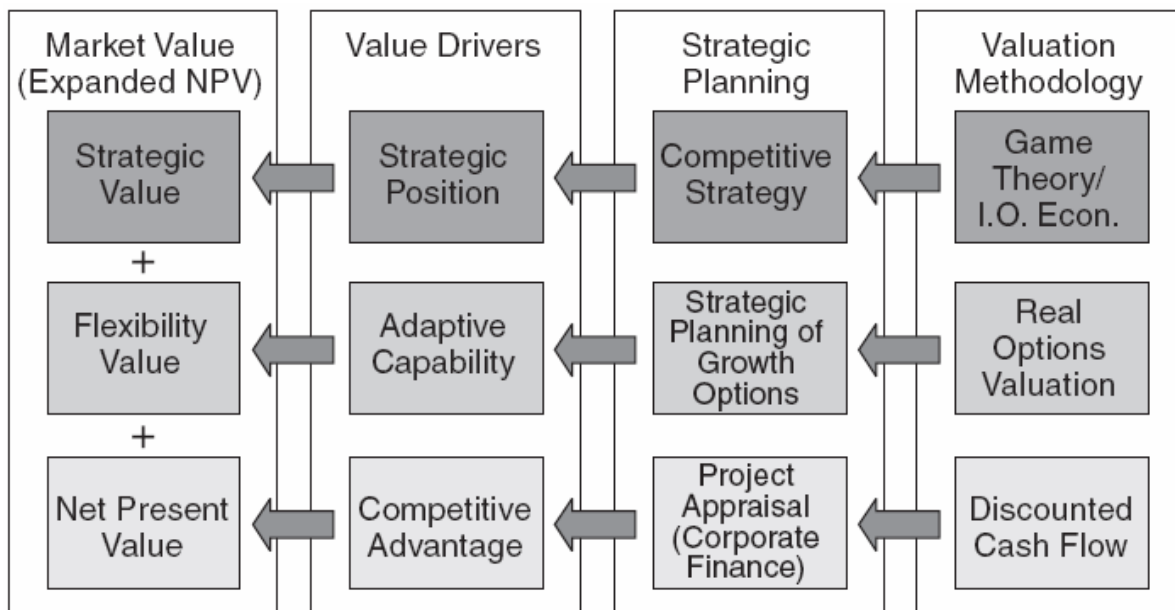
This model builds on the concept of real options and game theory. The opportunity to invest in a project is analogous to having a call option, a call option gives its holder the right, by paying a specified cost within a given period, to exercise the Option and acquire

the underlying asset. The ability to defer a project with an uncertain value, V_t , creates valuable managerial flexibility. (Smit & Trigeorgis 2004)

In this regard the game theory will help us to envision what will be the likely response of competitors for the strategic investment decisions of the firm. Investment decisions will have an impact on the future competitiveness of the firm as a result investment decisions are likely to generate a competitive counter action from the part of the firm's competitors.

The following figure adopted from (Smit & Trigeorgis 2004) shows the relationship among the expanded NPV model, firm value drivers, strategic planning and investment appraisal tools

Figure 2.3 Expanded (Strategic) NPV Rule



Source: Smit & Trigeorgis 2004

2.4 Discount Factor selection

The above paragraph specifically dealt with how to screen a project that will add value to the firm. Projects add value to the firm when their discounted cash flow exceeds their

acquisition cost. The next section focuses on the discount factor that we use to discount the cash flows of a project.

There is a debate among scholars as to which discount factor should be used, that is the after tax weighted average cost of capital (ATWACOC) or the before tax weighted average cost of capital (BTWACOC).

Scholars such as (Van Horne 1980), (Schal and Haley 1980) recommended the use of the after tax weighted average cost of capital as a discount rate to determine the NPV of the project. This approach (ATWACOC) defines the cash flow of the project as if the project were fully financed by equity financing. To the contrary scholars such as (Arditti and Levy 1977) recommended the use of the before tax weighted average cost of capital (BTWACOC) To discount the cash flow of the project and this approach explicitly incorporated the interest deductibility of interest expense.

Empirical studies have shown that ATWACOC generally commits the fewest errors in classifying profitable and unprofitable projects, assuming that the cost of capital of the unlevered firm is not constant through time (Brick and Weaver 1984).

2.5 Evaluating Investment on Information Technology (IT)

In the preceding section a detailed discussion is made on the criteria required to select an investment. It is already stated that, since the goal of the firm is to maximize value (even if this issue is a subject of debate) every business decision has to be seen in terms of its impact on the value of the firm (Jensen 2001) making investment decisions one of the challenges that managers has to cop up, this task recently has become one of the area of managerial puzzle as the business environment becomes more and more complicated and unpredictable.

The reasons why organizations appraise their investments are explained by Irani and Love (2002) as being:

- Comparison between different projects;
- Rank projects in terms of organizational priorities;
- Justify investment requests by management;
- Control expenditure, benefits, risk, development and implementation of projects;
- Provide a framework that facilitates organizational learning; and
- Mechanism to decide whether to fund, postpone or reject investment requests.

The role and scope of technology investment decision-making is complicated and ever changing. The reason for this is that there has been a continuous expansion of the boundaries surrounding the evaluation domain often grounded in the changing impact that IT offers through its advancement. The change in such boundaries is in part attributable to new technology (increased, scope, functionality and flexibility) and its impact (in human and organizational terms) on developing a new organizational IS infrastructure, juxtaposed With the many interacting socio-technical dimensions that support an organization. Hence, investment decision-makers not only need to have the skill to evaluate

the *nuts and bolts* of the technology sought but also need the foresight to assess its impact on the future of the organization and the people that rely on and use the system. Such impact may lie, in terms of the integration links, with existing and future systems, benefit realization, stakeholder exploitation, cost (direct and indirect) management and risk minimization. (Irani and Love 1994)

Investments are likely to be a long term commitment for the firm, especially when the investment undertaking is expected to change the way the firm does business. Finance text books suggest a set of quantitative tools to screen projects that are profitable and those that are unprofitable, but still the task is not easy for managers handling this matter, especially when it comes to investment on IT. Before going to the details of investment on IT, it is important to define the term investment on IT. “IT capital investment is any acquisition of computer hardware, network facilities, or pre-developed software, or any “in-house” systems development project, that is expected to add to or enhance an organization’s information systems capabilities and produce benefits beyond the short term”. (Bacon 1990). As other investment proposals are subject to evaluation as to their NPV, investments on IT have to pass the same appraisal stage. In evaluating every investment proposal’s NPV it is required to determine the cash inflows and out flows of the investment, but doing so for IT investments is difficult due to the intangible benefits and costs that are associated with the IT investment. As a result it is stated in most IT investment literatures that, Information technology investment is more difficult than many other investment decisions because the costs and benefits are hard to identify and quantify and the intangible factors present are likely to be significant (Powell 1992).

(Powell 1992) also argued that quantifying the benefit is of greater difficulty than quantifying the cost of the investment. (Overly 1973) comments, 'Current technological assessment programs are limited in their ability to account for all benefits and costs as they are too technology-oriented'.

Due to limitations discussed above such as: static view of the future, inability to assess intangible costs and benefits such as:

- The societal impact of an increase or decrease in employee numbers
- The environmental impact of the project

- Possible positive or negative governmental political attitudes towards the project
- The strategic consequences of consumption of scarce raw materials
- Positive or negative relationships with labor unions about the project
- Possible legal difficulties with respect to the use of patents, copyrights and trade or brand names
- Impact on the firm's image if the project is socially questionable.

The traditional investment appraisal techniques are insufficient to fully capture the benefit as well as the costs of investment on IT.

2.6 Business Value of IT

There is a general acceptance in the part of organizations that investment on IT will result in reduction of cost and generate superior profit. Studies have shown that investment on IT do not always result in increased profitability; (J.O Adewoye 2007) argued that IT investments alone cannot be taken as a sole factor for the profits of a firm. There appears to be no doubt as to the business value of IT, but the dimension and extent of the business value of IT depends on a varied array of factors. Studies found that IT is valuable, but the extent and dimensions are dependent upon internal and external factors, including complementary organizational resources of the firm and its trading partners, as well as the competitive and macro environment. (Melville, Kraemer & Gurbaxani 2004)

The business value of IT becomes even more noticeable in the financial service industry, as facilities should be shared. In the banking community, for example, many of the payments made are by electronic transfer. It is necessary to have the requisite systems, in order merely to participate in the current processes. (Powell 1992).

This lack of evidence whether IT improves productivity and business efficiency has led to the coining of the term "IT productivity paradox" (Prasad & Harker 1997).

Researchers came to the conclusion that this paradox exists due to seven factors that mask proper measurements and analysis. These factors are: (1) IT investments only represent a small share of GDP. (2) Computers have a rapid rate of depreciation and obsolescence. (3)

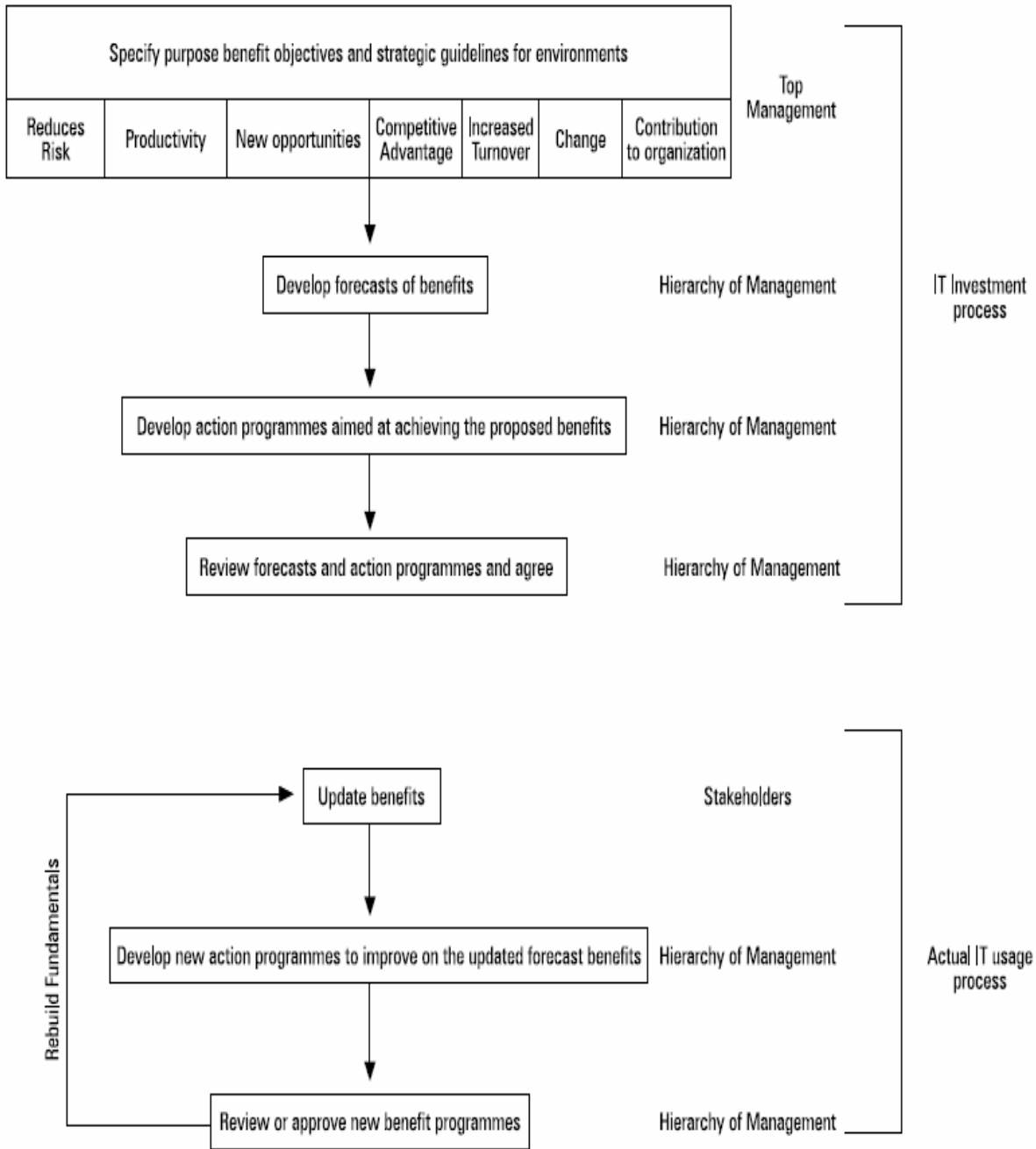
Old measurements do not apply in the new economy. (4) Poor analogy exists between the service sector (where productivity slowed down the most) and its heavy reliance on computers. (5) Computers have provided many intangible benefits. (6) A time lag exists between technology arrival and productivity benefits. (7) Web surfing, instant messaging and other nonproductive computer related activities have offset gains (Misra, 2003).

This paper has focused on the impact of IT spending on the profitability or the value maximization process of Ethiopian financial service institutions. The recent massive investment on IT by Ethiopian financial service institutions and the impact of this investment on management's value maximization responsibility had been examined. As the financial service industry in our country Ethiopia is still on its growing stage financial service institutions are investing highly on IT, hoping to rip the IT business benefit at this early stage of the industry. The appropriateness of whether starting to adapt an IT based financial service to a country like Ethiopia where the majority of the population is living in rural areas where IT infrastructures are not yet developed is another question to be explored.

2.7 Managing the benefits of information technology (IT)

Nowadays the business environment is much more complicated and unpredictable than ever before; as a result, businesses are required to take full advantage of the resources that they own. IT becomes one of the major resources of a firm and just like every resource businesses have to realize the full business benefit of IT. However, most organizations are not dropping the benefits of IT to the bottom line (Norton 1995). In this regard Norton went to further explain how to take advantage of the IT opportunity; management must recognize that we have entered an era of instability triggered by these waves of instability. The organizations that emerge successful in this new era will be those able to look beyond the approaches that have made them successful in the past, and develop new approaches based on new assumptions, new technologies, and new structures. (Norton 1995).

Figure 2.4: A Perspective On It Benefits – The It Investment Process And The It Usage Process



Source: Sam Lubbe and Dan Remenyi 1999

2.8 Factors Preventing Firms From Materializing The Full Benefit of IT

The following points have been listed as problem areas that have prevented firms from taking full advantage of IT (Norton 1995).

(1) We have been going through a period of technology-driven visions, during which we have learned how new technologies can ultimately affect an organization. However, if we are to achieve true benefits from our investments, we must refocus our vision. We must replace technology-driven visions with business-driven visions.

(2) We have not been making the radical organizational changes required to take advantage of IT. Technology is only an enabler. It permits new strategies to be executed. Any truly strategic move requires us to change the factors of competition. When all the strategies are defined and all the investments are made, the benefits will remain unrealized unless the underlying factors of competition are changed. This implies change in the structure of the organization, jobs, products and finance. Unless management is willing to make these changes, the strategic investment in IT will be for naught. The payoffs will be puny and the revolution will remain unfinished.

(3) We do not have the structures to help us manage the benefits of IT. IT is strategic, yet executives at the highest levels frequently are not involved in deciding how it should be used. IT is strategic, yet it is managed as an overhead expense. These problems are not parochial: we have observed them in every organization.

Figure 2.5: Managing the benefits model

Phase I	Phase II	Phase III	Phase IV
Vision	Investing	Cultivation	Harvesting
Managing the benefits:			
Sustained executive involvement			

Source: Norton 1995

2.9 Business - IT alignment

In today's rapidly changing world, Information Technology (IT) can become an enabler of business agility, or an inhibitor. It can also facilitate improving business performance or become another cost center to continually cut. For IT to provide added value, it is critical to have strong alignment between IT and the business (Belmonte 2008).

The investment on IT should be in line with the major strategic trust of the firm, meaning that the investment on IT should be driven from a business oriented strategy rather than a merely technology driven strategy (Norton 1995). Technology driven IT strategy is just a quest to adopt a current age technology without a due consideration of the impact of the investment on the long run value of the business.

Alignment is important to firms for many reasons. The primary reason is to ease the development and implementation of cohesive organization and IT strategies that enable firms to focus on the application of IT to improve the business. (Papp 1999).

Papp went to further explain the areas of business – IT alignment and identified four areas where the alignment should focus, these are:

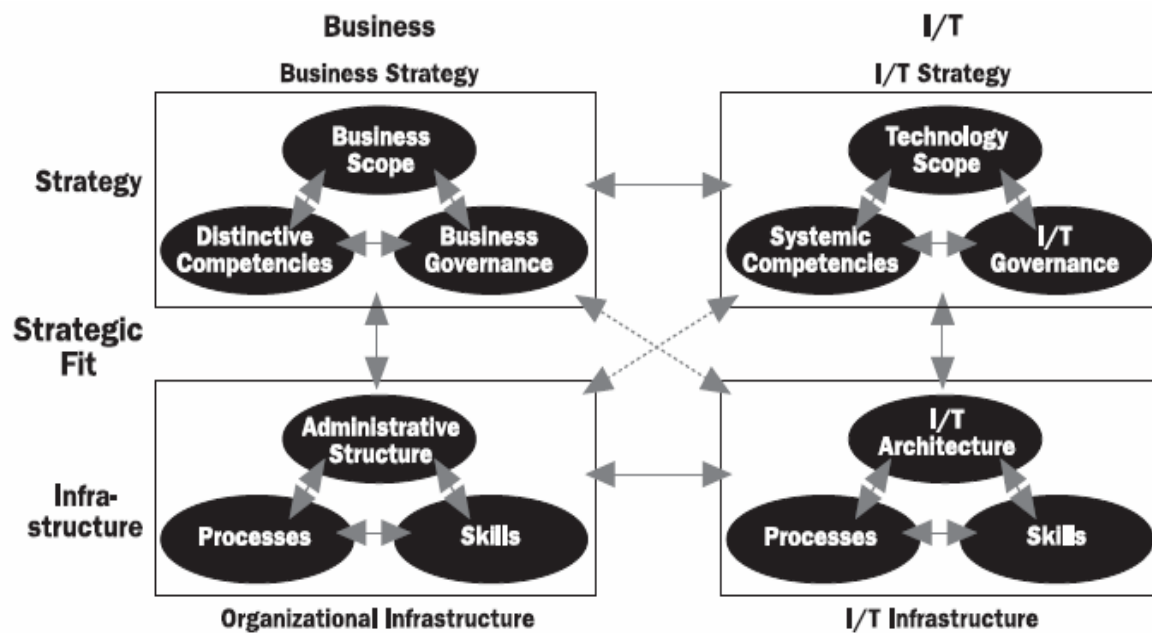
- Strategy
- Infrastructure
- Business
- Information technology

Traditional methods of developing business strategies have failed to take full advantage of IT (Papp 1999). Strategic alignment sheds new light on IT and its role in the development of business strategies; strategic alignment considers the following:

- Strategic fit between strategy and infrastructure
- Functional integration between business and IT

By focusing on business and IT, strategic alignment addresses both strategy and infrastructure concerns to achieve alignment among these four areas. (Papp 1999)

Figure 2.6: The Strategic Alignment Model



Source: Raymond Papp 1995.

Firms should continually monitor the direction where their IT investment is headed and where the business strategy intends to move and make sure that IT investments are under the general direction of the business strategy. There are different ways a firm can make sure that investment on IT and the business's strategy are going in the same direction. Management should follow the steps below to achieve alignment as a means of improving performance and profitability (Papp 1995). "ALIGN" your strategies by:

- Assessing the firm's perspective using the alignment model.
- Learning to recognize and leverage IT within your firm to maximize efficiency.
- Incorporating financial measurements suitable for your particular industry when assessing alignment.
- Giving everyone in the firm a clear and useful role to facilitate synergy between IT and the business.
- Never stopping the assessment of alignment within the firm. It is a continuous, dynamic process requiring constant monitor

In addition to the points raised by Papp above, the following points are worth considering. A company must ensure that the direction that IT is taking aligns closely with the business direction (Belmonte 2008). This is achieved through a variety of methods, including:

- A clearly defined IT strategy for how to best utilize information technology to enable business goals and direction.
- a sound governance process that facilitates IT decision-making.
- a supportive management team with an open mind.
- an objective process for determining the business case for IT investments.

Generally a firm has to make sure that the investment on IT and the business strategy has to go in line. The business strategy should be the one that governs the entire activity of the business including investment on IT.

2.10 Model construction: The resource based view of the firm (RBV)

A firm's resources at a given time could be defined as those (tangible and intangible) assets which are tied semi permanently to the firm. Examples of resources are: brand names, in-house knowledge of technology, employment of skilled personnel, trade contacts, machinery, efficient procedures, capital, etc. (Wernerfelt 1984)

Before going to the details of the model it is worth to understand what is meant by a resource, in fact one of the major difficulties encountered in the resource based view approach is to precisely define a resource, for the purpose of this paper the researcher accepts the view of Wade and Hulland (2004), that reads as “resources are assets and capabilities that are available and useful in detecting and responding to market opportunities or threats.” (Wade and Hulland 2004),

Together, assets and capabilities define the set of resources available to the firm. Assets are defined as anything tangible or intangible the firm can use in its processes for creating, producing, and/or offering its products (goods or services) to a market, whereas capabilities are repeatable patterns of actions in the use of assets to create, produce, and/or offer products to a market (Sanchez et al. 1996).

The resource-based view argues that firms possess resources, a subset of which enables them to achieve competitive advantage, and a further subset which leads to superior long-term performance (Wade & Hulland 2004).

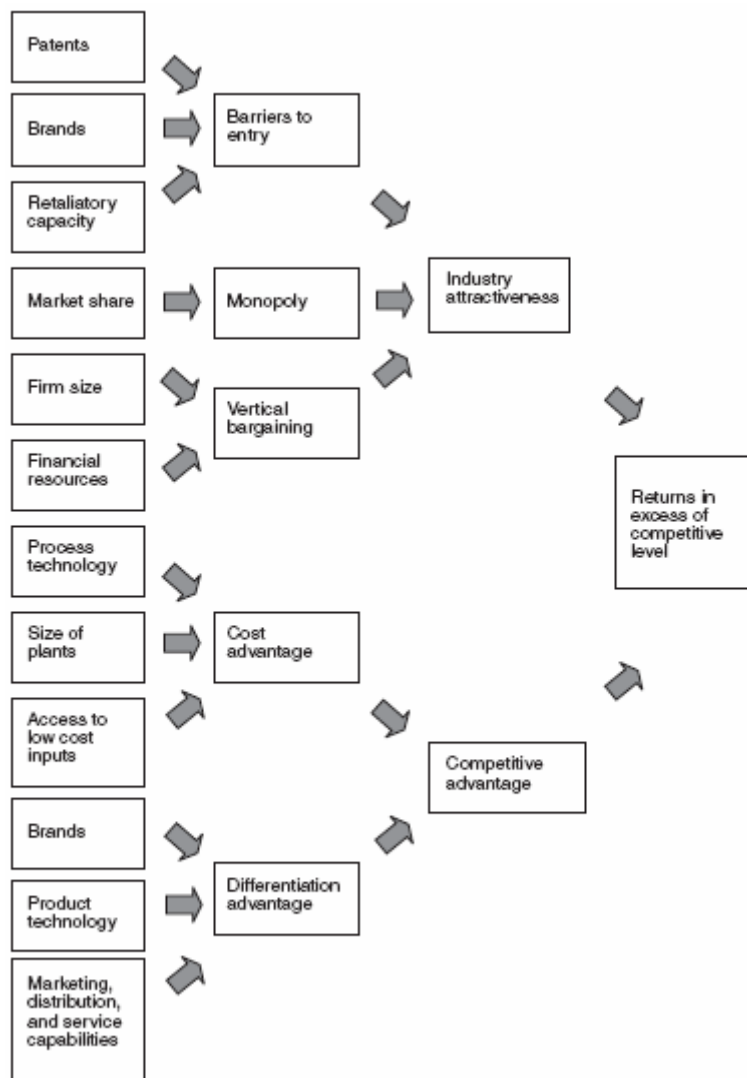
Resources that are valuable and rare and whose benefits can be appropriated by the owning (or controlling) firm provide it with a temporary competitive advantage. That advantage can be sustained over longer time periods to the extent that the firm is able to protect against resource imitation, transfer, or substitution.(Wade & Hulland 2004).

RBV is a model that sees the firm from inside out, meaning the firm's competitive advantage and value creation efforts, all depend on the inimitability, non transferability and no substitutability of the resource. The resource based theory of strategy emphasizes that each firm is characterized by its own collection of resources and capabilities. Exploitation of scarce firm specific resources and capabilities is the fundamental

determinant of value creation by the firm. It is the leveraging and scarcity of firm-specific resources and capabilities that enable the firm to generate a profit stream in excess of the opportunity cost of capital (Smit and Trigeorgis 2004).

The following diagram depicts a typical resource based view and how the firm’s resources are used to leverage the value of the firm.

Figure: 2.7 Resources as a Basis for Profitability



Source: Grant 1991.

In order to create value, the bundle of the firm's resources should have several important features (Barney 1986)

- **The resources should be distinctive, scarce, and relevant to establish competitive advantage;**
- **they should be durable and hard to imitate so the competitive advantage is sustainable;**
- **The firm should be able to appropriate the excess profits that result from the resources.**

When the firm has no such resources, it has little competitive advantage, and so will make an average return on capital.

It is possible to identify classes of resources for which resource position barriers can be built up. By their nature, these barriers are often self-reproducing; that is a firm which at a given time, finds itself in some sense ahead of others may use these barriers to cement that lead. It is the properties of the resources and their mode of acquisition which allow this to be done. What a firm wants is to create a situation where its own resource position directly or indirectly makes it more difficult for others to catch up (Wernerfelt 1984).

Since resources have to be the source of building a long lasting competitive advantage, and IT is one of the major resources of firms, it has to be the source of the firm's competitive advantage. Any competitive advantage developed by a firm should maximize the value of the firm. From this it can be concluded that, if a firm acquires a resource that full fills the three criteria mentioned above by (Barney 1986) and (Grant 1991) should develop a sustainable competitive advantage and earn a substantial rate of return that is in excess of its cost of capital.

2.11 Measuring The Impact Of IT On Firm Performance

IT has either a positive (high profit) or negative (loss or declining profit) impact on firms who are relying on it; as a result, it is considerably important to determine which impact is exactly resulted from the investment on IT.

This paper has attempted to measure the impact of IT on firm's performance specifically in the case of Ethiopian financial service firms. In this case, performance is measured solely by using financial performance metrics; the researcher has two reasons for selecting financial performance metrics:

- **The non financial performance metrics as they are called leading performance indicators (Kapalan and Norton 1996) are reflected through their effect on the financial performance metrics called lagging performance indicators, and**
- **The ease with which financial performance metrics offer for measurement and judgment of performance.**

Due to factors mentioned above the researcher has opted to use financial performance metrics as an indicator of IT's impact on the financial performance of firms under consideration.

Future researches may use both financial and non financial performance metrics to evaluate the impact of IT on firm performance. It is also worth focusing on the non financial performance metrics to assess the impact of IT on firm performance because much of the investment on IT is aimed at improving the work process, customer satisfaction, product/service quality etc. by definition these variables are of intangible and non financial, but very crucial in that the success or failure of a firm depends to a large extent by how well the firm excels on these areas.

There is no one best way of measuring non financial performances like quality of work process, product/service quality... etc, as a result any measure of these variables will be vulnerable for subjectivity and bias.

To avoid the potential subjectivity, the researcher has used the traditional financial ratios to measure the impact of IT on firm performance. The ratios are calculated for selected performance areas that the researcher believed the investment on IT has to affect the firm either positively or negatively. The following discussion presents the selected ratios for measuring the impact of IT on firm performance and the reason for selecting a particular ratio.

2.11.1 Profit Measures

The first two ratios, return on assets (ROA) and return on sales (ROS), have been widely used in the IT business value literature as measures of firm profitability (Cron and Sobol 1983; Hitt and Brynjolfsson 1996; Strassman 1990; Weill 1992).

The ROA measure, calculated as the ratio of net income to assets, indicates how profitably a firm employs its assets since it reflects how much profit a firm is able to generate for each Birr amount of asset invested. It is a broad measure that is correlated with several other profitability measures (Grinyer and Norburn 1975).

The ROS measure, which is the ratio of net income to sales, serves as another indicator of a firm's net profit margin. The operating income to assets (OI/A) and operating income to sales (OI/S) ratios focus on operating returns only and exclude incomes earned by the firm from other sources such as gain on disposal of assets and from other extraordinary sources. Operating income is, therefore, regarded as a more appropriate measure of the direct value of IT (McKeen and Smith 1993, 1996).

These profit ratios are believed to indicate the impact of IT on the financial performance of firms, than any other financial ratio and are the closest area where the impact of IT can clearly be seen.

2.11.2 Cost Measures

Two cost related ratios were used to compare the relative performance of the two groups: total operating expenses to sales (OEXP/S), and General and Administrative expenses to sales (G&A/S). Total operating expenses (defined as the sum of all operating expenses)

serve as a proxy for the firm's total cost of operations. Operating expense was selected because it is the most general and encompassing measure of a firm's total cost of operations (Mitra and Chaya 1996). General and Administration expenses serve as a proxy for the firm's total cost of general and administration overhead costs.

Chapter Three

3. Discussion And Analysis

3.1 Historical Back Ground Of Financial Service firms in Ethiopia

The financial service industry in Ethiopia was dominated by two state owned banks and one state owned insurance company until 1984 E.C, but after the socialist government was overthrown private investment has grown & businesses have started to contribute for the development of the country. Among these developments were the financial service sector. Until 1984 E.C there were only three (3) financial service industries but now Ethiopia has fifteen (15) established and running banks and ten (10) insurance companies (www.nbe.org.et)

In the year 1984 E.C there was no a single micro finance institution but in the year 2000E.C the number of micro finance institution has reached to twenty eight (28) (Birritu magazine No-105; 2009). The following table shows the overall growth of the financial service industry of Ethiopia since the year 1984 to 2000.

Table 3.1 Growths Of Ethiopian Financial Institutions

No		Budget year	Budget year	Difference
		1984 E.C	2000 E.C	In %
1	Number of Banks	3	11	266.7
	state owned banks	3	3	
	private owned banks	0	8 in (2000) 15 in 2002	
2	Number of banks branch office	194	562	189.7
	state owned banks	194	264	36.1
	private owned banks	0	298	
3	Total wealth of banks (in Millions)	9484.6	113,603.30	1097.8
	state owned banks	9484.6	78,022.80	722.6
	private owned banks		35,580.50	
4	Reserve accumulated	5,898.20	62,956.30	967 .4
	state owned banks	5,898.20	40,765.70	591.2

	private owned banks		22,190.60	
5	loan money reserve (in Millions)	4,167.90	41,339.80	891.9
	state owned banks	4167.9	24,894.90	497.3
	private owned banks		16,444.90	
6	Banks capital (In millions)	1,352.70	9,965.00	636.7
	state owned banks	1,352.70	6,601.00	388
	private owned banks		3,364.00	
7	Insurance Companies	1	10.00	900
	state owned banks	1	1.00	
	private owned banks		9.00	
8	Number of insurance Co. branch office	20	172.00	760
	state owned banks	20	37.00	85
	private owned banks		135.00	
9	insurance co. capital (in millions)	11	582.10	5,191.80
	state owned banks	11	229.3	
	private owned banks		352.80	
10	Number of micro finance		28.00	
11	micro finance capital (in millions)		1,340	
12	micro finance total wealth (in millions)		5,340.60	
13	money collected by Micro finance Intuition (in millions)		1,561.00	
14	loan given by micro finance (in millions)		4,475.00	

Source: birritu magazine No 105; 2009

As the table above shows Ethiopian financial institutions have grown in all of the following respects diversity, capital, wealth, number and branch office numbers. The last five years the financial sector of the country has seen tremendous growth. To further promote the growth of the financial service sector of the country, the government of Ethiopia has proclaimed banking business proclamation, which is to be referred as “Banking Business proclamation No 592/2008.” This proclamation has defined what a bank is, the duties and responsibilities of a bank, establishment and termination of the operation of a bank. These and other related issues are covered in this proclamation. The financial service industry in Ethiopia is still growing and this is evidenced by the number of banks that are in the

process of establishment, this development in fact will have an immense contribution for investment and economic growth of the country.

3.2 Data Analysis

In this part of the paper, a detailed analysis of the data gathered from the primary and secondary sources has been made, by using both quantitative and qualitative techniques. The impact of IT capital on the profit maximization and cost minimization of the banks selected for this study has been evaluated and the reliability of the result obtained from the analysis was tested by using an appropriate hypothesis testing tool.

3.2.1 Establishing The Treatment And Control Samples

The first step in order to measure the impact of IT on profit maximization and cost minimization was to develop two samples; in this case the two samples are defined as follows:

- ✓ **The treatment sample (IT leaders):** this sample consists of banks whose five years average IT capital was in the top three high IT capital intensive banks during the period 2005 through 2009. This sample is characterized by banks with relatively higher IT capital.
- ✓ **The control sample:** this sample consist of banks whose five year average IT capital was not among the top three high IT capital intensive banks during the period 2005 through 2009. This sample is characterized by banks with relatively lower IT capital.

The following table was used to rank the banks based on their average IT capital for the years covering 2005 through 2009

Table 3:2 IT Capital Of The Banks For The Five Years

No	Banks	IT capital (in years)					Average IT
		2005	2006	2007	2008	2009	Capital
1	Bank of Abyssinia	4,839,833	5,981,926	7,522,364	10,269,658	12,188,888	8,160,534
2	Awash International Bank S.C	21,771,188	34,899,100	39,148,491	53,335,061	72,662,539	44,363,276
3	Dashen Bank S.C	37,416,935	28,315,494	36,198,108	71,277,460	89,876,130	52,616,825
4	Nib Interantional Bank S.C	2,002,265	2,680,141	12,159,352	14,033,343	24,695,574	11,114,135
5	United Bank S.C	2,771,087	3,540,350	19,254,760	23,766,267	29,387,923	15,744,077
6	Wegagen Bank S.C	9,138,481	10,382,735	13,072,550	16,078,202	18,190,196	13,372,433
		Five years average IT capital for the six banks					21,440,429

Based on the bank's five years average IT capital, each bank was ranked based on its level of average IT capital. According to the table above the banks were ranked as below

1st Dashen Bank S.C with an average of br 52,616,825 IT capital

2nd Awash International Bank S.C with an average of br 27,634,571 IT capital

3rd United Bank S.C with an average of br 15,744,077 IT capital

4th Wegagen Bank S.C with an average of br 13,372,433 IT capital

5th Nib International Bank S.C with an average of br 11,114,135 IT capital

6th Bank of Abyssinia S.C with an average of br 8,160,534 IT capital

Based on the above ranking; the treatment sample (IT leaders) consists of the first top three IT capital intensive banks

These are:

1st Dashen Bank S.C with an average of br 52,616,825 It capital

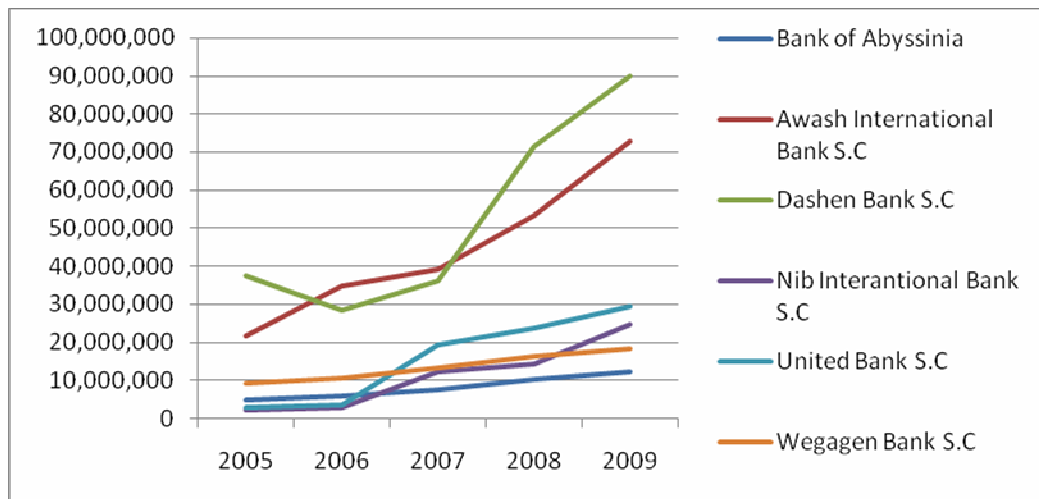
- 2nd Awash International Bank S.C with an average of br 27,634,571 IT capitals
- 3rd United Bank S.C with an average of br 15,744,077

The control sample consists of the remaining three relatively less IT capital intensive banks that are listed as below

- 4th Wegagen Bank S.C with an average of br 13,372,433 IT capital
- 5th Nib International Bank S.C with an average of br 11,114,135 IT capital
- 6th Bank of Abyssinia with an average of br 8,160,534 IT capital

The following graph depicts the five year growth trend of IT capital for the six banks included in both samples

Graph 3:1 IT capital growth trend



As the above graph shows almost all the banks' IT capital is rising over the years 2005 through 2009. The banks included in the treatment sample (IT leader leaders) have shown the highest IT capital growing trend compared to the control sample banks.

3.3 Measuring The Intensity Of It Capital

After identifying the banks with the treatment sample (IT leader) and control sample, the next step of the analysis was to measure the IT dependency rate of each bank. The IT dependency rate of the banks were measured by their relative IT capital deepening to the total asset; meaning that, the ratio of IT capital to the total asset of the banks was used to

measure the banks IT dependency rate. The following table shows the ratio of IT capital to the total asset of the banks.

Table 3:3 IT Capital To Total Asset Ratio

Banks	Average IT Capital	Average Total Asset	IT to total Asset Ratio	Percentage (%)
Bank of Abyssinia	8,160,534	3,713,863,781	0.002197316	0.219731646
Awash International Bank S.C	44,363,276	5,033,001,912	0.008814476	0.881447629
Dashen Bank S.C	52,616,825	6,291,649,477	0.008362962	0.8362962
Nib Interantional Bank S.C	11,114,135	2,964,427,679	0.003749167	0.3749167
United Bank S.C	15,744,077	2,551,593,836	0.006170291	0.6170291
Wegagen Bank S.C	13,372,433	3,118,447,239	0.00428817	0.428817

The table 3:3 shows the IT capital in relation to the Banks' total Asset, as the table show IT capital in all of the banks constituted below 1% from the total Asset of the banks. This ratio indicates that the banking industry in Ethiopia is highly dependent on non IT assets; this indicates that much of the banks' day to day operations were being handled by using manual procedures.

From table 3:3 it is also evident that all the banks that are included in the treatment sample (IT leaders) have shown more IT capital to total Asset ratio than those banks that are included in the control sample.

A better IT capital deepening ratio would be to calculate IT capital to total fixed asset ratio. Because most of the banks' total asset is dominated by current asset, the IT capital to total asset ratio could not indicate IT's proportion in the total fixed asset. As a result the IT capital to total fixed asset ratio provides a better picture of the banks IT decency rate. As IT capital is element of the banks fixed asset, this ratio provides the information as to the extent of IT capital dependency compared to other operating fixed assets. The following table shows the ratio of IT capital to total fixed asset

Table 3:4 It Capital To Total Fixed Asset Ratio

Banks	Average IT	Average	IT to total	percentage
	Capital	Total	Fixed Asset	
		Fixed Asset	Ratio	(%)
Bank of Abyssinia	8,160,534	78,026,303	0.104586962	10.45869624
Awash International Bank S.C	44,363,276	136,119,093	0.32591516	32.59151597
Dashen Bank S.C	52,616,825	145,637,583	0.361286036	36.12860356
Nib Interantional Bank S.C	11,114,135	55,187,832	0.20138742	20.13874196
United Bank S.C	15,744,077	45,874,150	0.343201495	34.3201495
Wegagen Bank S.C	13,372,433	61,214,480	0.21845212	21.84521204

NB: all amounts are before depreciation.

The IT to Total Fixed Asset ratio indicates that the Banks in the treatment sample have a higher IT capital to total fixed Asset ratio indicating their relatively higher reliance on IT. Whereas the banks in the control sample have shown a relatively lower reliance on IT and this was evidenced by their lower IT capital to total fixed asset ratio. The average IT capital to total fixed asset ratio for the IT capital leaders (the treatment sample) is 34.35% but the average IT capital to total fixed asset ratio for the control sample banks was 17.48%. This indicates that the IT capital in the treatment sample was almost double compared to that of the IT capital in the control sample.

This evidence also supports the classification of the banks in to the two samples namely to the treatment sample (IT leaders) and the control sample

In general the IT capital to total fixed asset ratio indicates that all the banks' IT capital to total fixed asset ratio was below 40%, indicating that there is a higher dependency on non IT fixed assets, this can be attributed to many factors, but to mention some:

- ✓ In adequacy of IT infrastructure in the country
- ✓ Relatively high cost of IT infrastructure
- ✓ IT requires knowledge and continuous updating
- ✓ Cultural barriers

- ✓ Lack of knowledge in the part of customers on how to use modern IT technologies
- ✓ High risk of malicious activities by employees of the banks or by other third party.

Most of the banks contacted have disclosed their plan to invest on IT even more in the coming years, and the banks who are identified as IT capital leader in this paper may not, as such will continue as IT capital leader of the industry in the coming future. As table 3:1 show most of the banks have invested on IT more in the years 2008 and in 2009 than the in preceding years, this indicates that there is an increased attention towards IT capability as a main tool of winning the competition in the industry.

The following paragraphs discuss the financial performance of the banks included in the treatment as well as in the control samples and tried to show the impact of IT on their financial performance. The performance analysis was made by computing the commonly used financial ratios. The financial ratios computed were used to measure IT's contribution towards the improvement or deterioration of the financial performance of the banks

3:4 Measuring the Financial Performance

The financial performance of the banks included in both the treatment and control sample were assessed in the following section. The financial performance measurement was made by using key financial ratios that are believed to indicate the impact of IT on the financial performance of the banks.

As it is stated in section 2.11 above in the review of the related literatures these financial ratios were grouped in to two categories, namely:

- ✓ Profit measures (profit performance indicators)
- ✓ Cost measures (cost performance indicators)

3:4:1 Profit Measures:

- ✓ Return on Asset (ROA): calculated as the ratio of net income to total assets, indicates how profitably a firm employs its assets since it reflects how much profit a firm is able to generate for each Birr amount of asset invested
- ✓ Return on sales (ROS): ratio focuses on operating returns only and excludes incomes earned by the firm from other sources such as gain on disposal of assets

and from other extraordinary sources. Operating income is, therefore, regarded as a more appropriate measure of the direct value of IT.

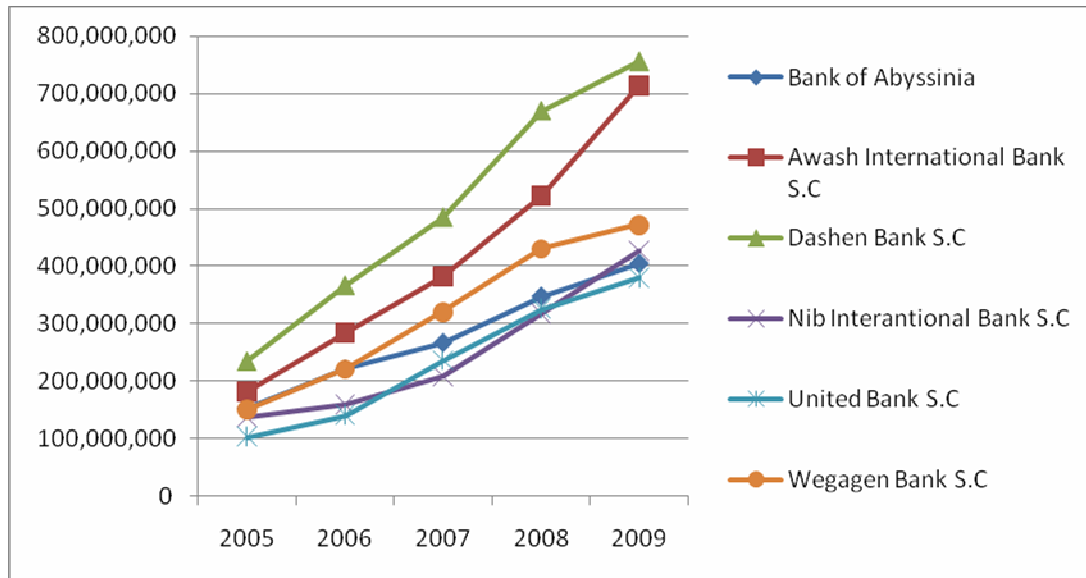
3:4:2 Cost Measures:

- ✓ **Total operating expenses to sales (OEXP/S):** Total operating expenses (defined as all expenses including G&A EXP) serve as a proxy for the firm's total cost of operations. Operating expense was selected because it is the most general and encompassing measure of a firm's total cost of operations
- ✓ **General and administrative expenses to sales (G&A EXP/S):** serve as a proxy for the impact of IT on general and administrative expenses.

If IT has an impact on the performance of the banks the profitability of the banks in the treatment sample has to indicate a considerably higher profit ratio and a considerably lower cost ratio than the banks in the control sample.

Before discussing the profitability and cost ratios it is important first to see some important trends such as trends in sales and costs. The following graph shows the trend in sales for banks included in the two samples.

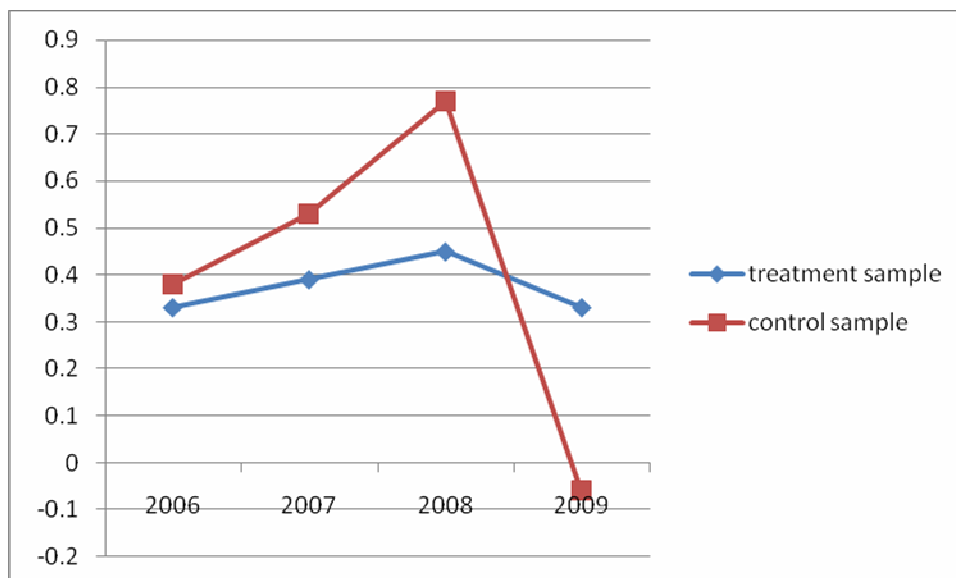
Graph 3:2 Sales Growth Trend



As the above graph depicts the sales amount of the majority of the banks in the treatment sample have been growing at a higher rate than the banks in the control sample, in this case one bank from the control sample has shown a sales growth rate which was greater than the bank in the treatment sample. In general as the graph above demonstrated, all banks included in both samples have shown an increasing trend of sales over the period covering 2005 through 2009.

The below graph shows the trend of total operating expenses for both samples, as indicated above total operating expenses is defined as all expenses including general and administration expenses.

Graph:3:3 Growth Trend Of Total Operating Expenses (In Percent)



As it can be seen from the above graph banks in the control sample have shown a higher growth rate of operating expenses till the year 2008 but have shown a declining trend afterwards. The average operating expenses growth trend in percentage for banks in the treatment sample was 37.4% per year as opposed to 40.7% per year for the banks in the control sample, a difference of 3.3% operating expenses saving for the banks in the treatment sample. These results are shown in the following table

Table 3:6 Annual Operating Expenses Growth Rate For the Treatment sample Banks

Banks In the treatment sample	Annual Growth Rate of Operating Expenses (%)				Average
	2006	2007	2008	2009	
Awash International Bank S.C	27.21	35.26	31.27	31.23	31.23
Dashen Bank S.C	32.37	24.47	49.49	19.52	31.46
United Bank S.C	38.43	58.47	52.89	48.29	49.52
Average	32.67	39.40	44.54	33.01	37.40

Table 3:7 Annual Operating Expenses Growth Rate For the Control sample Banks

	Annual Growth Rate of Operating Expenses (%)				
	2006	2007	2008	2009	
Banks(in the control sample)					
Bank of Abyssinia	54.69	95.99	108.72	36.53	55.72
Nib Interantional Bank S.C	11.88	30.09	54.50	30.69	.31.79
Wegagen Bank S.C	46.43	32.54	68.87	-10.04	34.45
Average	38	53	77	-6	40.65

As tables 3:6 and 3:7 show the banks in the treatment sample have performed slightly higher than the banks in the control sample, both in sales growth trend and operating expenses growth trend but the difference between the two sample companies were very small. Whether this relatively better financial performance is significant to warrant a conclusion that high IT capital has produced higher financial performance has been investigated in subsequent part of this paper.

3:5 Calculating The Profit Measures

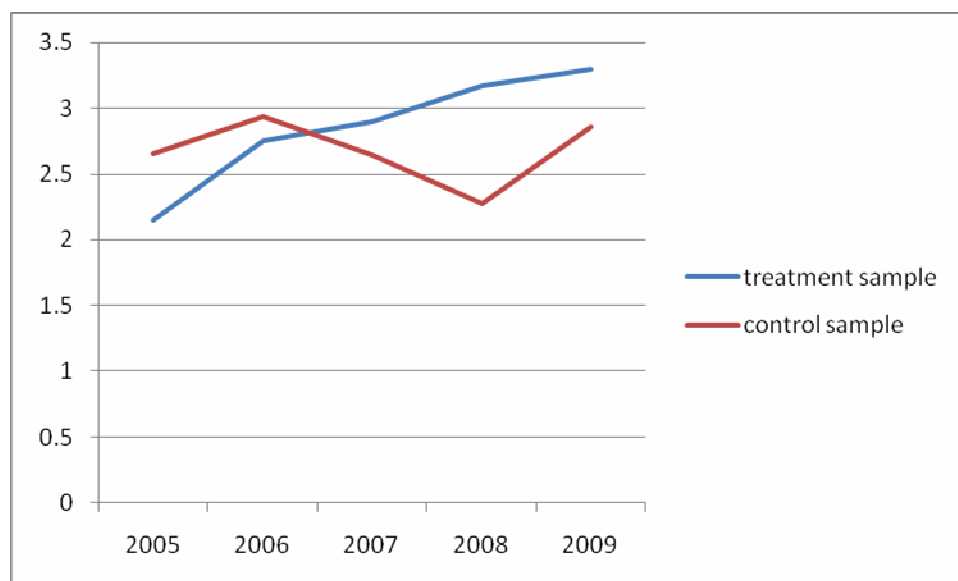
The profitability measures of the banks and their trend over the five years period in both cases: the treatment sample and control sample were discussed below.

3:5:1 Return On Asset (ROA)

The first profitability ratio studied was the return on asset; the following graph shows the return on asset for both samples and its trend over time from the year 2005 to 2009. The

return on asset (ROA) was calculated by dividing the net income after tax by total asset of the banks

Graph 3.4 Growth Trend Of ROA In Both Samples (in %)



As the above graph shows the banks in the treatment sample again performed slightly higher than their counter parts in the control sample. Starting from the year 2006 the return on asset (ROA) for the banks in the treatment sample have been raising and the difference in ROA between these two samples have reached to its maximum in the year 2008, but during the year 2009 the banks in the control sample have narrowed the gap. The average rerun on asset (ROA) for the banks in the treatment sample was 2.85% compared to 2.68% for banks in the control sample. The banks in the treatment sample have generated 0.18% extra return on their asset compared to banks in the control sample.

The above results are computed based on the tables shown below

Table 3:8 ROA Trend For Banks In The Treatment Sample

Banks	ROA for Banks in The treatment sample					Average ROA
	2005	2006	2007	2008	2009	
Awash International Bank S.C	1.49%	2.58%	2.65%	3.62%	5.31%	3.13%
Dashen Bank S.C	2.08%	2.94%	3.11%	3.09%	2.57%	2.76%

United Bank S.C	2.88%	2.73%	2.94%	2.80%	2.01%	2.67%
Average ROA	2.15%	2.75%	2.90%	3.17%	3.30%	2.85%

Table 3:9 ROA Trend For Banks In The Control Sample

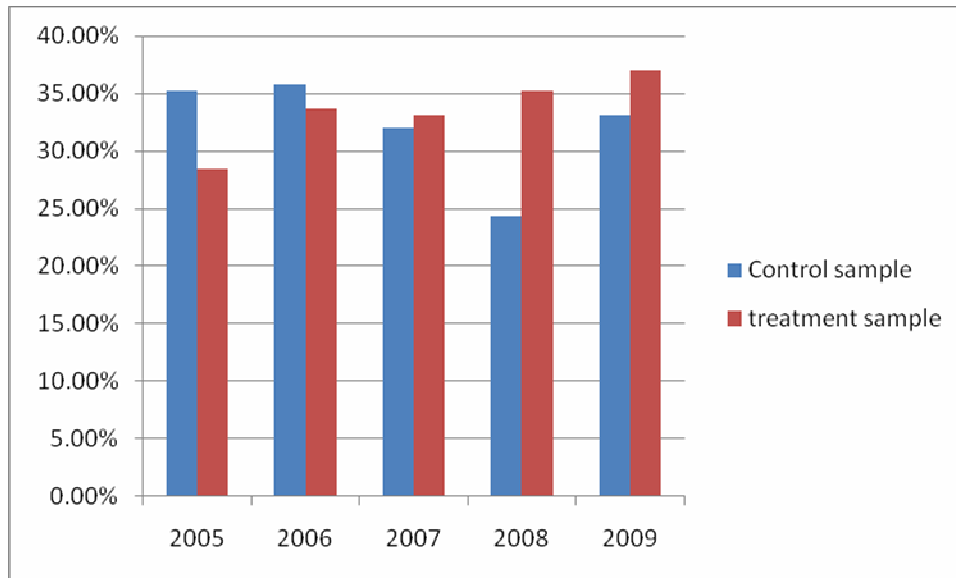
Banks	ROA for Banks in The control sample					average ROA
	2005	2006	2007	2008	2009	
Bank of Abyssinia	2.74%	2.90%	1.85%	0.39%	1.83%	1.94%
Nib Interantional Bank S.C	2.64%	2.79%	2.90%	3.09%	3.21%	2.93%
Wegagen Bank S.C	2.59%	3.14%	3.19%	3.37%	3.53%	3.16%
Average ROA	2.66%	2.94%	2.65%	2.28%	2.86%	2.68%

3:5:2 Returns On Sales (ROS)

The other profitability ratio was return on sales (ROS) this ratio is also called as profit margin ratio; help as to see the profits left to owners after paying for all expenses. This ratio measures the extent to which sales are converted in to net profits; as costs raise net profits tend to diminish and the return to owners will also diminish. Return on sales was computed here by dividing net profits by total sales. As the following graph shows; the banks in the treatment sample have shown a slightly better ROS performance than their counter parts in the control sample. The difference between the two samples is 1.41% which is in favor of the banks in the treatment sample.

The following graph shows the relative trend of ROS for the banks included in the two samples.

Graph 3:5 Comparisons Of ROS Between The Treatment And Control Sample.



As the graph above depicts the banks in the control sample have performed better in the years 2005 and 2006 but in the years 2007 through 2009 the banks in the treatment sample have slightly performed better than the banks in the control sample, but still the difference was considerably small which is 1.41%.

The following tables show the year to year variation in ROS for the banks included in both samples from 2005 through 2009, as the tables show there is a considerable year to year variation in ROS between the banks in the control sample and in the treatment sample

Table3:10 ROS Trend For Banks In The Treatment Sample

Banks	ROS for Banks in The treatment sample					Average ROS
	2005	2006	2007	2008	2009	
Awash International Bank S.C	24.70%	33.51%	33.14%	41.97%	53.15%	37.29%
Dashen Bank S.C	30.34%	36.44%	38.78%	35.69%	33.07%	34.86%
United Bank S.C	30.34%	31.15%	27.34%	28.00%	24.64%	28.29%

Average ROS	28.46%	33.70%	33.09%	35.22%	36.95%	33.48%
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Table 3:11 ROS Trend For Banks In The control Sample

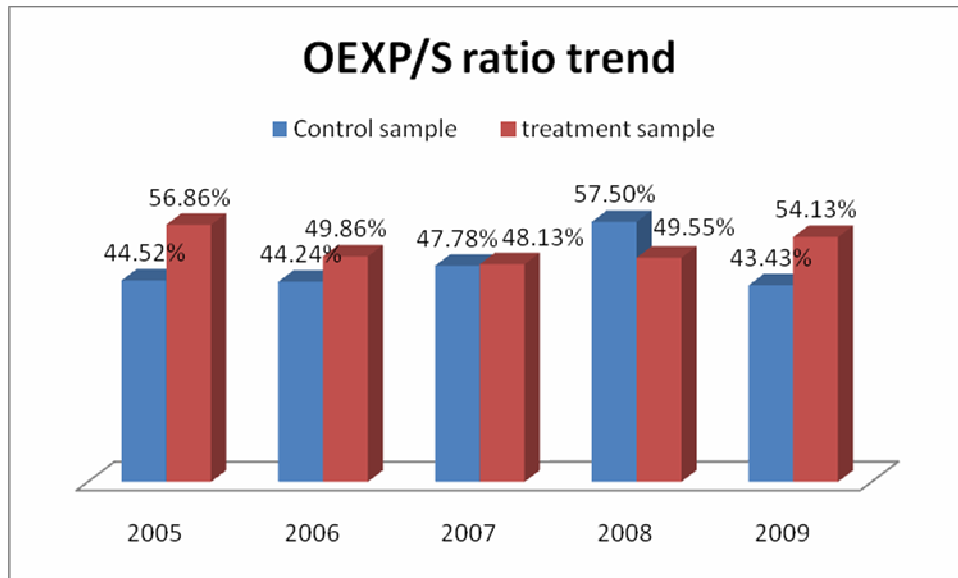
Banks	ROS for Banks in The control sample					average ROS
	2005	2006	2007	2008	2009	
Bank of Abyssinia	40.27%	39.59%	24.86%	4.73%	24.79%	26.85%
Nib Interantional Bank S.C	33.65%	35.76%	36.44%	35.71%	36.16%	35.54%
Wegagen Bank S.C	31.86%	32.09%	34.67%	32.27%	38.24%	33.83%
Average ROA	35.26%	35.81%	31.99%	24.24%	33.06%	32.07%

3:6 Calculating Cost Measures

3:6:1 Total Operating Expenses To Sales Ratio (OEXP/S)

Total operating expenses to sales (OEXP/S): the following tables and graphs discuss the proportion of operating expenses to total sales. This ratio was selected in order to see the impact of IT in reducing costs by enhancing efficiency and effectiveness in operations and activities of the banks included in both samples.

Graph 3:6 Comparison Of OEXP/S Ratio Between The Treatment And Control Sample



As the above graph shows the banks in the treatment sample have shown unexpected result. Despite their higher IT capital and automation, in most of the years the OEXP/S ratio was higher than what it was in the control sample banks. The average OEXP/S ratio for the treatment sample was 51.70% compared to 47.50 for the banks in the control sample leaving a significant difference of 4.20%. This can be interpreted as, on the average the operating expense of the banks in the control sample is less than what it is in the treatment sample by 4.20%, as a result IT's contribution towards minimizing operational expenses have not been seen in the treatment sample banks.

The following table provides more data as to the OEXP/S ratio for each bank included in both samples. The data shows the year to year variations of OEXP/S ratio between the banks in both samples.

Table: 3:12 Operating Expenses To Sales Ratio For The Treatment Sample

Banks	OEXP/S for banks in The treatment Sample					Average OEXP/S
	2005	2006	2007	2008	2009	

Awash International Bank S.C	65.12%	52.79%	53.07%	50.98%	48.97%	54.19%
Dashen Bank S.C	58.38%	49.43%	46.54%	50.35%	53.35%	51.61%
United Bank S.C	47.07%	47.36%	44.77%	47.31%	60.08%	49.32%
Average OEXP/S	56.86%	49.86%	48.13%	49.55%	54.13%	51.70%

Table: 3:13 Operating Expenses To Sales Ratio For The Control Sample

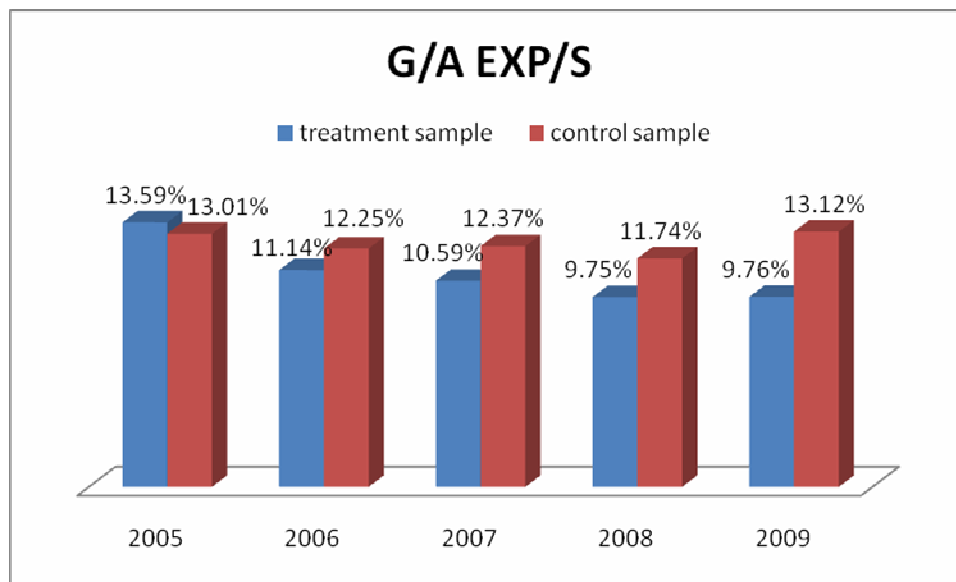
Banks	OEXP/S for Banks in The control sample					average OEXP/S
	2005	2006	2007	2008	2009	
Bank of Abyssinia	24.19%	25.74%	41.70%	66.81%	36.40%	38.97%
Nib Interantional Bank S.C	51.65%	49.65%	49.23%	49.84%	48.13%	49.70%
Wegagen Bank S.C	57.73%	57.33%	52.42%	55.84%	45.77%	53.82%
Average OEXP/S	44.52%	44.24%	47.78%	57.50%	43.43%	47.50%

The growth trend of OEXP/S ratio for the treatment sample is declining on the average by 0.89%, where as the average growth rate of OEXP/S ratio for the control sample has shown a positive and growing rate 0.81%. This indicates that the banks in the treatment sample are likely to enjoy cost advantage over their counter parts in the control sample in the years to come. This is because the banks in the treatment sample have a negative growth rate of OEXP/S ratio

3:6:2 General And Administration Expense To Sales Ratio (G&A EXP/S)

The other cost measure was the general and administration expenses to sales ratio (G&A EXP/S). This ratio was specifically designed to measure the extent to which how much of the G&A expense consume proceeds from sales. Since automation is expected to enhance efficiency and effectiveness, this ratio should be considerably lower for banks in the treatment sample and higher for banks in the control sample. The result of the actual measurement is shown by using the graph below.

Graph 3:7 Comparisons Of G/A EXP Between The Treatment And Control Sample



As the above graph depicts the difference in G&A EXP/S ratio between the two samples was 2.47% on the five year average, but the difference was considerably small given the difference that these two samples have in the IT capital to total fixed asset ratio.

The five year average G&A EXP/S ratio for the treatment sample was 10.97% of sales per year, whereas banks in the control sample have shown 12.50% of sales per year. The following tables show the year to year variation in the G&A EXP/S ratio for the two samples. As the tables below show except in the year 2005 when the banks in the control sample have over performed the banks in the treatment sample, in all the years (from the year 2006 through 2009) the G&A EXP/S ratio was slightly higher in the control sample banks compared to the banks in treatment sample.

Table 3:14 G&ADMN EXP To Sales Ratio For The Treatment Sample

Banks	Average
G&A EXP to Sales ratio for the treatment	

	sample					G&ADMN EXP/S
	2005	2006	2007	2008	2009	
Awash International Bank S.C	18.91%	13.16%	12.21%	10.46%	8.96%	12.74%
Dashen Bank S.C	9.53%	8.96%	8.10%	6.66%	7.49%	8.15%
United Bank S.C	12.32%	11.31%	11.47%	12.14%	12.82%	12.01%
Avg G&ADMN EXP/S	13.59%	11.14%	10.59%	9.75%	9.76%	10.97%

Table 3:15 G&A EXP To Sales Ratio For The control sample

Banks	G&A EXP to Sales ratio for the control sample					Average G&ADMN EXP/S
	2005	2006	2007	2008	2009	
Bank of Abyssinia	11.77%	10.37%	11.19%	12.28%	16.13%	12.35%
Nib Interantional Bank S.C	12.14%	12.22%	14.60%	12.92%	12.71%	12.92%
Wegagen Bank S.C	15.13%	14.17%	11.31%	10.02%	10.52%	12.23%
Avg G&ADMN EXP to Sales ratio	13.01%	12.25%	12.37%	11.74%	13.12%	12.50%

3.7 Results From The Financial Performance Measures

As it is mentioned in the literatures review part of this paper, most business managers believed that IT enhances efficiency and effectiveness as a result IT is associated with higher profit performance and lower cost of operations than business with low IT intensity. As the above sections in this paper have demonstrated the two profitability ratios namely ROA and ROS did not indicate that the banks in the treatment sample (high IT capital banks) have performed significantly better than the banks in the control sample provided the difference that these two samples have in the IT capital to total fixed asset ratio. Moreover, the cost measure namely OEXP/S ratio have indicated that the banks in the control sample have a lower OEXP/S ratio, in this regard the total operating expenses to sales ratio of the banks in the treatment sample was unexpectedly higher compared to the banks in the control sample; the other cost measure G&AEXP/S ratio did not indicate a

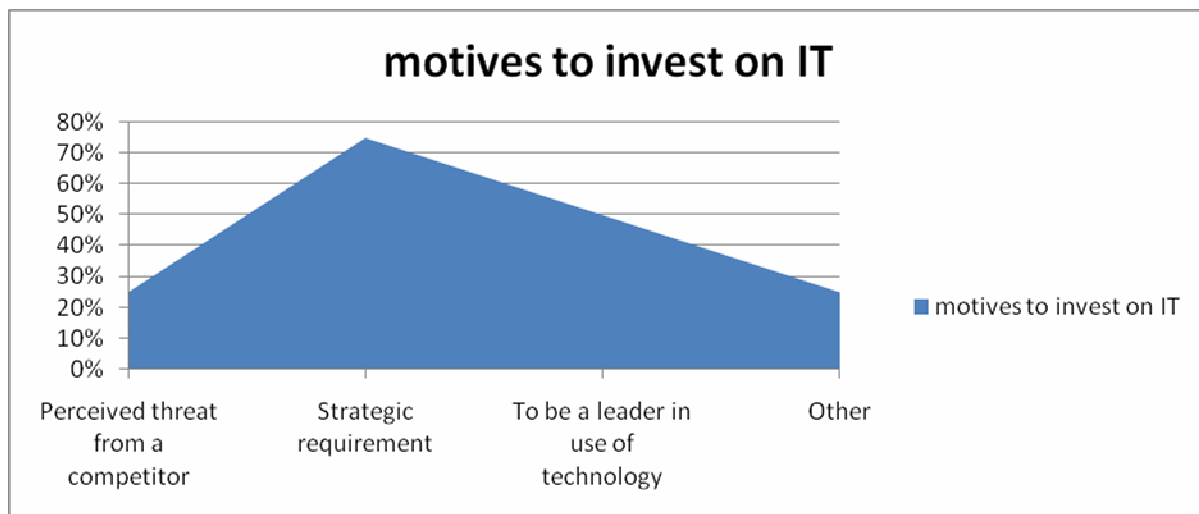
significant difference in G&A EXP/S ratio between the banks in the treatment sample and the banks in control sample.

In general the banks in the treatment sample have performed slightly better in three of the four financial performance measures but the difference was considerably small given that the difference these two samples have in the IT capital to total fixed asset ratio.

3.8 Summary Of Survey Results

It is common that long term investments have to be evaluated before the necessary funds are committed to undertake the investment. Below is a discussion of the experience of IT project appraisal and management in Ethiopian financial service firms. The following paragraph presents summary of the survey conducted on the six banks mentioned above. From the six banks response was obtained from four banks, this means a response rate of 66.67% was obtained. The full result of the survey has been included in the appendix part of this paper

I) Chart 3.1 Motives To Invest On IT



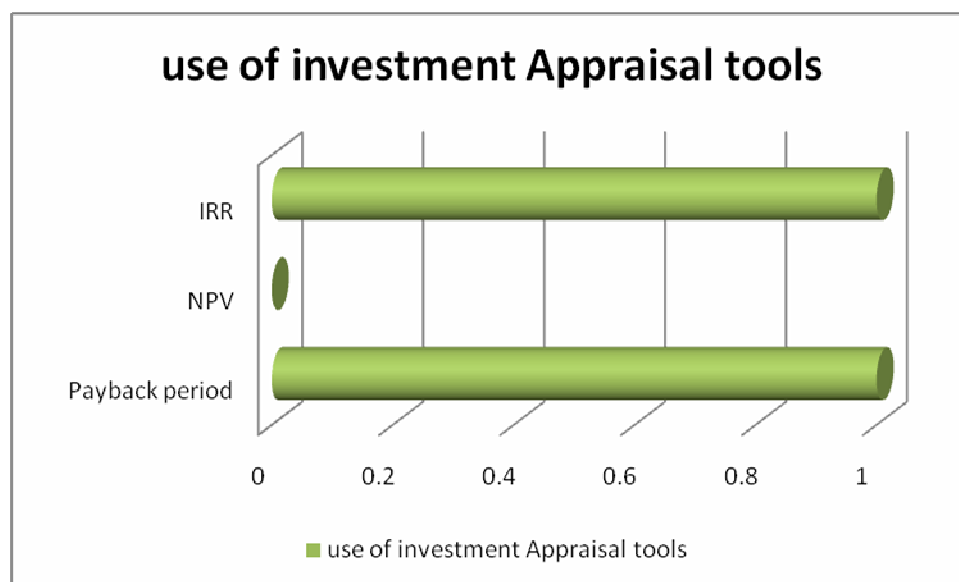
As the chart above depicts the driving force behind Ethiopian banks to invest on IT was strategic requirement (75%) and the next highest driving force to invest on IT was to be a

leader in use of technology (50%). Other reasons such as efficiency, convenience etc. were gives less emphasis and selected by 25% of the respondents.

II) Experience in using project appraisal tools

The banks in the survey; with the exception of one bank, did not use the known project appraisal tools. As the chart below show only one bank has used project appraisal tools namely, payback period and internal rate of return (IRR). From this it can be concluded that, the experience of using project appraisal tools have not yet developed and the banks in the survey have not been yet equipped themselves with the knowledge and techniques of project appraisal.

Chart 3.2 Experiences In Using Project Appraisal Tools



This trend may not be true for the years to come because two of the four banks are planning to replace their current project appraisal procedures and the other two are planning to supplement their current technique by known project appraisal tool.

III) As it is stated in the review of related literature, that most business executives believe that the investment on IT will always result in better financial as well as

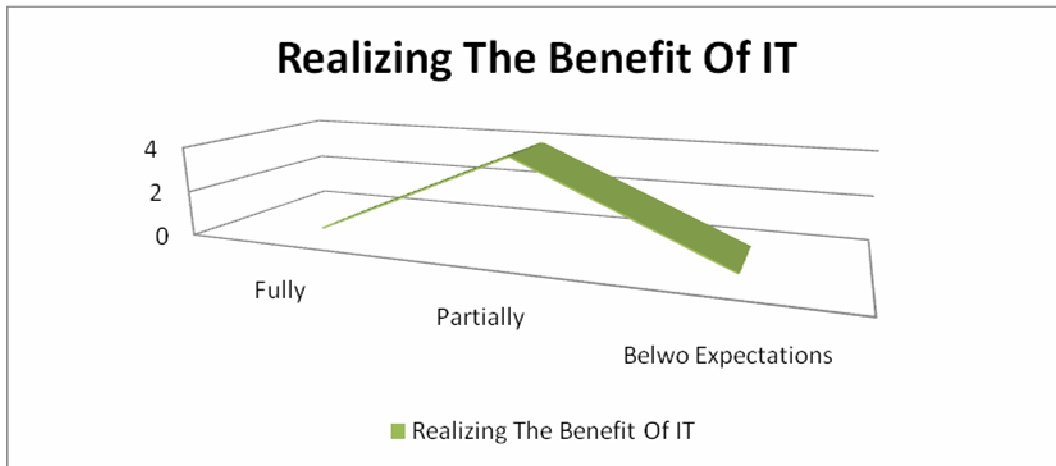
non financial performance. This generalization has got a wider acceptance by Ethiopian bank executives in that three of the four bank executives contacted believe in this generalization.

IV) Evaluating the investment on IT is different from evaluating other investment proposals, due to the fact that IT significantly involves intangible costs and benefits. Three of the four bank executives agreed with this conclusion.

According to the researcher this can be taken as the rationale behind the belief that IT will always result in better financial as well as well as non financial performance.

V) To what extent the benefit from IT investment was realized? All the banks contacted disclosed that they have partially realized the benefits of IT and they have not yet reached to the extent of fully utilizing their IT capacity.

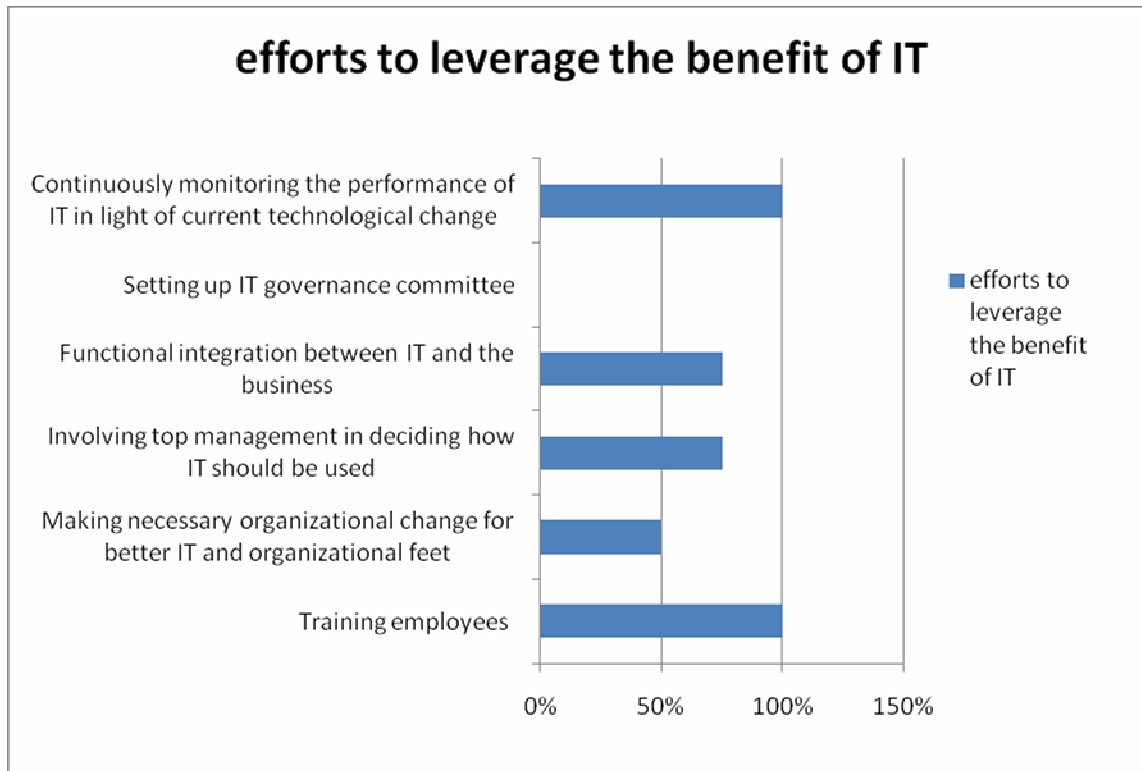
Chart 3.3 Realizing the benefit of IT



As it is shown in the chart above all the banks in the survey admitted that they have not yet fully utilized their IT capacity. According to the researcher this can be taken as one main reason for not having significant differences between the two samples in the profit and cost measures computed above in the emerial study part.

VI) What efforts are carried out to leverage (increase) the benefit of IT

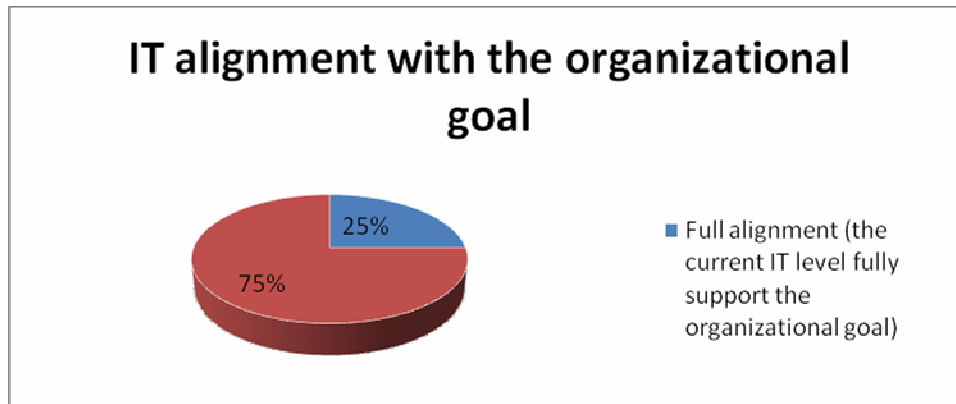
Chart 3:4 Efforts To Leverage The Benefit Of IT



As the chart above shows continuously updating IT facilities and providing training to employees were among the most widely practiced efforts to increase IT’s contribution towards organizational success. Top management involvement and integration of IT and business were the next widely practiced activities. Setting up of IT governance committee and making necessary organizational change for better IT and organizational feet were not practiced in all of the banks. All the banks surveyed did not organize themselves along with the requirement of their IT facilities. They have tried to adopt their IT technology to their existing organizational structure and this according to the researcher have limited the use of IT to some operation; as a result, the benefit of IT could not be fully realized.

VII) Rating the alignment between IT investment and organizational goal

Chart 3:3 IT Alignments With Organizational Goal



As the chart shows the alignment between investment on IT and organizational goal was very low; three of the four banks contacted admitted that their current IT level partially supports the organizational goal. This indicates that while making the decision to invest on IT the banks surveyed did not consider the impact that IT has on the already stated goal of the banks.

In general the survey results show the following points:

- IT investment decisions were not made by employing formal project evaluation tools that are necessary to have an ex ante knowledge of the likely costs and benefits of the IT project.
- Functional integration between IT and business and involving top management in how IT should be used were given less emphasis
- As the review of related literature indicated one of the areas to leverage the benefit of IT investment is setting up of IT governance committee, but in all of the banks included in the survey this committee was not yet established.
- The benefit form IT in all of the banks surveyed was partially achieved
- The alignment between organizational goal and IT infrastructure was considerably low. Only one bank has fully aligned IT and organizational goal.

3.9 Hypothesis Testing Using T-Test: Matched Sample Test

To further strengthen the generalization in section 3.6 above that the slightly better financial performance of the banks in the treatment sample was considerably insignificant compared to the difference that these two samples have in their IT capital to total fixed asset ratio, the following hypothesis was formulated and tested statistically by employing the matched sample test technique.

Hypothesis H_1 : there is no difference in profitability between high IT capital and low IT capital banks

H_2 : there is no difference in cost efficiency between high IT capital and low IT capital banks

To measure the impact of IT on profitability and cost efficiency, the above discussed financial ratios were used. The two profitability ratios namely the ROA and ROS were used as a proxy for profitability between the two samples. The cost efficiency measures used were the OEXP/S ratio and the G&A EXP to sales ratio. Each profitability and cost efficiency ratios were intended to measure different perspectives of firm financial performance which are discussed below.

3.9.1 Test Of Return On Investment: (Net Profit/Total Asset)

In this part of the paper, the impact of high IT capital on the overall return on investment was measured. In order to measure this objective the selected financial performance ratio was ROA. This ratio has been selected because it shows the extra return on asset that specifically comes from high IT capital. The justification for this was, the banks in the two samples were assumed to have identical non IT capital and operate in the same economical circumstances; the only difference between these two samples was their IT capital intensity. As a result any significant difference in ROA between the two samples is due to the level of IT capital intensity.

A t-test was run on the ROA which is obtained by calculating the simple arithmetic average of ROA for each year for each sample. The result of the t-test is shown in the table below.

Table 3:16 test results of ROA

Matched Sample Test	
ROA	
\bar{D}	0.14667
S_D	0.4930
Calculated t-value	0.72874
d.f	5
α (two tailed test)	.05
Critical test value	2.571

Since the critical test value (2.571) at 5% confidence level is greater than the t value calculated (0.72874) the null hypothesis that says there is no difference in profitability (measured in terms of ROA) between high IT capital and low IT capital banks is accepted

3.9.2 Test Of Profit Margin (Net Profit/ sales)

The other profitability measure was return on sales; this ratio measures the banks' ability in converting each Birr of sales in to net profit. The profit margin of each sample has been computed for each year and the simple arithmetic average of the five years ROS was taken for the two samples and a t- test was run. The result of the t-test is shown in the table below.

Table 3:16 Test results of ROS

Matched Sample Test	
ROS	
\bar{D}	1.176667
S_D	5.987988
t-value	0.481337
d.f	5
α (two tailed test)	0.05
Critical test value	2.571

As the table above shows the banks in the treatment sample did not earn significantly more net profit from each birr of sale than the banks in the control sample, because the calculated t-value (0.481337) is significantly below the critical test value which is 2.571 at the 5% confidence interval level. As a result the null hypothesis is accepted. In other wards high IT capital did not create an extra ability of generating more net profit from each birr of sales than low IT capital banks.

3.9.3 Test Of Cost Efficiency (OEXP/S)

This test was intended to measure the ability of having lower total operating expenses for a given sales amount. This objective was measured by calculating the OEXP/S ratio of the banks included in both samples for each year, then the simple arithmetic average of

OEXP/S ratio for each sample for each year was calculated and the t- test was run on this data to reveal any significant differences in OEXP/S ratio between these two samples. The following table shows the result of the t- test

Table 3:17 test results of OEXP/S ratio

Matched Sample Test	
OEXP/S	
\bar{D}	3.51
S_D	7.58603
t-value	1.133362
d.f	5
α (two tailed test)	0.05
Critical test value	2.571

The t-test again revealed that there is no significant difference in cost efficiency between the two samples. The t-value calculated was 1.133362 but the critical test value at 5% confidence interval level is 2.571. As a result the second null hypothesis that says there is no difference in cost efficiency between the two samples is accepted. The banks in the treatment sample did not enjoy cost advantage over their counter parts in the control sample.

3.9.4 Test Of Cost Efficiency (G&A EXP/S)

This cost ratio was intended to measure the general and administration costs of the banks in the two samples. The procedures described for the preceding ratios above have been performed to make the data ready to run the t-test. The following table shows the result of the t-test

Table 3:18 test results of G/A EXP/S Ratio

Matched Sample Test	
G&ADMIN EXP/S	
\bar{D}	-1.27667
S_D	2.04147
Calculated t-value	1.531835
d.f	5
α (two tailed test)	0.05
Critical test value	2.571

The t-test again revealed that there is no significant difference in cost efficiency between the two samples. The t-value calculated was 1.531835 but the critical test value at 5% confidence interval level is 2.571. As a result the second null hypothesis that says there is no difference in cost efficiency between the two samples is accepted. The banks in the treatment sample again did not enjoy cost advantage over their counter parts in the control sample.

Generally the t-test conducted revealed that the banks with higher IT capital did not generate a significantly higher amount of rate of return than the banks with relatively low IT capital and the banks with higher IT capital did not enjoy cost advantage over their counterparts with a relatively lesser IT capital.

Chapter Four

4. Conclusions And Recommendations

4.1 conclusions

The following paragraph discusses the major findings of the study based on the analysis made in chapter three.

From the analysis made above it is evident that all the banks studied were going in the same direction towards IT capability. But the pace at which they are moving towards this objective was very different, some banks have heavily invested on IT but others were still relied on manual banking system.

The decision to Invest on IT in the banks studied was not made by using the formal and known investment appraisal techniques. From the survey results; three of them have never used the techniques to evaluate the investment on IT, only one bank has used the techniques namely payback period and IRR. The decision to invest on IT was taken solely for two main reasons.

- ✓ Strategic requirement (75%)**
- ✓ To lead the industry in use of new technology (50%)**

The main reason identified for not using the investment appraisal tools were lack of knowledge of the available investment appraisal tools and as it is stated in the literature review, the majority (3 out of 4 bank executives) of the bank executives contacted believed that investment on IT will always result in better financial as well as non financial performance.

As the profitability, cost efficiency measures and the t-test show there was no significant difference between the banks with high IT capital and the banks with relatively low IT capital. Despite the fact that, in three of the four financial performance measures the banks with high IT capital have shown a slightly better financial performance, the difference when it is statistically measured was not significant. As a result it can be

concluded that high IT capital did not produce a superlative rate of return and did not help the banks with high IT capital to have a significant cost advantage over their counter parts with a relatively lower IT capital.

In general from the analysis made above the following points were concluded.

- ✓ According to the survey made except one bank all the remaining banks have never used project appraisal tools to make an ex ante evaluation of the feasibility of the investment on IT.**
- ✓ The two profitability measures used in this paper have indicated that there is a slight difference between the banks in the two samples, but the statistical test revealed that this difference was insignificant and it is concluded here as; there is no significant difference in profitability between high IT capital banks and the relatively low IT capital banks.**
- ✓ The cost efficiency measures used in this paper have indicated that the banks with high IT capital surprisingly showed a higher OEXP/S ratio but to the contrary the banks with relatively lower IT capital have shown a lower OEXP/S ratio. The G&A EXP/S ratio was lower in the high IT capital banks and higher in the lower IT capital banks but the difference still is insignificant. The statistical test conducted revealed that there is no significant difference in cost efficiency between high IT capital banks and the relatively lower IT capital banks.**

4.2 Recommendations

Based on the analysis made in chapter three and the conclusions made above the following recommendation points have been forwarded by the researcher. To leverage the benefit of IT under the context of the banks studied in this paper the following points are forwarded.

- ✓ **As per the survey conducted all the respondents have disclosed that their current IT capacity was not fully utilized. The researcher believed that the banks can leverage the benefits of IT by utilizing their IT capacity to the fullest. This means, by using their current IT capacity, the banks can diversify their service offerings and increase their sales volume and their profits as well.**
- ✓ **Creating a synergetic effect: this can be achieved by using common IT facilities to different product lines. In this way the banks with higher IT capital can minimize the cost of operating a particular product line.**
- ✓ **According to the survey conducted three of the four banks responded that there was no full alignment between IT investment and organizational goal, in fact the alignment as per the response obtained was partial. The banks are expected to make the necessary organizational change to go with the requirements of IT and make the investment on IT to fully support the organizational goal.**
- ✓ **The executives in the banks contacted are advised to make a second thought as to their generalization of; “IT will always result in better financial and non financial performance.”**
- ✓ **In general as the survey above indicated most banks did not employ project appraisal tools for making investment decisions on IT, as a result, the return on the investment was considerably below the expectation. So as to evaluate the pros and cons of the investment on IT the banks are expected to employ project appraisal tools before making the investment decisions.**

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Appendix

Appendix I Tables for the t-test

Table A:1

Year	Average ROA for the treatment sample	Average ROA for the control (%)	D	D2
	2005	2.15	2.66	-0.51
2006	2.75	2.94	-0.19	0.0361
2007	2.9	2.65	0.25	0.0625
2008	3.17	2.28	0.89	0.7921
2009	3.3	2.86	0.44	0.1936
		Sum	0.88	1.3444

Table A:2

Year	ROS for the treatment sample	Average ROS for the control sample (%)	D	D2
	2005	28.46	35.26	-6.80
2006	33.70	35.81	-2.11	4.4521
2007	33.09	31.99	1.10	1.21
2008	35.22	24.24	10.98	120.56
2009	36.95	33.06	3.89	15.132
		sum of D	7.06	187.5941

Table A:3

Year	Average OEXP/S for the treatment sample	Average OEXP/S for the control (%)	D	D2
	2005.00	56.86	44.52	12.34
2006.00	49.86	44.24	5.62	31.58
2007.00	48.13	47.78	0.35	0.1225
2008.00	49.55	57.5	-7.95	63.2025

2009.00	54.13	43.43	10.7	114.49
		sum	21.06	361.665

Table A:4

Year	G&A EXP/S for the treatment sample	G/A EXP/S for the control sample (%)	D	D2
2005	13.59	13.01	0.58	0.3364
2006	11.14	12.25	-1.11	1.2321
2007	10.59	12.37	-1.78	3.1684
2008	9.75	11.74	-1.99	3.9601
2009	9.76	13.12	-3.36	11.2896
		sum	-7.66	19.9866

Appendix II Income composition tables

Table A:5

Banks	composition of income					avearge	sales in fract
	2005	2006	2007	2008	2009		
Abysinia (total sale)	140,101,297	219,993,755	266,687,844	347,446,002	404,812,945	275,808,369	
interest income	104,677,146	165,275,931	201,548,788	252,419,524	275,894,414	199,963,161	0.725
gain on exchange rates	16,631,389	25,790,857	33,795,470	52,999,000	68,580,780	39,559,499	0.143
service charges	9,708,058	13,663,773	14,757,678	19,260,650	22,468,433	15,971,718	0.057
commissions	4,165,335	7,311,719	8,161,545	11,768,831	13,381,401	8,957,766	0.032
other	4,919,369	7,951,475	8,424,363	10,997,997	24,487,917	11,356,224	0.041

Table A:6

Banks	composition of income					avearge	sales in in fraction
	2005	2006	2007	2008	2009		
Dashen (total sale)	234,539,202	366,623,652	484,753,670	669,828,158	755,570,125	502,262,961	
interest income	161,886,146	241,893,298	319,927,692	420,074,747	434,777,119	315,711,800	0.628578
services income	13,822,754	24,221,209	24,988,268	30,301,885	35,122,125	25,691,248	0.05115
LC oeningg	5,862,085	10,507,419	9,848,581	12,524,910	14,121,029	10,572,805	0.0210503

charges							
commissions	18,643,834	26,038,498	32,804,602	44,026,969	57,447,593	35,792,299	0.071262
gains on forex	25,750,656	54,376,042	85,363,666	147,838,133	198,151,814	102,296,062	0.203670
sundry income	7,542,653	8,252,709	10,280,175	2,979,157	2,569,919	6,324,923	0.012592
invnt income from tana							
from Tana b/g	1,031,074	1,334,477	1,540,686	12,082,357	13,380,526	5,873,824	0.011694

Table A:7

Banks	composition of income					avearge	sales in in fraction
	2005	2006	2007	2008	2009		
united bank (total sale)	90,865,741	126,060,904	192,105,806	279,652,436	344,942,357	206,725,449	
interest income	45,955,806	71,269,924	122,146,169	171,133,540	210,075,178	124,116,123	0.600391
commissions	19,643,120	25,388,260	26,605,012	40,268,128	56,186,560	33,618,216	0.162622
gain from forex	23,630,994	26,824,029	40,380,801	59,408,716	72,867,127	44,622,333	0.215853
other income	1,635,821	2,578,691	2,973,824	8,842,052	5,813,492	4,368,776	0.021133

Table A:8

Banks	composition of income					avearge	sales in in fract
	2005	2006	2007	2008	2009		
wegagen bank (total sale)	149,740,653	220,812,482	320,048,789	430,242,529	472,239,641	318,616,819	
interest income	79,913,317	120,457,213	185,021,035	238,242,127	233,543,954	171,435,529	0.538
Commissions	39,176,276	52,411,420	66,633,394	90,625,922	90,186,237	67,806,650	0.212
gain from forex	29,370,387	46,379,629	66,689,701	98,687,993	139,694,032	76,164,348	0.239
other income	1,280,673	1,564,220	1,704,659	2,686,487	8,815,418	3,210,291	0.010

Table A:9

Banks	composition of income					avearge	sales in in fraction
	2005	2006	2007	2008	2009		
Nib Int. bank (total sale)	135,880,331	158,143,959	207,500,957	316,582,374	426,016,429	248,824,810	
interest income	82,954,648	106,187,449	147,290,760	209,998,084	253,590,455	160,004,279	0.643039
commissions	23,428,070	24,851,943	26,955,828	48,275,800	90,192,623	42,740,853	0.171770
gain from forex	28,259,538	25,242,049	29,607,784	55,076,142	77,259,553	43,089,013	0.173170

other income	1,238,075	1,862,518	3,646,585	3,232,348	4,973,798	2,990,665	0.0120192
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Table A:10

Banks	composition of income					avearge	sales in in fraction
	2005	2006	2007	2008	2009		
Aeash Int. bank (total sale)	180,960,177	283,993,520	382,103,369	569,440,827	862,020,578	455,703,694	
interest income	112,913,972	177,927,916	232,346,001	334,767,188	482,336,987	268,058,413	0.588229
commissions	33,320,106	43,331,911	52,288,426	65,547,960	82,169,906	55,331,662	0.121420
gain from forex	26,065,242	51,896,792	84,909,801	153,990,822	279,274,865	119,227,504	0.261633
other income	8,660,857	10,836,901	12,559,141	15,134,858	18,238,821	13,086,116	0.028716

ADDIS ABABA UNIVERSITY
FACULTY OF BUSINESS AND ECONOMICS
DEPARTMENT OF ACCOUNTING AND FINANCE
SCHOOL OF POSTGRADUATE PROGRAMS

The following questions are meant to be used in an ongoing research entitled “Capital Budgeting Decisions on IT and its Impact On Corporate Value Maximization the Case Of Ethiopian Financial Service Firms.” You are sincerely requested to provide answers for the questions here under; with due care and with all professional courtesy. The researcher is a candidate for MSC in Accounting and Finance at Addis Ababa University school of Business and Public Administration.

Part one: General information

Name of your organization_____

Name of your current work position_____

Part two: investment criteria

Please circle your answer; you may choose one or more alternatives as an answer

- 1) What motivates your organization to invest on information technology (IT)**
 - a) Perceived threat from a competitor**
 - b) Strategic requirement**
 - c) To adopt new technology**
 - d) To be a leader in use of technology**
 - e) Other**

If your answer is (e) “other” please state your reason in the space provided below

2) Do you have knowledge of the available capital budgeting techniques (investment proposal evaluation tools) that are used to evaluate the feasibility of investment?

- a) Yes b) No

3) Do you use capital budgeting techniques (investment proposal evaluation tools) to evaluate the feasibility of the investment on IT prior to investing on IT

- a) Yes
b) No

4) If your answer in (3) above is yes, please state the technique your organization has employed to evaluate the feasibility of investment On IT

- a) Pay pack period
b) Net present value (NPV) method
c) Internal rate of return (IRR)
d) Gut feeling (subjective estimate)
e) Other

If your answer in (4) above is (e) other; please state your answer in the space provided below

5) Please state the reason why the technique you choose is appropriate to evaluate the investment on IT

6) How do you rate the sufficiency (effectiveness) of your investment proposal evaluation technique in measuring the cost and benefit of the investment?

- a) Extremely adequate (all costs & benefits are measured)**
- b) Moderately adequate (some costs & benefits are not measured)**
- c) Inadequate (majority of the costs & benefits are not measured)**

7) In evaluating the investment on IT, which area in your assessment poses the greatest difficulty

- a) Measuring the cost of the investment**
- b) Measuring the benefit of the investment**
- c) Both equally**

Please state your reasons for your answer in (7) above?

8) Do you agree with the notion that investment on IT will always result in better financial as well as non financial performance?

- a) Yes**
- b) No**

9) Do you think investment on IT is different from other investments? In terms of evaluating the proposal to invest or not to invest

- a) Yes**
- b) No**

Please state your reason for your answer in (9) above

10) Do you use the required investment fund as a criteria to decide whether to use investment proposal evaluation techniques or not to use the techniques

- a) Yes**
- b) No**

11) What weight do you assign for qualitative factors such as: improvement in work process, customer satisfaction etc. in making the decision to invest or not to invest on IT

- a) More weight than quantitative results obtained from the investment evaluation technique**
- b) Equal weight with quantitative results obtained from the investment evaluation technique**
- c) Less weight than quantitative results obtained from the investment evaluation technique**
- d) Does not consider qualitative factors at all**
- e) Does not consider quantitative techniques and totally rely on qualitative factors**

12) What is the likely chance that your currently employed investment evaluation technique will be used for future IT investment proposal evaluation.

- a) Will be used without change**
- b) Will be replaced**
- c) Will be used together with other technique**

Part three: managing the benefits of IT

13) Does your estimate of the benefits to be obtained from the IT investment materialize?

- a) Yes**

b) No

14) If your answer in (13) above is “yes” to what extent is the benefits realized

a) Fully (the IT capacity is fully utilized)

b) Partially (the IT capacity is not fully utilized)

c) Below the expected level (the IT capacity is underutilized)

15) Do you consider IT as the main source of the current financial success of your organization

a) Yes

b) No

16) What efforts are carried out to leverage (increase) the benefit of IT

a) Training employees

b) Making necessary organizational change for better IT and organizational feet

c) Involving top management in deciding how IT should be used

d) Functional integration between IT and the business

e) Setting up IT governance committee

f) Continuously monitoring the performance of IT in light of current technological change

17) How do you rate the IT alignment with the organizational goal

A) Full alignment (the current IT level fully support the organizational goal)

B) Partial alignment (the current IT level partially support organizational goal)

C) Low alignment (the current IT level does not support organizational goal)

18) Do you see IT as your organization’s main strategy for growth and development

a) Yes

b) No

19) Do you consider that your organization’s IT resources posses features like

➤ Distinctive, scarce, and relevant to establish competitive advantage;

➤ Durable and hard to imitate so the competitive advantage is sustainable;

- **Appropriate the profits that result from the IT resources.**
 - a) **Yes**
 - b) **Yes; but not all (please select**
 - c) **No**

20) Do you consider IT capability as the major competition base in your industry

- a) **Yes**
- b) **No**

21) How do you rate your organization's current level of IT compared to other organizations in your industry?

- a) **Leading**

Medium

C) Low

Results of the survey

1)What motivates your organization to invest on information technology (IT)	No of respondents (%)	
f) Perceived threat from a competitor	25	
g) Strategic requirement	75	
h) To adopt new technology	0	
i) To be a leader in use of technology	50	
j) Other	25	
	No of Responses (YES)	No of responses (NO)

2)Do you have knowledge of the available capital budgeting technique that are used to evaluate the feasibility of investment	1	3
3)Do you use capital budgeting techniques to evaluate the feasibility of the investment on IT	1	3
4)Do you agree with the notion that investment on IT will always result in better financial as well as non financial performance	3	1
5)Do you think investment on IT is different from other investments? In terms of evaluating the proposal to invest or not to invest	3	1

6)How do you rate the sufficiency (effectiveness) of your investment proposal evaluation technique in measuring the cost and benefit of the investment?	No of respondents
d) Extremely adequate (all costs & benefits are measured)	0
e) Moderately adequate (some costs & benefits are not measured)	4
f) Inadequate (majority of the costs & benefits are not measured)	0
7)In evaluating the investment on IT, which area in your assessment poses the greatest	

difficulty	
d) Measuring the cost of the investment	1
e) Measuring the benefit of the investment	3
a) Both equally	0

8) What is the likely chance that your currently employed investment evaluation technique will be used for future IT investment proposal evaluation.	No of respondents
a) Will be used without change	
b) Will be replaced	2
c) Will be used together with other technique	2
9)What weight do you assign for qualitative factors such as: improvement in work process, customer satisfaction etc. in making the decision to invest or not to invest on IT	
f) More weight than quantitative	3

results obtained from the investment evaluation technique	
g) Equal weight with quantitative	1
a) Fully (the IT capacity is fully utilized) investment evaluation technique	0
b) Partially (the IT capacity is not fully utilized)	4
h) Less weight than quantitative results	0
c) Below the expected level (the IT capacity is underutilized)	0
i) Does not consider qualitative factors at all	0
10)What efforts are carried out to leverage (increase) the benefit of IT	
j) Does not consider quantitative techniques and totally rely on qualitative factors	0
g) Training employees	4
9)To what extent the benefit of IT investment is realized	
h) Making necessary organizational change for better IT and organizational feet	No of respondents
i) Involving top management in deciding how IT should be used	3
a) Functional integration between IT and the business	3
b) Setting up IT governance committee	0
c) Continuously monitoring the performance of IT in light of current technological change	4

11)How do you rate the IT alignment with the organizational goal		
a) Full alignment (the current IT level fully support the organizational goal)	1	
b) Partial alignment (the current IT level partially support organizational goal)	3	
c) Low alignment (the current IT level does not support organizational goal)	0	
	No of Responses (YES)	No of responses (NO)
12)Do you see IT as your organization's main strategy for growth and development	4	
13)Do you consider IT capability as a major competition base in your industry	4	
14)How do you rate your organization's current level of IT compared to other organizations in your industry	No respondents	
b) Leading	2	
c) medium	2	
C) Low	0	

