INFLUENCE OF INVESTMENT APPRAISAL AND DIVERSIFICATION ON PORTFOLIO SELECTION IN THE SOFT DRINK INDUSTRY IN WESTERN KENYA.

BY

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DECLARATION

This thesis is my original work and has not been previously presented for a degree in Maseno University, or in any other University. The work reported herein has been carried out by me and all sources of information have been acknowledged by means of references.

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DEDICATION

This thesis is dedicated to wife Grace Abuga, my sons Einstein Omambia and Heisen Omwando and my parents: David Mogwambo and Rose Bosibori, my siblings: Selina, the late Mary, Gesare, Cosmas, the late Ronald and Joash for their moral support and inspiration that is required for effective learning.

ABSTRACT

Economic reports reveal that Western Kenya has 16% poverty depth due to unemployment; sectoral reports reveal that 71% of employment opportunities are created in the informal sector and a long distribution system. Distribution networks in the soft drink industry require substantive investment in assets for their optimal performance. Past studies on distribution systems concentrated on customer value management and profitability with no concern on assets for optimal performance and creation of employment opportunities. The assets of this industry have uncertain imitability and are valuable for competitive advantage. Investment appraisal techniques rank investments according to their optimality of returns but drawbacks are observed in the mean - variance paradigm of these investments indicating a problem in diversification, the mismatch of cash flows, discount rates and inflation leading to rejection of worthwhile investments and as portfolios increase in size their variance increase rather than decreasing, this contradicts portfolio theory as profit to total assets will be dismal indicating that no known information on investment appraisal, diversification and portfolio selection in the industry soft drink industry in western Kenya. The purpose of the study was to assess influence of investment appraisal and diversification on portfolio selection in the soft drink industry. The objectives were: to establish influence of investment appraisal techniques on portfolio selection, to establish influence of diversification alternatives on portfolio selection, and establish the relationship between investment appraisal, diversification and portfolio selection. Portfolio theory, investment appraisal and diversification theories guided this study. Cross sectional research design was used and target population was 302 respondents selected by saturated sampling technique. Primary data was collected using questionnaire administered through oral interview. Reliability of the instrument, the computed Cronbach's Alpha was 0.970 suggesting strong internal consistency; content validity was achieved through expert advice. Data was analysed using regression analysis techniques. Study results show strong and significant relationship between investment appraisal techniques and portfolio selection ($R = 0.917^a$, $F = 259.641$, $R^2 = 0.842$, $p\ 0.000 < 0.05$),where NPV effect size (ß=0.463) on EPS was 0.463% and PBP effect size (ß=0.773)on EPS was .773% as indicated by the standardized beta coefficients; part analysis results for NPV and PBP the model becomes better($F=622.286$;$R=.913^a$; $R^2=.834$; NPV ß=0.386; PBP ß=0.550; $p<0.05$) their joint significance increased with F values. Considering only PBP the model give best contribution to portfolio selection ($R=.898^a$; $F=1037.205$; $R^2=0.807$; $p<0.05$). This result reveals that investment appraisal techniques significantly influence portfolio selection in the industry. Strong and significant relationship exist between diversification alternatives and portfolio selection ($R= .911^a$; $F =398.020$; $R^2 =0.829$; $p<0.05$), where WDA has insignificant effect size on EPS as its ß=0.000, ADA (ß=0.248) and BDA (ß=0.733) had significant effect size on EPS. When only ADA and BDA were considered only F value increased ($R= .911^a$; $F =599.457$; $R^2 =0.829$; $p<0.05$); the model achieved better results for BDA and EPS ($R= .890^a$; $F =947.112$; $R^2 =0.792$; $p<0.05$) and the magnitude of unstandardized beta (0.934) and standardized beta (ß=0.890) were very high indicating greater effect size to EPS. These results reveal that best diversification alternative significantly influence portfolio selection in the drink industry. Results for investment appraisal, diversification and portfolio selection a strong and significant relationship exist ($R= .946^a$; $R^2=0.895$; $F = 1056.830$; $p<0.05$); the betas for the predictors DA (ß=.701) and INA (ß=.288) show that DA has high and significant effect size on EPS in this industry. The study concludes that investment appraisal techniques and diversification alternatives significantly influence efficient portfolio selection; and a significant relationship exist between investment appraisal, diversification and portfolio selection in the soft drink industry in western Kenya. The study recommends that firms should use PBP technique and BDA for portfolio selection to achieve optimal performance.

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LIST OF ABBREVIATIONS

APT- Arbitrage Pricing Model

CAPM- Capital Asset Pricing Model

CCE- Coca- Cola Enterprises

CCAPM- Consumption oriented Capital Asset Pricing Model

DCF- Discounted Cash Flow Techniques

KD- Key Distributors

ICAPM- Inter-temporal Capital Asset Pricing Model

ICDC- Industrial and Commercial Development Corporation

IRR-Internal Rate of Return

NPV-Net Present Value

ROA- Return on Assets

ROE- Return on Equity

SSD- Strategic Supply Depots

OPERATIONAL DEFINITION OF TERMS

Capital Budgeting is the process of making long term planning decisions for investments and their finance. It includes current cash outlay or a series of cash outlays in return for an anticipated flow of future benefits. This technique is employed to asses' long term expenditure decisions which involve current outlays and the benefits that occur in the future years.

Net Present Value (NPV) this refers to the difference between the present value of the cost inflows and the present value of the cash outflows. A negative value of net present value means the investment is not desirable.

Internal Rate of Return (IRR) this is the discount rate at which the present value of expected capital investment outlays is exactly equal to the current value of anticipated cash earnings on that capital project. This can also be said to be the rate of return on invested capital which the project returns to the firm when the net present value is equal to zero.

Payback Period (PBP) is the period necessary for the working cash surpluses created by a certain investment to equate, in total to the capital sum initial invested. Any investment with payback period above the specified payback period maximum is however rejected because it will take too long a time to retrieve initial capital.

Profitability Index (PI) refers to Benefits Cost Ratio as a ration of the present value of future cash flows to the actual cash outflow. It assists decision makers in choosing among several courses of actions.

The Accept-reject Decision means after making some cash flow estimates, the project can be evaluated in financial terms and assessing whether the decision to go ahead with the project is in line with the strategic goal of maximizing shareholder value.

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CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

A portfolio analysis starts with information concerning individual securities and it ends with conclusions on securities appropriate for investment. It is a balanced whole providing the investor with protections and opportunities. The modern portfolio theory (Markowitz, 1952, 1959) formulated the portfolio problem as a choice of the mean and variance of assets returns. The theory summarised two fundamental principles: holding constant variance while maximizing expected return and holding constant expected return while minimizing variance. These principles led to the formulation of an efficient frontier from which the investor can choose a preferred portfolio depending on individual risk return preferences. The theory reveals that assets are selected by considering characteristics unique to the security and how each security co-moves with all other securities, and uncertainty is a salient feature of security investment. Since 1950's several models like Capital Asset Pricing Model (CAPM), Inter-temporal Capital Asset Pricing Model (ICAPM), Arbitrage Pricing Theory (APT) and the Consumption oriented Capital Asset Pricing Model (CCAPM) were developed to support portfolio theory and solve portfolio problem of expected return and risk (Mankiw and Shapiro, 1986; Burnside and McCurdy,1992; Farel,1997). However inadequacies were observed in these models particularly the valuation errors. Therefore investors may not rely on them for decision making on portfolio selection.

Graham and Harvey (2001) study focused on popularity of different investment appraisal techniques used by firms; results showed a tendency to rely on DCF methods. The study failed to justify whether the magnitude of hurdle rates used in the investment appraisal process were appropriate. Trahan and Gitman (1995) study confirmed that when firm-wide hurdle rates are used particularly in firms with multiple divisions it creates problems of under-investment or over-investment. The study inadequately expressed the technique that could be associated with under or over investment in these firms with multiple divisions. Firms are guilty of rejecting worthwhile investments (Drury and Tayles, 1997; Morck et.al, 1988; Finnie, 1988); this is associated with future cash flows conversion which must be deflated by the general rate of inflation, though a complex process, real cash must be discounted at real discount rate, on this basis improper treatment of inflation affects investment decision. These inadequacies affect the link between investment appraisal and

efficient portfolio selection. Therefore this study seeks to establish the extent to which investment appraisal techniques influence efficient portfolio selection.

Corporate management prefer IRR and financial theorists prefer NPV, however both methods suffer from inconsistencies when ranking potential investments. For example, IRR is consistent when evaluating unique normal investments; otherwise it is inconsistent indicating a shift from IRR to NPV (Du Toit and Pienaar, 2005). Further NPV is inconsistent when treatment of discount rates, inflation and interest rates are violated (Taylor, 1964; Miller, 1987; Woods et.al.1989 and Ross, 1995); but study by Gilbert (2005) showed that NPV is a superior method. These mixed results indicate that there is no known information about investment appraisal techniques and efficient portfolio selection. Therefore this study seeks to establish the influence of investment appraisal techniques on portfolio selection.

When IRR is used to appraise a non-normal asset three unique inconsistencies arise: first, for mutually exclusive investments the IRR selects unprofitable investment and simultaneously rejects the profitable investment; secondly, for a non-normal investment it may not have an IRR; and finally it may have multiple IRR's for a single investment (Brigham and Gapenski, 1985). Large firms use extensively the discounted cash flow techniques (DCF) where NPV is relied on by 90% of the firms and Pay Back Period (PBP) is considered as simple proxy measure to capture the impact of liquidity and risk. Firms use a combination of investment appraisal techniques, but it is unclear which technique is relevant. Further major reasons for under-investment relate to incorrect application of techniques rather than their weaknesses (Drury, 2004; Drury and Tayles, 1997; Primrose, 1991). These contradictions reveal that it remains unknown of the investment appraisal that stands out for investors to use for portfolio selection. There is no known information about the relationship between investment appraisal and efficient portfolio selection. Therefore this study seeks to establish the influence of investment appraisal techniques on portfolio selection.

Larry and Rene (1993) study on Tobin's Q, corporate diversification and firm performance reveal that Tobin's Q and firm diversification are negatively correlated. Diversified firms have lower Tobin's Q values than equivalent portfolios of specialized firms. Firms seek growth through diversification when they have exhausted internal growth opportunities. This study by Larry and Rene failed to find evidence of the view that diversification provides firms with valuable intangible asset. On this basis the findings are inconsistent with the principles of diversification. This indicates that no known information about diversification

and portfolio selection for optimal performance. Therefore this study seeks to establish the influence of diversification on portfolio selection.

William and John (1994) study on firm diversification effects on performance as measured by Tobin's q revealed that diversification effects on firm performance remained unclear; the results revealed no significant relationship between diversification and performance. Pandya and Rao (1998) carried out an empirical evaluation on diversification and firm performance; the results revealed that diversification is a strategic option that managers use to improve their firm's performance, where diversified firms performed better compared to undiversified firms on both risk and return dimensions. The robustness of these results was further carried out by classifying firms by performance class. The findings revealed that among the best performing class of firms, undiversified firms had higher returns which were accompanied with high variance, while diversified firms showed lower returns and much lower variance. Again on risk return dimensions diversified firms performed better than undiversified firms. This indicate mixed results, therefore no clear relationship exist between diversification and portfolio selection for optimal performance.

Firms diversify to increase economy of scale and scope, to improve debt capacity, reduce chances of bankruptcy and improve profitability (Hitt, 1997; Alonso, 2003). Further Singh (2003) confirmed that Coinsurance effect exists on firms that diversify in terms of risk and return. Bhide (1993) expressed that a diversified firm can transfer funds from a cash surplus unit to a cash deficit unit without taxes or transaction costs. Therefore, firm's pool unsystematic risk and reduce the variability of operating cash flow and enjoy comparative advantage. Therefore the impact of diversification on firm performance is mixed. This observation indicate that no known information on the relationship between diversification and portfolio selection for optimal performance.

Past studies like Datta, Rajagopalan and Rasheed (1991); Hoskisson and Hitt (1990), and Mahajan and Varadarajan (1990) broadly concluded that empirical literature on diversification is inconclusive and the relationship between diversification and firm performance is complex. This indicate that no known information on the relationship between diversification and portfolio selection for firm's optimal performance. Therefore this study seeks to establish the influence of diversification on portfolio selection.

Portfolio selection problem is concerned with favourable trade-off between return and risk where the investor has a maximum utility function or at least a near optimum expected utility. Investors constructing portfolios face problems on parameters of asset return's that are unknown, it is a mere projection of the uncertain future; hence they are unable to define the portfolio weights explicitly and instead use the estimation of portfolio weights, a consideration which create inaccuracies (Litterman, 2003; Kroll et al, 1984; Lo and MacKinley, 1990; Mech, 1993; Fang et al, 1990); choosing appropriate investments' that form efficient portfolios is a necessity in a firm (Rose and Lawton,1999). These studies did not link investment appraisal techniques and diversification alternatives as a basis to portfolio selection problem. Therefore this study seeks to establish the relationship between Investment appraisal, diversification and efficient portfolio selection.

The Kenya National Bureau of Statistics report (KNBS 2010) reveals that employment to population ratio for the working age population was 69% in 2009. Although the total employment has increased, a larger share of new jobs created is in the informal economy. This finding concurs with Kenya Economic report (2013) that 71% of all employment is in the informal sector. In this context, poverty and population dynamics including changes in population growth rates and their distributions are closely linked to national and global development challenges. The poverty depth in western Kenya indicate that Kisii county is at 20%, Kisumu County 15%, Migori County 21% ,Nyamira County 18%, Siaya County 12% ,Vihiga 10% and Homabay 15% (KIHBS2005/6) as revealed in a survey for the period 2007 to 2012. On this basis, priority on sectors that will help improve creation of job opportunities for the unemployed groups is a necessity. Firms in the soft drink industry provide employment opportunities informally particularly along the distribution system and they must therefore invest prudently along their distribution network for optimal performance, this indicate that investment appraisal and diversification for the investors in this chain's optimal performance is inevitable.

Past studies by Evans (2002) and Aila et al (2007) confirmed that customer value management aims to improve productivity of marketing activity and profitability of business. It enables companies to take full advantage of the economies of scale, loyalty by increasing retention, reducing risk and amortizing acquisition costs over a long and profitable period of engagement. The focus of this is to manage the profitability of each individual investor (customer) over the entire life of the relationship (Gebert et al,2003). It is the

customers that have business, their level of investment appraisal and type of diversification they adopt influence firm performance. On this basis no known information on investment appraisal, diversification and portfolio selection particularly in firms utilizing distribution network systems including the firms in the soft drink industry. Investing in stock levels represent a major distribution strategy decision; Lucey (2002) expressed that su-optimization and other inefficiencies may result in large stocks or in stock outs. Further storage costs reflect the opportunity cost of tying up capital in inventory and allocating physical storage costs to it including warehouses and route trucks (Aila, 2007). Therefore investments must be available to produce sales and optimize performance of the firm, trend performance in the distribution chain in western Kenya is a challenge (Aila,2007). Warehousing function concerns the physical holding of finished products before they are dispatched to vendors, wholesalers and retailers. Warehouses represent sizeable investments for individual investors and firms; also there must be a focus on transportation logistics, the physical movement or flow of goods. This network is composed of transportation agencies that provide a service for the firm (Aila et al., 2007). Therefore substantive investment must be considered in this industry for optimal performance.

Stakeholders in distribution chain are important in any industry and management must search for distribution economics in inventory control, warehouse locations, and transportation modes with clear agreements on individual investors expected functions in the supply chain with insight into the manufacturers requirements, fulfilling their commitments to the manufacturer by meeting the volume targets and offering value-added services in relation to company products (Narus and Anderson,1987; Aila et.al 2007). The portfolios held by these investors in the distribution chain range from one real asset to another; however studies have not linked these investments to the performance of the firm. Therefore no known information about investment appraisal techniques, diversification and portfolio selection among companies utilising distribution chain systems.

1.2 Statement of the Problem

Economic reports indicate that western Kenya on average has 16% poverty depth, this is associated with unemployment of the working age in the region. The sectoral reports show that 71% of all employment opportunities are in the informal sector of which a larger share of is created by distribution networks of firms. The firms operating in Western Kenya utilize a network distribution system with substantive investments in assets for optimal performance. Past studies in this sector and region have concentrated on customer value management, marketing strategy and profitability without any concern on the intensity of assets required for businesses to attain optimal performance; indicating that the contribution of investment appraisal and diversification in ranking of investments and mean-variance trade-off in this sector and region remain unknown. Investors are indifferent and have diverse investments; past studies show that investors reject worthwhile investments due to mismatch of cash flows, discount rates and improper treatment of inflation as they convert projected cash into their real value. These inadequacies affect the link between investment appraisal, diversification and portfolio selection. Past studies have concentrated on the simple accept-reject decision criterions and avoided sophisticated models due to valuation errors accompanied with emphasis on how IRR and NPV suffer from inconsistencies on investment evaluation. This contradictions and mixed results indicate inconsistency with investment strategies and principles of finance. This scenario makes it difficult for an investor to make a prudent investment decision. Further firm specific components remain under explored; further the assets of firms in the soft drink industry have uncertain imitability making them valuable for sustainable competitive advantage. However no known information about the value of these assets particularly those in the distribution chain. Therefore no known information about investment appraisal, diversification and portfolio selection for optimal performance in the soft drink industry.

1.3 Objectives of the Study

The broad objective of this study was to establish influence of investment appraisal and diversification on efficient portfolio selection in the soft drink industry in Western Kenya. The study was guided by the following specific objectives:

i) Establish the influence of investment appraisal techniques on efficient portfolio selection in the soft drink industry
ii) Determine influence of diversification alternatives on efficient portfolio selection in the Soft Drink Industry
iii) Examine the relationship between investment's appraisal techniques, diversification alternatives and efficient portfolio selection in the Soft Drink Industry

1.4 Research Hypotheses

The following research hypotheses were tested during the study:

Hypothesis 1: H_0: Investment appraisal techniques do not influence efficient portfolio selection in the soft drink industry

Hypothesis 2: H_0: Diversification alternatives do not influence efficient portfolio selection in the Soft Drink Industry

Hypothesis 3: H_0: A relationship doesn't exist between investment's appraisal techniques, diversification alternatives and efficient portfolio selection in the Soft Drink Industry

1.5 Scope of the Study

This study focused on portfolio theory, trends in investment appraisal, diversification and the relationship towards efficient portfolio selection for optimal performance among business firms. The study examined the investment opportunities appraised by experts in the coca-cola bottlers limited with great concern on matters relating to techniques used, level of risk estimation and measurement, investment return and portfolio selection in relation to organizational performance.

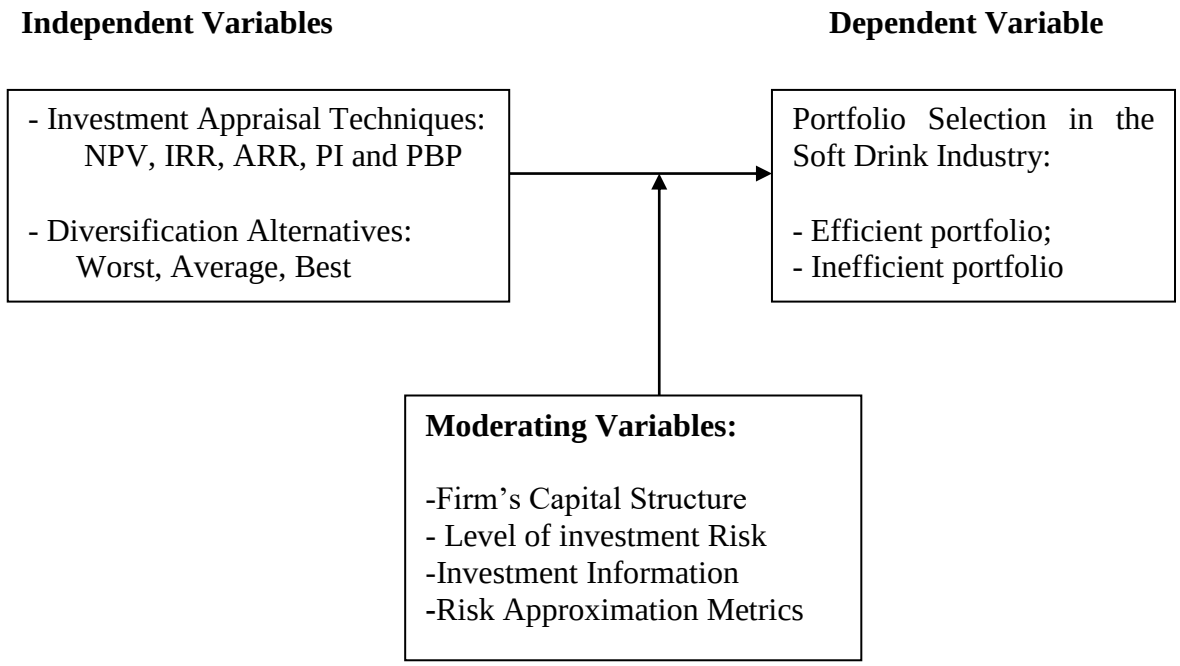
1.6 Significance of the Study

The manufacturers of the soft drinks focus their product development and promotional activities more on niche categories in the distribution system with key aspects like billboards, in-store marketing, truck routes and warehousing in a bid to grow sales for optimal performance. The analysis of key supply side and demand trends as highlighted in Aila (2007) reveal that substantial investment in assets is a necessity in this industry to maintain customer value management in the chain of distribution. On this basis this study is important as its findings on investment appraisal and diversification alternatives adopted will have a bearing on portfolio selection for optimal performance in the distribution system and the firm at large. Further the findings informs the investors on the use of right investment appraisal techniques to select investment alternatives during their portfolio selection to improve business performance, since the results show a significant relationship between investment appraisal, diversification and portfolio selection in this industry. The findings can be used by the firm managers and government to inform the investment policy to boost the informal sector employment along the distribution systems as employment opportunities in this sector is a function of distribution chain performance. This will further help investors to prudently make choice on investment appraisal, diversification and portfolio selection to avoid leakage and volatility of returns on their investments in the distribution networks.

1.7 Conceptual framework depicting a relationship between Investment Appraisal, Diversification and Portfolio selection

The information on the conceptual framework shows that investment appraisal techniques are criterions which help investors to evaluate investment opportunities by ranking them as per the optimality of returns. The ranked investments are selected by the investors to form portfolios, but investors are indifferent, their risk perception and a version index influence the combinations which they select for allocation of their economic resources. The conceptual framework depict that investors in the soft drink industry are exposed to a variety of investment choices like inventories, warehousing and truck routes as part of the distribution logistics in this industry. These investments must be ranked on the basis of risk-return trade-off; all these issues will be moderated by financing decisions as influenced by capital structure, level of investment information and risk available to investors in this distribution system.

The diversification alternatives available in this industry range from inventories at stockist level, warehousing facilities and truck operators in the distribution system for all groups of investors in the franchise territory of these firms in western Kenya. The company's distribution network consist of key distributors, strategic supply deport operators, stockists, retailers and street vendors all of which the firm must focus and rely on for its optimal performance. These groups of investors have different investment abilities as influenced by investor's business ability on capital structure and investment risk; therefore their investment combinations form sets for optimal performance which in turn are influenced by investment appraisal techniques adopted and diversification alternatives for each investor in this distribution chain from the firm to the customer. This shows that investment appraisal techniques and diversification alternatives exhibit a relationship with portfolio selection in the industry which either can be efficient or inefficient.



Source: Researcher (2013)

Figure 1.1 Conceptual Frame work depicting the relationship between investment appraisal, diversification and portfolio selection

CHAPTER TWO

LITERATURE REVIEW

This section reviewed theories in which study variables were anchored and related; it focused on literature relating to investment appraisal techniques, diversification and efficient portfolio selection.

2.1 Portfolio Theory

Markowitz formulated the Portfolio Theory (Markowitz 1952) on which the idea of investment return and the risk are based. The theory states that preference be given to a portfolio with higher return for a give level of risk. It attempts to maximize expected return for a given amount of portfolio risk or equivalently minimize risk for a given level of expected return and carefully choosing the proportions of various assets. The foundation of approaches to portfolio construction and performance measurement lies in the mean-variance framework. (Markowitz 1952, 1959). However, the suitability of such approaches in practice is questionable in the light of considerable evidence of non-normalities in returns. The portfolio performance index (PPI) is based on assumption that investors associate risks with the failure to achieve a target return. Therefore portfolio construction and performance measurement should be approached by calculating the decay rate in the probability that a given portfolio underperforms its designated benchmark (Stutzer, 2000). On this basis academics and practitioners are keenly interested in measuring the performance of investment portfolios as per the optimality of their returns. The application of portfolio performance index to rank under Stutzer's PPI differs from rankings under Sharpe ratio indicating economic significance of return deviations from normality. The Portfolio performance index is closely aligned to investor's objective function of return and risk. Goodwin (1998) argues that Sharpe ratio is adopted when a risk free benchmark is adopted and information ratio used when an index benchmark is chosen; however the correlation of risk free and index benchmarks to investment ranking remains unresolved.

Portfolio performance is a function of portfolio selection; Stutzer (2000) show that when a portfolio is expected to earn a higher average return than the chosen benchmark, the probability that the portfolio will underperform the benchmark approaches zero as the sample period lengthens. This implies that the decay rate can be adopted as the measure of portfolio

performance. The Stutzer's portfolio performance index highlights key issues linked to portfolio efficiency. First, unlike the Markowitz Mean-Variance paradigm that gives the Sharpe ratio, PPI is a distribution free measure of performance and the probabilities inherent in the index computation rely on the central limit theorem applied to portfolio returns. Secondly, the Portfolio performance index explicitly quantifies decay rate in the probability and the investor is assured of zero underperformance if the investment is done on that benchmark index. Finally, the portfolio performance index captures the investor preference for positively skewed returns which the mean variance disregards. The basis of portfolio performance lies on the application of investment appraisal tools that lay the foundation for portfolio selection and subsequent portfolio performance. Therefore optimal portfolio construction is considered along with the portfolio benchmark of the risk free rate.

Despite the theoretical importance of portfolio theory its model of financial market does not match its application to real assets; therefore in the effort to translate theoretical foundation into a viable portfolio construction algorithm is plagued by technical difficulties which stem from the instability of original optimization problem with respect to the available data which is historical. The model asserts that returns are normally distributed which is not the case as asset returns are asymmetrically distributed forming non-normal distributions (Stutzer, 2000). The inconsistencies observed in the portfolio theory on its suitability of Mean Variance framework is questionable and has failed to link effectively investment appraisal techniques and portfolio selection for optimal performance. Therefore no known information on the extent to which the investment appraisal techniques can be associated to portfolio theory principles of risk and return which form the basis for portfolio selection in business cycles.

Modern portfolio theory utilizes the capital asset pricing model to define risk for the purposes of measurement and management. Total risk is partitioned into systematic (market risk) and unsystematic (specific components) which are industry components. The most significant market risk identified is that relating to the scarcity of information, particularly specific risks located at the assets rather than at the portfolio level. Theoretically the conventional measure of a single asset risk is the standard deviation of the distribution of future returns. This return is not directly observable and the volatility of future returns must be estimated, but a standard approach is to measure the volatility of past returns and assume that the future will resemble the past (Hendershott and Hendershott, 2002). However the future is uncertain and its projected cashflow must be converted to their real values by the general rate of inflation. On

this basis therefore past data of returns may not exactly reflect the future as inflation may not be accurately predicted. Criticisms of the theory originate from its assumptions that correlations between assets are fixed and constant forever; this assumption is inconsistent as these correlations depend on the symmetric relationships between investment risk and return. The correlation measures used in portfolio theory are based on expected values and they are mathematical statements about the future, such expected values fail to take into account new circumstances which did not exist at the time historical data was generated. Therefore it is unclear the level of information that can be incorporated into investment appraisal techniques to predict accurately the results of investment opportunities for easy ranking and optimality of returns.

2.2 Theory of Investment Value

The John Burr William's (1937) proposed the theory of Investment Value's whose fundamental principle is the value of any financial asset in relation to its present value of the expected cash flows. On this basis beating the market when making investment decision means outperforming it by generating more return on investments beyond its expected after adjusting for risk and transactional costs. The theory focused on the value of the firm, cost of capital and return on investments and expressed that cost of capital and return are constant which is inconsistent with the real practice of finance and investment. In relation to Modigliani-Miller Capital structure irrelevance theorem, it is asserted that there is no risk and uncertainties on investments and all investors are rational (Williams, 1938). This is inconsistent with the present day business life and investors are not rational otherwise efficient market hypothesis will be contradicted. The Irving Fisher's theories on capital and investment which was introduced in 1906 and theory of rate of interest in 1907, the theory of interest which was developed in 1930 set the investment decisions of the firm as an intertemporal problem. Through this theory the marginal efficiency of investment was developed to determine the optimum conditions for the firm's investment decision which could be equated as interest rate. On this basis a negative relationship exist between investment and interest rate when analysed from a wider macroeconomic theory on the consumption-savings decision versus the savings investment decision. This theory brings the issue of investment value which is anchored in risk and return of investment opportunities. Therefore the theory constructs relate to hurdle rates, risk and return which form the major focus on investment appraisal, diversification and portfolio selection in business firms.

2.3 The Concept of Investment Appraisal and Portfolio Selection

Investment appraisal is the process of analyzing potential investments where key aspects of any investment are time, return and risk. The sacrifice takes place now and is certain; benefit is expected in the future and tends to be uncertain. The process forms an important activity in any organization as huge sums of money can be wasted easily if the investment turns out to be wrong or unrealistic. The investment practice entails the use of techniques that seek to build on the concepts of the future value of the money spent today. Further, the implications of uncertainty on investment decisions remain controversial as it is widely held that individuals are indifferent to investment returns and uncertainty where investments have uncertain returns and volatility is high due to prediction or estimation inadequacies. The concept of return provides investors with a convenient way to express the financial performance of an investment. (Eugene and Houston, 2004; Eugene and Michael, 2008).

The investment appraisal tools entail the use of capital budgeting practices like Net Present Value (NPV), Payback Period (PBP), Profitability Index (PI) and Internal Rate of Return (IRR). The net present value (NPV) of an investment proposal is the present value of the proposal's net cash flows less the proposal's initial cash outflow, (Van Horne and Wachowicz, 2005). NPV requires the selection of a discount rate that gives NPV>0. For capital budgeting process where multiple investments are being apprised with limited budgets it means that some investments cannot be funded. Therefore this technique NPV helps in ranking investments in order of priority and optimality of returns to the investor over time; the objective function of this practice is to maximize net present value of returns. The Internal Rate of Return in another technique which gives a discount rate for an investment that equates net present value to zero. The rate at which the Present Value (PV) of measured benefits equals the PV of measured costs. This technique IRR is used to appraise individual investments and provide information to help make decisions about appraising and ranking multiple investment opportunities (Pandey, 2005). With individual investments the appraisal must compare the IRR with the pre-selected rate of return called the hurdle rate which usually represents the cost of capital. The objective function of this technique is to ascertain that the investment's earning rate (IRR) equal to or greater than the hurdle rate (cost of capital invested in the asset). This pre-selected hurdle rate in most cases does not match with inflation rates hence increasing uncertainty of returns.

According to Van Horne (2006), payback period techniques is considered popular and widely used methods of evaluating investment opportunities in terms of how fast the investor recovers his capital invested in the assets. Any investment with a payback period less than the pay back standard is accepted. It gives an insight of the liquidity of the investment. Profitability index (PI), also known as Profit Investment Ratio (PIR) or value investment ratio (VIR) is the ratio of investment to payoff of a proposed investment. It is a useful tool for ranking investments because it allows quantification of the amount of value or profit created per unit of investment. As the value of the profitability index increases so does the financial attractiveness of the proposed investment (Pandey, 2005).

Different investors adopt different investment strategies in seeking to realize their investment objectives. The optimal investment decision always corresponds to the solution of an expected utility maximization problem, therefore risk itself is a subjective concept and even if the desirable features of an investment risk measure are identified no unique risk measure may exists that can be used to sort out every investor's problem (Balzer, 2001).

2.4 The Concept of Diversification and Portfolio Selection

Diversification means reducing risk by investing in a variety of assets. It is a technique or mechanism for reducing investment risk. If prior expectations of returns on all assets in the portfolio are identical, the expected return on a diversified portfolio is identical to that of undiversified portfolio. The simple measure of financial risk is variance. Diversification may lower the variance of portfolio's return below what it would be if the entire portfolio is invested in the asset with the lowest variance of return even if the assets' returns are uncorrelated. Given that asset A has a stochastic return $ä$ and asset B with a stochastic return of $ß^*$ with returns variances $\sigma_{ä}{}^2$ and $\sigma^2{}_{ß*}$; given q as a fraction of a one unit portfolio that is placed in asset A and the fraction 1-q is in B; the stochastic portfolio return is $q\,ä + (1\text{-}q)\,ß^*$. When $ä$ and $ß^*$ are uncorrelated, the variance of the portfolio return is Var $(q\,ä + (1\text{-}q)\,ß^* = q^2\,\sigma_{ä}{}^2 + (1\text{-}q)^2\,\sigma^2{}_{ß*}$. The variance minimizing value is $q = \sigma^2{}_{ß*} / (\sigma ä^2 + \sigma^2{}_{ß*}\ ;)$ which strictly lies between 0 and1. It is therefore noted in this case that a favourable effect of diversification on portfolio variance cannot be eliminated. More assets in a portfolio lead to greater diversification benefits particularly when portfolio variance considered is a function of assets invested by the firm. The study by Samuelson (1967), noted that a portfolio variance of '*n'* number of assets, if all assets returns are mutually uncorrelated and have identical variances σ^2,then their portfolio variance is minimized by holding all assets in equal

proportions 1/*n*. Therefore portfolio return variance equals to Var{ $(1/n)x_1 + (1/n)x_2 + ... + (1/n)x_n$} = $n(1/n^2)\ \sigma_x{}^2 = \sigma_x{}^2$ /n which monotonically decreases in *n* (number of assets). Therefore in this case adding uncorrelated risky assets to a portfolio it will increase the portfolio size but it may not be regarded as diversification but as a mere subdivision of the portfolio among many smaller investments.

2.5 Empirical Literature

2.5.1 Investment Appraisal Techniques and Portfolio Selection

Choppra and Ziemba (1993) study on ten selected Dow Jones Industrial Average (DJIA) securities, the study analysed mean variance optimization forecasts like mean returns, variances and covariance's using historical data on the assumption that they are true values of these parameters. Research findings revealed that small changes in input parameters results in large changes in composition of the optimal portfolio. The study concluded that the use of historical inputs or data based on complex forecasting scheme the results continue to hold even if the inputs have errors. Further analysis on the influence of errors in parameter estimates on the resulting optimal portfolio the findings indicate that the portfolio is sub-optimal for the investor because it is not based on true input parameters. Investors use the mean variance framework to allocate wealth among individual assets and set all their expected returns to zero; the findings indicate that using forecasts that do not accurately reflect the relative expected returns of different investments can substantially degrade Mean-Variance performance (Choppra and Ziemba, 1993). An investor who cares only about the mean and variance of static portfolio returns should hold a portfolio on the mean variance efficient frontier as characterised by Markowitz (1952) where optimal performance is possible. However, because of estimation error, policies constructed in firm's using these estimators are extremely unstable, and the resulting portfolio weights fluctuate substantially over time. This has greatly undermined the use of mean variance popularity and managers are reluctant to implement policies that recommend drastic changes in the portfolio composition. Value at risk (VaR) is a key tool for risk management; the risk measurement models assist in understanding and setting risk prevention strategies. VaR provides a quantitative and synthetic measures of risk that takes into account the many kinds of relation that exist between asset returns, financial options and level of default risks.

In portfolio selection problems, it is accepted that investors must deal with a trade off between expected returns and the variance of returns. Markowitz (1952). Markowitz theory and Sharp (1964) investigated on the market equilibrium under conditions of risk and gave an asset pricing theory called CAPM. Further a study by Ross (1976) generalized the Security Market Line (SML) in the CAPM to a multi-factor case which served as a basis for the Multi-Factor Model. Research by Fama and French (1993) showed a multi-factor model containing three factors: the market index, firm size and the book to market equity. It is noted that in portfolio selection the original data brought to the model are not always accurate; it may be subject to errors indicating that result may be influenced by disturbance in the parameters relating to this data. Investment appraisal process also depends on estimated future expected returns these values are not expected to be accurate. Therefore, the data may choose an investment that falls in either efficient or inefficient portfolio. When investments chosen are many, the aggregate portfolio risk is minimized and returns maximized. Despite the theoretical importance of the modern portfolio theory, the same model has failed on financial markets. Hence an image of investment alternative is not the same in the real world scenarios (Bertero, 1998). Therefore it is unclear whether the projected cash inflows for an investment are just predictions that can either be real image or the contrary in investment returns; the images may choose alternatives that falls in either the efficient or inefficient frontier.

The basic decision rule for an investment appraisal using certainty equivalent values as inputs and discounted at a rate adjusted for risk is simply to accept or reject the investment opportunity depending on whether its net present value is positive or negative. When choosing among alternatives the decision is to select the opportunity with the higher net present value provided that value is positive. In a deterministic appraisal the investment risk is usually accounted for by including a risk premium in the discount rate for appraising the investment opportunity. The magnitude of this risk premium is basically the difference between expected return required by the investor and the risk free interest rate. The derivation of the risk premium is subjective and arbitrary. On this basis Brealy and Myers (1992), argue that the most appropriate discount rate to use in investment appraisal subjected to risk analysis is the risk free rate because any other discount rate prejudices the level of risk in an investment opportunity. The most appropriate discount rate is that involving the application of risk analysis and careful consideration of risk components of the main variables and their relationship on the investment opportunity.

Savvakis (1994) study show that risk analysis presents the investor with additional information on risk-return profile of an investment; this is influenced by the probability distribution of return that best suits the investors predisposition towards risk. The risk taker investor invests on opportunities with high returns while showing less concern in the risk involved. The investment process is surrounded by costs of uncertainty. Therefore investing firms must take into account the uncertainty which help in defining whether it is appropriate to postpone the investment decision if the cost of uncertainty is greater than the cost of securing more information on the same opportunity. This cost implication when factored in the investment appraisal may affect the investment decision to either reject or accept the investment.

Past studies show the need to analyse the impact of different risks, the risk measures and skewness in portfolio theory. It is demonstrated that the input parameters are still insufficient to evaluate the complexity of a portfolio choice problem particularly when contingent claims on returns are considered. It is necessary to indicate the risk measure that gives optimal performance. The impact that a risk measure has on portfolio choice is much more evident as many other aspects of distributional behaviour of asset returns are considered. The assumption of conditional homoskedasticity is often violated in financial data where volatility clustering and the class of auto-regressive (moving averages) with auto-regressive conditional heteroskedastic AR(MA)-GARCH models used are better ways for conditioning the past returns series. In this context the complexity of portfolio selection grows enormously (Tokat et al,2005; Bertocchi et al. 2005); however in some cases it can be reduced by either considering the asymptotic behaviour of asset returns(Rachev and Mittnik,2000; Ortobelli et al.2003) or by considering alternative equivalent optimization problems that reduce the computational complexity (Rachev et al,2004,2005). The portfolio theory has based the concept of risk in strong connection with the investor's preferences and their utility function but from the historical point of view the optimal investment decision always corresponds to the solution of expected utility maximization problem.

In portfolio selection the investor decides how to allocate the wealth among a universe of financial assets appraised. Most approaches to portfolio selection depend on the expected utility of the final wealth which is maximized to determine the optimal set of weights. This expectation has taken over the multivariate probability distribution of the asset returns. Hawkes and Date (2007) compared several GARCH forecasts using statistical measures, their

findings in contrast to other literatures on statistical comparisons of GARCH type predictions the findings revealed that not many studies considered comparisons that directly evaluate portfolio performance and link them to risk or return. This therefore shows that inadequate information is available for investment appraisal, diversification and portfolio selection relationship.

A study by Chopra and Ziemba (1993) confirm that portfolio selection is more sensitive to estimation error of expected returns. Therefore portfolio weights and subsequent portfolio performance are sensitive to the Variance-Covariance matrix estimation. Therefore it remains unknown on the contribution of GARCH forecasts on portfolio performance evaluation without any linkage on the relationship between investment appraisal and efficient portfolio selection. Further in the investment practice, it is evident that the implications of uncertainty on investment decisions remain controversial; investors as individuals are not indifferent to uncertainty but are indifferent to utility of their investments. Therefore a great concern arise as predetermined hurdle rates used in investment appraisal doesn't match inflation rates, this then complicates the uncertainty on the present value of returns which are cash flow projections used to evaluate investment opportunities. Investors' investment strategies seek optimal opportunities to realise their expected utility maximization problem, unfortunately past studies indicate that there is no unique risk measure that exist for sorting every investor's problem. The inconsistencies observed in input parameter estimation and errors in the input parameters, mean-variance of returns, Value at Risk and derivation of risk premium all as issues in the investment process are subjective and arbitrary which complicates further the investment appraisal process. These inadequacies and inconsistencies indicate that there is no known information about the relationship between investment appraisal and portfolio selection.

Evaluation of investments focused on large firms suggested that internal rate of return (IRR) was the primary method for valuation. Gitman and Forrester (1977) surveyed 103 firms and the study revealed that 53.6% of the firms use IRR while 9.8% of firms used NPV as their primary technique. These findings concurred with Stanley and Block (1984) whose study findings indicated 65% use IRR as a primary Capital Budgeting Technique. These results are similar to findings in Trahan and Gitman (1995). These studies are inconsistent with research by Burns and Walker (1997), which suggested that NPV is superior to IRR, but the study surveys conducted consistently show that firms prefer IRR to NPV. It is implied that firms

prefer IRR because it is easier to understand and compute than NPV; as its values can be compared more readily with returns from other investment opportunities. However this claim that IRR is easier to compute than NPV is questionable; further when conflicts occur firms apparently favour the use of NPV technique.

Apap and Massion (2004-2005) study indicate that 56% of firms rely on NPV to resolve conflicts compared to 19% of firms in favour of IRR. These findings concur with Ryan and Ryan (2002). The payback technique remains popular as a secondary tool for investment evaluation despite its declining popularity as a primary tool. The percentage of firms using the payback period as a secondary selection tool is 39% (Kim and Farragher, 1981) and its use has increased to 72% in recent years (Trahan and Gitman, 1995); this observation raises the question as to why its use as a primary tool is decreasing; past studies haven't highlighted issues as to why it is not a primary tool for investment appraisal despite its ability to measure the investment's level of liquidity to the firm.

A study by Burn and Walker (1997) indicate that payback technique continued popularity results from its ease of computation and its usefulness in conjunction with discounted cash flow techniques as a measure of both liquidity and risk. Further, firms use more than one selection criteria; they combine pure financial techniques Discounted Cash Flow (DCF) or non discounted cash flow with non financial measures such as strategic consideration. Apap and Massion (2004-2005) study indicated that some methods give more information than others (72%) and therefore managers may lack confidence in using only one method. Further, Chen (2008) study concluded that firms with high product standardization tend to emphasise DCF analysis, while firms with low standardization tend to focus on using Non financial measures such as firm strategy, growth and competition. Thus firms that have investments requiring complex manufacturing processes or high Research and Development expenses (uncertain outcomes) rely more on non financial measures. This is inconsistent with investment appraisal process as research and development for a business firm are considered as assets particularly when the findings of the research are viable to the firm.

Investment opportunities analyses require appropriate choice of hurdle rate. Poterba and Summers (1995) study indicate that most firms use more than one hurdle rate based on a specific project being selected or considered; later studies show a substantial increase in the Weighted Average Cost of Capital (WACC) usage to 93 percent as the hurdle rate (Bruner et.al, 1998). The recent studies by Ryan and Ryan (2002) and Meier and Tarhan (2007) report

similar trend on the use of WACC rate in investment selection. Bruner et.al (1998), examined how firms compute WACC; the findings show that firms generally base WACC weights on the market value rather than book values and base the after tax cost of debt on the marginal tax rate. This result may not accurately reflect the true value of assets selected as the interaction of capital structure, level of investment information and level of investment risk will be inadequate in relation to investment appraisal and portfolio selection.

The use of CAPM to estimate the cost of equity has increased. Its use of CAPM is reported to be 74% by firms. The CAPM is a centrepiece of modern financial economics; it gives precise prediction of the relationship observed between risk of an asset and its expected return; this relationship serves vital functions: it provides a benchmark rate of return for evaluating possible investments and the model helps to make an educated guess on the expected return on assets that have not yet been traded in the market place. The CAPM is a set of predictions concerning equilibrium expected returns on risky assets. The time for this gestation indicate that the Markowitz's portfolio selection model to the CAPM is not trivial (Sharpe,1964; Lintner,1965; Mossin,1966). The CAPM implies that as individuals attempt to optimize their personal portfolios they arrive at the same portfolio with weights on each asset equal to those of the market portfolio. It is easy to see that investors desire to hold identical risky portfolios; and are rational Mean-Variance Optimizers in the Markowitz portfolio selection model. If all investors use identical Markowitz analysis, and apply to the same universe of securities in the same time horizon with the same input list, they all must arrive at the same composition of the optimal portfolio; the portfolio in the efficient frontier as identified by the tangency line of the Security Market Line (SML) and the Capital Allocation Line (CAL), hence the optimal risk portfolio of all investors is simply the market portfolio (Graham and Harvey, 2001). When all the relevant information about the universe of securities is incorporated investors choose the market portfolio; this means that investors can skip the trouble of doing security analysis and obtain an efficient portfolio by holding a market portfolio. This observation is inconsistent since no investor will perform security analysis and the result of the market portfolio will no longer hold, implying that CAPM is of no practical importance.

In the simplified CAPM economy, risk-free investments involve borrowing and lending among investors. Any borrowing position must be offset by the lending position of the creditor; this means that the net borrowing and lending across all investors must be zero. In

this context CAPM is built on the insight that appropriate risk premium on an asset will be determined by its contribution to the risk of investors overall portfolio financed by borrowed funds (debt capital). Brennan (1973) examined the impact of differences of investor's personal tax rates on market equilibrium. Mayers (1972) analysed the impact of nontraded assets such as human capital (earning power). These studies found out that although the market portfolio is no longer each investors optimal risk portfolio, the expected return-beta relationship still hold. Therefore if the expected return-beta relationship holds for any individual asset, then it must hold for any combination of assets. It can be concluded that investments in the soft drink industry are not an exception to this scenario because if all investors know that a firm is well run, its stock price will be bid up consequently returns to stockholders who bought at high prices will not be excessive as security prices already reflect publicly held information about the firms prospects; therefore only the risk of the company as measured by beta in the CAPM affects the expected returns. Hence in an efficient market where investment appraisal, diversification and efficient portfolio selection processes interact investors receive high expected returns only if they are willing to bear risk. In this context again CAPM is useful in investment appraisal process and capital budgeting decisions as it provides the required rate of return that new investments opportunities needs to yield based on their betas for them to be acceptable to the investors. Managers in firms can use the CAPM to obtain a cut-off internal rate of return or hurdle rate for the investments (Gitman and Mercurio, 1982; Graham and Harvey, 2001; Bodie et.al 2012)

Investments are prioritized depending on the level of risk involved; risk analysis is on how to incorporate risk in making capital budgeting decisions. Evidence suggests that firms use sensitivity analysis as the primary risk assessment tool (Ryan and Ryan, 2002). Risk adjustment in most firms is done by changing the required rate of return, adjusting the cash flows and modifying the payback period. Stanley and Block (1984) and Shao and Shao (1996) studies indicate that firms use risk adjusted cash flows more frequently than risk adjusted discounted rates. The process of incorporating risk by adjusting discount rates or cash flows is not formal but ad hoc. Investors' main target is to distribute their investment to different assets in the best way possible. Markowitz portfolio selection process is a Mean-Variance optimization problem where the main issue is to keep the balance between risk as measured by the variance of the future asset returns and the return. The assumption of the normality of the returns allows the simplification of the optimization problem in a quadratic program and many effective algorithms have been developed for its solution

(Anagnostopoulos et.al 2010). The Markowitz model is subject to criticism for both its main assumptions and because it neglects some important constraints that are met very often in real life when constructing portfolios. This study focused on additional factors like level of investment information, capital structure and level of investment risk and how they influence the interaction of investment appraisal, diversification and efficient portfolio selection in the soft drink industry in western Kenya.

Trahan and Gitman (1995), firms shun formal techniques, the formal models are impractical, based on unrealistic assumptions, hard to explain to top management and difficulty to apply. Mukherjee (1987) study indicates that sophisticated models are avoided due to their inability to reflect risk from the firm's perspective, their need for massive amounts of data and the need for high data processing efficiency. Theoretically, no limit should be to the amount that firms can invest in projects as long as the return is equal to or greater than the required rate of return. In efficient markets, capital rationing may influence firms to limit the size of their capital budgeting consequently rejecting positive NPV investments. Gordon and Myers (1991) their study indicate that the intensity of performance evaluation is tied to the asset base. Thus the level of intensity is highest for strategic assets. The recent expansion observed in Kisii Bottlers limited and Equator bottlers limited were of high intensity; the study addressed to confirm whether investments are efficient in relation to its effects in their distribution chains in western Kenya.

Markowitz (1952) and Sharpe (1964) research on the market equilibrium under conditions of risk; the CAPM model was developed on which the security market line is generalized (Ross,1976). The model contained three factors: the market index, firm size, and book to market equity (Fama and Frech, 1993); the use of the model in portfolio selection encountered problems that original data used are not always accurate and may be subject to errors; consequently the result inevitably influenced by disturbance in the parameters relating to this original data; the result of this data may choose investments that are efficient or inefficient. It is observed from empirical literature that modern portfolio theory has failed in financial markets despite its importance (Bertero, 1998). Further past studies indicate that 53.6% of the firms use IRR (Gitman and Forrester, 1977), the result is consistent with Stanley and Block (9184) that 65% of the firms use IRR as the primary technique; these results are consistent with Trahan and Gitman(1995). These results contradicts findings that NPV is superior to IRR (Burns and Walker,1997); which is consistent with Apap and

Massion(2004,2005) study that 56% of the firms rely on NPV to solve complex investment conflicts; this result is consistent with Ryan and Ryan (2002).This study notes inadequacies and inconsistencies on past scholars works particularly scanty information on why large firms 53.6% use IRR while 9.8% rely on NPV as their primary technique, and why 56% of firms rely on NPV to resolve investment conflicts compared to 19% in favour of IRR. The payback period technique is considered secondary technique despite its importance in showing the level of risk and liquidity of invested assets; moreover, empirical evidence indicates use of PBP has increased to 72%, why is it not considered as primary tool. It is further shown that sophisticated models are avoided due to their inability to reflect risk from the firm's perspective. It is noted that rules of the thumb such as payback and hurdle rate can approximate optimal decision rules that account for the option-like features of many investments, especially in the evaluation of very uncertain investments. Therefore little is known about investment appraisal and efficient portfolio selection.

2.5.2 Diversification and Portfolio Selection

A study by Rose (1999) revealed that when adding investments the portfolio return is expected to be additive and its variance for uncorrelated assets as a product n $\sigma_x^{\,2}$ which should increase with *n* rather than decreasing. This decrease will be proportionately and will be regarded as diversification. Past studies have analysed extensively the issue of uncertainty in unexpected returns and its implications for portfolio selection (Barry, 1974, Bawa, Brown and Klein 1979). However asset return predictability gained attention as one of the most debated topics in applied finance (Barberis, 2000; Britten-Jones, 2002). Unfortunately these studies so far have failed to highlight the issues surrounding uncertainty and predictability of asset returns and the likely implications to portfolio selection. These inadequacies motivate this study to unearth these issues from the perspective of investment appraisal and diversification to the logical end of efficient portfolio selection where portfolio returns are maximized.

According to the pecking order theory, firms are financially constrained due to information asymmetry between managers, owners and investors, therefore firms adopt hierarchy in selecting sources of finance. A negative relationship is expected between profitability and debt. Firms with high growth opportunities undertake investments which generate greater needs for finance; when internal finances are exhausted firms prefer debt capital rather than external equity for funding growth opportunities (Sogorb-Mira, 2005; Ramalho,Silva 2009:

Gonzalez, Gonzalez, 2012; Shyam-Sunder, Myers,1999). Considering that a higher level of tangible assets increases the possibility of offering collaterals, lessening problems of information asymmetry between managers, owners and creditors. Appositive relationship exists between asset tangibility and debt. The financing behaviour of firms along the life cycle, older firms have greater capacity to retain and accumulate earnings; the need to resort to external financing requirements is less compared to the case in young firms (Michaelas et al. 1999; Sogorb-Mira,2005; LaRocca et al, 2011).

Liquidity of a firm indicates the availability of cash for near future, after taking into account the financial obligations corresponding to that period. Liquidity is important to shareholders, lenders of long-term debt and creditors; it provides information about a business's safety margin to creditors of long-term capital and short term loans payments. The overall cashflow of the business affect the liquidity of the firm. Illiquidity unless remedied will give rise to insolvency and eventually bankruptcy as the business liabilities exceed its assets; where excessive debt exposes the business to potentially large interest costs and the risk of potential bankruptcy. Shareholders, long term lenders of capital and creditors evaluate the level of risk they bear and require compensation for the risks which arise from a business capital structure. The proportion of assets financed by debt capital is of particular importance to shareholders since lenders of such capital have priority claim on the same assets in the event of liquidation (Maness, 1994; Gitman, 1997; Cooper, et al, 1998). There is inadequate link between liquidity of assets to capital structure, level of investment information, investment risk and their interaction during diversification and subsequent efficient portfolio selection for optimal performance with a focus on cash flow from invested assets. Therefore little is known about diversification and efficient portfolio selection particularly in firms in the soft drink industry.

Portfolio selection is the process by which an investor decides how to allocate the wealth among universe of financial assets. Most approaches to portfolio selection depend on the expected utility of the final wealth which is maximized to determine an optimal set of weights. This expectation is typically taken over by the multivariate probability distribution of the asset returns. Maximization of the expected utility leads to a criterion that depends on the parameters of the underlying probability distribution of returns. Hawkes and Date (2007) compared several GARCH forecasts using statistical measures; despite large body of literature not many studies consider comparisons that directly evaluate portfolio performances. Although it is well known that portfolio selection is more sensitive to

estimation error in expected returns (Chopra and Ziemba, 1993); portfolio weights and subsequent portfolio performance are sensitive to the Variance-Covariance matrix estimation. In practice the most important portfolio selection application is to ensure the optimal portfolio prediction over a certain horizon.

Markowitz's (1952) Mean-Variance optimization is the most common formulation of portfolio selection problem. However portfolios constructed from sample moments of stock returns have proved problematic. The main problems in the optimal mean variance portfolio are that the portfolios are often extremely concentrated on a few assets; which is a contradiction to the notion of diversification and out-of –sample performances of the mean variance portfolios are not very good. It is generally thought that these drawbacks are due to statistical error in estimating the moments that are used as inputs in the mean variance optimization. These errors change optimal portfolio weights dramatically. Extensive research on reducing statistical errors in sample mean and covariance matrix have been done; one alternative is shrinkage of estimators, used shrinkage estimation for the mean and covariance matrix, results indicate that shrinkage estimators compensate for the positive (negative) error that tends to be embedded in extremely high (low) estimated coefficients by pulling them downward (upward) and prevent extreme positions in portfolio selection. Past studies assumed that means, variances and correlations for all assets are the same, so that their target mean and covariance's matrix are of equally weighted portfolio. In this scenario it is very hard to achieve certain shrinkage target preferred by asset managers in most firms particularly when a capitalization-weighted portfolio is considered (Jobson and Korkie, 1980; Ledoit and Wolf, 2003; Jorion, 1986; Frost and Savarino, 1986). According to Kullback and Leibler (1951), their study proposed an objective function the Kullback –Leibler information Criteria(KLIC) which they defined as Pseudo distance between two probability distributions(portfolio weights; p_i and q_i);

$$\text{KLIC } (\boldsymbol{p, q}) = \sum_{i=1}^{n} \boldsymbol{p}_i \left(\ln \frac{p_i}{q_i} \right)$$

Where KLIC is Kullback –Leibler information Criteria

The Kullback –Leibler information Criteria is the cross entropy measure; if the investor minimizes the Kullback –Leibler information Criteria measure with *q* as the reference distribution that satisfies certain constraints, a value or solution is obtained ***p*** closest to ***q.*** If *q* is set as *q=(1/n 1/n....,1/n)* and form uniform distribution. Then Kullback –Leibler

information Criteria as entropy measure implies that estimating p that is closest to q equally weighted portfolio helps achieve a well diversified optimal portfolio, similar to Shannon's negative entropy measure. Entropy's objective function is meant obtain maximum diversity in a portfolio allocation; it is clear that when Kullback –Leibler information Criteria measure is maximized a portfolio is shrinked towards an equally weighted portfolio. A measure of uncertainty of the probability distribution that can be maximized subject to the mean constraint which represents the available information is the Kullback –Leibler information Criteria measure (Shannon, 1948; Jayness, 1963; Fernholz, 2002).

In order to incorporate problems of imprecision of estimates confidence interval of maximized expected utility values must be defined to lead to inequality constraints for optimization procedures. Most asset managers are not allowed to sell short (the portfolio weights cannot be negative) in real world; therefore constructed portfolio weights to obtain maximum entropy (Kullback –Leibler information Criteria) their probabilities which are weights are certainly non-negative. It is therefore clear that if sample sizes of individual assets returns are not large enough compared to the number of assets, sample covariance matrix tends to be very imprecise. By taking into account Kullback –Leibler information Criteria, for a given mean and covariance matrix, the paradigm provide a very elegant way to achieve an efficient allocation such that higher expected returns can only be achieved by taking more risk as indicated in the efficient frontier, a locus for optimal portfolios. However there are drawbacks in this mean Variance paradigm associated with diversification and portfolio efficiency; first the mean variance solutions are very sensitive to estimation errors of mean returns, a small increase in the mean of just one asset drives half of the securities out of the portfolio's efficient frontier. Secondly, sample assets out of mean variance of efficient portfolio, their portfolio performance are very poor; they are even worse than the naive equally weighted portfolio; finally the mean variance portfolio often has extreme portfolio weights due to statistical errors in mean and covariance estimates, which contradicts the notion of diversification (Jorion,1986; DeMiguel et.al, 2005;Jobson and korkie,1980; Best and Grauer,1991; Michaud,1989). All these studies have inadequately confronted issues relating to what the investor or managers should do in relation to capital structure, investment risk and information as expressed in the efficient market hypothesis theory to give direction when carrying out investment diversification and portfolio selection to achieve shareholders wealth maximization. Therefore the relationship between diversification

alternatives and efficient portfolio selection for shareholders wealth maximization remains unknown.

The fundamental question in corporate strategy and industrialization is why profit differences exist across firms and industries. Profit existence and persistence may not be driven by the same factors(Jacobsen,1988; Cubbin and Geroski,1987). The persistence arises primarily from firm specific component of profits rather than from industry component (Cubbin and Geroski, 1987). Further, Waring (1996) study analysed in detail industry determinants of firm specific profits persistence; however the firm specific component remained un- explored (McGahan and Porter, 2003). The resource based view of the firm (RBV) indicate that a firm's endowment of resources is what makes its competitive advantage sustainable in time(Barney,1996; Amit and Schoemaker, 1993; peteraf,1993). Intangible resources are typically tacit and hard to codify (Kogut and Zander, 1992; Conner and Prahalad, 1996). They are likely to trade in imperfect factor markets (Barney, 1996); and exhibit complementarities (Milgrom et al., 1991; Athey and Stern, 1998; Rivkin, 2000). As a result, intangibles are difficult to acquire or develop, and to replicate and accumulate within the firm. For the same reasons, they are difficult to be understood and imitated by others. This uncertain imitability is what makes them valuable and the basis of a sustainable competitive advantage for a firm (Nelson, 1991; Winter, 1987; Hall, 1993). The coca cola company is endowed with intangible assets like copy rights, patents which cannot be imitated by any other entrepreneurs in the same sector; this resource base view makes the firms in the soft drink industry to compete favourably in its territorial operations. These intangible assets enable the firms in the soft drink to diversify their product and assets mix for operational performance.

Zhaoliang and Xiaonan (2006) analysed diversification in 51 retail listed companies of which 29 were controlled by the state and 22 companies were privately owned in China after an outcry on China Enterprise Confederation (CEC) relating to company's failure in a situation where most of the companies lost business because of diversification. The study used regression analysis, the independent variable was index of diversification and relative book value of the company was the dependent variable. The study findings indicate that diversification significantly influenced the corporate value and more diversified companies performed worse in China's economy. Therefore little is known about investment information, level of risk, investment appraisal, diversification and efficient portfolio selection for optimal financial performance.

The choice of a portfolio involves a trade off- between risk and return (Markowitz,1952); to find a portfolio that maximizes the expected return subject to a maximum acceptable volatility level and satisfying the asset allocation and portfolio budget constraints form the focus for most scholars. Optimal investment decisions corresponds to the expected utility maximization problem a situation where risk itself is subjective, therefore no unique risk measure exist that can be used to sort out every investor's problem. Investors rely on mean-variance optimization forecasts on mean returns, variances and covariance's using historical data on the assumption that they are true values of the parameters analysed; it is important for investors to take into account change in input parameters over time as the future is uncertain; a small change in input parameters results in a change of the composition of the optimal portfolio; the portfolio may be sub-optimal for the investor. It is noted that favourable effect of diversification on portfolio variance cannot be eliminated, hence more assets lead to greater benefits when the portfolio variance is a function of assets invested by a firm; past studies reveal that when adding uncorrelated risk assets to a portfolio it only increases the portfolio size and it may not be regarded as a diversification but regarded as a mere sub-division of the portfolio among many smaller investments; their variance expressed as $n\sigma^2_x$ which is increasing in n rather than decreasing, this contradicts the basis of portfolio theory which directed this study. Therefore little is known about the relationship between diversification and efficient portfolio selection.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter provides the methodology the study adopted. It highlights the overall research paradigm and design that guided this study. This section presented the research design, target population and sampling frame, research instruments and data analysis tools.

3.1 Research Design

A research design is a set of logical procedures that enables the researcher to obtain evidence to determine the degree to which a theoretical hypothesis or set of hypotheses are correct. This study adopted cross sectional research design. In this type of research study either the entire population or a subset is thereof selected to collect data to address research questions of interest. It is cross sectional because the information gathered on the variables in this study represents what is going on at only one point in time in relation to investment appraisal, diversification and portfolio selection. The design is important when the data collection strategy is broader in scope and involves systematic data collection at a point in time. Baumgartner and Steenkamp (2006) confirm that cross sectional approach is viable and less costly means of doing research enhancing causal inference. The results of Monte Carlo simulations suggest that cross sectional research design is sufficient when the relationship among constructs of interest are reasonably large in magnitude ($p>0.05$). While we can observe correlations' we cannot observe cause; cause can be inferred. These inferences are necessarily fallible, they are only indirectly linked to observables (Cook and Campbell, 1979). A research design ensures that evidence obtained enables the researcher answer the initial question as unambiguously as possible. The design deals with a logical problem and not logistical problem (Yin, 1989).

3.2 Study Area

This study was carried out in western Kenya the region lies between latitudes and longitudes of $0^{0}30^{'}$N and $34^{0}30^{'}$E. The firms in this study are Equator Bottlers Limited and Kisii Bottlers Limited whose franchise territory is in western part of Kenya. the region under study has a population of 9.7 million (KNBS report, 2009). The climatic conditions for this area are suitable for the consumption of the carbonated drinks from these two firms. Further the poverty depth in western Kenya indicate that Kisii County is at 20%, Kisumu County 15% Migori County 21% Nyamira County 18%,Siaya County 12% Vihiga 10% Homabay 15% in a survey conducted during the period 2007 to 2012 (Kenya Economic report, 2013). On this basis a study in western Kenya's soft drink industry will help improve creation of job opportunities for the unemployed groups if investments in the distribution chain are well addressed by various investors.

3.3. Target Population, Sample Design and Sampling Technique

The study target population was 302 respondents comprised of heads of sections whose information is relevant in this study. Therefore 26 respondents from human resources and administration section, 30 respondents from finance department, 30 respondents from factory department; the distribution system will comprise of 46 respondents from sales department in the firms while 18 respondents were from supply chain department, 38 respondents from Key Distributors (KDs), 36 respondents from Strategic Supply Depots operators and 78 respondents from stockists in the distribution system of the soft drink industry in western Kenya (appendix I). The respondents in this study are best placed to articulate issues of investments, their appraisal, diversification and portfolio selection in the study as they have the conceptual view of the firms. This is in agreement with Elbana and Child (2007), a view supported by Hambrick and Mason (1984) arguing that organization strategy is shaped by perceptions and opinions of its leadership and stakeholders. The study sample was 302 respondents in the target population. The study adopted a saturated sampling technique of all respondents in a population; 52 respondents were used in the pilot study to test reliability of the research instrument and they were not included in the final result analysis; therefore only 250 of the total respondents were used in the tabulation of the results and analysis. Saturated sampling technique was adopted since the units of study possessed important information, time and other resources (Sekaran, 2000; Saunders *et al.*, 2007). According to Kothari (2004) saturated sampling enhances validity of the study providing a true measure of the population

with no sampling error, giving detailed information about small subgroups within the population and providing benchmark data for future studies.

Table 3.1 Category and Distribution of Respondents

	Distribution of Respondents		
Category of Respondents	Urban set up	Rural set up	In a Firm
Human Resources And Administration	0	0	26
Finance Department	0	0	30
Factory Department	0	0	30
Sales Department	24	16	6
Supply Chain Department	4	5	9
Key Distributors	30	8	0
Strategic Deport Operator	26	10	0
Stockists	46	32	0

Source: EBL and KBL (2014)

3.4 Data Type and Collection Method

3.4.1 Sources of Data

Primary data were used in this study. The researcher gathered categorical data from the respondents in this study who comprised of section heads and investors in the distribution chain of both Equator Bottlers Limited and Kisii Bottlers Limited and operated within their franchise territory. Categorical variables represent types of data which may be divided into groups. It is often more informative to categorize information relating to variables under investigation. The researcher assigned weights to categories which could not be ordered in this study.

3.4.2 Data Collection Procedure

The researcher obtained a letter of introduction from Maseno University. A reconnaissance visit was made to the firms operating in western Kenya in order to identify the nature and scope of the research challenges ahead and ways to handle them. Further the purpose of the reconnaissance was to declare the intention to conduct research in the industry and secure the related appointments with both the respondents in the firms and those in the distribution system with appropriate permission from the firm's management to collect the data for this study.

3.4.3 Data Collection Instrument

The survey questionnaire was used to collect primary data from the respondents in this study. The questionnaire was administered to the respondents through an oral interview by the researcher. It is a data collection form that is used to ask respondents research questions. This instrument was suitable for cross sectional studies. The items tapping the theoretical constructs of the variables in this study were developed based on the literature review. In order to ensure high statistical variability among the responses from the respondents in this study the variable constructs were scored with weights ranging from 1.0 to 5.0 for the first independent variable while the dependent variable its constructs were weighted from weight of 1.0 for inefficient portfolio selection to weight 3.0 for efficient portfolio selection. The respondents were required to give responses very specific to elements of the constructs in the study variables; though subjective process it is supported by past studies like Acquaah and Eshum (2010), Tang and Peng (2003) , Ojera et al (2011), Wall et al (2004) and Morgan et al (2004). These scholars concur when the approach is geared to collecting categorical data and even if data is available it may not be presented in comparable format across respondents or where firms studied are of different sizes with unsatisfactory records. Further this approach is suitable as the respondents involved are in the same distribution chain and there is a likely strong correlation between the information they provide and the actual performance data.

3.4. 4 Reliability Test for Data Collection Instrument

Reliability refers to the extent to which any measuring procedure yields the same results on repeated trials. The reliability test was aimed at determining consistency and stability of the instrument in relation to data collection. The research instrument was tested on a pilot group of 52 respondents from the area under investigation in the same industry but was not included in the final results analysis; they were asked to respond to questions in the research instrument. The results of analysis established a Cronbach's Alpha of 0.970 which suggest strong internal consistency of the research instrument when compared with the Cronbach's Alpha standard of 0.70 which is in agreement with Kothari (2005) and Taylor *et al.* (2006).

3.4. 5 Validity Test for Data Collection Instrument

Validity of the research instrument implies the extent to which the constructs of the study or measures in the survey instrument represent the concept and the degree to which it is free from subjective error (nunally, 1978). The content and construct validity was achieved through expert advice; content validity was achieved through adequate coverage of the topic under study; the 52 respondents were used to provide face validity of the research instrument. The expert opinion on the instrument indicated that the instrument addressed the research intention. Construct validity was achieved by requesting experienced researchers who critiqued the instrument for purposes of eliminating ambiguity, improving clarity, appropriateness of the instrument's intention to collect data; this was in agreement with other scholars in research like Kothari (2005) and Taylor *et al.*(2006).

3.5 Data Analysis and Presentation

Quantitative data analyses were done using descriptive statistics and inferential statistics. Descriptive statistics involved the use of percentages and means. A regression analysis was used to establish the relationship between investment appraisal techniques, diversification alternatives and efficient portfolio selection; determination of coefficient of multiple correlations(R), coefficient of determination(R^2) and ANOVA (F values) were used to test the goodness of fit model used; the t-test was used to test for significance of the regression coefficients. The regression models below were used;

$$EPS. = b_0 + b_1 ARR_i + b_2 NPV_i + b_3 PBP_i + b_4 IRR_i + b_5 PI_i + e \quad \text{.....} \quad (3.1)$$

Where; EPS - is efficient portfolio selection

IRR- internal rate of return

NPV- net present value

PBP- payback period

ARR- accounting rate of return

PI- profitability index

e - Error term

$EPS = b_0 + b_1 WDA_i + b_2 ADA_i + b_3 BDA_i + e$ ..... (3.2)

Where; EPS - efficient portfolio selection;

WDA – worst diversification alternative

ADA- average diversification alternative;

BDA- best diversification alternative;

b_0, b_1, b_2 and b_3 are regression coefficients;

e - Error term

$EPS = ß_0 + ß_1 DA_i + ß_2 INA_i + e$ ..... (3.3)

Where; EPS. - is efficient portfolio selection

INA_i- Investment Appraisal (where i= 1,2,..n)

DA_i -Diversification Alternative (where i= 1,2,..n)

$ß_1$, $ß_2$, $ß_3$, $ß_4$ and $ß_5$ are regression coefficients.

3.6 Diagnostic Tests for Assumptions in the Regression Model

3.6.1 Tests for Multicollinearity

Before the regression procedure, test for multicollinearity was carried out. The Variance Inflation Factor (VIF) was used as a basis to detect multicollinearity; it quantifies the severity of multicollinearity. The variance inflation factors (VIF) obtained for the test were all less than 10 hence multicollinearity was not severe to interfere with the relationship between independent variables and the dependent variable (Montgomery , 2001; Murphy and Myors,1998).

Table 3.2 Tests for Multicollinearity

Model Variable	Collinearity Statistics	
	Tolerance	VIF
IRR	.123	8.106
NPV	.101	9.859
PBP	.137	7.288
PI	.129	7.751
ARR	.140	7.149

Dependent Variable: Portfolio Selection (EPS)

The information in table 3.2 show that all the VIF values are below 10.0 as proposed by Montgomery (2001) and Murphy and Myors (1998) indicating absence of multicollinearity between diversification alternatives and portfolio selection for optimal performance.

Table 3.2 Tests for Multicollinearity

Model Variable	Collinearity Statistics	
	Tolerance	VIF
Constant		
WDA	.588	1.701
ADA	.421	2.376
BDA	.597	1.675

Dependent Variable: Portfolio Selection (EPS)

The diagnostic results in table 3.3 for multicollinearity on investment appraisal and diversification alternatives, the VIF values obtained indicate that multicollinearity does not exist

Table 3.3 Tests for Multicollinearity

Model Variable	Collinearity Statistics	
	Tolerance	VIF
Constant		
INA	.373	2.678
DA	.373	2.678

Dependent Variable: Portfolio Selection (EPS)

The Variance Inflation Factor (VIF) shows how much the variance of the coefficient estimate is being inflated by multicollinearity.

3.6.2 Tests for Heteroscedasticity

Heteroscedasticity is when the error terms do not have constant variance which means different dispersions. The errors may increase as the value of an independent variable increases. The test was to assess the effect of serial correlations of the regression results generated from independent variables interaction with the dependent variable. Durbin-Watson test was preferred in this study.

Table 3.4 Test for Heteroscedasticity

Model Variable	Test Statistics	
	Std. Error of Estimate	Durbin-Watson
Constant		
Investment Appraisal Techniques	.34626	.139
Diversification Alternatives	.19371	.178

Dependent Variable: Portfolio Selection (EPS)

Table 3.4 shows that the proportion of variance in investment appraisal techniques as explained by the independent variable is 34.626% of the residuals from the regression analysis and the Durbin-Watson value is 0.139 which is less than 2.0 indicate the absence of serial correlation. The variance proportion in diversification alternatives as explained by the independent variable is 19.371% of the residuals from the regression analysis and the Durbin-Watson value is 0.178 which is less than 2.0 indicate the absence of serial correlation (Durbin and Watson, 1950,1951; Odondo, et. al 2013). When the variance of errors differ at different values of predictor variables, Heteroscedasticity is indicated, but when the values

are less than 50% as explained by the independent variable it does not have effect on significance tests (Tabachnick and Fidell (1996). Hence in this study there is no distortion of findings and the results show the possibility of type I error is minimized.

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter gives the descriptive statistics and presents analyses of various responses relating to the variables in this study. The analyses results are presented based on the objectives of the study.

4.1 Investment Appraisal Techniques used to evaluate Investment Opportunities

Capital budgeting practice is a fundamental criterion for a company planning to undertake an investment. It is one of the most important decisions that face financial managers today; these decisions shape the future of the company. In most cases the process of capital budgeting is done taking into account the firm's strategic plan. Typical investments include the acquisition of plant and equipment, a marketing campaign, developing a new business or product. These investments are expected to produce future benefits to the firm. The selection of potential investment is done using investment appraisal techniques which are designed to aid in the calculation of expected return from a promising investment opportunity. These techniques are theoretically superior to others, but each has its own criticisms; they include: Net present Value (NPV), Internal Rate of Return (IRR), Profitability Index (PI), Pay Back Period (PBP) and Accounting Rate of Return (ARR). Firms use different techniques for different investment alternatives.

Table 4.1 Investment Appraisal Techniques used to evaluate Investment Opportunities.

Investment Appraisal Technique	Response Rate			
	Yes	% freq.	No	% freq.
Internal Rate of Return	131	52.4 %	119	47.6%
Net Present Value	168	67.2%	82	32.8%
Profitability Index	211	84.4%	39	15.6%
Accounting Rate of Return	108	43.2%	142	56.8%
Pay Back Period	159	63.6%	91	36.4%

Table 4.1 indicate that profitability index is rated at 84.4%, net present value at 67.2%, payback period at 63.6%, internal rate of return at 52.4% and accounting rate of return at 43.2%. Past studies indicate that 53.6% of the firms use IRR (Gitman and Forrester, 1977; Stanley and Block, 1984; Trahan and Gitman, 1995); Du Toit and Pienaar (2005) study on investment appraisal techniques frequency of use in industries , results show that IRR 37.1%,

NPV 27.4% , PI at 0%, ARR at 11.3%, PBP 8.1%, MIRR at 0% and other methods used at 8.0%. this study results show that IRR is rated highest followed by NPV, the ARR and finally PBP at 8.1%. The study though failed to account for 0% use of some investment appraisal techniques. Past studies results like Lambrechts (1976) study on 100 quoted firms results indicated that 48% response rate showed that the firms' preferred technique was IRR; industrial and mining firms PBP technique is preferred 26% (Andrews and Butler,1986); study on 524 listed firms by DuToit and Pienaar (2005) results show that IRR technique was preferred, this results concurred with findings of Lambrechts (1976). Study by Correiria and Cramer (2008) on 150 listed firms, results contradicted that listed companies prefer NPV technique; study by Hall and Millard (2010) on 177 industrial firms the results show that IRR is preferred. The results are inconsistent and contradict the past studies' findings that profitability is rated highest as the most used investment appraisal technique followed by NPV at 67.2% and PBP at 63.6% respectively in the soft drink industry.

Capital investments normally have fundamental effect on the future cash flows of the firm once an investment decision is made; it is often not possible to reverse or it is costly once funds are committed. The investments affect profitability, therefore firms and individual investors use profitability index to evaluate their investment alternatives. Several studies have dealt with investment appraisal techniques as essential tools for evaluating the feasibility of possible investments (Graham and Harvey, 2001; Lefley, 1996). Study results by Andrews and Butler (1986) indicate that despite capital intensive nature of some industries like mining, companies are not fully utilizing investment appraisal techniques when making investment decisions; in most cases selected technique and situation for its application is not highlighted.

This study results indicate that PI is more preferred compared to other techniques; it is inconsistent with Hall and Millard (2010); but it is consistent with findings of Correria and Cramer that NPV more popular than IRR in most companies; but it contradicts DuToit and Pienaar (2005) study which showed that IRR was popular than NPV in their application as investment appraisal techniques. The profitability index model take into account only the relationship between present values of cash inflows and initial cash outlay. The technique does not take into account the characteristics of the chief finance officers (CFOs). Study by graham and Harvey (2001), indicate that CFOs characteristics and size of firms influence the investment appraisal techniques adopted. Larger firms are inclined to sophisticated

investment appraisal techniques. Elumilade et al. (2006) for small investment opportunities pay back method are preferred; and for large investments firms NPV is preferred.

It is important to recognise that a relationship may exist between two or more variables considerably when one set of data is used or from one pair of variables to another. The Pearson correlation coefficient is a standard measure of the degree of association between two variables, the absence of causality is implied in that the association is not as in dependent and independent variables observation; it gives descriptive statistic measuring the degree of Covariation between independent variables in this study to help in showing the conditions under which it is appropriate to interpret the results as a measure of the strength of causal relationship in this case the influence of investment appraisal techniques and diversification alternatives (investment alternatives) on efficient portfolio selection in the soft drink industry.

4.2 Objective One: Investment Appraisal Techniques and Efficient Portfolio Selection

The first objective of the study was to investigate the influence of investment appraisal techniques on efficient portfolio selection. In this study a portfolio is said to be efficient *iff* it achieves the maximum expected return for a given level of risk; in this analysis Kruskal-Willis mean rank was tabulated.

Table 4.2 Investment Appraisals Mean Rank on Efficient Portfolio Selection

Investment Appraisal Technique	IRR	NPV	PBP	ARR	PI
Kruskal-Wallis Mean Rank	183.23	190.72	187.91	183.03	182.76
N	250	250	250	250	250

The investment appraisal techniques help rank investment opportunities as per the optimality of their returns. The study results relating to Kruskal-Wallis Test indicate that NPV had the highest mean rank of 190.72, PBP had a mean rank of 187.91; IRR mean rank 183.23, ARR mean rank of 183.03 and least was PI with a mean rank of 182.76, the technique helps to understand the rank based on means.

Table 4.3 Test Statistics[a,b]

	IRR	NPV	PBP	PI	ARR
Chi-Square	189.425	210.493	209.802	190.508	190.262
df	2	2	2	2	2
Asymp. Sig.	.000	.000	.000	.000	.000
Mean Rank					

a. Kruskal Wallis Test

b. Grouping Variable: Portfolio Selection

The test statistic results indicate that NPV had the highest Chi-Square values (210.493) the value is significant ($p<0.05$); followed by PBP (209.802) the least Chi-Square value (189.425) occurred at IRR. These mean ranks and their Chi-Square values are significant ($p <0.05$). The findings revealed that NPV is an investment appraisal technique that is important in selection of investment alternatives for efficient portfolio selection in the soft drink industry. The Kruskal Wallis Test is one way analysis of variance test by ranks; it is non parametric method to evaluate whether the data samples originated from the same distribution and its appropriateness for comparing two or more responses that are independent. The method doesn't assume a normal distribution of the residuals unlike the analogous one way analysis of variance; the responses in these groups of study are unmatched. Therefore non parametric methods can be used on any data indicating that they do not have restrictions and it does not assume the normality of residuals (William, 2002)

Table 4.4 Correlations of Investment Appraisal Techniques and Portfolio Selection

		EPS	ARR	PI	PBP	NPV	IRR
Pearson Correlation	EPS	1.000					
	ARR	.854	1.000				
	PI	.826	.894	1.000			
	PBP	.898	.932	.931	1.000		
	NPV	.882	.916	.865	.903	1.000	
	IRR	.827	.895	.977	.937	.876	1.000
	Sig. (1-tailed)	.	.000	.000	.000	.000	.000

Kruskal-wallis Test: Investment Appraisal Techniques and Portfolio Selection

The investment appraisal techniques have a significant relationship with efficient portfolio selection ($p< 0.05$). The correlation coefficients indicate that PBP (0.898) is strongly correlated to efficient portfolio selection followed by NPV (0.882), ARR (0.854), IRR (0.827) and least was PI with correlation of 0.826. The correlation coefficient is a number between -1 and 1 that indicates the strength of the linear relationship between two variables. The magnitude of indicates the strength of the relationship. Very strong positive linear relationship is observed between PBP and EPS. This implies that as the use of PBP increases causes a similar increase in portfolio selection. The independent variables all have strong and positive linear relationship to efficient portfolio selection. This result indicates a strong and positive association between investment appraisal techniques and efficient portfolio selection in the soft drink industry in western Kenya. The techniques also show strong linear relationship among them, this reveal that they influence each other as regressors to dependent variable.

Table 4.5a Coefficients for IRR, NPV, ARR, PBP, PI and Portfolio Selection

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.088	.108		-.814	.416
	IRR	-.255	.112	-.294	-2.288	.023
	NPV	.378	.056	.463	6.787	.000
	PBP	.525	.064	.773	8.246	.000
	PI	.072	.104	.085	.697	.487
	ARR	-.081	.063	-.104	-1.287	.199

a. Dependent Variable: portfolio selection

The contribution of each investment appraisal to efficient portfolio selection, results indicate that ARR influence efficient portfolio selection negatively by magnitude of -0.088; PBP influence efficient portfolio selection with highest magnitude (0.525) followed by NPV (0.378); only NPV and PBP have significant influence to efficient portfolio selection ($p< 0.05$); the results show that three techniques IRR, NPV and PBP are significant in the model ($p< 0.05$); in terms of effect size of these techniques on efficient portfolio selection PBP has the highest standardized coefficient(B= .773) indicating that it has the highest cause effect of 77.3% when other techniques are held constant. Therefore PBP technique alone explains 77.3% of the variation in EPS and in that effect it has the highest t statistic (8.246). this observation is in agreement that the higher the t- statistic values indicates more significance

of that variable in the model. Also taking into account the standard error in this result it shows that the smaller the standard error value the better is the estimate of the unstandardized coefficient which is used in the model.

$EPS = b_0 + b_1ARR_i + b_2 NPV_i + b_3 PBP_i + b_4 IRR_i + b_5 PI_i + e$

Where: EPS - portfolio selection; IRR- internal rate of return; NPV- net present value; PBP- payback period; ARR- accounting rate of return, PI - profitability index; and b_1, b_2, b_3, b_4 and b_5 are regression coefficients and e - Error term. Substituting the Unstandardized coefficients in table 4.14*a* the equation changes to;

$EPS = -0.088 – 0.081\ ARR + 0.378NPV + 0.525\ PBP - 0.255IRR + 0.072PI$

The results reveal that ARR and IRR negatively influence on portfolio selection. Their application in the investment appraisal process decreases efficient portfolio selection while the application of NPV, PBP and PI increases efficient portfolio selection. IRR values unstandardized coefficient (-.255) is significant but considering the standardised coefficient (-0.294), that using IRR causes effect size of 29.4% negative variation to portfolio selection. This finding differs with other scholars that corporate management prefer IRR and financial theorists prefer NPV; both methods suffer from inconsistencies when ranking potential investments; IRR is consistent when evaluating unique normal investments; otherwise it is inconsistent indicating a shift from IRR to NPV (Du Toit and Pienaar,2005). This results indicate that investor continued use of IRR will not achieve efficient portfolio selection despite its coefficients being significant ($p<0.05$) but for ARR its t statistic value (-1.287) and unstandardized coefficient (-0.081) being negative the result is not significant ($p\ 0.199 > 0.05$) at 5% level of significance. Therefore its contribution in the model is insignificant and can be dropped.

Table 4. 6 Model Summary IRR, NPV, ARR, PBP, PI and EPS

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		Durbin-Watson
					F Change	Sig. F Change	
1	.917[a]	.842	.839	.34626	259.641	.000	.139

a. Predictors: (Constant), IRR, NPV, ARR, PBP, PI

b. Dependent Variable: EPS

The results show that the coefficient of multiple correlation (R= .917[a]) show positive and a strong (almost a perfect relationship) association between the predictors and dependent variables in this study. The predictors can explain the variation in dependent variable upto 84.2% (R^2 = .842) and this result is statistically significant (F = 259.641; p < 0.05); the findings further reveal absence of Heteroscedasticity as Durbin -Watson value is 0.139 which is less than 2.0.

Table 4.7: ANOVA[b] for IRR, NPV, ARR, PBP, PI and EPS

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	155.646	5	31.129	259.641	.000[a]
	Residual	29.254	244	.120		
	Total	184.900	249			

Predictors: (Constant), IRR, NPV, ARR, PBP, PI
Dependent Variable: efficient portfolio selection

The results in table 4.7 indicate a significant relationship between investment appraisal techniques (IRR, NPV, PI, ARR and PBP) and efficient portfolio selection (*F*= 259.641; p 0.000< 0.05*).* Part analyses of investment appraisal techniques influence on efficient portfolio selection different results are observed. When ARR is not factored the efficient portfolio selection results indicate that regressors(NPV,IRR,PBP, and PI) have a strong correlation of 0.917[a] and R^2 is 0.841; efficient portfolio selection is accounted for upto 84.1% ; the results indicate significant relationship of the variables (F= 323.272; P< 0.05).

Table 4.8: Model Summary IRR, NPV, PBP, PI and EPS

				Change Statistics				
Model	R	R Square	Adjusted R Square	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.917[a]	.841	.838	323.272	4	245	.000	.127

a. Predictors: (Constant),IRR, NPV, PI, PBP
b. Dependent Variable: EPS

Table 4. 9: Coefficients[a] for PI, PBP, NPV and EPS

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Colinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.170	.102		-1.662	.098		
	PI	-.131	.061	-.154	-2.161	.032	.130	7.685
	PBP	.458	.056	.675	8.112	.000	.095	10.480
	NPV	.331	.049	.406	6.695	.000	.180	5.567

When both IRR and ARR are not considered in the analysis due to their negative contribution to efficient portfolio selection as in table 4.17 results; In this case the influence of PI is negative (beta coefficient -0.131); indicating that continued use of PI negatively contribute to efficient portfolio selection in the soft drink industry in western Kenya despite its test statistic being significant (p 0.032< 0.05); its continued use causes negative effect size of 15.4% on portfolio selection for optimal performance in the industry. The technique contributes to selection of inefficient portfolios rather than efficient portfolios. Payback period technique still maintains at superior level of influencing portfolio selection, its magnitude gives unstandardized coefficient of (0.458; p 0.000< 0.05) with small standard error (0.056) but its effect size on the dependent variable variation is high at 67.5% (Standardized Coefficient beta is 0.675). Further the use of NPV as a technique its effect size on portfolio selection is 40.6% (Beta is 0.406; p 0.000< 0.05) this result is consistently showing that PBP technique is better in effect size to portfolio selection in the soft drink industry.

$EPS = b_0 + b_3\,PBP + b_4\,IRR + b_5\,PI + e$

Substituting the Unstandardized coefficients in table 4.9 in the equation, the results show that: EPS = -0.170 + 0.331NPV + 0.458 PBP - 0.131PI

Table 4.10: Model Summary NPV, PI, PBP and Portfolio Selection

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		Durbin-Watson
					F Change	Sig. F Change	
1	.915[a]	.837	.836	.34950	422.578	.000	.107

a. Predictors: (Constant), NPV, PI, PBP
b. Dependent Variable: EPS

The findings reveal that regressors (NPV, PBP, and PI) account for 83.7% of the efficient portfolio selection while 16.3% remain unexplained($R=0.915$; $R^2 = 0.837$; $F= 422.578$; $p < 0.05$). Table 4.19 show part analysis results when PI is not considered, the regressors (NPV and PBP) indicate a strong correlation of 0.913^a and its R^2 is 0.834 (the variation of dependent variable is accounted for upto 83.4%); its F value increases to 622.286 and p0.000<0.05 indicating that model results are better as regressors have greater influence on portfolio selection as the F value increases.

Table 4.11: Model Summary NPV, PBP and EPS

					Change Statistics		
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F Change	Sig. F Change	Durbin-Watson
1	.913[a]	.834	.833	.35208	622.286	.000	.096

a. Predictors: (Constant), Net Present Value, Pay Back Period
b. Dependent Variable: EPS

The model changes to; EPS = -0.318 + 0.314NPV + 0.373 PBP. This model show that the magnitude of the techniques NPV and PBP to EPS is small compared to when the regressors are many. This model shrinkage informs that a model of this type is better as its F values increased (F = 622.286; p 0.000<0.05); considering the standardized beta values in table 4.9 and those in table 4.12 shows that when PI is not included in portfolio selection the decrease in size effect of PBP on EPS is by a big margin (B = .675 to .550) the decrease of change in beta by 0.125 compared to the decrease in size effect of NPV on EPS (B= 0.406 to 0 .386) the difference of change in beta by 0.020, this result indicate an interaction between PI and PBP towards portfolio selection in the soft drink industry.

Table 4.12: Coefficients NPV, PBP and EPS

		Unstandardized Coefficients		Standardized Coefficients		
	Model	B	Std. Error	Beta	t	Sig.
1	(Constant)	-.318	.077		-4.141	.000
	Pay Back Period	.373	.041	.550	9.118	.000
	Net Present Value	.314	.049	.386	6.389	.000

a. Dependent Variable: efficient portfolio selection

Table 4.13 show results for Payback Period technique and EPS model shrinks to one independent variable and dependent variable. Considering that correlation coefficients in

table 4.4 between PBP and EPS was highest (0.898) almost a perfect and positive correlation, based on this result the research finding the part analysis for only PBP and EPS were done.

Table 4. 13: Model Summary Pay Back Period and Efficient Portfolio Selection

Model	R	R Square	Adjusted R Square	Change Statistics				Durbin-Watson
				F Change	df1	df2	Sig. F Change	
1	.898[a]	.807	.806	1037.205	1	248	.000	.098

a. Predictors: (Constant), Pay Back Period
b. Dependent Variable: efficient portfolio selection

Analyzing only PBP as a regressor to portfolio efficiency, F value increased from F= 622.286 to F= 1037.205; a big margin. This informed the study that PBP is a better technique for portfolio selection in this industry; although its R decreases to 0.898[a]; and R^2 decreases to 0.807; but still the result indicate a significant relationship between PBP and efficient portfolio selection. Therefore investment appraisal techniques particularly payback period significantly influence efficient portfolio selection. The study confirms that instead of using it as a secondary technique for investment appraisal it should be considered as a primary technique in portfolio selection by investors along the distribution system of the soft drink industry in western Kenya.

Past studies show that payback technique remains popular as a tool for investment evaluation despite its declining popularity as a primary tool in past studies (Kim and Farragher, 1981) but its increased use to 72% in recent years (Trahan and Gitman, 1995) confirms its role in influencing firm performance an indicator of efficient portfolio selection. Burn and Walker (1997) payback technique continued popularity results from its ease of computation and its usefulness in conjunction with discounted cash flow techniques as a measure of both liquidity and risk. This result concurred with Chen (2008) that firms with high product standardization tend to emphasise DCF analysis, while firms with low standardization tend to focus on using Non financial measures such as firm strategy, growth and competition; the soft drink industry has high product standardization and its investments require complex manufacturing processes or high Research and Development expenses (uncertain outcomes) it may rely more on non financial measures. Gordon and Myers (1991) confirm that the intensity of performance evaluation is tied to the asset base and level of intensity is highest for strategic assets. Further past studies indicate that 53.6% of the firms use IRR (Gitman and Forrester,

1977), the result is consistent with Stanley and Block (9184) that 65% of the firms use IRR as the primary technique; these results are consistent with Trahan and Gitman(1995). These results further concurs with Burns and Walker(1997) that NPV is superior to IRR which is consistent with Apap and Massion(2004,2005) that 56% of the firms rely on NPV to solve complex investment conflicts and is consistent with Ryan and Ryan (2002). Therefore the study concludes that NPV and PBP techniques are best in a model for efficient portfolio selection.

4.3 Objective Two: Diversification and Efficient Portfolio Selection

The second objective of the study was to investigate the influence of diversification on efficient portfolio selection. The study indicate that diversified investments opportunities form an efficient portfolio in the Soft Drink Industry; a perfect correlation exist between diversified alternatives and efficient portfolio; the alternatives were categorized as worst diversification alternative(WDA), average diversification alternative(ADA) and best diversification alternative(BDA).

Table 4.14: Correlations for WDA, ADA, BDA and Efficient Portfolio Selection

		WDA	ADA	BDA	EPS
WDA	Pearson Correlation	1			
	Sig. (2-tailed)				
ADA	Pearson Correlation	.642**	1		
	Sig. (2-tailed)	.000			
BDA	Pearson Correlation	.407**	.635**	1	
	Sig. (2-tailed)	.000	.000		
EPS.	Pearson Correlation	.458**	.713**	.890**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	250	250	250	250

**. Correlation is significant at the 0.01 level (2-tailed).

There is a positive correlation for the diversification alternatives to efficient portfolio selection; worst diversification alternative (0.458^{**}) this result indicate a weak association between WDA and EPS, for the results of average diversified alternative (0.713^{**}) and best diversified alternative (0.890^{**}) this correlations were high indicating strong and positive significant correlations at ($p<0.01$; 2-tailed). Based on the correlation coefficients between independent variables multicollinearity did not exist as these coefficients are all below the standard value of 0.700 (Murphy and Mayors,1998; Montegomery,2001).

Table 4.15: Model Summary Diversified Alternatives and Efficient Portfolio Selection

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics
					Sig. F Change
1	.911[a]	.829	.827	.19371	.000

a. Predictors: (Constant), BDA, ADA, WDA
b. Dependent Variable: Efficient Portfolio Selection

The results in table 4.15 indicate that R is 0.911[a] which indicate a strong and positive (almost perfect) correlation existing between diversification sets (WDA, ADA, and BDA) and portfolio selection while its R^2 is 0.829 indicating that the variation in portfolio selection is accounted for upto 82.9% by the predictors in the regression analysis as only 17.1% remains unexplained.

Table 4.16: ANOVA Diversified Investments and Efficient Portfolio Selection

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	44.805	3	14.935	398.020	.000[a]
	Residual	9.231	246	.038		
	Total	54.036	249			

a. Predictors: (Constant), BDA, and ADA, WDA

b. Dependent Variable: efficient portfolio selection

The results further indicate a significant relationship between investment alternatives (WDA, ADA, and BDA) and efficient portfolio selection (*F*= 398.020; *p* 0.000< 0.05*)*. The contribution of diversification alternative towards efficient portfolio selection shows that only ADA and BDA have positive contribution while WDA has negative contribution to efficient portfolio selection; there exist a significant relationship between ADA, BDA and efficient portfolio selection.

Table 4.17: Coefficients WDA, ADA, BDA and Efficient Portfolio Selection

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.103E-16	.052		.000	1.000
	WDA	-2.795E-15	.034	.000	.000	1.000
	ADA	.231	.038	.248	6.103	.000
	BDA	.769	.036	.733	21.487	.000

a. Dependent Variable: efficient portfolio selection

The results indicate that portfolio efficiency depends on diversification sets constructed by investors.

$EPS = b_0 + b_1WDA + b_2 ADA + b_3 BDA + e$

Where; EPS - efficient portfolio selection; WDA – worst diversification alternative; ADA- average diversification alternative; BDA- best diversification alternative; b_0, b_1, b_2 and b_3 are regression coefficients; e - Error term. Substituting the Unstandardized coefficients in the equation becomes;

$EPS = 2.103E\text{-}16 – 2.795E\text{-}15\ WDA + 0.231ADA + 0.769\ BDA$

Therefore in the soft drink industry only average diversification alternatives and best diversification alternatives do cause an increase in efficient portfolio selection. Part analysis of ADA, BDA and efficient portfolio selection show better performance in efficient portfolio selection; the R is 0.911, R^2 is 0.829; and adjusted R^2 has a dismal increase; but the F value increased from 398.020 to 599.45; this indicate that ADA and BDA are better in influencing efficient portfolio selection and their values are statistically significant.

Table 4.18: Coefficients[a] of ADA, BDA and Efficient Portfolio Selection

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-9.333E-16	.050		.000	1.000
	ADA	.231	.032	.248	7.283	.000
	BDA	.769	.036	.733	21.530	.000

a. Dependent Variable: efficient portfolio selection

The results in table 4.18 for part analysis the model for portfolio changes to;

EPS = b_0 + b_2 ADA + b_3 BDA + e; Substituting the Unstandardized coefficients. The resultant model defines EPS as positively related with ADA and BDA and all the coefficients are significant (P 0.000< 0.05).

EPS = -9.333E-16 + 0.231ADA + 0.769 BDA

This results show that an increased use of best diversification alternatives increase efficient portfolio selection for optimal performance in firms. For BDA its standardized beta (.733) indicate that holding constant values of ADA as a variable, BDA effect size on efficient portfolio selection is accounted for upto 73.3%, and t statistic value (21.530) is high three times compared with that of ADA (7.283). Further it is observed that ADA accounts for 24.8% (Standardized Beta is 0.248) of the effect size on portfolio selection in the industry. This result reveals that BDA is a favourable option in portfolio selection for optimal performance in the industry.

Table 4.19: Model Summary for ADA, BDA and Efficient Portfolio Selection

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics			
					F Change	df1	df2	Sig. F Change
	.911[a]	.829	.828	.19332	599.457	2	247	.000

a. Predictors: (Constant), BDA, ADA

b. Dependent variable : efficient portfolio selection

The results in table 4.15, table 4.16 and table 4.19 reveal unique results in relation to independent variables WDA,ADA and BDA; the coefficient of multiple correlation R = 0.911[a] and R^2 = 0.829 are the same. This result indicates that WDA has no effect size on portfolio selection, the result in table 4.17 its standardized beta is zero (0.000); but their adjusted R^2 are not the same; without WDA as a predictor variable this value changes from .827 to .828 as the F values increase from 398.020 to 599.457 as indicated in table 4.19; this result difference is dismal indicating that WDA has no chance in efficient portfolio selection in business firms.

Table 4.20: ANOVA for ADA, BDA and Portfolio Selection

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	44.805	2	22.403	599.457	.000[a]
	Residual	9.231	247	.037		
	Total	54.036	249			

a. Predictors: (Constant), BDA, ADA
b. Dependent Variable: Portfolio Selection

In order to determine the significance of the influence of diversification alternatives on efficient portfolio selection, the t-test was applied. For the constant b_0 = -9.333E16; T_0 = 0.000, the p values (p> 0.05) study fails to reject H_0 and conclude that b_0 = -9.333E16 is not significantly different from zero. For ADA its b_1 = 0.231; T_1 = 7.283,(p< 0.05): the study rejects H_0 and conclude that b_1 is significantly different from zero; and it is statistically significant to efficient portfolio selection. For BDA its b_2 = 0.769; T_2 = 21.530,(p< 0.05); b_2 is significantly different from zero; and it is statistically significant to efficient portfolio selection. When only BDA is considered in efficient portfolio selection it gives the best result in efficient portfolio selection.

Table 4.21: Coefficients[a] BDA and Portfolio Selection

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.066	.054		1.208	.228
	BDA	.934	.030	.890	30.775	.000

a. Dependent Variable: Portfolio selection

Therefore the model for diversification alternative and portfolio efficiency reduces to;

$EPS = b_0 + b_1 BDA + e$

Where; EPS –portfolio selection; BDA- Best Diversification Alternative; b_0, b_1 are regression coefficients; e- Error term. Substituting the Unstandardized coefficients in table 4.21 the equation becomes; EPS = 0.066 + 0.934 BDA. The equation indicate that best diversification alternative promotes efficient portfolio selection in firms.

Table 4.22: Model Summary for BDA and Portfolio Selection

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	Change Statistics: Sig. F Change
1	.890[a]	.792	.792	.21264	.792	.000

a. Predictors: (Constant), Best Diversification Alternative
b. Dependent Variable: portfolio selection

Table 4.23: ANOVA for BDA and Portfolio Selection

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42.823	1	42.823	947.112	.000[a]
	Residual	11.213	248	.045		
	Total	54.036	249			

c. Predictors: (Constant), Best Diversification Alternative(BDA)
d. Dependent Variable: portfolio selection

In order to determine the significance of BDA (best diversification alternative) on portfolio efficiency, the t-test was applied. For the constant $b_0 = 0.066$; $T_0 = 1.208$, $p > .05$) study fails reject H_0 and conclude that $b_0 = 0.066$ is significantly different from zero; but is not significant to efficient portfolio selection ($p>0.05$). For BDA its $b_1 = 0.934$; $T_1 = 30.775$; ($p< 0.05$): the study rejects H_0 and concludes that b_1 is significantly different from zero; and it is statistically significant to efficient portfolio selection. Thus BDA is the best model for selection of efficient portfolio ($F= 947.112$; $R= 0.890$; $R^2= 0.792$; $p< 0.05$). This result concurs with the findings in table 4.25 on correlation coefficients between EPS and BDA.

Liquidity of a firm indicates the availability of cash for near future, after taking into account the financial obligations corresponding to that period. Liquidity provides information about a business's safety margin to creditors and the overall cashflow of the business. The proportion of assets as diversification alternatives financed by debt capital is of particular importance to shareholders since lenders of such capital have priority claim on the same assets in the event of liquidation (Maness, 1994; Gitman, 1997; Cooper, et al, 1998). Portfolio selection

processes make investors to decide how to allocate the wealth among universe of financial assets (diversification alternatives). Hawkes and Date (2007) compared several GARCH forecasts using statistical measures; results showed not many studies considered comparisons that directly evaluate portfolio performances. Portfolio selection is more sensitive to estimation error of expected returns (Chopra and Ziemba, 1993); portfolio weights and subsequent portfolio performance are sensitive to the Variance-Covariance matrix estimation. In this scenario it is very hard to achieve certain targets by asset managers in most firms due to inadequacies in the selection of appropriate diversification alternatives. Kullback –Leibler information Criteria(KLIC) which is defined as Pseudo distance between two probability distributions(portfolio weights; p_i and q_i); indicate that if the investor minimizes the Kullback –Leibler information Criteria measure with q closest to q_i as the reference distribution that satisfies certain constraints, it is implied that a well diversified optimal portfolio is achieved(Kullback and Leibler 1951). It is therefore clear that if sample sizes of individual assets returns are not large enough compared to the number of assets, sample covariance matrix tends to be very imprecise; therefore diversification and portfolio efficiency will not be achieved. In this case investors or managers must always incorporate capital structure, investment risk and information as expressed in the efficient market hypothesis theory to give direction when carrying out investment diversification and portfolio selection to achieve shareholders wealth maximization. The study concludes that best diversification alternatives and efficient portfolio selection maximises shareholders wealth through assets optimal performance.

4.4 Objective three: Relationship between Investment Appraisal, Diversification Alternatives and Efficient Portfolio Selection

This section addressed the third objective of the study to examine the relationship between investment appraisal, diversification and efficient portfolio selection in the soft drink industry. The study results are in tables below

Table 4.24 : Correlations INA, DA and Portfolio Selection

		EPS	DA	INA
EPS	Pearson Correlation	1		
	Sig. (2-tailed)			
DA	Pearson Correlation	.930**	1	
	Sig. (2-tailed)	.000		
INA	Pearson Correlation	.844**	.792**	1
	Sig. (2-tailed)	.000	.000	
	N	250	250	250

**. Correlation is significant at the 0.01 level (2-tailed).

Results in table 4.24 show that the variables diversification alternative (DA), investment appraisal (INA) and efficient portfolio selection have a strong correlation (perfect correlation). The association between these variables is positive and strong. The regression results are presented as in table 4.25 below.

Table 4.25: Model Summary[b] INA, DA and Portfolio Selection

					Change Statistics			
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F Change	df1	df2	Sig. F Change
1	.946[a]	.895	.895	.26499	1056.830	2	247	.000

a. Predictors: (Constant), Investment Appraisal, Diversification Alternative

b. Dependent Variable: Portfolio Selection

The results indicate a strong correlation and positive association between the independent variable and dependent variable(R= 0.946[a)]; the analysis reveal that investment appraisal and diversification can explain efficient portfolio selection upto 89.5% (R^2 = 0.895; F = 1056.830; $p<0.05$) indicating a significant relationship exist between the variables.

Table 4.26: ANOVA[b] INA, DA and Portfolio Selection

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	148.420	2	74.210	1056.830	.000[a]
	Residual	17.344	247	.070		
	Total	165.764	249			

a. Predictors: (Constant), Investment Appraisal, Diversification Alternative

b. Dependent Variable: Portfolio Selection

Table 4.27: Coefficients[a] INA, DA and Portfolio Selection

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.430	.067		-6.394	.000
	DA	.748	.036	.701	20.828	.000
	INA	.528	.062	.288	8.561	.000

a. Dependent Variable: Portfolio Selection

$EPS. = ß_0 + ß_1DA + ß_2INA + e$

Where: EPS –portfolio Selection; DA – diversification Alternative; INA – investment appraisal; $ß_1$ and $ß_2$ are regression coefficients, e- Error term. Substituting the Unstandardized Coefficients in table 4.27 the equation becomes:

$EPS = -0.430 + 0.748DA + 0.528INA$

An increase in use of investment appraisal techniques influence efficient portfolio selection positively by a change of 0.528 while diversification alternatives influence efficient portfolio selection by appositive change of 0.748; a significant relationship exist between investment appraisal and efficient portfolio selection ($F=1056.830$; $p<0.05$). The Unstandardized beta coefficients indicate that they are statistically different from zero; and are statistically significant. The results in table 4.27 show that DA has smallest standard error (0.036) while INA has almost twice the standard error (0.062) when compared, further the standardized beta for DA is very high (.701) this reveal that effect size of this variable explain upto 70.1% of the variation in portfolio selection while INA's effect size as expressed by the standardized beta (.288) is 28.8% accounting for the variation in efficient portfolio selection. On this basis

the combination which investors choose to form diversification sets significantly influence efficient portfolios in the soft drink industry. Therefore investment appraisal and diversification alternatives significantly influence efficient portfolio selection.

In portfolio selection problems, it is accepted that investors must deal with a trade off between expected returns and the variance of returns. The Security Market Line (SML) in the CAPM served as a basis for the Multi-Factor Model; in portfolio selection the original data brought to the model are not always accurate, it may be subject to errors (Markowitz, 1952; Sharp, 1964; Fama and French, 1993). Investment appraisal depends on estimated future expected returns whose values are not expected to be accurate. Therefore, chosen investments may fall in either efficient or inefficient portfolio. Hence an image of investment alternative is not always the same in the real world scenario (Bertero, 1998). An increase in use of investment appraisal techniques influences efficient portfolio selection through diversification; it implies that diversification alternatives significantly influence efficient portfolio selection; and thus a significant relationship exists between investment appraisal and efficient portfolio selection for optimal portfolio performance in the soft drink industry in western Kenya.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

The results reveal that ARR and IRR negatively influence on portfolio selection. Their application as investment appraisal techniques decreases efficiency of portfolio selection. For NPV, PBP and PI increases efficiency of portfolio selection as their unstandardized betas are positive; in terms of statistical significance of the coefficients PI was insignificant and statistically not different from zero. For IRR values unstandardized coefficient despite its negative sign the value was statistically significant and different from zero. Therefore considering the standardised coefficient of IRR causes effect size of negative 29.4% variation to portfolio selection. This finding differed with other scholars who indicated in their work that corporate management prefer IRR and as financial theorists prefers NPV. Therefore its contribution in the model is insignificant and can be dropped. These results indicate that investors who continue to use of IRR will not achieve efficient portfolio selection for optimal performance. The results showed a coefficient of multiple correlation which was positive and a strong (almost a perfect relationship) association between the predictors and dependent variables in this study. The predictors can explain the variation in dependent variable upto 84.2% and this was result statistically significant absence of Heteroscedasticity was observed as Durbin -Watson value of 0.139 was less than 2.0.

Results for part analyses of investment appraisal techniques and portfolio selection different observations were made. When ARR is not factored the portfolio selection results indicate that regressors(NPV,IRR,PBP, and PI) have a strong correlation of 0.917^{a} and R^2 is 0.841; efficient portfolio selection is accounted for upto 84.1% ; the results indicate significant relationship of the variables almost similar to when all techniques are used. Also when both IRR and ARR are not considered in the analysis due to their negative contribution to efficient portfolio selection the influence of PI becomes negative indicating that its continued use negatively contribute to portfolio selection in the soft drink industry in western Kenya despite its test statistic being significant and causes negative effect size of 15.4% on portfolio selection for optimal performance in the industry. The technique therefore contributes to selection of inefficient portfolios rather than efficient portfolios. In this case Payback period technique still continued to maintain a superior level of influencing portfolio selection as its

magnitude of unstandardized coefficient and its effect size on portfolio selection variation was still high at 67.5% as indicated by its standardized beta coefficient. Further the use of NPV as a technique showed an effect size on portfolio selection of 40.6% a result which consistently showed that PBP technique was still better in effect size to portfolio selection in the soft drink industry. Analyzing only PBP as a regressor to portfolio efficiency, F value increased from F= 622.286 to F= 1037.205 which is a big margin. This finding informed the study that PBP is a better technique for portfolio selection in this industry. The study confirmed that instead of using it as a secondary technique for investment appraisal it should be considered as a primary technique in portfolio selection by investors.

The results for diversification alternatives and portfolio selection a weak association between WDA and EPS was observed and for average diversified alternative and best diversified alternative their correlations showed strong and significant relationship. Based on the correlation coefficients between independent variables multicollinearity did not exist as these coefficients are all below the standard value. The result showed that only ADA and BDA had positive and significant contribution to portfolio selection. Considering the standardized beta BDA effect size on efficient portfolio selection is accounted for upto 73.3%, and t statistic value (21.530) is high three times compared with that of ADA (7.283). This result revealed that BDA was a favourable option in portfolio selection for optimal performance in the industry.

Results on diversification alternative, investment appraisal and portfolio selection relationship show a strong and significant relationship existing between them. An increase in use of investment appraisal techniques and diversification alternatives influence positively portfolio selection. The results show that DA had the smallest standard error while that of INA was almost twice when compared. The standardized beta for DA was very high and its effect size was 70.1% of the variation in portfolio selection while that of INA was 28.8%. On this basis the diversification alternative have significant influence portfolio efficiency. Therefore investment appraisal and diversification alternatives significantly influence efficient portfolio selection in this industry.

5.2 Conclusion

From the findings of investment appraisal techniques and portfolio selection. The study concludes that investment appraisal techniques significantly influence portfolio selection. Therefore a strong and significant relationship exists between investment appraisal and portfolio selection in this industry. In terms of effect size of these techniques to portfolio selection, Payback Period technique was the best with highest magnitude of effect size to portfolio selection and in the model for portfolio selection.

From the findings on diversified alternatives and portfolio selection. The study concludes that diversification alternatives significantly influence portfolio selection. Therefore a strong and significant relationship exists between diversification alternatives and portfolio selection. In terms of effect size of these diversification alternatives on portfolio selection, best diversification alternative was the best in the model and with highest magnitude to portfolio selection.

From the findings on diversification alternative, investment appraisal and portfolio selection. The study concludes that a strong and significant relationship exist between diversification alternatives investment appraisal and efficient portfolio selection. In terms of effect size of these variables, diversification alternative variable has greater magnitude and best in the model for portfolio selection in this industry.

5.3 Recommendations

Based on the findings and conclusion on investment appraisal techniques and portfolio selection, the study recommends that investors in all lines of business including those in the distribution chain in the soft drink industry to use payback period technique when selecting their portfolios to attain optimal performance.

Based on the findings and conclusion diversification alternative and portfolio selection, the study recommends that firms and individual investors to consider the best diversification alternatives for their businesses portfolio to achieve optimal performance**.**

Based on the findings and conclusion on investment appraisal, diversification alternative and portfolio selection the study recommends that firms and individual investors to properly use best investment appraisal techniques like payback period and best diversification alternatives to achieve efficient portfolio selection for optimal performance.

5.4 Suggestions for Further Research

Further research can be done to establish the mediating role of investment appraisal on the determinants of optimal portfolio selection

5.5 Limitations of the Study

A number of limitations were identified in the conduct of this research. First, the study used a cross sectional research design. Cross sectional survey is limited in accuracy due to the fact that it is a snap shot at a point in time. Despite this limitation accuracy and validity of results was enhanced as the data was obtained by questionnaire administered by oral interview by the researcher and that minimized ambiguity and issues of concern corrected at source of information for the study. The data collection instrument comprised of questions which was self administered. The region under study was multi linguistic and to enhance validity of the responses of this instrument, an oral interview was administered with the aid of language translators to effectively obtain information from respondents.

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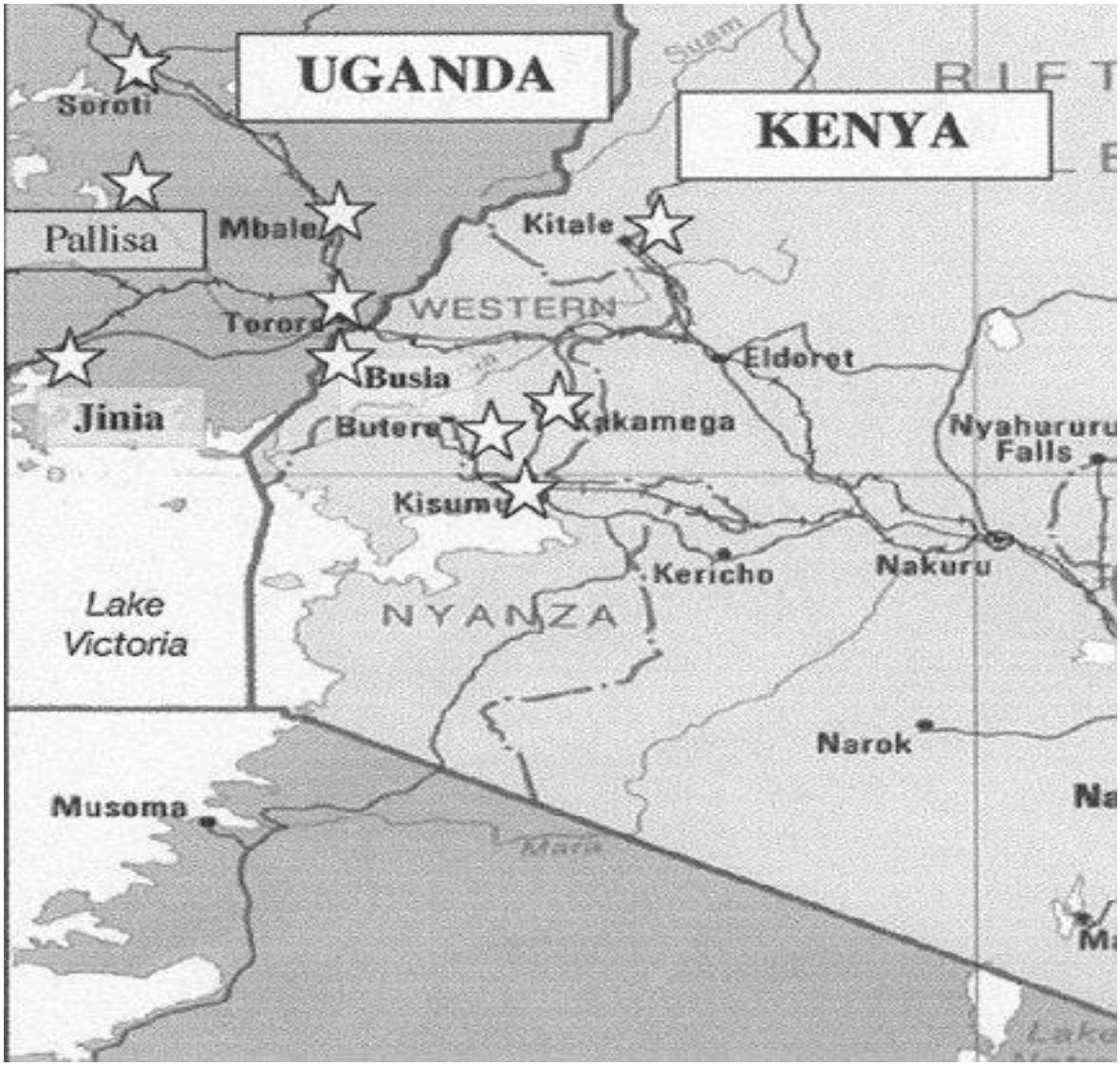
APPENDICES

APPENDIXI: Target Population

Department/Section of Respondents in this Study	Kisii Bottlers Limited (Number of respondents)	Equator Bottlers Limited (Number of respondents)
Human Resource and Administration department	13	13
Finance department	15	15
Factory department	15	15
Sales department	20	26
Supply Chain Department	8	10
Key Distributors for the Company	12	26
Strategic Supply Deports Operators for the Company	16	20
Stockists (appointed) for the Company	34	44
Total	133	169

Source: Firms in the soft drink industry in western Kenya: KBL and EBL (2014)

Appendix II: Map of Western Kenya



APPENDIX III: QUESTIONNAIRE

Q1. Do the company/ your Business use the following investment appraisal techniques to evaluate investment sets?(Indicate using a tick)

i.	Internal Rate of Return(IRR)	YES	☐	NO	☐
ii.	Net Present Value(NPV)	YES	☐	NO	☐
iii.	Pay Back Period(PBP)	YES	☐	NO	☐
iv.	Profitability Index (PI)	YES	☐	NO	☐
v.	Accounting Rate of Return (ARR)	YES	☐	NO	☐

Q2. Given Weights 1.0, 2.0, 3.0 4.0 and 5.00 how can you rate these investment appraisal tools in terms of their influence on the investment opportunity's actual returns when used in this industry?

Internal Rate of Return (IRR)
- ☐ Most Influential (5.00 weight)
- ☐ More Influential (4.00 weight)
- ☐ Moderately Influential (3.00 weight)
- ☐ Less Influential (2.00 weight)
- ☐ Not Influential (1.00 weight)

Net Present Value (NPV)
- ☐ Most Influential (5.00 weight)
- ☐ More Influential (4.00 weight)
- ☐ Moderately Influential (3.00 weight)
- ☐ Less Influential (2.00 weight)
- ☐ Not Influential (1.00 weight)

PayBack Period (PBP)
- ☐ Most Influential (5.00 weight)
- ☐ More Influential (4.00 weight)
- ☐ Moderately Influential (3.00 weight)
- ☐ Less Influential (2.00 weight)
- ☐ Not Influential (1.00 weight)

Profitability Index (PI)
- ☐ Most Influential (5.00 weight)
- ☐ More Influential (4.00 weight)

☐ Moderately Influential (3.00 weight)
☐ Less Influential (2.00 weight)
☐ Not Influential (1.00 weight)

Accounting Rate of Return (ARR) ☐ Most Influential (5.00 weight)
☐ More Influential (4.00 weight)
☐ Moderately Influential (3.00 weight)
☐ Less Influential (2.00 weight)
☐ Not Influential (1.00 weight)

Q3. Does the firm perform a trade-off between portfolio risk and expected returns?
YES ☐ NO ☐

Q4. Does the firm consider the utility scores to alternative sets of investments based on expected returns and risk? YES ☐ NO ☐

Q5. How can you rate investment appraisal techniques in terms of their influence on investment alternatives (Diversification Alternatives) for selection or resource allocation?

Internal Rate of Return (IRR) ☐ Most Influential (5.00 weight)
☐ More Influential (4.00 weight)
☐ Moderately Influential (3.00 weight)
☐ Less Influential (2.00 weight)
☐ Not Influential (1.00 weight)

Net Present Value (NPV) ☐ Most Influential (5.00 weight)
☐ More Influential (4.00 weight)
☐ Moderately Influential (3.00 weight)
☐ Less Influential (2.00 weight)
☐ Not Influential (1.00 weight)

PayBack Period (PBP) ☐ Most Influential (5.00 weight)
☐ More Influential (4.00 weight)
☐ Moderately Influential (3.00 weight)

☐ Less Influential (2.00 weight)

☐ Not Influential (1.00 weight)

Profitability Index (PI) ☐ Most Influential (5.00 weight)

☐ More Influential (4.00 weight)

☐ Moderately Influential (3.00 weight)

☐ Less Influential (2.00 weight)

☐ Not Influential (1.00 weight)

Accounting Rate of Return (ARR) ☐ Most Influential (5.00 weight)

☐ More Influential (4.00 weight)

☐ Moderately Influential (3.00 weight)

☐ Less Influential (2.00 weight)

☐ Not Influential (1.00 weight)

6. Does the firm take into account the considerable risk and commensurate gain? On this basis which of investment appraisal techniques do influence efficient portfolio selection.

Internal Rate of Return (IRR) ☐ Most Influential (5.00 weight)

☐ More Influential (4.00 weight)

☐ Moderately Influential (3.00 weight)

☐ Less Influential (2.00 weight)

☐ Not Influential (1.00 weight)

Net Present Value (NPV) ☐ Most Influential (5.00 weight)

☐ More Influential (4.00 weight)

☐ Moderately Influential (3.00 weight)

☐ Less Influential (2.00 weight)

☐ Not Influential (1.00 weight)

PayBack Period (PBP) ☐ Most Influential (5.00 weight)

☐ More Influential (4.00 weight)

☐ Moderately Influential (3.00 weight)

☐ Less Influential (2.00 weight)

☐ Not Influential (1.00 weight)

Profitability Index (PI)

☐ Most Influential (5.00 weight)

☐ More Influential (4.00 weight)

☐ Moderately Influential (3.00 weight)

☐ Less Influential (2.00 weight)

☐ Not Influential (1.00 weight)

Accounting Rate of Return (ARR)

☐ Most Influential (5.00 weight)

☐ More Influential (4.00 weight)

☐ Moderately Influential (3.00 weight)

☐ Less Influential (2.00 weight)

☐ Not Influential (1.00 weight)

Q7. Given the weights (weight of 1.0 for inefficient portfolio selection; weight of 2.0 for indifferent portfolio selection, and weight of 3.0 for efficient portfolio selection) on each technique indicate the type of portfolio efficiency selected

i) ARR selects:

Inefficient portfolio selection ☐

Indifferent portfolio selection ☐

Efficient portfolio selection ☐

ii) PI selects:

Inefficient portfolio selection ☐

Indifferent portfolio selection ☐

Efficient portfolio selection ☐

iii) NPV selects:

Inefficient portfolio selection ☐

Indifferent portfolio selection ☐

Efficient portfolio selection ☐

iv) IRR selects:

Inefficient portfolio selection ☐

Indifferent portfolio selection ☐

Efficient portfolio selection ☐

v) PBP selects:

Inefficient portfolio selection ☐

Indifferent portfolio selection ☐

Efficient portfolio selection ☐

Q8. The firm invests on behalf of its investors (shareholders) as directed by the Board of Directors. On this basis which category can you place the shareholders of this company?

- a) conservative investors ☐
- b) moderate investors ☐
- c) aggressive Investors ☐

Q9. Uncertainty and investment constraints can influence diversification and subsequent process of efficient portfolio selection. Given the constraints below and weights (weight of 0.00 for constraints having no influence on diversification; weight of 1.0 for constraints having positive influence on diversification) rate the constraints below how they influence diversification in the soft drink industry (indicate using a tick √)

Firms Capital Structure [ ] does not influence [ ] positively influence

Level of Investment Information [ ] does not influence [ ] positively influence

Level of Investment Risk [ ] does not influence [ ] positively influence

Q10. Given the constraints as conditions surrounding investments in the soft drink industry and weights (weight of 0.00 for constraints having no influence on the interaction between diversification and efficient portfolio selection; and weight of 1.0 for constraints having positive influence on the interaction between diversification and efficient portfolio selection)

rate the constraints below how they influence the interaction of diversification and efficient portfolio selection in the soft drink industry (indicate using a tick √)

a) Firms Capital Structure

[ ] does not influence interaction of diversification and efficient portfolio selection

[ ] positively influence interaction of diversification and efficient portfolio selection

b) Level of Investment Information

[ ] does not influence interaction of diversification and efficient portfolio selection

[ ] positively influence interaction of diversification and efficient portfolio selection

c) Level of Investment Risk

[ ] does not influence interaction of diversification and efficient portfolio selection

[ ] positively influence interaction of diversification and efficient portfolio selection

Q11 the firm's management normally construct diversification sets (Categories); Please rate the categories (given that efficient portfolio selection is weighted at 2.0 weight and for inefficient portfolio at 1.0 weight) in relation to efficient portfolio selection.

a) Worst Diversification Alternative results in :

☐ Efficient portfolio selection

☐ Inefficient portfolio selection

b) Average Diversification Alternative results in :

☐ Efficient portfolio selection ☐ Inefficient portfolio selection

c) Best Diversification Alternative results in:

☐ Efficient portfolio selection

☐ Inefficient portfolio selection

Q12. The firm's management normally constructs diversification sets (Categories); please rate the categories (given that efficient portfolio selection is weighted at 2.0 weights and for inefficient portfolio selection at 1.0 weight) in relation to efficient portfolio selection.

a) Worst Diversification Alternative interaction with firms capital structure results in :

- ☐ Efficient portfolio selection
- ☐ Inefficient portfolio selection

b) Average Diversification Alternative interaction with firms capital structure results in:

- ☐ Efficient portfolio selection
- ☐ Inefficient portfolio selection

c) Best Diversification Alternative interaction with firms capital structure results in:

- ☐ Efficient portfolio selection
- ☐ Inefficient portfolio selection

Q13. The firm's management normally constructs diversification sets (Categories); please rate the categories (given that efficient portfolio selection is weighted at 2.0 weights and for inefficient portfolio selection at 1.0 weight) in relation to efficient portfolio selection.

a) Worst Diversification Alternative interaction with level of investment risk results in :

- ☐ Efficient portfolio selection
- ☐ Inefficient portfolio selection

b) Average Diversification Alternative interaction with level of investment risk results in:

- ☐ Efficient portfolio selection
- ☐ Inefficient portfolio selection

c) Best Diversification Alternative interaction with level of investment risk results in:

- ☐ Efficient portfolio selection
- ☐ Inefficient portfolio selection

Q14. The firm's management normally constructs diversification sets (Categories); please rate the categories (given that efficient portfolio selection is weighted at 2.0 weights and for inefficient portfolio selection at 1.0 weight) in relation to efficient portfolio selection.

a) Worst Diversification Alternative interaction with level of investment information results in :

☐ Efficient portfolio selection

☐ Inefficient portfolio selection

b) Average Diversification Alternative interaction with level of investment information results in:

☐ Efficient portfolio selection ☐ Inefficient portfolio selection

c) Best Diversification Alternative interaction with level of investment information results in:

☐ Efficient portfolio selection ☐ Inefficient portfolio selection

Q15. Carefully link the following constructs relating to firm's management investment decision ; please rate the categories given that efficient portfolio selection is weighted at 3.0 weight; indifferent portfolio at weight of 2.0 and for inefficient portfolio selection at 1.0 weight; for worst diversification alternative (weight 1.0), average diversification alternative (weight 2.0) and best diversification alternative (weight 3.0); for the application of investment appraisal technique a weight of 2.0 is given and no application of investment appraisal technique the weight is at 1.0. Using this relationship rate the following information in table below appropriately:

Investment appraisal techniques	Diversification alternative	Type of Portfolio selected	Response
Application	Worst diversification	Inefficient Portfolio	
	Average diversification	Inefficient Portfolio	
	Best diversification	Inefficient Portfolio	
	Worst diversification	Efficient Portfolio	
	Average diversification	Efficient Portfolio	
	Best diversification	Efficient Portfolio	
	Worst diversification	Indifferent Portfolio	
	Average diversification	Indifferent Portfolio	
	Best diversification	Indifferent Portfolio	
No Application	Worst diversification	Inefficient Portfolio	
	Average diversification	Inefficient Portfolio	
	Best diversification	Inefficient Portfolio	
	Worst diversification	Efficient Portfolio	
	Average diversification	Efficient Portfolio	
	Best diversification	Efficient Portfolio	
	Worst diversification	Indifferent Portfolio	
	Average diversification	Indifferent Portfolio	
	Best diversification	Indifferent Portfolio	

INDICES

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Data on Investment Appraisal and Portfolio Selection (Survey 2014)

IRR	NPV	PBP	PI	ARR	EPS	IRR	NPV	PBP	PI	ARR	EPS
1.00	1.00	1.00	1.00	1.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00
1.00	2.00	1.00	1.00	1.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00
1.00	2.00	1.00	1.00	1.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00
2.00	2.00	1.00	1.00	1.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00
2.00	2.00	1.00	1.00	1.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00
2.00	2.00	1.00	1.00	1.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00
2.00	2.00	1.00	2.00	1.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00
2.00	2.00	1.00	2.00	1.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00
2.00	2.00	1.00	2.00	1.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00
2.00	2.00	1.00	2.00	1.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00
2.00	2.00	1.00	2.00	1.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00
2.00	2.00	1.00	2.00	1.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00
2.00	2.00	1.00	2.00	1.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00
2.00	2.00	1.00	2.00	2.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00
2.00	2.00	2.00	3.00	2.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00
2.00	2.00	2.00	3.00	2.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00
3.00	2.00	2.00	3.00	2.00	1.00	3.00	2.00	2.00	3.00	2.00	1.00

3.00	2.00	2.00	3.00	2.00	1.00	4.00	3.00	3.00	4.00	3.00	1.00
3.00	2.00	2.00	3.00	2.00	1.00	4.00	3.00	3.00	4.00	3.00	1.00
3.00	2.00	3.00	3.00	2.00	1.00	4.00	3.00	3.00	4.00	3.00	1.00
3.00	2.00	3.00	3.00	2.00	1.00	4.00	3.00	3.00	4.00	3.00	1.00
3.00	3.00	3.00	3.00	2.00	1.00	4.00	3.00	3.00	4.00	3.00	1.00
3.00	3.00	3.00	3.00	2.00	1.00	4.00	3.00	3.00	4.00	3.00	1.00
3.00	3.00	3.00	3.00	2.00	1.00	4.00	3.00	3.00	4.00	3.00	1.00
3.00	3.00	3.00	3.00	3.00	1.00	4.00	3.00	3.00	4.00	3.00	2.00
3.00	3.00	3.00	3.00	3.00	1.00	4.00	3.00	3.00	4.00	3.00	2.00
3.00	3.00	3.00	3.00	3.00	1.00	4.00	3.00	3.00	4.00	3.00	2.00
3.00	3.00	3.00	3.00	3.00	1.00	4.00	3.00	3.00	4.00	3.00	2.00
3.00	3.00	3.00	3.00	3.00	1.00	4.00	3.00	3.00	4.00	3.00	2.00
3.00	3.00	3.00	3.00	3.00	1.00	4.00	3.00	3.00	4.00	3.00	2.00
3.00	3.00	3.00	3.00	3.00	1.00	4.00	3.00	3.00	4.00	3.00	2.00
3.00	3.00	3.00	3.00	3.00	1.00	4.00	3.00	3.00	4.00	3.00	2.00
4.00	3.00	3.00	3.00	3.00	1.00	4.00	3.00	3.00	4.00	3.00	2.00
4.00	3.00	3.00	3.00	3.00	1.00	4.00	3.00	3.00	4.00	3.00	2.00
4.00	3.00	3.00	3.00	3.00	1.00	4.00	3.00	3.00	4.00	3.00	2.00
4.00	3.00	3.00	3.00	3.00	1.00	4.00	3.00	3.00	4.00	3.00	2.00
4.00	3.00	3.00	4.00	3.00	1.00	4.00	3.00	3.00	4.00	3.00	2.00
4.00	3.00	3.00	4.00	3.00	1.00	4.00	3.00	3.00	4.00	3.00	2.00
4.00	3.00	3.00	4.00	3.00	1.00	4.00	3.00	3.00	4.00	3.00	2.00
4.00	3.00	3.00	4.00	3.00	1.00	4.00	3.00	3.00	4.00	3.00	2.00
4.00	3.00	3.00	4.00	3.00	1.00	4.00	3.00	3.00	4.00	3.00	2.00
4.00	3.00	3.00	4.00	3.00	1.00	4.00	3.00	3.00	4.00	3.00	2.00

4.00	3.00	3.00	4.00	3.00	2.00	4.00	3.00	4.00	4.00	4.00	2.00
4.00	3.00	3.00	4.00	3.00	2.00	4.00	3.00	4.00	4.00	4.00	2.00
4.00	3.00	3.00	4.00	3.00	2.00	4.00	3.00	4.00	4.00	4.00	2.00
4.00	3.00	3.00	4.00	3.00	2.00	4.00	3.00	4.00	4.00	4.00	2.00
4.00	3.00	4.00	4.00	3.00	2.00	4.00	3.00	4.00	4.00	4.00	2.00
4.00	3.00	4.00	4.00	3.00	2.00	4.00	3.00	4.00	4.00	4.00	2.00
4.00	3.00	4.00	4.00	3.00	2.00	4.00	3.00	4.00	4.00	4.00	2.00
4.00	3.00	4.00	4.00	3.00	2.00	4.00	3.00	4.00	4.00	4.00	2.00
4.00	3.00	4.00	4.00	3.00	2.00	4.00	3.00	4.00	4.00	4.00	2.00
4.00	3.00	4.00	4.00	3.00	2.00	4.00	3.00	4.00	4.00	4.00	2.00
4.00	3.00	4.00	4.00	3.00	2.00	4.00	3.00	4.00	4.00	4.00	2.00
4.00	3.00	4.00	4.00	3.00	2.00	4.00	3.00	4.00	4.00	4.00	2.00
4.00	3.00	4.00	4.00	3.00	2.00	4.00	3.00	4.00	4.00	4.00	2.00
4.00	3.00	4.00	4.00	3.00	2.00	4.00	4.00	4.00	4.00	4.00	2.00
4.00	3.00	4.00	4.00	3.00	2.00	4.00	4.00	4.00	4.00	4.00	3.00
4.00	3.00	4.00	4.00	4.00	2.00	4.00	4.00	4.00	4.00	4.00	3.00
4.00	3.00	4.00	4.00	4.00	2.00	4.00	4.00	4.00	4.00	4.00	3.00
4.00	3.00	4.00	4.00	4.00	2.00	4.00	4.00	4.00	4.00	4.00	3.00
4.00	3.00	4.00	4.00	4.00	2.00	4.00	4.00	4.00	4.00	4.00	3.00
4.00	3.00	4.00	4.00	4.00	2.00	4.00	4.00	4.00	4.00	4.00	3.00
4.00	3.00	4.00	4.00	4.00	2.00	4.00	4.00	4.00	4.00	4.00	3.00
4.00	3.00	4.00	4.00	4.00	2.00	4.00	4.00	4.00	4.00	4.00	3.00
4.00	3.00	4.00	4.00	4.00	2.00	4.00	4.00	4.00	4.00	4.00	3.00
4.00	3.00	4.00	4.00	4.00	2.00	4.00	4.00	4.00	4.00	4.00	3.00
4.00	3.00	4.00	4.00	4.00	2.00	4.00	4.00	4.00	4.00	4.00	3.00

4.00	4.00	4.00	4.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
4.00	4.00	4.00	4.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
4.00	4.00	4.00	4.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
4.00	4.00	4.00	4.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
4.00	4.00	4.00	4.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
4.00	4.00	4.00	4.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
4.00	4.00	4.00	4.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
4.00	4.00	4.00	4.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
4.00	4.00	4.00	4.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
4.00	4.00	4.00	4.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
4.00	4.00	5.00	4.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
4.00	4.00	5.00	4.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
4.00	4.00	5.00	4.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
4.00	4.00	5.00	4.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
5.00	4.00	5.00	4.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
5.00	4.00	5.00	4.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
5.00	4.00	5.00	4.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
5.00	4.00	5.00	5.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
5.00	4.00	5.00	5.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
5.00	4.00	5.00	5.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
5.00	4.00	5.00	5.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
5.00	4.00	5.00	5.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
5.00	4.00	5.00	5.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
5.00	4.00	5.00	5.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00
5.00	4.00	5.00	5.00	4.00	3.00	5.00	4.00	5.00	5.00	4.00	3.00

5.00	4.00	5.00	5.00	4.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	4.00	5.00	5.00	4.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	4.00	5.00	5.00	4.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	4.00	5.00	5.00	4.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	4.00	5.00	5.00	4.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	4.00	5.00	5.00	4.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	4.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	4.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	4.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	4.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	4.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	4.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	4.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	4.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	4.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	4.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	4.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	4.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	5.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	5.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	5.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	5.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	5.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	5.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	5.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00

5.00	5.00	5.00	5.00	5.00	3.00						
5.00	5.00	5.00	5.00	5.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	5.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	5.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	5.00	3.00						

INDEX II:

Data on Diversification and Portfolio Selection (Survey 2014)

IRR	NPV	PBP	PI	ARR	DA
1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00
2.00	1.00	1.00	1.00	1.00	1.00
2.00	1.00	1.00	1.00	1.00	1.00
2.00	1.00	1.00	1.00	1.00	1.00
2.00	1.00	1.00	1.00	1.00	1.00
2.00	1.00	1.00	1.00	1.00	1.00
2.00	2.00	1.00	1.00	1.00	1.00
2.00	2.00	1.00	1.00	1.00	1.00
2.00	2.00	1.00	1.00	1.00	1.00
2.00	2.00	1.00	1.00	1.00	1.00
3.00	2.00	1.00	1.00	1.00	1.00
3.00	2.00	1.00	1.00	1.00	1.00
3.00	2.00	1.00	1.00	1.00	1.00
3.00	2.00	1.00	1.00	2.00	1.00
3.00	3.00	1.00	1.00	2.00	2.00
3.00	3.00	1.00	1.00	2.00	2.00
3.00	3.00	1.00	1.00	2.00	2.00
3.00	3.00	1.00	1.00	2.00	2.00
3.00	3.00	1.00	1.00	2.00	2.00
3.00	3.00	1.00	1.00	2.00	2.00
3.00	3.00	1.00	2.00	2.00	2.00
3.00	3.00	1.00	2.00	2.00	2.00

IRR	NPV	PBP	PI	ARR	DA
3.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00

3.00	3.00	2.00	2.00	2.00	2.00	3.00	3.00	3.00	3.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00	3.00	3.00	3.00	3.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00	3.00	3.00	3.00	3.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00	3.00	3.00	3.00	3.00	2.00	2.00
3.00	3.00	2.00	2.00	2.00	2.00	3.00	3.00	3.00	3.00	2.00	2.00
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4.00	4.00	4.00	4.00	3.00	3.00	5.00	4.00	5.00	4.00	3.00	3.00
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4.00	4.00	4.00	4.00	3.00	3.00	5.00	4.00	5.00	4.00	3.00	3.00
4.00	4.00	4.00	4.00	3.00	3.00	5.00	4.00	5.00	4.00	3.00	3.00
4.00	4.00	4.00	4.00	3.00	3.00	5.00	4.00	5.00	4.00	3.00	3.00
4.00	4.00	4.00	4.00	3.00	3.00	5.00	4.00	5.00	4.00	3.00	3.00

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5.00	5.00	5.00	5.00	5.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00
5.00	5.00	5.00	5.00	5.00	3.00	5.00	5.00	5.00	5.00	5.00	3.00

INDEX III :

Data on Moderating Variables and Diversification Alternatives (Survey 2014)

DA	FCS	LI	LIR	DA	FCS	LII	LIR	DA	FCS	LII	LIR
.00	.00	.00	.00	.00	.00	.00	.00	.00	1.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	1.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	1.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	1.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	1.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	1.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	1.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	1.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	1.00	.00	.00
.00	.00	.00	.00	.00	1.00	.00	.00	.00	1.00	.00	.00
.00	.00	.00	.00	.00	1.00	.00	.00	.00	1.00	.00	.00
.00	.00	.00	.00	.00	1.00	.00	.00	.00	1.00	.00	.00
.00	.00	.00	.00	.00	1.00	.00	.00	.00	1.00	.00	.00
.00	.00	.00	.00	.00	1.00	.00	.00	.00	1.00	.00	1.00
.00	.00	.00	.00	.00	1.00	.00	.00	.00	1.00	.00	1.00
.00	.00	.00	.00	.00	1.00	.00	.00	.00	1.00	.00	1.00
.00	.00	.00	.00	.00	1.00	.00	.00	.00	1.00	.00	1.00
.00	.00	.00	.00	.00	1.00	.00	.00	.00	1.00	.00	1.00
.00	.00	.00	.00	.00	1.00	.00	.00	.00	1.00	.00	1.00
.00	.00	.00	.00	.00	1.00	.00	.00	.00	1.00	.00	1.00
.00	.00	.00	.00	.00	1.00	.00	.00	1.00	1.00	.00	1.00
.00	.00	.00	.00	.00	1.00	.00	.00	1.00	1.00	.00	1.00

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1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				

INDEX IV:

Data on Investment Appraisal , Diversification and Portfolio Selection (Survey 2014)

EPS	DA	INA	EPS	DA	INA	EPS	DA	INA	EPS	DA	INA
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	2.00	2.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	2.00	2.00	2.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	2.00	2.00	2.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	2.00	2.00	2.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	2.00	2.00	2.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	2.00	2.00	2.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	2.00	2.00	2.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	2.00	2.00	2.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	2.00	2.00	2.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	2.00	2.00	2.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	2.00	2.00	2.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	2.00	2.00	2.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	2.00	2.00	2.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	2.00	2.00	2.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	2.00	2.00	2.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	2.00	2.00	2.00
1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	2.00	2.00	2.00

2.00	2.00	2.00	2.00	2.00	2.00	2.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	2.00	2.00	2.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	2.00	2.00	2.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	2.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	2.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	2.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	2.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	2.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	2.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	2.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	2.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	2.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	2.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	2.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	2.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	2.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	2.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	2.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
2.00	2.00	2.00	2.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00

3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00
3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00			
3.00	3.00	2.00	3.00	3.00	2.00	3.00	3.00	2.00			