Determinants of Capital Investment Criteria with Moderating Effect of Firm's Age: Evidence from Companies listed on Pakistan Stock Exchange"

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Master in Management Sciences (Finance)

COMSATS, Islamabad, 2012

A DSSERTATION SUBMITTED IN THE PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

In MANAGEMENT SCIENCES

Supervised By

Dr. Anjum Ihsan

Submitted To

FACULTY OF MANAGEMENT SCIENCES

NATIONAL UNIVERSITY OF MODERN LANGUAGES, ISLAMABAD

NATIONAL UNIVERSITY OF MODERN LANGUAGES FACULTY OF MANAGEMENT SCIENCES

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ACKNOWLEDGEMENTS

First of all, I have special gratitude to **Almighty Allah**, who blessed me the worthy firmness and vitality to effectuate this perception based study. Afterwards, I show my special attachment to **Muhammad (PBUH),** who were the conspicuous researcher of this universe and whose way of living inspired me to target for PhD level study. After Allah Almighty, my **Mother Kaneez Fatima Mirza, My father Mirza Zaman Mehdi Khan (late), and late elder brother Mirza Zumard Hussain Mehdi Khan are deserved for thanks by me.**

Besides, I would like to express my special gratitude to my worthy **supervisor, Dr. Anjum Ihsan** who gave me tough time during the accomplishment of this study but provided me regular guidance whenever I needed that, and also encouraged my innovative endeavors, and appreciated my hardworking nature. It is worthy to say that it is Dr. Anjum Ihsan whose contribution in this research work made me able to submit this dissertation timely.

Furthermore, special credit also goes to **Dr. Maqsood-UL-Hassan (Ex-Dean Social Sciences)** whose motivation since my proposal approval period, also inspired me lot to carry out the step-wise tasks of dissertation effectively. Also, honorable **HoD, Dr. Nadeem Talib (Ex-HoD)** instigated me positively to finish my dissertation of PhD tasks speedily but effectively. It is **also Dr. Naveed Akhtar, Dean Social Sciences (Ex-Director QEC and my teacher in PhD course work**, who is also capable of special gratitude from my side because, he also advised me to work with dedication whenever I visited NUML, and especially in his office. **Dr. Faid Gul (Current HoD**, Department of Management Sciences) also helped me lot to improve the research instrument for this study and he has special contribution in the re-phrasing of my PhD proposal and in the final model selection. Thank You Dr. Sahib, for your valuable comments and value addition in the right direction. The services of **Coordinators (MS & Ph.D.** Programs) **Mr. Ali Azfar and Dr. Abdul Wahid** are also worthy to mention. These both personalities guided me lot and offered their valuable services to pursue the processes of my Ph.D. dissertation and final defense. Thanks both of you Sir a lot. God Bless You all the university related mentors.

I am also grateful to **Vice President Bank Alfalah Mr. Ejaz Ahmed and Marketing Manager (Textile Company), Mr. Badar Zaman Mirza** who helped me lot in the data collection process. A special credit also goes to **Dr. Shaila Latif, Senior Micro-Biologist,** Punjab University, who assisted me lot in creating the references to meet and conduct interviews with corporate managers. **Dr. Shaila Latif** also assisted me how to tabulate the data and how to improve the thesis write-up. Other than this, I am also thankful to **my cousin Alishba Tahir,** who also encouraged me a lot for the accomplishment of this dissertation. The Parents **(Mr. and Mrs. Tahir Iqbal)** of my cousin also motivated and asserted me to finish the dissertation in time. Thanks to Alishba Tahir, her parents and her brother and sister, **Maryam Tahir wh**o prayed for me like my younger sister.

I cannot underestimate augmented contribution of **Mr. Jam Umair Sahb, Dr. Shahid Bashir**, Mr. Khawaja Mudassar, Dr. Mazhar Iqbal, Dr. Atif Bilal, Dr. Naveed Ahmed, Mr. Ali Moeen, Mr. Shamsh Nazir, and Dr. Fuad Bashir, Mr. Aziz Ahmad Chaudhry, Mr. Hassan Zada, Madam Dr. Shumaila, Dr. Gulfam, Dr. Ghulam Shabbir Niazi. They assisted me on numerous occasions, for the completion of this research. Last, but not the least, I am highly gratitude to Mrs. Saima Adil, Syed Turab Ali, Mr. Humayun Mirza, Dr. Shamsh-ul-Din, Dr. Azhar, Mr. Rauf Ahmad, Mobilink Shah Sahib, who financially assisted me during my PhD needs. To conclude, The Moral Support of **Mr. Khusru Pervaiz Khan (HoC, Szabist),** and **Dr. M. Asif Khan (HoD, Szabist),** are above board, who with passion enquired me every time for my PhD Degree while attending any official meeting or any business forum, Thanks to both of you executives, Sir.

Abstract

The matter of capital investment decision making has always been a key issue for the corporate and project managers. The criteria with which capital projects are evaluated, have always been the focal point for the corporate managers who are involved in the capital investment decision making to decide about the feasibility of capital projects. This study aims to review and investigate the managerial perceptions regarding their preferences for the application of capital investment selection criteria. This study is also aimed to study the relationship between conspicuous determinants involved in capital investment decision making process and capital investment selection criteria. This study also intends to conduct moderation analysis to check the extent of relationship between predictors (determinants) and capital investment selection criteria. This study is targeted to collect data from 1000 corporate managers of 250 sample companies listed on Pakistan Stock Exchange (PSX) through the questionnaires. The first model, RMM depicts the acceptance of seven alternative hypotheses out of ten with respect to the Multi-variant analysis, suggesting the favorable impact of seven determinates on Risk Management Methods (RMM). In essence, moderation results of this model are significant because firm age as a moderator, strongly moderates the relationship between all determinants and RMM. In the same way, second model CAM, indicates the significant effect of seven determinates on CAM (Conventional Appraisal Methods). The moderation results in CAM model due to firm age are favorable. In the third model SAM (Strategic Appraisal Methods), six alternative hypotheses are accepted. In case of moderation, again firm age has good moderation. By and large, it has been concluded, that all the results and findings of this capital investment decision making study are in agreement with the results and findings of previous studies in terms of impact of selected determinates on the capital investment decision making criteria and the effect of respective moderators on the relationship between them. The delimitations can be captured to broaden the scope and horizon of this study. To conclude, this study proceeds from general theoretical justification of past researchers to the specific direction by doing the practical and applied research and analyzing the collected data in order to meet objectives of the study after testing the stated hypotheses of all the three models.

Key Words: Pakistan Stock Exchange (PSX), Risk Management Methods (RMM), Conventional Appraisal Methods (CAM), Strategic Appraisal Methods (SAM), Capital Investment Criteria, Project Financing, Capital Projects, Managerial Perceptions, Moderation Effect, Determinants, Delimitations

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List of Abbreviations

CAM	Conventional Appraisal Methods
NPV	Net Present Value
IRR	Internal Rate of Return
PBP	Pay Back Period
ARR	Accounting Rate of Return
RRR	Required Rate of Return
CIDM	Capital Investment Decision Making
RMM	Risk Management Methods
SAM	Strategic Appraisal Methods
DCF	Discounted Cashflows Methods
PI	Profitability Index
MIRR	Modified Internal Rate of Return
BA	Beta Analysis
SA	Sensitivity Analysis
ADR	Adjusted Discount Rate
QRA	Quantitative Risk Analysis
PA	Probability Analysis
AMT	Advanced Manufacturing Technology
VC	Venture Capital
CIDMC	Capital Investment Decision Making Criteria
PSX	Pakistan Stock Exchange
SECP	Securities and Exchange Commission of Pakistan
ROI	Return on Investment
ROCE	Return on Capital Employed
OLS	Ordinary Least Square
NDCF	Non-Discounted Cashflows
CFO	Chief Financial Officer
CEO	Chief Executive Officer
MBA	Master in Business Administration

CG	Corporate Governance
MF	Manufacturing Flexibility
WE	Workforce Efficiency
RO	Reliability of Outputs
EV	Expansion in Volume
EUC	Environmental Uncertainty
ECF	Effect of Competitive Force
ITA	Innovative Technology Adoption
VC	Venture Capital
AC	Agency Cost
FAP	Financial Appraisal profile
CAPM	Capital Asset Pricing Model
WACC	Weighted Average Cost of Capital
APV	Adjusted Present Value
D/E	Debt-Equity Ratio
GCC	Gulf Cooperation Council
FEI	Financial Executive Institute
BSC	Balanced Score Card
ROA	Real Option Analysis
VCA	Value Chain Analysis
BM	Benchmarking
T Rm.	Technology Roadmapping
FOREX	Foreign Exchange Rates
RADR	Risk Adjusted Discount Rate
ISE	Islamabad Stock Exchange
LSE	Lahore Stock Exchange
DAM	Data Analysis Methods
FA	Factor Analysis
RA	Regression analysis
STATA	Software for Statistical Applications
SPSS	Statistical Package for Social Sciences

SME	Small Medium Enterprises
VP	Vice President
SVP	Senior Vice President
AVP	Assistant Vice President
CFB	Corporate Finance Banking
GM	General Manager
CCS	Cross Country Swaps
IRS	Interest Rate Swaps

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Chapter-1

Introduction

1.1. Background of the study

Business firms all over the world are confronted with many quantitative and perception based financial decisions regarding capital investment decision making. Capital investment decision making is targeted towards investment decisions by corporate managers regarding new projects or expansion of existing projects, and the replacement of the existing infrastructure for the long term survival of those firms which are involved in diversified business (Akalu, 2003). The managers' perception affects these decisions which in turn determine the firms' capital expenditures and their financing modes (Alessandri et al., 2004). The investment strategy adopted by the business firms determines their future growth and profitability. Future success of the firms, however, depends not only on finding an investment strategy but also on the managerial perceptions which induce the way a strategy is implemented (Peterson and Fabozzi, 2002).

In the typical capital investment decisions, management makes a commitment of current resources in order to secure a stream of benefits in future years. Generating investment proposals is the prerequisite for the systematic capital investment decision making that is often neglected. A good investment proposal is not just born, it has to be suggested. In the absence of a creative search for new investment opportunities, even the most sophisticated technique and criterion is worthless (Prakash et al., 2003). A smart and quantitative and perception based investment decision making requires the comparison of alternatives. It is the fact that many firms always earn a positive return that lends importance to the time dimension of the typical capital investment project (Akalu, 2003; Fadi and Northcott, 2006). A dollar given up today is not equivalent of the dollar received in the future as long as there exists the alternative of earning a positive return on the dollar during the interim.

In the industrialized nations today, financial analysts, economists, management scholars, policy makers, corporate executives, and special interest groups are engaged in high-stakes debate over corporate governance, financial decision making, investment appraisal evaluation techniques, and determinants of capital investment projects and decision making (supported by, Andor et al., 2011). Jenson (2001) recommended to corporate planning managers that they must have a criterion or criteria for evaluating the performance to make alternative courses of action. The aim of the each criterion for the capital investment decision making should be to maximize the long term value of firm.

Akalu (2001) found on the basis of survey responses that the computation of the Pay Back Period (PBP) is simple if the cash flows are in the form of annuity. He determined that PBP has a number of drawbacks despite its simplicity; for example it does not consider the time value of money. He also identified that Accounting Rate of Return (ARR) is designed to compute the percentage of the accounting return on the project which uses the accounting profits to measure the benefits of a project (Gitman, 1977; Gitman and Mercurio, 1982). In one of his studies based on perception of corporate managers, Lefley (1998) documented that ARR also has the practical weaknesses like the PBP. He observed that it does not take into account the time value of money and ignores the timing and patterns of cashflows from the capital projects.

Strategic Appraisal methods are also applied by the corporate level senior practitioners for the effective capital investment decision making. Fadi and Northcott (2006) studied the perceptions of corporate level managers and noted the use of strategic capital investment decision making analysis tools. They highlighted that strategic dimensions for the effective capital investment decision making include the Balanced Scorecard (Kaplan and Norton, 1992, 1996, 2001; Mulmi, 2001; Milis and Mercken, 2003; Lyons et al., 2003; Kim et al., 2003), Real Option Analysis (see Copeland and Howe, 2002; Black, F., Scholes, M., 1973), Value Chain Analysis (Black and Scholes, 1973, 1974; Cox et al., 1979), Value chain Analysis (Porter, 1985; Shank and GovindraJan, 1992; Govindarajan and Shank; Hoque, 2001), Benchmarking (Hoque, 2001; Camp, 1989), Technology Road mapping (Groenveld, 1997).Afonso & Cunha (2009) also observed from the survey responses that the real option reasoning is the strategic capital investment decision making criterion (Copeland and Howe, 2002; Black and Cox, 1976; Black and Scholes, 1973, 1974). Hussain and Shafiq (2013) on the basis of corporate managers' responses also asserted on the application of the strategic methods like real option. They also observed that 8% of sample business firms apply the Real Option Tool for the investment decision making and it is the basic area where management focuses the more (Merton, 1976; Kaplan and Norton, 1992; Milis and Mercken, 2003; Lyons et al., 2003).

In the empirical literature Beta Analysis, Sensitivity Analysis, Adjusted Discount Rate, Quantitative Risk Analysis, Probability Analysis are the frequently applied risk management dimensions for the effective capital investment decision making (Fadi and Northcott, 2006; Afonso and Cunha, 2009). Fadi and Northcott (2006) supported the view that strategic projects are substantial investments that involve high levels of risk and have a significant long term impact on corporate performance. Bhimani (2009) and Afonso & Cunha (2009) also determined in the light of managerial view that capital projects involve risk. Therefore, it is perceived by the corporate level managers that Risk Management is the dimension of the capital investment decision making (e.g. Ryan and Ryan, 2002, Graham and Harvey, 2001, Farragher et al., 2001, Moore and Reichert, 1983, and Gitman and Forrester, 1977).

Capital investment decision making for the capital projects is also affected by the modern technology adoption as computer-based technologies have speeded up the projects which needs the appropriate decision making dimensions for the selection (see Hopwood, 1990; Scapens, 1985; Kim et al., 1986; Sangster (1993; Hoque et al., 2001). Kotha and Swamidass (2000) are of the view that capital projects investment decision making is also affected by the corporate strategy, advance manufacturing technology (AMT) and firm's performance (Dean and Snell, 1991, 1996; Dean et al., 1992; Gerwin, 1993; Parthasarthy and Sethi, 1993). Baker and Dutta (2010) also observed that advanced manufacturing, business technologies, substantial shifts in production capability (Butler et al., 1991; Slagmulder et al., 1995; Slagmulder, 1997), company acquisitions and mergers, the introduction of major new product lines and the installation of new manufacturing processes affect all the dimensions of the capital investment decision making (Hearth and Park, 2002; Fadi and Northcott, 2006).

Afonso and Cunha (2009) as based on the views of corporate executives noted that some environmental external factors like industry type, competitive aspects with the business rivals, and economy characteristics (Porter, 1985; Fisher, 1998) and some of the internal factors like firm's corporate strategy, production technology and firm's age have direct effect on the effective capital investment decision making (Davilla, 2005; Mile's and Snow, 1978). Croce et al., (2013) conducted a survey to solicit the corporate managerial view. They observed that Venture Capital has link with the Productivity Growth of the business firms (see Bottazzi et al., 2008; Davila et al., 2003; Gompers and Lerner, 2001). Gul et al., (2013) carried out a survey study and explored the effect of corporate governance mechanism on firms' corporate financing decisions (see, Jensen, 1986; Jenson, 2001 Fisher, 1998; Domes, 1998).

Fama and Jensen (1983) determined that in order to reduce agency problems, key roles must be performed at different levels. Arsaln et al., (2014) in their survey of corporate managers supported the view that competitive business environment is a big challenge for the investment decisions that has the effect on the effective capital budgeting methods and leads towards the effective capital investment decision making. They also determined that venture capital plays a pivot role in the capital investment decision making as these are the new ventures which require the venture capital (Holmes, 1998; Arsaln et al., 2014). Furthermore, it is perceived that investors prefer the role of the corporate governance for the capital investment decisions (Bhujraj and Sengupta, 2015; Coombes and Watson, 2000; Lin, 1996; Fama and Jenson, 1983).

Ozmel et al. (2013) in a research soliciting the managerial view, observed the tradeoff between Venture Capital and Strategic Alliances for the capital investment decisions. These strategic Alliances are made to minimize the risk of the capital projects. They identified the role of strategic alliance partners as sources of capital for nascent firms (Lerner et al., 1998). Robinson and Stuart (2007) also determined that capital projects of the business firms are financed through venture capital (VC) strategic decisions. Lindsey (2008) also supported that VCs facilitate Strategic investment decisions of the portfolio companies. In addition, Hochberg, Ljunqvist, and Lu (2007) also found in the light of surveyed data that better net- worked VCs have more successful portfolio companies. In addition, it is also perceived by the managers that many high-tech companies rely heavily on inter-firm commercialization agreements (Strategic Alliances) for capital funding to make capital investment decisions (Ozmel et al., 2013). Capital investment related studies also support the view that Venture Capital funding is important source of private capital for biotechnology firms (Lerner and Merges, 1998, Stuart et al., 1999).

There are also some studies which have been conducted on the role of moderating relationship between the determinants and capital investment decision making criteria such as (Sangster, 1973; Pike, 1982; Kim et al., 1986; Mills and Herbert, 1987; Black and Gilson, 1998; Arnold, 2001; Gompers and Lerner, 2001; Ryan and Ryan, 2002; Fadi and Northcott, 2006; Afonso and Cunha, 2009; Davilla and Foster, 2007; Cumming, 2010; Gul et al., 2013; Arsaln et al., 2014). Considering these studies, the pertinent moderating variables are firm's age, firm's size, D/E ratio and management style which are mostly taken as the moderators. In view of the above, this study is aimed to examine the different internal and external determinants affecting the capital investment decision making criteria with moderating effect of Firm Age. The criteria for investment include the Risk Management Methods, Conventional Appraisal methods and Strategic Appraisal Methods which are described with details in the theoretical framework section.

The literature depicts that Capital Investment Decision Making (CIDM) Criteria include the Risk Management Methods (RMM), Conventional Appraisal Methods (CAM), and the Strategic Appraisal Methods (SAM). This study is also focused on the measurement of these dimensions as contrasted with the internal and external determinants affecting the CIDM Criteria in terms of managerial perceptions. Furthermore, this study is also determined to check the moderation effect of Firm Age. It is expected that Firm Age as a moderator, affects the relationship between capital investment decision making criteria and all the independent internal and external determinants of this study.

1.2. Brief Description and History of Pakistan Stock Exchange (PSX)

The history of Pakistan Stock Exchange is not very old because it is adjoined very soon after the birth of Pakistan. Pakistan Stock Exchange Limited (PSX) (formerly: Karachi Stock Exchange Limited (KSE) was established on September 18, 1947. It was incorporated on March 10, 1949. Only five companies were initially listed with a total paid-up capital of 37 million rupees. The first index introduced in KSE was based on fifty companies and was called KSE 50 index. Trading used to be carried out on open out-cry system. Computerized trading system called Karachi Automated Trading System (KATS) was introduced in 2002 with a capacity of 1.0 million trades per day and the ability to provide connectivity to an unlimited number of users. In October 1970, under the Securities and Exchange Ordinance of 1969 by the Government of Pakistan, a second stock exchange was established in Lahore in response to the needs of the provincial metropolis of the province of Punjab. It initially had 83 members and was housed in a rented building in the crowded Bank Square area of Lahore. The LSE was the first stock exchange in Pakistan to use the internet services of the treading of stocks listed on it.

Other than the LSE, Islamabad Stock Exchange was established in Islamabad, the capital city of Pakistan on October 25, 1989 with the main object of setting up of a trading and settlement infrastructure, information system, skilled resources, accessibility and a fair and orderly market place that ranks with the best in the world and to cater to the needs of less developed areas of the northern part of Pakistan. It was licensed as a stock exchange on January 7, 1992. All these three exchanges had separate management, trading interfaces, indexes, listing criteria etc. and thus had no mutual links to each other. All three exchanges were previously operating as a non-profit organizations with mutualized structure wherein these respective members had trading as well as ownership rights.

This structure inherently created conflict of interest and perceived to jeopardize the investors' interest. Therefore, the Stock Exchanges (Corporatization, Demutualization & Integration) Act, 2012 (known as "Demutualization Act") was promulgated by the Government. As a result these three exchanges were merged together to form a new combined exchange called Pakistan Stock Exchange Limited (PSX) which started its operations on January 11, 2016 under this new title, namely Pakistan Stock Exchange (PSX). As provided under the aforesaid Demutualization Act, now Members have ceased to be Members of PSX and they have been issued Trading Right Entitlement Certificates ("TRECs") and PSX's ownership shares, thus separating trading rights from ownership rights. Whereas TRECs represent trading rights, PSX shares represent ownership. Now, TREC holders need not be a shareholder of PSX nor a PSX shareholder is required to be TREC holder of Pakistan Stock Exchange (PSX).

It is provided information to the participants of PSX that under the provisions of the Demutualization Act, regulatory functions have been segregated from commercial functions of PSX, so that regulatory functions are not compromised for achievement of commercial objective of generating revenue. Moreover, under the provisions of the said Act, after demutualization, persons representing TREC holders on the PSX Board shall not be in majority and the Act also envisages divestment of shares of TREC holders held in their blocked accounts to strategic investors and general public/financial institutions within a certain time limit. Karachi branch of Pakistan Stock Exchange is located on Stock Exchange Road, in the heart of business district of Karachi. This premises in the heart of Karachi, is known as Stock Exchange Building plaza.

Listing in PSX

To be aligned with the data, recorded on on July 9th, 2019 there are 557 companies listed in PSX and the total market capitalization is Rs. 6,843.958 billion. The listing is done on the basis of strict rules and regulations laid out by Securities Exchange Commission of Pakistan (SECP) & the management of Pakistan Stock Exchange Limited (PSXL). All the listed companies on the PSX, are categorized in various main business sectors. As on July 9th, 2019 there are total 35 sectors listed on Pakistan Stock Exchange which contribute towards the market capitalization and all the listed companies (excluding their future contracts) are divided among these. Rest of the noncontributory sectors are allocated for indexes, futures, bonds and other financial securities as well.

KSE 100 Index

The KSE-100 Index was introduced in November 1991 with base value of 1,000 points. The Index comprises of 100 companies selected on the basis of sector representation and highest free-float capitalization, which captures over 80% of the total free-float capitalization of the companies listed on the Exchange. 35 companies are selected i.e. one company from each sector on the basis of the largest free-float capitalization and the remaining 65 companies are selected on the basis of largest free-float capitalization in descending order. This is a total return index i.e. dividend, bonus and rights are adjusted. It is revised after every six months for inclusion or exclusion of companies on the basis of above mentioned criteria.

Free-Float is the proportion of total paid-up shares issued by a company that are readily available for trading at a Stock Exchange. It implies that the shares held by controlling directors, sponsors, promoters, government and other locked-in shares which are not available for trading in the normal course are excluded. During 2012, the governing board of directors of the Pakistan Stock Exchange (formerly: Karachi Stock Exchange) decided to implement the KSE-100 Index on the basis of free-float market capitalization instead of total market capitalization. The Rules for composition and recomposition of Index based on free-float methodology have remained un-changed other than selection of companies on the basis of free-float market capitalization as against total market capitalization.

KSE-All Indexes

In 1995, the need was felt for an all-share index to reconfirm the KSE-100 and also to provide the basis of index trading in future. By August 29, 1995 the KSE-All Share Index was constructed which became operative on September 18, 1995. KSE-All Index is calculated using total market capitalization method.

KSE-30 Index

In June 2005, another index named KSE-30 was introduced with a base value of 10,000 index points to provide investors with a sense of how large companies' scrips of Pakistan's equity market are performing over a period of time. KSE-30 Index is designed in such a way that it becomes comparable over a period of time similar to other indicators that track various sectors of economy activity such as the gross national product, consumer price index etc. KSE-30 Index is calculated using the free-float capitalization methodology. In accordance with methodology, the level of index at any point of time, reflects the free-float market value of 30 companies in relation to the base period. The free-float methodology refers to an index construction methodology that takes into account only the market capitalization of free float shares of a company for the purpose of index calculation.

KMI-30 Index

This Index was introduced in September 2008, objective of KSE-Meezan Index (KMI) is to serve as a gauge for measuring performance of Shariah compliant equity investments. Besides tracking performance of Shariah compliant equities, its construction will increase investor trust and enhance their participation. KSE-Meezan Index is also calculated using freely floating system

ALL SHARES ISLAMIC Index

This index was introduced on November 18, 2015 as a joint effort by the management of Pakistan Stock Exchange (PSX) and Meezan Islamic Bank Limited. The principal objective of the All Shares Islamic Index is to gauge the performance of the Shariah compliant segment of the equity market. Accordingly, it is important that all those shares which meet the Shariah screening criteria should be included in the All Shares Islamic Index in order to ensure completeness of the index and adherence to the core objective of proposed All Shares Islamic Index. The companies included in this index are selected on the basis of a six factors selection criteria. First criteria is that the core business of the company must be permissible in Islamic Shariah and also on ethical grounds.

The remaining five factors determine the financial compliance of the companies. After selection, these companies pass through another six stage filter to exclude defaulter, non-operational companies along with all Mutual Fund companies. Base value for this index has been set at 15,000 points. Review and Re-composition will be carried out bi-annually. You can get download a complete brochure and current list of companies included in this index from the official web site of Pakistan Stock Exchange. For your convenience we have also given below direct links to both the files.

1.3. Problem Statement

In the global business village, the corporate managers of firms have to confront the hurdles in the way of decisions related to investment selection criteria of capital projects on the basis of quantified managers' perceptions. Furthermore, managers also have to face the hurdles in the choice of the key determinants which directly or indirectly affect the investment criteria of the business firms for the selection of healthy capital projects. To examine the factors which play a role of moderation relationship for the selection of investment criteria is also the key problem which the corporate managers of the business firms are confronted with. Therefore, this study is determined to find out and suggest the appropriate capital investment criteria in collaboration with key internal and external determinants affecting the investment criteria and also to recommend the selection of pragmatic indicator which creates the moderation effect.

1.4. Research Questions

After taking a keen review of problem statement and keeping in view the significance of the study, the following questions have been pointed out:-

1. How do internal determinants (including corporate governance and strategy, manufacturing flexibility, workforce efficiency, and reliability of outputs) affect Capital Investment Decision Making Criteria of companies listed on Pakistan Stock Exchange (PSX) in terms of corporate managers' perception?
2. To what extent external determinants (including environmental uncertainty, effect of competitive force, innovative technology adoption, venture capital and agency cost) affect Capital Investment Decision Making Criteria of companies listed on PSX in terms of corporate managers' perception?
3. How does firm age moderates the relationship between internal and external determinants and Capital Investment Decision Making Criteria as assessed in terms of corporate managers' perception?

1.5. Research Objectives

Objectives must be pragmatic so that these are adequately addressed in the methodology. They should also be in agreement with the research problem and research questions. In this view, the objectives of this study are as follows:-

1. To examine the relationship between internal factors (corporate governance and strategy, manufacturing flexibility, workforce efficiency, reliability of outputs and expansion in volume) and Capital Investment Decision Making Criteria.
2. To analyze the relationship between external factors (environmental uncertainty, effect of competitive force, innovative technology adoption, venture capital and agency cost) and Capital Investment Decision Making Criteria.
3. To check the moderating effect of firm age in the relationship between internal & external factors and Capital Investment Decision Making Criteria.

1.6. Gap in Prior studies

The perception based studies related to capital investment criteria conducted in Pakistan are included the "capital budgeting practices in Islamic banking" (Hussain and Imran, 2013), it stresses just on the use of capital budgeting methods for the capital investment decisions ignoring the other investment methods like risk management methods and strategic appraisal methods. There is another study based on Corporate Governance and financing decisions of registered firms (Gull et al., 2013), which includes the sample of merely 24 banking companies from the services sector whereas ignoring the other growing sectors of the economy. In the context of capital investment decision making, the impact of Firm size on capital budgeting techniques also has been investigated by Arsaln et al., (2014). But this investment related study (Arsaln et al., 2014) focuses only on textile sector firms while ignoring the other healthy sectors of the economy. Furthermore, these researchers (2014) solely applied the capital budgeting methods to measure capital investment decision making.

Furthermore, in the past studies, the main focus was on the application of capital budgeting methods (NPV, IRR, PBP, and ARR) solely to appraise the projects. But, this study is also targeted to deliver the application of risk management methods (Beta Analysis, Sensitivity Analysis, Probability Analysis, Computer Simulation Analysis, and Risk adjusted Discount Rate) and strategic appraisal methods (Balanced scorecard, Real Option Analysis, Value Chain Analysis, Benchmarking, and Technology Roadmapping) by the managers to evaluate and select the capital projects. In this study, the application of all these three methods are tested through the perceptions of corporate managers at different levels which are quantified at later stage of the dissertation after the data collection. Moreover, so far in Pakistan no study is conducted to examine the perception based quantified relationship among the variables (independent and dependent) by applying the related measures and techniques which are applied and recommended in this study.

Also in this capital investment related study, the effect of moderator, firm age is checked in view of relationship between the determinants (internal and external) and capital investment decision making criteria so that the level of moderation of this driver can be assessed. The selection of firm age has been done on the basis of previous relevant studies and strong theoretical support (Pike, 1982; Mills and Herbert, 1987; Chenhall and Brownell, 1988; Chalos and Poon, 2000). The other moderating drivers including the Firm Size, Management Style, Profitability and D/E ratio could also have been taken in this study. But, we selected only the firm age owing to its limited application in this kind of study in Pakistan. Other than this, the firm age plays a contributive role in the selection and attainment of capital projects. The investors' confidence increases with the maturity of firms (Firm Age). It is perceived by all the stakeholders of capital projects that corporate managers of matured firms are in better position to make healthy investment decisions. This is the reason for the selection of firm age as a moderator.

Therefore, to fill this gap, this study is conducted with the purpose to search out the appropriate pragmatic capital investment decision making criteria adopted by the business firms of Pakistan and to assess the determinants of the same investment criteria in collaboration with the moderating driver, firm age

The results of this study are aimed to recommend the suitable and pragmatic criteria to the corporate financial managers of the business firms to evaluate the capital projects on the basis of the pragmatic perceptions related to investment decisions by the corporate executives which in details can be hardly seen in anyone of the studies of Pakistan in this area of research. In short, this study is undertaken to examine the relationship between internal and external determinants affecting the capital investment decision criteria as moderated by the relevant factor, firm age.

In summary, most of the studies in the past are mainly focused on financial literature in relation to the quantitative measures based on secondary data which is used in selection of capital projects. But as regards the managerial perceptions (Primary data) in view of the capital investment decision criteria, the pertinent literature is limited especially with reference to the developing countries such as Pakistan. Keeping in view the managers' responses, this study fills the gap of lack of managers' perceptions in decision making of capital investment projects related studies.

1.7. Significance of the study

Capital investment criteria play a key role in the success of any firm's investment projects. The application of the capital budgeting techniques for the capital investment decisions is the debate that is predominant in the literature of Projects Investment and Financial Economics since last four decades. As far as the managerial perception regarding the capital investment decision making practices is concerned, several studies can be found mainly for US firms (see Ryon and Ryon, 2002; Graham and Harvey, 2002; Farragher et al., 2001; Gitman and Forester, 1977), some evidences for UK business firms (see Akalu, 2002; Pike, 1984), some evidence for Sweden (see Sandahl and Sjogren, 2003), for Netherland (see Verbeeten, 2006), for Portugal (see Afonso and Cunha, 2009) and evidence for New Zealand (see Fadi &Northcott, 2006). But owing to limited research conducted in Pakistan, more understanding is required regarding the perception of corporate managers of business firms that why they adopt different methods/techniques for capital investment decision making particularly.

This study will be a good guideline for the investment related decisions of financial experts to adjust their investment for the future returns with the help of conventional tools, risk analysis, and strategic appraisal. The findings of this study will facilitate academicians, practitioners and financial experts in the financial and non-financial business sectors of Pakistan to take right kind of decisions while selecting any type of the capital investment project. There is hardly any advanced perception based work on this issue in Pakistan.

Moreover, this study will also benefit the business firms' investment decisions that are expected to promote the profit which is one of the main goals of the managers of the business firms. Future research may be undertaken with a motivation of further exploring and expanding the results of this study and suggesting how the theory and practice gap can be mitigated in the business sectors of Pakistan.

Keeping all this in view, the perception of corporate managers of companies listed on Pakistan Stock Exchange (PSX) have been studied in view of application of the above mentioned techniques. In this study, the parameters of risk analysis are examined to reach at appropriate capital investment decision making criteria. The view pertaining to the application of Conventional Appraisal Methods in the capital investment decision making is also limited in the empirical literature specifically with reference to corporate managers' perceptions of the business firms in Pakistan. Therefore, the dimensions of these techniques have also been evaluated so that corporate managerial decision making process may be facilitated in connection with capital investment decision making criteria.

The view pertaining to the application of Strategic Appraisal Methods in the capital investment decision making is limited in the empirical literature specifically with reference to Pakistan. Therefore, the dimensions of these techniques will be appraised so that managerial decision making process may be facilitated in connection with capital investment decision making criteria. This study will also be helpful for the understanding of corporate managers about the moderation effect of firm age. Though they are well aware of this fact that older firms can perform better than the newly born firms. But, by the results of this study they will be in this position of understanding how a single factor affects both the capital investment criteria and different key determinants simultaneously.

1.8. Delimitations of the study

In research, the delimitations are those characteristics that limit the scope and define the boundaries of our study. The delimitations are in the control of the researchers. The researcher delimits the study including the choice of objectives, the research questions, variables of interest, theoretical perspectives that we adopt (as opposed to what could have been adopted), population and the sample size. Keeping all this in view, following are the delimitations of the study:

1. Many factors or dimensions have been selected by the past researchers in the capital investment decision related studies. The selection of selected dimensions in the theoretical framework of this study is because of the reason that these kinds of factors have been hardly applied in the kind of perception based capital investment related studies with specific reference to Pakistan. Therefore, only few factors pertinent to the Pakistani context were selected excluding other important factors which can have significance implications regarding the capital investment area.

2. We could have included non-listed companies in the sample but they were excluded owing to the reason that such companies do not meet the listing requirements of PSX. Listing of the companies is beneficial as listed companies normally follow the healthy corporate practices in view of the capital investment decisions. For this reason, only the listed companies were sampled in the study.

3. Finally, we could have selected the other evaluation methods which are used for the capital investment decision making such as, Return on Investment (ROI) and Return on Capital Employed (ROCE). But we selected only the Risk Management methods including the Conventional Appraisal Methods, and Strategic Appraisal Methods because these methods are mainly applied in the capital investment decision related studies with particular regard to the managerial perception.

1.9. Organization of the Thesis

The remaining part of this perception based study has been organized into six chapters. A brief overview of these chapters is given below:

Chapter-2 of this perception based capital investment study provides a detailed and descriptive overview of the concerned literature review to the problems of study. All the literature review of this study mainly focuses on the risk management methods, conventional appraisal tools, and strategic appraisal methods which are applied by the corporate managers of the business firms in Pakistan as well as all over the world.

All these methods and techniques are applied for the effective decision making of the capital investment projects. In the section of literature review, the overview of all the firms' efficient methods have been given with proper references quoted in the parentheses. The conventional methods are included the discounted cashflows methods (NPV and IRR) and the, the non-discounted cashflows methods (PBP and ARR). The separate literature of all these concerned variables have been presented in the literature review section of this perception based study as well.

The Strategic Appraisal Methods include the Real Option Analysis, Balance Scorecard, Benchmarking, Value Chain Analysis, and Technology Roadmapping. The literature-review section briefly describes all these strategic methods with proper references. Chapter-2 also provides the relevant literature of all the risk management methods embedded with the capital projects' investment decision making with proper references. The literature review section of this perception based study also provides the brief overview of some of the internal and external determinants of the business firms on which the capital investment decision making also depends upon. The literature of these factors have also been reported with the proper references quoted from the past studies of the researchers in this field.

All the concerned literature aims to construct the suitable theoretical frameworks so that predictors can be adjusted in the theoretical frameworks to establish the econometric models for the financial modeling of the results and findings. In this chapter three theoretical frameworks have been formulated to create the relationship between the capital investment decision making criteria and the internal & external determinants with the moderating effect of moderators, to decide the better capital investment related criterion or criteria for the capital projects' decision making. The hypotheses based on each theoretical framework have also been formulated in this chapter of the perception based study. All these hypotheses are to be tested with the help of data collected through the instruments (questionnaire and interviews). The chapter is summarized in the last with appropriate references that beautifully summarized the gap of this empirical perception based study.

Chapter- 3 of this investment related perception based study exposes the detailed description of the Methodology that has been applied in this empirical perception based study. The basic background of the target population and the sample size of the business firms listed on PSX have been described in this section of the thesis. This chapter also provides the detailed description of the research instrument, data sources, data collection and data processing methods. This chapter also encompasses the econometric models and statistical tests for the statistical modelling of the data collected through the instruments (questionnaire and interviews). Finally, in this chapter the brief description of the statistical tools and Softwares has also been given which are applied to empirically test the hypotheses based on the problem statement and objectives of the study. The summary of this chapter has been described in the last part of the chapter.

Chapter-4 of this capital investment related empirical perception based study describes the findings and results of the statistical modelling based on the data collected through the instruments. This chapter of the study describes in depth the empirical results of the tests based on the assumptions of OLS regression and multiple regressions. The chapter-4 describes the descriptive results and the regression results based on Model-1, Model-2 and Model-3 of this perception based study. The figures, graphical analysis and chart analysis of the data collected also have been elaborated in this chapter and it describes the residuals (error terms) of the prescribed models of this perception based study as well. This chapter also explains the reliability and validity of the questionnaire and interviews before testing the assumptions of Regression models. Finally, the summary of this chapter has been put up in the end of this chapter.

Chapter-5 of this perceptions based study describes a detailed and comprehensive discussion of the results and findings of the study based on the statistical results that have been analyzed in the chapter-4. In chapter-5, the results and findings of this study related to Capital Investment Decision Making Criteria, have been compared with the results and findings of the same kind of studies in the past. The results and findings of the follow-up interviews and thematic interviews have also been reported with the concerned references of the corporate financial executives of the business firms in Pakistan.

The other results of the study have been discussed with suitable references to capital investment related studies in the past. The implications of this capital investment related study has also been discussed in this section of the thesis. The real life applications and relevance of the results of the study for the investment related decisions are also elaborated in this chapter. Finally, overall summary of the discussion has been discussed in the last part of chapter.

Chapter-6 of this capital investment related perception based study provides the conclusions of all the three models of this Capital Investment Decision Making study and recommends some future directions to take one step ahead of this perception based investment study. This chapter also provides practical applications and future guidelines to the new researchers and corporate managers in this area how to conduct capital investment related matters and how to reach at the appropriate capital investment criteria to maximize the worth of the firms and wealth of the owners of firms. The new researchers can capture new lines in this area or expand limitations of this study as well.

The detailed list of the references have been reported at the end of this study. In the end of the report, an appendix has also been added. In the appendix, the research instrument has been attached that was applied to collect data from target key corporate executives of the sample business firms listed on PSX. For the future researchers, it is recommended that they can use, modify, adapt and rectify this questionnaire for conducting the same kind of empirical research task in this area. This modification and rectification can increase the reliability and validity of this instrument for these kind of perception based studies. The statistics for the reliability and validity of this perception based study, based on collected data from the sample, and the instrument used, have been provided in the results and findings section of this current study related to capital investment decisions.

CHAPTER-2

REVIEW OF LITERATURE

2.1. Background of Literature

There have been conducted many studies to determine the capital investment decision making criteria including those, which reflect the managerial views related to the capital investment decision making. The main focus of this study is to capture the perception and beliefs of the corporate level senior managers of the companies listed on Pakistan Stock Exchange regarding the relevant determinants to evaluate the capital investment decision making criteria.

The literature on capital investment decision making criteria is predominantly focused on as how to maximize the shareholders' wealth of the companies. The first and primary objective of the corporate level senior managers of the business firms should be to formulate such policies and strategies which can help in growing the value of the firms in order to increase the worth of owners' investment. In this connection the right choice of the capital investment decision making criteria play a significant role (Ryon and Ryon, 2002). The corporate level managers are recommended to undertake all those strategic and non-strategic projects which may enhance the wealth for the shareholders and firms' future prospects simultaneously (Gilbert, 2005).

Abdel-Kader and Dugdale (2001) identified that the traditional investment appraisal methods basically involves ROI or FCFs analysis, PBP, NPV and IRR for the Advanced Manufacturing Technology (AMT) related investment projects, however, these methods were unable to capture all the relevant information that is pre-requisite for the well-knitted projects financing decision making (see for example, Abdel-Kader, 1997; Chen & Small, 1996; Dugdale & Jones, 1995; Accola, 1994; Cheug, 1993; Lavelle & Liggett, 1992). They determined that these methods emphasize mainly the application of loaded quantitative and financial analysis for the capital projects evaluation but ignore the other side of the picture, i.e. the intangible incentive of the investment projects and the perceptions of the corporate level managers towards the right kind of investment selection criterion. They also identified that benefits of capital projects can be captured through the manufacturing flexibility of the production units, refined product quality and high morale of the workforce (see Naik & Chakravarty, 1992; Azzone et al., 1993; Ruland, 1989; Park & Son, 1988; Srinivasan & Millen, 1986; Kaplan, 1986; Knott & Getto, 1982).

Al-Ajmi (2011) observed that capital investment decision making has crucial role for the long term survival of the financial and non-financial business firms. For this reason, the investment related decisions are positively related to the maximization of shareholders' value. Capital investment projects related decisions are among the most important financial decisions which are dealt with or taken by the corporate financial executives of any firm or project manager of a company. In this view, capital budgeting process refers to the process of determining the capital investment projects which will maximize the corporate shareholder's value. And to carry out this process well, the business firms are expected to evaluate capital investment alternatives with the application of appropriate tools which are used to evaluate the acceptance or rejection of the capital investment project (Graham & Harvey, 2001; Brounen, de Jong, and Koedijk, 2004).

Bennouna et al. (2010) conducted an electronic mail survey of corporate executives of the Canadian business firms to assess their preferences towards the selection of the criterion or criteria for the projects' appraisals and the capital investment decision making. The researchers targeted the key corporate executives of 500 largest business firms which were registered in the Financial Post magazine. But their sample size was confined to only 88 business firms because the response rate was just 18.4 %. The results of their study indicated that the sales revenues of the targeted business firms increased from 1000 to 1999 Million Canadian dollars due to the application of capital budgeting tools for the projects' evaluation (see Graham & Harvey, 2001).

Brounen et al. (2004) conducted an electronic mail survey of the financial executives of 6000 registered financial and non-financial business firms in U.K, Germany, and France and 500 business firms which were listed in Netherland. The stocks of these firms were publicly traded as well as privately held. They also included the demographic data about the CFOs and the CEOs other than the targeted business information related to capital budgeting decision and the projects appraisal financing. The response rate of their study was just 5 percent. They found that corporate level executives apply the mixed tools for the decision making of the capital investment projects. They highlighted that some corporate managers apply DCFs methods while other managers apply Non-DCFs methods. They also observed that more weighted preference is given to the NPV and IRR as compared to the PBP and ARR (Graham & Harvey, 2001; Brounen et al., 2004).

Maquieira et al. (2012) observed the practices of capital budgeting methods for capital investment decisions making in the survey of corporate managers of Latin American companies. Their target sample was CFOs and CEOs of these companies. These companies were also registered on the Chilean Stock Exchange. They also arranged face to face interviews and electronic contacts with the alumni of MBA, and Master in Finance programs of the universities to gather responses of the academicians and practitioners about the capital projects' evaluation and decision making tools. Only 290 alumni responded and showed interests towards the capital budgeting tools in selection and evaluation of projects of the said Latin American companies. However, these results were found significantly different from those of developed countries' capital markets. The researchers also observed in view of the survey responses that these financial executives and business Alumni were inclined more towards the DCF methods than the non-DCF methods for the projects evaluation and capital investment decision making.

Hermes et al. (2007) observed the practices of the corporate level managers of the companies listed on China and Netherlands stock exchanges with regard to the capital investment decision making process. They sent electronic questionnaires but their response rate was very low from the financial executives of the Dutch companies out of which 69% of the firms were publicly traded, whereas response rate of Chinese companies was 93 percent which were also publicly traded. They found that 84% of the interviewed companies had sales target lower than 500 Million Euros. They identified in view of the survey responses that corporate managers were more inclined towards capital budgeting methods for investment decision making rather than other methods (Graham & Harvey, 2001; Brounen, de Jong, and Koedijk, 2004; Brounen et al., 2004).

In the light of above literature, it can be argued that the capital investment decision making can be done using different methods. The most suggested methods are the Strategic Appraisal Methods, Risk Management Methods, and the Conventional Appraisal Methods. The available literature also highlight that there are a number of factors as regarded important by the corporate managers, which affect the capital investment decision making criteria. Among those factors, some can be categorized as the internal determinants/factors and some as external determinants/factors which have direct effect on the capital projects investment decision making criteria. These detailed discussion of these determinants are provided in the below sections.

2.2. The Linkage of Independent Factors with Capital Investment

By taking a keen stock of the past studies, the following internal and external factors have the solid empirical and theoretical background:

2.2.1. Internal Determinants & Capital Investment Decision Making Criteria

1. Effect of Corporate Governance & Strategy on Capital Investment

Corporate Governance is the governance mechanism of the management inclined towards shareholders' interests, corporate securities decisions and the strategic goals for the long term benefits of the firms (Gul et al., 2013; Kotha and Swamidass, 2000; Jenson, 1986) which may enhance the capital investment opportunities for companies in the future. The managers of the business firms perceive that corporate governance and strategy has the direct linkage with the corporate decisions related to the capital investment. The corporate managers believe that capital investment projects can be undertaken successfully if there is good governance and flexible strategic decisions are taken by the directors of the companies (Gul et al., 2013).

The background of different theories related to corporate governance is also embedded with the capital projects investment decision making. Almost all the theories directly or indirectly are correlated with the capital investment projects which ultimately lead to increase the wealth of the shareholders and serve the interests of other stakeholders. The Stakeholders Theory (Abrams, 1951) ensures the interests of each of the stakeholders inside the organization who are involved in the process of capital investment decision making. This theory also asserts to serve all the internal shareholders' interest in case of successful completion of the projects undertaken. But on the other hand Coleman (2008) criticizes this theory owing to the reason that it merely focuses on the interests of the corporate management whereas it ignores the other stakeholders outside the organization. The Resource Dependency Theory (Pfeffer and Salancick, 1978) supports the capital investment projects decision making. This theory states that there is environmental linkage between the firms and the external resources of the society. Williamson (1985, 1987) also supports the Resource Dependency theory and capital investment. He argues that transactions costs of the capital projects can be alleviated if there is networking between the corporate governance of the firms and outside resources. Another school of thought that is linked with the performance of the

Kotha and Swamidass (2000) found that overall firm's efficiency is based on increase in sales and the employment level that can be used as decision making criterion for the effective capital investment decision making (Snell and Dean, 1992; Gerwin, 1993; Parthasarthy and Sethi, 1993; Abernathy, 1995).They also determined that sales of the products depend upon the factors like cost, differentiation and market competition. Therefore, cost leadership strategy, differentiated strategy and effective competitive strategy are the well-built determinants of the effective investment decision making which managers include in their evaluation reports.

Afonso and Cunha (2009) identified the link of corporate strategy with effective capital investment decision making methods based on conventional appraisal, risk management and the strategic appraisal. Their findings also revealed that corporate strategic decisions support the conventional methods (see Pike, 1996; Brealey and Myers, 2012; Verbeeton, 2006). Corporate strategic and governance mechanism also affects the strategic appraisal methods like real options, value chain, balanced score card due to unbiased results (see Copeland and Howe, 2002; Black, F., Scholes, M., 1973). Risk Management is the dimension of the effective capital Investment decision making (e.g. Ryan and Ryan, 2002; Graham and Harvey, 2001; Farragher et al., 2001) due to its risk alleviation quality towards capital investment projects. Capital investment can be enhanced if there are solid decisions at the corporate levels by the corporate managers of the financial and non-financial firms (Ryan and Ryan, 2002).

Gul et al. (2013) in a study based on the perceptions of corporate managers of business firms documented relationship between corporate governance mechanism & firms' financing decisions based on the conventional, strategic and risk management tools. They also found that capital investment decision making also deals with appropriate selection of debt and equity that a firm uses to finance its assets. Furthermore, large size boards may result in higher agency problems which can make weak the corporate governance due to which leverage increases; whereas, low leveraged firms were identified with having fewer number of outside directors (Jenson, 1986).

Bhujraj and Sengupta (2003) and Sengupta (2015) recorded the corporate managerial responses and observed the effect of corporate governance on the investment decision through the bonds offering. They noticed that effective capital investment decision is based on the criterion of Firms' efficiency. They (2003) also believed that corporate boards have the fiduciary duty of monitoring the management performance and protecting the shareholder interests (Fama and Jenson, 1983; Lin, 1996; Suto, 2003). Their (2003) results also indicated that 80% of the investors would pay a premium for the well-governed firms which highlight the favorable role of corporate governance (Coombes and Watson, 2000) for the capital investment.

2. Effect of Manufacturing Flexibility on Capital Investment

This is the flexibility in the manufacturing processes of the business firms with respect to time and place. This flexibility is also related to the production of the goods outside the factories' premises (Afonso and Cunha, 2009; Snell and Dean, 1992, 1996; Gerwin, 1993; Parthasarthy and Sethi, 1993). The perception based studies in the past show that flexibility in manufacturing processes or services has the direct relationship with the capital investment decision making.

This capital investment study is based on the following theories which focus on the flexibility of production and services processes. Just in Time Approach (Kannan and Tan, 2005) also focuses on the manufacturing processes of investment projects. The availability of the raw materials and inventory is ascertained to accomplish the initiation and competition of the capital projects which are targeted in the production of goods and services. JIT also emphasizes on quick production of products to satisfy the customers' needs without causing over stocks. Therefore, JIT goals achievement is an internal matter of the firm which affects the performance level and is defined by the management decisions (Kannan and Tan, 2005). This flexibility in the manufacturing process also ensures the success of the capital investment project (Callen et al., 2000; Fulleron and McWatters, 2001, 2002, 2003; Germain, 1996).

Total Quality Management (TQM) Theories (Germain and Gitman, 1996) also have implications for the success of the capital projects. These theories are directly linked with the manufacturing processes and units (Tari, 2005). Hodder (1985, 2001) conducted a perception based study of the corporate level senior managers of the business firms and discussed the effect of manufacturing units' flexibility on the conventional methods for the decision making. It was noted that that NPV and IRR are biased against long term projects and have inability to evaluate strategic capital investment investments with future growth opportunities (Gerwin, 1982; Gold, 1983). It was also that underinvestment in manufacturing units as well as in other strategic projects in US firms, is the result of excessive use of DCF analysis. The results of the study also supported conventional techniques and found these Discounted Cash flow Techniques conceptually valuable for capital investment decision making.

Fadi and Northcott (2006) gathered the responses of senior corporate level managers and found that flexibility in the manufacturing process has direct relationship with the effective capital investment decision making criteria (Butler et al., 1991; Slagmulder et al., 1995; Slagmulder, 1997; Cooper and Slagmulder, 1997). The researchers identified that the manufacturing flexibility include the flexible working hours, flexible manufacturing units, flexible wages, flexible labors and availability and installation of any machine or units whenever needed. Their findings also revealed if there are flexibilities in these elements, then capital investment decision making can be made more effective and logical. The results of the study conducted by Milis and Mercken (2003) also showed the same direct linkage of the manufacturing flexibility and the strategic appraisal methods (see also Ulaga, 2003; Copeland and Howe, 2002; Pike and Ho, 2001; Shank and GovindraJan, 1992; Cox et al., 1979; Black, F., Scholes, M., 1973).

Li et al. (2013) in a study based on the perceptions of the senior level corporate managers identified the effect of manufacturing practices on the process efficiency and organizational performance. They also recorded the interviews of managers and noticed that organizational performance is improved if it is an increase in both the sales and employment level of the firms (Nemeth and Cook, 2007). They documented that manufacturing practices improve organizational performance which has positive relationship with manufacturing operations. They were also of the view that manufacturing practices and organizational performance result in the increase of business sales and employment level of emerging Asian and industrialized Western countries (supported by Power et al., 2010; Van and Weken, 1998).

3. Effect of Workforce Efficiency on Capital Investment

Workforce efficiency means to what extent the work force at different levels is efficient for the growth of the business firms (Afonso and Cunha, 2009; Porter, 1980; Caves et al., 1980). This workforce creates the horizons of the skills and efforts at both management and working-units level. The existing literature suggests that the efficient workforce has direct linkage with the effective capital investment decision making process by the corporate managers.

Two Factor Theory (Herzberg, 1967; House, 1967) describes that by increasing the motivation level of the workforce, the efficiency of the capital investment projects at job level can be enhanced (Deshields, 2005). The efficiency of the workforce for the capital investment projects can be achieved if the basic needs of the workforce at the job levels are met. This verifies the Maslow's Hierarchy Needs Theory (1943), which identifies the demand for fulfilling the basic needs of workforce along with other hierarchical needs including safety, love, esteem and self-actualization. It is also noticed that workforce efficiency for the capital investment projects may be increased if the workforce is carefully observed by some observers and researchers and rewards are given accordingly (Alderfer, 1969). The workforce efficiency at top levels is also affected by the Contingency Theory (1915). This theory states that the efficient managers who are involved into the capital investment projects, take decisions on the basis of current situation and also apply the intuitional skills to increase the efficiency of the investment projects.

Marimuthu et al. (2009) conducted a survey of the business executives from the corporate sector and explored the linkage between the capital investment decisions and the performance of the workforce. They found that workforce is the human capital that enhances the efficiency of the organization through sales and employment level (see Bruggen et al., 2009; Eckel and Grossman, 2008; Zeithaml et al., 2000; Majchrzak et al., 2000; Davenport, 1998; Thorbjornsen and Mouritsen, 2003; Van Marrewijk and Timmers, 2003). The researchers (2009) determined that the knowledge, skills, and expertise of the individuals affects knowledge creation and sharing and in turn improves the learning process (Argyris and Schon, 1974, 1978; Forrester, 2000; Lewis et al., 2004). They supported the view that in order to expand the human capital, an organization needs to invest in the development of employees and attract people with the high knowledge, skills, and expertise from the external labor pool so that capital investment projects may be succeeded in the future (Snell and Dean, 1992; Greenwood, 1993; Koch and McGrath, 1996).

They (2009) also supported the notion that the combined knowledge, wisdom, expertise, skill, intuition, innovativeness, and ability of the individuals should be taken into account to meet the tasks and goals at hand, which include values, culture, and philosophy (Zeithaml and Malhotra, 2000; Majchrzak, 2000; Davenport 1998; Thorbjornsen and Mouritsen, 2003; Van Marrewijk and Timmers, 2003). It was further highlighted that the experienced workforce may ensure the successful capital investment whereas the corporate executives appear to show a better understanding than the investors in case of indicators such as staff satisfaction index, staff capacity, motivational index, workforce stability, and workforce competence profile.

4. Effect of Reliability of Outputs on Capital Investment

Reliability of outputs means to what extent the goods and services are reliable towards the customers and stakeholders of the business firms (Fadi and Northcott, 2006; Stevenson and spring, 2007; Stevenson and Jarillo, 2007; Stevenson and Radin, 2009; Afonso and Cunha, 2009). The reliability of the outputs (both goods and services) has direct impact on the capital investment decisions. Greater the reliability of the goods and services, there would be more capital investment decisions both in financial and non-financial sectors. There have been conducted many perception based studies and surveys regarding the reliability of outputs and the capital investment. Among those studies, the following studies are prominent which describe the direct linkage of the reliability of outputs and the capital investment decision making process.

The reliability of the products and services lead towards the consistent customers' satisfaction level which ultimately produce more opportunities for the future capital investment projects due to increase in the demands of the specific goods. The Assimilation Theory (Anderson, 1973) is preliminary based on the assumption of the Dissonance Theory (Festinger, 1954; Aronson, 1969). This theory states that product's performance is the direct result of the capital project's investment efficiency (Oliver, 1979, 1980, 1987, 1989). These studies imply that customers' satisfaction level is linked with the reliability of goods and services which should be considered while making and implementing the capital investment projects. The Contrast theories by Hovland et al., (1957), Oliver and Winer (1987) and Jacoby (1987), are rooted in the reliability of products and services to ensure the success of the capital projects (Wegener, 1997).The Contrast Theory portraits an alternative approach of consumer post-applied evaluation process than was presented in assimilation theory in that post-applied evaluations lead to results in opposite predictions for the effects of expectations on satisfaction from the consumer side.

But, on the other hand, the Negative Theory (Aronson and Carlsmith, 1963) describes the negative linkage between the discrepancies of performance or reliability with the future capital projects decision making. According to the authors of this theory, any deviation from the expected reliability of the products will lead to the disconfirmation from the consumers' side because expectations are strongly held from the customers about the reliability of the products and services. Arnold and Hatzopoulos (2000) recorded the responses of the corporate level senior managers of the business firms. They found that reliability of the outputs has direct effect on the effective capital investment decision making (see Pike, 1988, 1996; Ho and Pike, 1991). They determined that the reliability of the outputs enhance the firm's efficiency as the demands of the products in the eyes of the customers is increased which results in more capital investment on financial and non-financial grounds.

Milis and Mercken (2003) in their survey based study also described the direct linkage of the reliability of the outputs with the strategic appraisal methods (Gumbus et al., 2003; Copeland

and Howe, 2002; Black, F., Scholes, M., 1973; Cox et al., 1979). Their results are consistent with the results of other studies (see Shank and GovindraJan, 1992; Hoque, 2001; Camp, 1989; and Groenveld, 1997). They also noted the linkage of reliability of outputs with the conventional methods in case of long term projects. The results of the studies conducted by Pike (1988, 1996), Ho and Pike (1991), and Arnold and Hatzopoulos (2000) based on the responses and experiences of the corporate level senior managers also supported the positive linkage of reliability of the outputs with the risk management methods for the capital investment decision making.

Fadi and Northcott (2006) also conducted a perception based survey of the corporate level managers to check the effect of the manufacturing flexibility and reliable goods on the firm's performance. Their results are consistent with Arnold and Hatzopoulos (2000). The results of Pike (1988, 1996), Ho and Pike (1991), and Arnold and Hatzopoulos (2000) as based on the managerial view, also show the positive linkage of reliability of the outputs with risk management methods for the capital investment decision making.

Freiesleben (2010) in their survey based study solicited the opinions of corporate executives to explore the linkage between the capital investment decisions and the reliability of outputs. They (2010) determined that growth of any firm is the result of capital investment decision making process of the firm and this capital investment decision is ultimately affected by the reliability of the outputs (Wruck and Jensen, 1994; Powell, 1995). Furthermore, they (2010) also highlighted that reliability of outputs is dependent on many sub-factors like input efficiency of some features adopted during the manufacturing, production technology, pollution costs and production cost. Their (2010) results also indicated that pollution and production cost can be shifted toward the customers in order to produce the reliable goods (e.g. Taguchi, 1986; Freiesleben, 2005; Erni et al., 2008).

5. Effect of Expansion in Volume on Capital Investment

Expansion in volume is increase in the size of the business firms; that is the products and services are increasing continuously and are also expected to increase in future as well (see Stevenson, 2007; Butler et al., 1991). The results of the perception based studies and surveys in the empirical literature show that expansion in volume of the business has direct link with the capital investment. The corporate level senior managers believe that more opportunities for the capital investment are created with expansion of the current businesses of the firms.

The theoretical literature also supports the linkage between the expansion in volume of business and capital investment projects. The classical theories in economics more vividly describe this relationship. The Classical Trade Theories presented by Smith (1776) and Ricardo (1817) discuss that expansion of the firms depends upon the resources to produce the goods and services, and to increase the profit levels. The profit oriented firms, ultimately contribute towards the economic growth of those countries where the firms are operating. These resources are utilized whenever any capital investment project is to be initiated and finished. Factor Proportion Theory (Hecksher and Ohlin, 1991) also supports the conviction of Classical Trade Theories. According to this theory, the capital investment projects are successful if the firms of the countries are utilizing the available level of abundant resources and expanding the current level of products line. The Product Life Cycle Theory (Garvin, 1984; Vernon, 1966; Levy et al., 1991) is stemmed into the capital investment projects decision making. It states that with the initiation of capital investment projects, the foreign production starts, which pushes up the export level of the countries of production which leads to increase the value of the firm.

Segelod (1998) in a study based on the responses of corporate executives, documented relationship between expansion of the firms and effective capital investment. He is of the view that whenever expansion in the volume of the existing business is required, then the investment decision making is mandatory to avail expansion of the business (Pike, 1982; Scapens, 1985; Roberts and Scapens, 1985; Mills, 1988; Evans, 1992). The results of these studies also showed that expansion has the direct effect on the capital investment criterion or criteria. They also documented the corporate managers' philosophy that expansion needs the conventional and risk management methods to be availed and evaluated. His (1998) results also support the view of the corporate managers that expansion needs the cost of time, labor, manufacturing and services.

Hopwood (1990) gathered the responses of senior level corporate managers and identified that expansion of products has direct link with the capital investment criteria. He determined that large expansion needs more appropriate decision making criterion or criteria for the effective capital investment decision making so that future losses can be avoided or mitigated. The results of his study (1990) supported the view that conventional appraisal and risk management methods for expansion (Pike, 1982; Mills and Herbert, 1987) can be applied for capital investment decision making. Kim et al. (1990) also supported their view that expansion in the current assets affects the conventional and risk management methods for effective capital investment. They determined in light of the survey responses that the expansion needs cashflows spread over multiple years, and conventional appraisal methods are more appropriate to deal with these cashflows.

Arsaln et al. (2014) recorded the corporate managerial responses and observed the effect of expansion on the capital investment decision making. They also identified the link of expansion of the business firms with the conventional methods for effective investment decision making. They supported the view of corporate managers that NPV is the most applied criterion despite its limitations for uncertainty in discount rate (Viviers and Cohen, 2011). They (2014) also determined that IRR is the best generalized method to be applied by the corporate financial managers (Scott and Petty, 1984; Wang, 2011). Their (2014) results also indicate that DCF methods, including the NPV, IRR, and PBP, are applied simultaneously for the evaluation of capital investment projects due to their sophistication and easiness (Trahan and Gitman, 1995).

2.2.2. External Determinants & Capital Investment Decision Making Criteria

The following external factors have the solid empirical and theoretical background.

1. Effect of Environmental Uncertainty on Capital Investment

Environmental uncertainty is distortion in the political and economic environment that affects the effective capital investment decision making(Afonso, 2009; Fadi and Northcott, 2006; Porter, 1980).The corporate managers perceive that it causes low input from investors that results in the reduction of capital projects and can impede the capital investment opportunities.

The theoretical literature supports the link of environmental uncertainty with the capital investment decision making. The theory which was presented to describe this relationship by Miller (1992), is called Miller's General Environmental Uncertainties Theory. This theory describes the five major environmental uncertainties which impede the capital investment decision making. The first uncertainty is called Political Uncertainty that is linked with the factors like war, abrupt revolution, political turmoil, and sudden changes in democratic government (Lee and Miller, 1992; Rajagopalan and Spreitzer, 1997). The second uncertainty is called Government Policy Uncertainty which is involved with the factors like fiscal & monetary reforms, price control, trade restrictions, nationalization and government restrictions and regulation etc. The third uncertainty is named as Macroeconomic Uncertainty that is involved with the changes in inflation, relative prices, exchange rates, interest rates and terms of trade.

The fourth uncertainty is the Social Uncertainty that is involved with changes in social concerns, social unrest, riots, and terrorism movements etc. The last uncertainty is named as Natural Uncertainty that is involved with the variations in rainfall, hurricanes, earthquakes, and other natural disasters. Two system contingency theories also describe the relationship between the environmental uncertainty and capital investment. The first System Contingency Theory by Burns and Stalker (1968) states when there is stability in the environment, then the projects decision making should be done by the managers on the basis of the mechanistic system of the organization as this type of system retains the capital projects in the most effective way (Fouraker and Stopford, 1968). On the other hand, if there is uncertainty in the environment, then the organic type of system is more appropriate for the pre and post evaluations of the capital projects investment decisions. The second System Contingency Theory by Lorsch and Morse (1974) states that there should be more coordination among the management of the business firms and environmental stakeholders while conducting and evaluating the capital investment projects, especially in those cases when the clouds of uncertain conditions are prevailing over the whole environment as a whole (supported by Burns and Stalker, 2006; Goodnow, 1982).

Akalu (2003) conducted a perception based survey of the corporate level senior managers of business firms and documented the relationship between environmental uncertainty and capital investment process. He also determined the effect of uncertain circumstances, embedded with risk, on the conventional appraisal, strategic appraisal and risk management methods to evaluate the capital investment decision making (Arnold, 2001; Graham and Harvey, 2001). He (2003) identified that the corporate managers criticize DCF methods as these are unable to appraise the soft projects adequately, which lead the management to select such projects on intuition, experience and rule of thumb methods (Ross, 1986; Venkatraman, 1986; Motta, 2001).

Fadi and Northcott (2006) in another study soliciting managerial view documented the link between uncertainty of the environment and the effective capital investment decision making (Butler et al., 1991; Slagmulder et al., 1995; Slagmulder, 1997). They (2006) determined that uncertainty involves the demand and supply problems, strikes, economic and political crises, and machines breakdown etc. They also identified that if there are adjustments in these elements, investment decision making can be made more effective and logical. Milis and Mercken (2003) also conducted a survey of the corporate level managers and identified the linkage of uncertainty of the environment with the strategic appraisal methods.

Afonso and Cunha (2009) gathered the responses of senior level corporate managers in the business firms. They documented the relationship between uncertainty of the environment and the capital investment decisions, based on conventional, strategic and risk management methods. They (2009) identified that uncertainty has direct relationship with the conventional and strategic methods. They (2009) also found that environmental uncertainty has negative relationship with risk management methods (e.g. Davilla and Foster, 2005; Ryan and Ryan, 2002; Graham and Harvey, 2001; Farragher et al., 2001; Moore and Reichert, 1983; Mile’s and Snow, 1978).

2. Effect of Competitive Force on Capital Investment

Effect of competitive force means the effect of competitive environment and competitive business rivals on the capital investment decision making of the business firms (Afonso and Cunha, 2009; Fisher, 1998; Porter, 1985). The corporate managers perceive that in the presence of competitive business arena, the process of capital investment decision making criteria can be made more valuable and worthy to be selected and implemented.

The Generic Strategy Model depicts that the superior value of the products of firms results from the lower prices and better quality than the competitors' products of the same type. This model describes that capital investment projects are beneficial for the owners and customers of firms only if these projects are competing with the projects of their business rivals. The firms can take the competitive advantage over their business rivals if they are the followers of cost leadership and differentiation strategies. The Resource Based Theory (Grant, 2000, 2004) also identifies the relationship between capability to compete with the business rivals and capital investment decision making. This theory states that before starting the capital projects, the management should ponder over the strategies of their business rivals and then find out their capabilities to meet the resources to complete the capital investment projects.

Porter Five Forces theoretical model was first time published in 1980. It was refined and reworded in 1985 by Michael E. Porter by himself and was published again. This model also indirectly states the linkage between competitive position analysis and capital projects investment decision making. According to Porter (1985), the rivalry among the existing competitors is affected by new entrants, bargaining power of suppliers, bargaining power of buyers, and threat of substitute products or services. The capital or long term projects of the business firms are started with the objective to produce the goods or services in the future. Therefore, the capital investment projects are affected by the forces as described by the Porter in his model.

Afonso and Cunha (2009) conducted a survey study of the business firms to evaluate the capital investment decision making criteria. They documented the linkage between the effect of competitive force and the capital investment decision making based on conventional, risk management and the strategic appraisal methods. They (2009) also determined that competitive environment of the firms supports the corporate managers to apply the conventional methods to evaluate the capital projects (see Porter, 1985; Pike, 1996; Brealey and Meyer, 1998; Verbeeton, 2006). Their (2009) results also revealed that business firms face competition; therefore, the managers of such firms have to make the best capital investment projects decisions. They also identified use and application the other evaluation strategic appraisal methods like real options, value chain and balanced score card due to their unbiased results (Porter, 1985; Fadi and Northcott, 2006). It was also identified that the real options method is as an important tool in the managerial decisions involving the products, technology and services.

Arsaln et al. (2014) conducted a study of business firms to take a stock of views of corporate managers regarding the capital investment decision making criteria. They determined that competitive business environment is a big challenge for the investment decisions of textile based firms in Pakistan. They identified that competitive business environment has direct effect on the conventional methods which lead towards the effective capital investment decision making by the corporate managers of the business firms (Brounen, 2004; Graham and Harvey, 2001).

3. Effect of Innovative Technology Adoption on Capital Investment

This is the effect of modern technology on the capital investment decisions (Ozmel et al., 2013; Afonso and Cunha, 2009; Fadi and Northcott, 2006; Nicolaou, 2002).The corporate managers believe that the process of capital investment can be made more effective with the adoption of innovative technology and modern production methods.

The previous studies also support the linkage between Innovative Technology Adoption and capital projects decision making. The Diffusion of Innovation Theory (Rogers, 1995) also strengthens the linkage between different stakeholders of the capital investment projects through communication (i.e. diffusion) with the help of innovative technological instruments like computerized networking stations. This theory is also called the Multi-step flow theory. Through Multi step Flow theory, Roger is of the view that efficiency of the capital investment projects can be enhanced through innovative medium of contacts between the firms' members as well as inter-personal contacts which provide information and influence opinion or judgment. Rogers argues that capital projects are affected by the innovative technology when the effect of their application is reflected into the products of those capital investment projects.

Sangster (1993) recorded the responses of corporate level senior managers of business firms and documented relationship between innovative technology and the quantitative investment decision making criteria. He found that effective investment decision making for the capital projects is affected by the modern technology adoption. The results of the study showed that the computer-based technologies have speeded up the projects which needs the appropriate decision making dimension for selection (see Hopwood, 1990; Kim et al., 1986; Scapens, 1985). He (1993) identified that corporate level senior managers assert on the application of conventional appraisal methods in its principal forms of NPV and IRR. He also found that the corporate financial executives use one or more of these techniques but prefer the NPV criterion than all others methods. Furthermore, he identified that few of the corporate managers also criticize NPV and IRR as these are more time consuming and costly than ARR and PBP. The application of the risk management methods was also asserted to minimize the risk of the projects. It was also highlighted that soft projects (computer based projects) need the appropriate decision making based on risk mitigation (see Hopwood, 1990; Kim et al., 1986; Roberts and Scapens, 1985).

Fadi and Northcott (2006) in a study gathered the responses of corporate managers and identified the link of innovative technology with capital investment decision making criteria. They found that corporate managers stress for the effect of innovative technology adoption on the conventional appraisal methods (see Slagmulder et al., 1995; Pike, 1996), strategic appraisal methods (Lyons et al., 2003; Copeland and Howe, 2002; Cox et al., 1979; Black, F., Scholes, M., 1973) and the risk management methods (Arnold and Hatzopoulos, 2000) for the capital investment decision making. They (2006) determined that projects availed with innovative technology adoption are probable to increase the cashflows making the positive NPV and IRR greater than the hurdle rate, and also mitigate uncertainty of projects with application of risk and strategic methods for decision making (see Pike, 1996; Arnold and Hatzopoulos, 2000).

Lindsey (2008) also recorded the responses of corporate level senior managers and observed the link of innovative technology with capital investment decision making. He found that technological based firms facilitate Strategic Alliance activities. They (2008) also determined that better net-worked strategically allied firms have more successful technological based companies (Hochberg, Ljunqvist, and Lu, 2007). He also identified that many high-tech companies rely heavily on inter-firm commercialization agreements for capital funding to make capital investment decisions. Ozmel et al. (2013) also recommended in view of managerial view that capital funding is important source of private capital for bio-technological firms (Lerner and Merges, 1998; Stuart, Hoang and Hybels, 1999) which are popular among investors due to risk mitigation characteristics for the capital projects decision making.

4. Effect of Venture Capital on Capital Investment

This is the capital of the business firms that is raised for new ventures from issuing of debt and equity in the capital markets with the assistance of investment bankers through IPO (Initial Public Offering). The managers believe that effective capital investment decision making especially for new ventures can be made more worthy with the issuing of venture capital as enough cash-inflows are in hand to meet the capital expenditures of the respective projects. Venture Capital affects the investment decision making process (Bottazzi et al., 2008; Davila et al., 2003).

During the 1960s and 1970s, venture capital firms focused their investment activity primarily on starting and expanding companies. Venture capital firms suffered a temporary downturn in 1974, when the stock market crashed and investors were naturally cautious of this new kind of investment. The 1978 was the first big year for venture capital. The industry raised approximately $750 thousand in 1978.In 1980, legislation made it possible for pension funds to invest in venture capital firms. The 1983 was the boom year - the stock market went through the roof and there were over 100 initial public offerings for the first time in U.S. history. Due to the excess of IPOs (Initial Public Offerings) and the inexperience of many venture capital managers, VC returns were very low through the 1980s. VC firms worked hard to make their portfolio companies successful. The late 1990s were a boom time for the VC firms.

Stuart and Sorensen (2007) conducted a study on the corporate senior level executives of business firms and observed the effect of venture capital on the firm's efficiency which is the criterion for the effective capital investment decision making. They found that most of the surveyed business firms are registered on the relevant stock exchanges. They also determined that venture capital provides value-adding services (see Sapienza et al., 1996), such as coaching, mentoring and access to investment bankers, which could have signaling effects on the performance of the firms (Megginson and Weiss, 1991). Amit et al. (1998) in a perception based study of corporate managers of the business firms found that venture capital financing is generally considered by both academicians and practitioners as the most suitable financing mode in the earlier stages of capital projects' life (Chan, 1983; Jain and Kini, 1995; Hellmann and Puri, 2002, 2002).

Lindsey (2008) in relation to corporate senior executives' view documented the relationship between venture capital and capital investment decision making. He found that venture capital facilitates Strategic Alliance activities among portfolio companies. He also supported the views of Hochberg, Ljunqvist, and Lu (2007) that better net- worked VCs have more successful portfolio companies. Moreover, he identified that corporate managers rely heavily on inter-firm commercialization agreements (Strategic Alliances) for capital funding to make capital investment decisions. Ozmel et al. (2013) in their study of corporate level senior managers also highlighted that venture capital funding is important source of private capital for biotechnology firms (Lerner and Merges, 1998; Stuart, Hoang and Hybels, 1999) as these firms are popular among investors due to less risk of their default.

Croce et al. (2013) noted the view of corporate level senior managers of the European business firms regarding the capital investment decisions. They documented the effect of Venture Capital on the Productivity Growth, a criterion for effective capital investment decision making. They (2013) identified that Productivity Growth is the Firm's Efficiency that can be measured by the sales and employment growth of the business firms (see Bottazzi et al., 2008; Davila et al., 2003; Gompers and Lerner, 2001). The authors (2013) were also of the view that Venture Capital affects the efficiency of the firms that is applied as the dimension for capital projects' investment decision making (see Amit et al., 1998; Tyebjee and Bruno, 1984; Chan, 1983).

Arsaln et al. (2014) recorded responses of the key level corporate managers of the business firms and observed the effect of venture capital on the capital investment decisions. They (2014) determined that venture capital plays a pivot role for the capital investment decision making as most of the capital investments may be the new ventures which may require the venture capital for their success (Cassar and Holmes, 2003). Bhujraj and Sengupta (2015) in a study also gathered the responses of the corporate level senior managers of the business firms and observed the effect of the venture capital on capital investment decision making criteria through bonds offering. They (2014) determined based on survey results that corporate boards have the fiduciary duty of monitoring management performance and protecting shareholder interests (Fama and Jenson, 1983; Lin, 1996) if the capital projects are financed by venture capital.

5. Effect of Agency Cost on Capital Investment

Agency cost are expenses that the company or business firm affords to proceed its operation for the production and services. Agency Cost affects the capital investment decision making process of the business firms (Gul et al, 2013; Jensen, 1986). The corporate managers believe that capital investment decision making can be made more effective if the agents or managers who are involved in the capital projects have good knowhow or expertise about the capital projects nature and evaluation criteria fir the selection.

De Massis et al. (2013) in a study documented the corporate managerial view in relation to the effect of agency cost on the capital investment decision making. They (2013) also identified the effects of liquidity and institutional activism on the capital investment decisions by corporate planning managers. They (2013) determined that capital investment decisions are based on the firm's efficiency, risk management and the conventional appraisal methods (Chrisman and Patel, 2012). Carpenter and Guariglia (2008) also studied the effect of agency cost on capital investment decision making process in a survey undertaken to record and investigate the managerial view.

They (2008) found that activism of institutional investors tends to be more towards the supervision and control of the behavior of the managers of big companies. They (2008) also noted that corporate managers need the compensation and rewards to make capital investment decisions (Fazzari et al., 1988; Myers and Majluf, 1984; Stiglitz and Weiss, 1981). It was also noticed that the loyalty of corporate level senior managers can be increased with incentives and perks to make better capital investment decisions (Masulis and Wang, 2009).

Gul et al. (2013) conducted a research on corporate senior level managers and explored the link between Agency matters and firms' capital investment decisions based on conventional, strategic and risk management tools. They (2013) determined that large size boards are associated with higher agency problems which weakens corporate governance due to which leverage increases, however low leverage firms have fewer numbers of outside directors (Jensen, 1986). Fama and Jensen (1983) also solicited managerial view and identified that in order to reduce the agency problems, effective and pragmatic roles must be performed by different persons inside or outside the firms. The results of their study (2013) also showed that companies with increased leverage have fewer non-executive directors and CEO duality have positive correlation with firm's capital investment decisions (Fama and Jensen, 1983; Jensen, 1986).

Bhujraj and Sengupta (2015) documented the effect of Agency Cost on the Firm's efficiency through bonds offering in relation to the managerial perception solicited in their study (De-Angelo and Rice, 1983; Dechow and Sloan, 1991; Murphy and Zimmerman, 1993). They (2015) also determined that if governance mechanism of the corporate level business firms reduces the agency risk then firms with stronger governance mechanism are associated with superior capital investment decisions criteria in terms of capital projects.

2.3. Risk Management Methods

The following studies related to the capital investment decision making assert on the application of Risk Management Methods for the evaluation of the capital projects.

Lefley and Morgan (1998) conducted a survey of the corporate level managers of business firms to justify the new pragmatic approach to capital investment decision making which they named Financial Appraisal Profile (FAP). They argued on the basis of financial literature that academicians and experts also believe on the application and importance of more sophisticated methods for the risk analysis. But on the other hand assessment of the risk analysis application by the risk managers of these business firms for the capital projects investment decision making to some extent is disappointing (Lefley and Morgan, 1998). They (1998) argue that most of the business firms for the capital projects' investment and projects appraisal financing, ignore risk altogether by adopting an un-scientific approach based on just intuition which can't overcome the risk that is hidden in the capital investment projects (Drury et al., 1993; Chadwell et al., 1996).

Fadi and Northcott (2006) recorded the views of corporate executives of UK based manufacturing investment business firms which undertook the long term capital investment projects. The respondents were interviewed to show their preferences regarding risk analysis methods to evaluate the capital investment decision making criterion or criteria and the factors which have influence on the capital investment decision making. They (2006) observed that the real purpose for the application of risk management methods in the evaluation of capital projects is how frequently and appropriately these methods quantify the risk exposure (see Pike, 1996; Arnold and Hatzopolous, 2000). The results of Fadi and Northcott (2006) show that corporate managers perceive the adjustment of discount rate, adjusted forecasted cash flows and computer simulation as the three additional risk analysis tools since these risk adjusted methods are applied in the same kind of risk management studies (see Abdel-Kader and Dugdale's, 1998).

Li et al. (2013) conducted a survey study to solicit managerial responses regarding the adoption of risk management methods for the decision making of capital investment projects. According to them, corporate level managers perceive that the national culture of the economies also influences the corporate risk-taking behavior. They (2013) argue that most of corporate financial management and the academic theories have been developed under the assumption of the market efficiency that capital markets are "semi-strong" efficient (see Fama and French, 1964). But on the other hand, this assumption of the market efficiency seems to be questionable when it is applied to the emerging markets that are typically characterized by higher information asymmetries, higher transaction costs, relatively concentrated ownership with small and medium enterprises, and relatively low market liquidity. They observed that corporate managers are involved to adjust these asymmetries with the tendency to also adjust the capital projects for the risk taking behavior in order to induce the revenue component of the project for its success.

The five methods to appraise the capital investment decision making are more frequently applied and suggested by the practitioners and corporate risk managers of the business firms which are stated below in details:-

2.3.1. Capital Asset Pricing Model (CAPM) or Beta-Analysis

Chazi et al. (2010) also recorded the responses of key financial executives who were involved in capital projects investment decision making. They (2010) documented that accounting management practices by the corporate financial executives of these business firms are based on right kind of cost of capital (cost of equity or cost of debt or WACC). They also found that most of the projects' concerned financial executives calculate cost of capital with the help of CAPM. Beta-analysis was identified as the most popular choice among corporate managers of the business firms together with the application of discount rate for the entire company and this approach minimizes or mitigates the risk of capital projects' investment decision making.

Lazaridis (2004) studied the perceptions of corporate managers of the business firms for the capital investment decision making that is based on some investment criteria and the appropriate cost of capital (the discount rate). The results of his study (2004) showed that the corporate managers are seriously concerned about the uncertainty revolving the capital projects. Moreover, CAPM application or Beta analysis were not found to be the favorite technique among the corporate managers for the calculation of the cost of capital which is based on the right discount rate used to incorporate risk into project analysis. He (2004) also identified that the cost of borrowing of these medium sized and small sized business firms was preferred over the cost of equity by the corporate managers in view of the capital investment decision making criteria.

Johnstone et al. (2011) gathered the managerial responses in relation to the capital projects investment decision making criteria adopted by corporate managers of the Indian business firms. They observed that in order to evaluate the risk of a project, its cost of capital is compared with discount rate or the opportunity cost of an alternative project (Anand, 2002). Their (2011) results also showed that CAPM is the widely used financial model that is applied by the practitioners for calculation of the cost of equity to evaluate the riskiness of capital investment (Ryan and Ryan, 2002; Anand, 2002; Graham and Harvey, 2001; Gitman and Vandenberg, 2000).

Almeida et al. (2013) conducted a study to gather information related to the cost of capital for the capital projects. They observed from the survey responses that the managers of the firms, are mostly interested to consider company-wide risk or project related risk while evaluating the projects' selection criteria. The researchers (2013) also observed that managers are interested towards the selection of CAPM as it merges the risk factor in itself. They derived from the survey results that financial managers and project finance directors apply CAPM for the estimation of cost of capital than other methods (only 4% of corporate respondents of these firms were using other methods instead of CAPM).

2.3.2. Sensitivity Analysis

Sensitivity Analysis is a statistical technique used to determine how different values of an independent factor impact a particular dependent factor under a given set of conditions, circumstances and assumptions. Sensitivity Analysis should be an integral part of any solution methodology. The status of a solution cannot be understood without such information. This has been well recognized since the inception of scientific inquiry and has been explicitly addressed since the beginning of mathematics. (Fiacco, 1983).

Chang (2003) conducted a survey of corporate managers of the business firms of Australia, Hong Kong, Indonesia, Malaysia, Philippines, and Singapore to document their view regarding the capital project financing evaluation methods and risk analysis. His (2003) results indicated that almost in all of these countries except Australia, sensitivity analysis is the most popular risk assessment tool which is applied by the key financial executives of these firms to assess the risk inherent in the capital projects' life time. He (2003) also found that capital investment decisions are affected by these risk adjustments that is why mostly investment decisions are based on Sensitivity Analysis /Scenario Analysis.

Lazaridis (2004) also undertook a survey of different companies with the purpose to study the risk analysis nature of the corporate managers for the investment decision making based on the investment criterion and the appropriate cost of capital based on the discount rate. He observed that the corporate managers are concerned about the risk that is inherent in the capital projects. He (2004) also identified that scenario analysis is the second most applied method to assess the risk of the capital investment projects. The results also highlighted that investment risk managers of almost 30% of the sample business firms apply the sensitivity analysis as a risk management method for the risk evaluation of the effective capital investment decision making process.

Andor et al. (2015) identified that larger business firms which employ sophisticated capital evaluation tools such as sensitivity analysis and real option analysis are significantly more likely to employ the target D/E ratio for the capital investment projects to avoid any potential bankruptcy issue if the economic condition is bad. The results of their (2015) perception based study suggest that larger business firms are likely to analyze more than ten strategic capital projects per year and, therefore, the project financial managers are likely to apply the more strategic capital investment evaluation tool such as Sensitivity Analysis than the small-medium business firms which undertake the capital investment projects. Their results were also consistent with prior studies (see Graham and Harvey, 2001; Pike, 1996; Sangster, 1993).

2.3.3. Probability Analysis

Lefley and Morgan (1998) based on a survey conducted on corporate managers of different companies asserted on the risk-analysis with regard to the decisions for selection of capital investment projects. They argue that the tools which are related to the evaluation of investment projects may conveniently be divided into two types. First, those methods which identify the level of risk which is inherent in the capital investment projects; secondly, those methods of evaluation which analyze the risk and afterwards allow for risk (Lefley, 1997; Lefley, 1996).

Fadi and Northcott (2006) also conducted a survey of the UK based investment business firms which undertake the strategic capital investment projects to check the perceptions of corporate level managers regarding capital investment and risk analysis methods. They (2006) noted that Probability Analysis is one of the most widely applied tools for the assessment of the risk for strategic and non-strategic type capital projects' evaluation decision making. Their results were consistent with the Abdel-Kader and Dugdale's (1998), Arnold and Hatzopoulos (2000) and Pike (1996). They (2006) also suggested that the popularity of probability analysis derives from its perceived simplicity and intuitive appeal by the statisticians. It was found that project director and corporate risk evaluators of 77% of the business firms apply probability analysis for strategic and non-strategic kinds of capital projects' investment decision making.

2.3.4. Computer Simulation Analysis

Computer simulation is use of a computer software to represent dynamic responses of one system by behavior of another system modeled after it. In simulation evaluation we use mathematical description, or model, of a real system in the form of a computer program which identify the cost and expenditures of different activities involved in the capital projects (Crosby, 1973; Roberts et al., 1983; Gatti et al., 2007).

Dailami and Lipkovich (1999) conducted a survey study and identified different kinds of project risks (Pouliquen, 1970; Maindonald, 1984). They (1999) observed that computer simulation technique can be applied to manage the multiple kinds of risks inherent in the capital projects decision making. They (1999) also determined that computer simulation methods identify the main risks in the project life cycle. They further noted that risk of project life cycle is consisted of two parts, construction and operation (Froot et al., 1993; Hurley, 1998). Their (1999) results also indicated that the debt parameters for the capital projects are estimated through assuming different values of probabilities along with application of conventional appraisal methods to evaluate the capital projects (Finnerty, 1996).

According to Fadi and Northcott (2006), Computer Simulation is also applied for the assessment of the risk of strategic and non-strategic capital projects' coupled with appraisal of project financing modes. Lefley and Morgan (1998) also documented that through the computer simulation analysis different values can be simulated and risk is adjusted accordingly. Rebiasz (2007) conducted a survey of the business firms to identify appropriate tool for capital investment decision making. They noticed that risk quantification is one of the most difficult tasks associated with investment project risk management, and computer simulation seems to be an effective tool for such risk appraisal involved in the activities of the capital projects (Wibowo, 2004).

2.3.5. Risk Adjusted Discount Rate

The risk-adjusted discount rate is based on the risk-free rate and a risk premium. The risk premium is derived from the perceived level of risk associated with a stream of cash flows for which the discount rate will be used to arrive at a NPV (Carlsson et al, 2007).

Bennouna et al. (2010) conducted a study of corporate managers to check their preferences respecting application of risk adjusted discount rate to evaluate the feasibility of capital projects. They identified that risk adjusted discount rate applied in DCF methods, is the true opportunity cost of capital and is based on CAPM (Fadi and Northcott, 2006; Damodaron, 2007). They (2010) were also of the view that discount rate to calculate the NPV and IRR reflects the relevant risk that is related with capital projects and corporate assets. The results of their survey also indicated that for the Adjusted Present Value (APV), CAPM is the best method to calculate the right risk adjusted discount rate (Block, 2005; Ross et al., 2002; Hubbard, 1997; and Fama, 1977).

Arnold and Hatzopolous (2002) also gathered the managerial responses with respect to the application of risk adjusted discount rate to discount the future cashflows of the capital projects. They identified that in order to evaluate the risk of an underlying capital project, its cost of capital is compared with risk adjusted discount rate of an alternative project (Coffee, 2002; Shleifer, 2000; and Berk et al., 1999). The perception based results of their study also indicated risk adjusted discount rate can be easily calculated by using the CAPM model because this model denotes the element of risk which is inherent into capital projects (supported by Frank and Goyal, 2009; Ross et al., 2008).

Mahmoodzadeh (2007) also conducted a study of the business firms and solicited the managerial responses of the key financial executives to check their preferences for the use of risk adjusted discount rate for the investment decision making of capital projects. He (2007) noted from the survey results in terms of descriptive and regression coefficients that risk adjusted discount rate has significant relationship with cashflows which are produced due to the success of capital projects (Verhoef, 2005). He (2007) also noticed that CAPM is the best model for calculation of risk adjusted discount rate that is applied to discount the risky future cashflows (Block, 2005).

2.4. Conventional Appraisal Methods

Normally, conventional appraisal methods (i.e. DCF and Non- DCF) are considered the preferable methods for the decision making of the capital project (Damodaran, 2001; Afonso and Cunha, 2009).The benefits of the conventional DCFs methods are being given consideration by the academicians, financial practitioners and corporate managers over the world including the Pakistan. The DCFs methods consider the time value of money in its essence that is consistent with Lefley (1997). The application of the DCFs methods is not the new trend for the capital projects investment decision making. The foundation of the discounted capital budgeting methods (NPV, IRR), was laid down by the Fisher (1930), almost 85 years before. Since then the academicians and the practitioners are inclined towards the application of these general financial evaluation methods. However, the real practical application of these methods started recently in the late 1970’s. The modern foundation of the DCFs methods was laid down by Modigliani and Miller by considering time value of money as an investment evaluation method for the capital projects investment decision making (Modigliani and Miller, 1958).

Hussain and Shafique (2013) conducted a survey study of business firms in Pakistan and ascertained the findings of corporate managers in their research oriented task, “Capital budgeting practices in the Islamic Banking” for the application of conventional appraisal methods (for example DCF- methods; NPV, IRR and MIRR). They noticed that sample Islamic banks are not interested to invest in the ventures where the cashflows comes from Riba (Ahmad et al., 2015; Zahid et al., 2012).They (2013) found that DCFs methods are prioritized by the managers of conventional and Islamic banks (Bacha, 2004; Febianto, 2009).They also documented that corporate managers in Islamic Banks apply DCF methods to find the quantitative and qualitative appraisal of projects because of its technical applications in evaluation process (Magni 2009; Bennouna, 2008; Bosch et al., 2007; Pike, 1996).

Maquieira et al. (2012) also conducted a survey to observe the practices of financial and risk managers regarding conventional appraisal methods for capital investment decisions of the Latin American business firms. Their sample consisted of CFOs and CEOs from financial and non-financial business firms registered at the Chilean Stock Exchange. They also arranged face to face and electronic contacts with the alumni of MBA. They (2012) found that Just 290 alumni responded and showed their interests towards conventional appraisal tools in Latin American business firms where capital markets are still emerging and show significantly different results from those of developed capital markets. Overall financial executives and business Alumni were more inclined towards DCF conventional methods than non-DCF methods for capital investment decisions.

Al-Ajmi (2011) recorded view of the corporate managers of 34 business firms in the Gulf Cooperation Council (GCC), who were using the conventional appraisal DCF and Non-DCF methods for the evaluation of the capital projects investment decision making. They targeted a sample of corporate managers of business firms from the industrial sectors of Bahrain, Kuwait, Oman, and UAE. They (2011) found that corporate managers are more inclined towards the capital evaluation methods specifically the DCF methods like PBP and ARR. They (2011) also noted that NPV is the most widely used conventional appraisal investment tool for capital projects evaluation whereas IRR is the second most used technique for capital projects investment decision making (Chazi et al., 2007). Further, the corporate managers were also interested in the PBP method of evaluation for the risky projects which is the third most used technique by majority of the corporate managers of different business firms (Chazi et al., 2007).

2.4.1. Net Present Value (NPV)

NPV method of conventional appraisal is based on the time value of money which uses some appropriate discount rate for discounting the cash flows expected to be generated in some specified future time period. Moreover, this method describes the parameters for the selection of the investment proposal and the capital projects investment decision making. According to NPV, only those capital investment projects should be accepted where present value of expected cash inflows exceed the present value of cash outflows (i.e. NPV should be positive). The pertinent literature shows the importance of NPV as a capital investment criterion by the corporate financial executives of firms involved or expected to be involved in different capital projects.

Arsaln et al. (2014) surveyed the corporate managers to examine the application of conventional appraisal tools including NPV in the textile sector and the impact of firm size on the projects' investment methods. Their results indicated that the application of conventional investment appraisal tool, NPV, is considered a sound and pragmatic approach by practitioners, and every business venture is accepted if its NPV is positive (Cumming, 2010). They (2014) are also of the view that NPV is considered a brick for the capital projects' investment decision making (Holmes, 2013; Peterson and Fabozzi, 2003, 2010). Furthermore, in case of mutually exclusive projects, the project with higher NPV value is accepted (Drury, 2004).

A survey results of corporate managers of 58 large firms of the Fortune-500 in 1992 show that there is 88% application of NPV by the managers as an investment appraisal method whereas in case of 26 small firms its application by the corporate managers is 65% (Trahan and Gitman, 1995). Managers argue that NPV is the most reliable project investment decision making criterion as it uses the absolute values and considers the time value of money and risk associated with the expected cash flows (Karim, Geoffrey, and Teresa, 2010; Horngren et al., 2003, p. 720; Garrison and Noreen, 2000, p. 677). However, managers also pointed out the limitation of this method when discount rates are uncertain, as decrease or increase of discount rates can also lead to respected change in NPV (Trahan and Gitman, 1995; Cheng, 2000).

Andor et al. (2013) also documented the managerial notion that NPV method examines whether the present value of the projected discounted cash flows is higher than the present value of the initial capital investment and operating expenses. The corporate managers responded that both the methods; NPV and IRR are theoretically identical, but despite all this they treat NPV and IRR separately for the capital projects investment decision making. NPV is preferred by the corporate financial executives of most of the business firms for the capital investment decisions. Andor et al. (2013) observed that 56% of corporate managers of the small size sample business firms apply NPV and IRR methods whereas 64% of corporate financial executives of the large size targeted business firms apply both NPV and IRR methods for the capital investment decision making with the use of NPV on prioritized basis (Brigham, 2013).

Al-Ajmi et al. (2011) undertook a survey on the American corporate managers and identified that these managers frequently apply the conventional appraisal methods; with NPV is the second most preferred technique whereas other evaluation methods, such as the PBP and ARR were less applied tool for capital project investment decision making. They (2011) also noted that to calculate the NPV, appropriate kind of discount rate or cost of capital is mandatory and the CAPM is the method to calculate the right discount rate. The managers responded that the application of a typical method of a capital project investment decision making, like NPV is explained by the size, financial leverage, and perceptions of the CEO and other corporate financial executives. Moreover, the firms of small size are unlikely to evaluate the capital projects by the sophisticated NPV method and are less likely to avail the sensitivity analysis or other sophisticated risk evaluation techniques (see Graham and Harvey, 2001; Prather et al., 2009).

Fadi and Northcott (2006) conducted a perception based survey of corporate executives of UK manufacturing companies in view of the application of strategic capital investment decision making analysis tools. In this regard, the most frequent use of conventional appraisal tools like NPV and IRR was noted. They also found that NPV method has different trends among different firms which is consistent with other studies (see Lefley, 1994; Pike, 1996). They (2006) also observed the wide spread use of conventional appraisal methods by the practitioners of business firms (see Pike, 1996; Abdel-Kader and Dugdale, 2001). They (2006) noticed different reasons for the selection of NPV by the managers of the sample business firms; for example, its consideration for the time value of money and it discounts the future expected cashflows for the risk purpose (see Arnold and Hatzopolous, 2000).

Lazaridis (2004) investigated the view of the corporate managers of Cypriot business firms pertaining to the capital projects investment decision making. They (2004) doubted that these managers are mostly not inclined towards the use of NPV as a primary project conventional investment decision making criterion rather than PBP is the most favorite criterion. Their (2004) findings show that the selection of NPV is based on this assumption that it does not consider the risk adjustment of the cash flows from the selling activities of the firms.

2.4.2. Internal Rate of Return (IRR)

The IRR conventional method for evaluating capital investment is widely used because it employs a rate of return as the decision variable (Steiner, 1996). IRR is determined by calculating the discount rate at which the NPV is zero. The criterion for investment decision on acceptance or rejection of a proposed investment is by comparing IRR with the opportunity cost of capital. Thus, managers only accept to undertake a project for which IRR exceeds the opportunity cost of capital (Damodaran, 2010).

Arsaln et al. (2014) investigated the corporate managers' behavior regarding application of IRR. Their results supported the view that IRR is that discount rate at which the PV of the Initial Cash Outlay becomes equal to the PVs of all the future inflows and it causes the NPV of the project equal to zero (Maher, et al., 1997). Moreover, when IRR exceeds the project's cost of capital, then it is accepted; on the other hand if cost of capital exceeds the IRR, then it must be rejected as it lead to negative NPV (McWatters, et al., 2001). Their (2014) results depicted that managers prefer IRR for the capital projects decision making because of its percentage results which makes easier the task of the practitioners to compare IRR for the alternative projects (Cheug, 1993; Baldwin and Clark, 1994; Hayes and Garvin, 1982)).

Hussain and Shafique (2013) documented the corporate managers' view of Islamic banks that little investment with greater rate of return needs the higher IRR. The results of their study demonstrated that managers set the hurdle rate for the capital investment and IRR is compared with this rate for the acceptance or rejection of the capital investment projects. The drawbacks of IRR were also identified such as time and scale difference may lead to wrong capital investment decision if the investment is done in mutually exclusive projects, which may cause reinvestment at different rate of return thus ultimately resulting in multiple IRRs (see Brigham and Ehrhardt, 2002). Their (2013) results also indicated that there is 87.7% usage of IRR by the financial executives of the sampled banks for the capital investment decision making despite some drawback of IRR. Besides, their results are consistent with results of the study conducted by Truong et al., (2008).

Raza and Mohsin (2011) also surveyed the corporate managers to record their view regarding using the IRR. They (2011) determined that IRR method is useful to find out the rate that equates the cost and revenues of the project in terms of present values which is consistent with (Akalu, 2001). The managers also asserted that projects are accepted on the basis of IRR in contrast to NPV (see, Damodaran, 2012). The managers responded that IRR is easy to be calculated and convenient than the other DCF methods for the evaluation of the capital investment projects. However, like NPV, it also considers the same cost of capital for the whole year which creates practical ambiguity about its application (see, Willey and Fetter, 1990). But, despite the problems embedded with it, still IRR is one of the most frequently used decision making technique. Willey and Fetter (1990) noted the importance of IRR in 150 British firms by the managers who were using this method for the capital investment decision making (Pike, 1982).

Fadi and Northcott (2006) conducted a perception based survey of the corporate managers to take stock of conventional appraisal methods like NPV and IRR. They observed that the application of IRR method for the capital investment decision making is consistent with other studies (Arnold and Hatzopolous, 2000; Akalu, 2003). They (2006) also noted that IRR is the second most widely used technique in the arena of investment evaluation methods (almost 89% of the managers laid a greater stress on the importance of IRR method). Moreover, most of the corporate managers stressed on the application of both the methods, NPV and IRR for investment decision making of strategic projects (see, Arnold and Hatzopolous, 2000).

Lazaridis (2004) conducted a survey of the managers of Cypriot business firms to determine their opinion regarding the capital investment decision making criteria. He (2004) determined that these managers did not prefer IRR as a primary project investment decision making criterion rather than PBP was considered favorite capital investment decision criterion. The reason for low preference of IRR was based on the view that some hurdle rate is pre-planned and settled by projects' financial executives, which is sometimes fluctuated if the discount rate is abruptly changed by the federal authority of any country.

Kester et al. (1999) surveyed the corporate managers from financial and non-financial business firms of Australia, Hong Kong, Indonesia, Malaysia, Philippines, and Singapore regarding the preferred methods for the investment decision making of capital projects. According to them (1999), IRR was found the second most applying method for evaluating the capital investment projects except the Hong Kong where managers preferred the application of IRR for the capital projects investment decision making due to its pre-settled hurdle rate (Gitman and Vandenberg, 2000; Ryan and Ryan, 2002).

2.4.3. Payback Period (PBP)

This method entails how much time is needed to recover the initial outlay of the capital investment project and is used as a criterion for the acceptance or rejection of the capital investment projects. The corporate managers are of the view that only those capital investment projects should be accepted which have evaluated PBP less than the targeted (projected) PBP and the vice versa (Damodaran, 2001). The application of this method has a lot of advantages including; it is easy to understand and calculate, it is simple to implement, it is the best predictor of liquidity and risk of capital investment projects (Afonso and Cunha, 2009; Longmore, 1989).

Arsaln et al. (2014) noted that corporate executives focus on the application of PBP as this method is the simplest one for the evaluation of the capital investment projects and provides the accurate time of returning the initial investment (Brigham, 1988; Peterson and Fabozzi, 2002). They (2014) also found that managers prefer PBP over other capital investment criteria and also it is the frequently applied method by the North American and Western European firms (Graham and Harvey, 2001; Brounen, 2004).

Hussain and Shafique (2013) also observed the application of BPB by managers of targeted Islamic banks. Their results indicated that it is the simplest and widely used method in industry for capital investment decision making as it considers required time to recover the original investment (Suzette Vivers and Howard Cophen, 2011). They point out on the basis of managerial preferences that project with less PBP is selected by corporate managers in case of mutually exclusive projects (Suzette Vivers and Howard Cophen, 2011; Pike, 1996; Lefley, 1993). They (2013) also observe from the survey findings that PBP provides gauge for liquidity and risk for financial and non-financial type capital investment projects (Sangster, 1993). The results of their survey (2013) indicate that 78.5% of respondent corporate managers from the target Islamic banking firms still apply PBP for capital investment decision making. These results are consistent with the result of study (Suzette Vivers and Howard Cophen, 2011).

Almazan et al. (2009, 2010) conducted a survey on the Indian business firms (both financial and non-financial) and reported that PBP is the most widely used method for evaluating the capital investment projects applied by the financial analysts, corporate managers and financial executives followed by the IRR, with NPV at third preference. These results are in agreement with Anand (2002), who conducted a same kind of survey on the corporate managers of Indian business firms and revealed that corporate financial managers of 85% financial and non-financial investment firms apply IRR as the primary capital project investment decision making criterion. The results of their study (2010) highlight that corporate managers assert on the application of PBP due to its early recovery nature of the projected cash flows within the specified time frame of the capital projects (see Verma, 2009; Brounen et al., 2004; Anand, 2002; Graham and Harvey, 2001).

Hermes et al. (2007) found that corporate financial managers of the Dutch companies mainly apply the sophisticated methods of conventional appraisal like NPV, IRR, and PBP as compared to their Chinese counterparts for the capital projects investment decision making (see Sandahl and Stefan Sjögren, 2003; Graham and Harvey, 2001). This may be attributed to the factual broad way approach that Netherlands is the more developed and furnished economy than the Chinese economy. Their (2007) results also highlighted that the corporate managers of European firms who have tendency to use the conventional DCF methods, are still lagged behind than their American counterparts and use PBP for capital investment projects decision making. They (2007) found that it minimizes the risk of the capital projects as the cashflows are recovered within the specified time frame (Brounen et al., 2004; Graham and Harvey, 2001).

Fadi and Northcott (2006) observed that financial executives of business firms apply PBP investment decision criterion because it is risk averse conventional appraisal technique, most familiar and easy to capture. Also 71% of financial experts use PBP for the strategic capital investment decision making (Lefley, 1994) and 88% are inclined towards three evaluation techniques including IRR, NPV and PBP for their use in capital investment decisions and these results are consistent with Arnold and Hatzopolous (2000). The findings of their study (2006) show that application of PBP is actually the decline of conventional sophisticated methods (i.e. IRR and NPV). In another survey of the corporate managers of the firms, Fadi and Northcott (1997) found that almost 66% managers of business firms use PBP for capital investment decision making due to its easy calculation and risk adjustment nature.

Abdel Kader and Dugdale (2001) surveyed the corporate managers regarding their view of capital investment decision making of Advanced Manufacture Technology Projects (AMT).They (2001) found that the application of the more non-sophisticated methods, like PBP is necessary in evaluation process. But the nature, type of project and strategic benefits from underlying projects should also be assessed (Lefley, 1996). Also wider array of financial and non-financial benefits from the AMT projects should also be considered as they enhance understanding of the advantages which are produced by the AMT projects (Scott et al., 1998; Lefley, 1996). Furthermore, traditional management accounting techniques for the capital projects evaluation, enhance the understanding of corporate financial executives to assess the benefits of quality, organizational learning, training, process improvement and innovation of capital projects.

Lefley (1996) identified that US and UK managers primarily use PBP for capital investment evaluation (see Chen and Clark, 1994). He (1996) also observed that the application of PBP is positively correlated with the size of the capital budgeting (i.e. the firms with larger capital budget of more than $100M than the firms with smaller capital budget; for example, see Scapens, 1990; Sangster, 1993). The researcher derives from the managerial perceptions that PBP is observed to be inversely correlated with the capital budgeting size (see Fremgen, 1973; Cooper, 2002). The researcher (1996) also observed from the survey responses that PBP still has the capacity to be survived despite the growing application of sophisticated conventional investment methods including; NPV and IRR (see McIntyre and Coulthurst, 1986).

2.4.4. Accounting Rate of Return (ARR)

Accounting Rate of Return is used to compute the percentage of the accounting return on the strategic capital investment projects of the firms. It is computed as the ratio between the projects estimated average profit and the average accounting value of the investment (Brealey and Myers, 2012). This ratio is then compared with the firm’s settled or standard Accounting Rate of Return or some other benchmark external to the firm like Industry Average value of any relevant ratio. There is the need to set a target rate of return as a prerequisite to apply ARR as a capital investment method (Akalu, 2001, 2003; Afonso and Cunha, 2009).

The managerial view in the pertinent literature highlights that if ARR is used as an investment criterion for two projects having the same investment outlay then ARR criterion ranks higher the project that generates more cash inflows in later years than the project which has more cash receipts in the beginning years. Fadi and Northcott (2006) observed the importance of Accounting Rate of Return (ARR) by the corporate managers. These results are consistent with Abdel-Kader and Dugdale (2001). Fadi and Northcott (1997) also noted that 55% of the financial executives are interested to use the ARR as an investment criterion. However, this method was least preferred among board of directors of business firms (Pike, 1996; Arnold and Hatzopolous, 2001), yet it was applied almost by the 66% of financial executives from the business firms (see, Fadi and Northcott, 2006).

Andor et al. (2015) also observed through their empirical survey that the business firms of the CEE also employ the conventional appraisal non-DCF tools like (ARR and PBP) other than the conventional DCF methods like NPV and IRR. The empirical survey results of the Andor et al., (2015) based on a survey of financial managers of financial and non-financial business firms identified that financial managers select a portfolio approach by applying more than one capital budgeting tools at a time to reach at the appropriate evaluation criteria. They (2015) also noted that that 87% of financial managers of the business firms frequently use the PBB method of evaluating the projects' financing decision; whereas, 78% of the corporate financial managers are inclined towards the ARR tool for the financing decision. Among those corporate financial managers who do not apply the DCF-evaluation method; 50% employ the Sensitivity Analysis method for the capital projects investment decision making, while only 30% employ the Real Option Analysis for the capital investment decision making. Furthermore, that 70% of corporate managers of the small size sample business firms apply the ARR method whereas 72% of corporate financial executives of the large size targeted business firms apply the ARR method as an effective criterion for the capital projects investment decision making.

Akalu (2001) also noticed that ARR is applied as an investment appraisal method for the decision making of capital projects by the financial executives of business firms. He (2001) found that ARR is used to compute the percentage of accounting earnings that is the main target of managers in the business firms, whereas the projects' benefits are calculated with the help of accounting profits of business firms. He (20111) observed from the verdicts of corporate managers that all accounting records and the business reports are evaluated and confirmed through the calculation of ARR. These findings of his study are consistent with the results of study conducted by Gitman and Vandenberg (1997). They (1997) also recorded the observations and reservation of corporate managers regarding ARR. These researchers (1997) pointed out from the survey responses that that the application of ARR has created doubts among the practitioners. The doubt is based on the assumption that it does not take into account the time value of the money and the timing and pattern of the profits don't hold the vivid picture as well.

Sangster (1993) also identified the application of the Accounting Average Rate of Return (AARR) in the large and small business firms. The findings of his study point out that managers of smaller companies apply AARR as a pragmatic quantitative method for the evaluation of capital projects. He also observed that managers of 26% of smaller firms use AARR, while on the other hand, the managers of 33% of larger firms use AARR for the capital investment decision making. Overall, his results are consistent with the results of prior studies (McIntyre and Coulthurst, 1986; Mills and Herbert, 1984; Pike, 1980).

2.5. Strategic Appraisal Methods

Lefley and Morgan (1998) state that the application of the more sophisticated conventional appraisal capital budgeting and risk assessment methods is also disappointing, with many business organizations ignoring the sophisticated and risk evaluation methods due to their limitations by adopting many non-scientific approaches (Drury, 1996; Chadwell et al., 1996; Lefley, 1996; Lefley, 1997; Chenhall, 1998). They argue that many of the today's capital investment decision making processes have strategic implications and corporate managers are unable to evaluate the capital projects in the right direction with the application of pure capital investment appraisal methods. They also assert that sophisticated methods though produce the quantification but benefits of the strategic projects are still not measured by these methods, whereas the strategic appraisal tools are good predictors for the evaluation of the capital investment projects (Boaden and Dale, 1990; Primorse, 1991).

In this study five strategic investment appraisal tools among the multiples tools, have been selected namely; The Balanced Scorecards, Real Option Analysis, Value Chain Analysis, Benchmarking and Technology Roadmapping. The empirical literature of these strategic analysis tools have been given below.

2.5.1. The Balanced Scorecard

The Balanced scorecard theory was developed by Kaplan and David P. Norton (2004). The balanced scorecard concept arose out of a recognized need to measure success on more than just financial statements. Focusing strictly on financial results doesn't provide an organization with the information that it needs to prosper in today's environment. Financial results provide an indication of past performance, but don't provide you with insight into your current status or where you'll likely be in the future. In addition, the balanced scorecard provides a framework and language that enable you to describe your strategy in a consistent, reliable manner. Therefore, the ultimate goal behind balanced scorecard theory (2004) is to measure the factors that create value for an organization and directly influence its ability to prosper which is only possible through capital projects. The balanced scorecard method translates an organization's strategy into performance objectives, measures, targets and initiatives. It is based on four balanced perspectives, and links them together with the concept of cause and effect.

Another theory for Balance Scorecard was presented by Johnsen (2001). He (2001) argued that positive agency theory is a relevant theoretical perspective in studies of the balanced scorecard in business management because agency theory addresses implementation and organizational control issues. If the balanced scorecard is to be applied also in capital projects decision making, then positive agency theory should be complemented with political economy to incorporate possible implementation and organizational control issues related to political uncertainty, common agency and implementation ambiguity. It is argued that uncritical application of the balanced scorecard in projects decision making could result in dysfunctions common in central planning. However, such dysfunctions could be reduced with certain modifications of the balanced scorecard in order to facilitate firms' competition to a relatively larger extent.

The Multi-Attribute Utility Theory was presented by Youngblood and Collins (2003). According to this theory The Balanced Scorecard system (A performance measurement system) serves as a useful tool for managers monitoring productivity and performance of the capital projects within an organization. However, in many circumstances conflict exists on how to give some performance metrics higher importance than others when analyzing overall performance of the capital projects. This theory describes a quantitative technique to evaluate trade-off issues between performance metrics on a balanced scorecard for the decision making of capital projects. Multi-attribute Utility Theory is also beneficial to identify different utility functions for changing states of nature. This theory demonstrates contributions on the effect of dynamic weighting factors for performance measures due to changing missions of an organization, and provides a means for situation-dependent utility functions to be incorporated into a performance measurement system.

Fadi and Northcott (2006) suggest the application of the balanced scorecard for the capital investment decision making process. They argue that this tool links the financial measures with non-financial measures of the firms (Kaplan and Norton, 2001). According to them (2006) the non-financial measures of the firms may be inclusion of focus on the customers' perceptions and wants, business processes relating to internal strategies of the firms, innovation and learning to keep pace with modern technology (Kaplan and Norton, 2001; Mills and Mercken, 2003).

Canedo and Almeida (2010) described a multi-criterion approach to prioritizing projects by integrating balanced scorecard methodology indicators. They (2010) argue that costs and risks of the multi projects must be balanced and should be monitored with care so that the potential incentives of the projects can be enjoyed (Venkatraman and Henderson, 1993). These researchers (1993) observed from the survey information and findings of results that federal government is interested in the capital investment of those IT related projects which can improve the state reforms and makes it easier the administration and infrastructure of the welfare projects. Despite all these positive results still the failure rates of the electronic government projects is 85% in the Brazilian firms (Heeks Apud Estevez and Joseph, 2007).

The findings of the survey (2010) also stress on the need of alignment between IT related strategies and business oriented strategies because these alignments can produce the desired results of the capital investment in in these projects (Venkatraman and Henderson, 1993; Almeida and Costa, 2003).The results and findings of their survey study (2010) also suggest that different factors should be prioritized and balanced according to the need arises for the projects. They suggest on the basis of survey responses that IT and business alignment strategies, communication & cooperation between IT and business, achievement of IS/IT Project evaluation formal practices, adequate measures to evaluate IT efficiency and prioritized projects, understanding the necessity of cultural and organizational changes, are necessary factors to identify the potential investment projects (Coughlan et al., 2005).

The researchers argue on the basis of survey responses that these factors contribute to achieve the balance for different projects. They also observe from the survey findings if cooperation does exist, it is translated into agreements which are involved in the selection of prioritized projects and the schedule of carrying those project out (Newkirk and Lederer, 2006). They pointed out from the survey findings that these strategies can minimize the conflicts between different functional areas and contribute for the establishment of a common vision of the same kinds of projects in the future, which can further improve the functions of the organization in connection with IT related project. They also observed from the results of survey that formal practices of evaluating IS/IT projects do contribute to establish those agreements which can provide a well-structured decision processes fitted to the organizational needs (Hamid and Sarmad, 2009; Stewart, 2007).

2.5.2. Real Option Analysis

Whereas business managers have been making capital investment decisions for centuries, the term "real option" is relatively new, and was coined by Professor Stewart Myers of the MIT Sloan School of Management in 1977. In 1930, Irving Fisher wrote explicitly of the "options" available to a business owner (*The Theory of Interest*). The description of such opportunities as "real options", however, followed on the development of analytical techniques for financial options, such as Black–Scholes in 1973. As such, the term "real option" is closely tied to these option methods. Reflecting the "mainstreaming" of ROV, Professor Robert C. Merton discussed the essential points of Arundel in his Nobel Prize Lecture in 1997. In particular, the investors must determine the value of the sequel rights before any of the first films are produced. Here, the investors face two main choices. They can produce an original movie and sequel at the same time *or* they can wait to decide on a sequel after the original film is released. The second approach, he states, provides the option *not* to make a sequel in the event the original movie is not successful. This real option has economic worth and can be valued monetarily using an option-pricing model.

Real options theory is a modern theory on how to make decisions regarding investments when the future is uncertain. Real options theory draws parallels between the valuation of the financial options available and the real economy. The theory has become a popular theme in most business schools across the world, as well as the boardroom, especially within oil companies. Real options theory is a major new framework in the theory of investment decision-making. It modifies NPV (Net Present Value) theory of investment decisions. NPV theory says that an investment project’s future cash flows are estimated, and if there is doubt regarding those cash flows, the expected value is determined. The expected cash flows are discounted at the capital cost for the company, and the results are added up. If the NPV is zero, it makes no difference to the company whether the project is approved or turned down. If it is greater than zero, NPV theory tells us to go ahead with the project. Examples of real options include determining whether to build a new factory, change the machinery and technology on a production line, decide whether to buy potentially lucrative oil fields and when to start drilling or pumping, etc. They do not include derivative financial instruments such as stocks or bonds.

Ford and Lander (2011) also observed that the Real Options is an effective tool for the decision making of the capital investment projects which manages the level of uncertainty embedded with the size of the capital projects and thereby enhances the value of the project. They (2011) also argued that most of the managers apply their intuitions to appraise the capital projects uncertainty level rather than applying the real options methods within the business firms (Ward and Chapman, 2003; Yeo and Qiu, 2003; Ng and Bjornson, 2004). Keeping this in view, the corporate financial executives and project managers perceive the differences and similarities of their decision regarding the capital investment and focus on the real options and real option theory and conclude that application of the real options is critical for the success of the capital projects (Amram and Howe, 2002; Ford et al., 2002; Ward and Chapman, 2003).

They (2011) also claim that projects are also affected by the amount of risks which are involved in the projects; they argue that success level of most of the engineering related projects depends on the amount, nature and management of the uncertainty factor pertaining to the projects (see Miller and Lessard's, 2000). According to them, uncertainty creates complexity which is not easy to be managed as sometimes the risk option of the financial or non-financial business firms exceeds the competency of the techniques and evaluation methods which are applied in the projects' financing decisions.

Fadi and Northcott (2006) point out to the facts that conventional investment analysis tools like NPV and IRR are unable to evaluate the flexibility of the capital projects in the real sense (Copeland and Howe, 2002). According to them (2006) all capital investment decisions are almost reversible without penalty if the DCF methods are applied which are not matching in the competitive environment. To solve this limitation and complexity of the DCF techniques, Real Option Tools have been recommended by the researchers (Cox et al., 1979; Fadi and Northcott, 2006). These studies describe the flexibility in the application of capital investment tools which is referred as "options". The authors are of the view that the application of the real option analysis has the value for the firm's current and future status (see, for example; "Option Pricing Model", Black and Scholes, 1973).

The findings of their survey (2006) highlight that options of expansion, defer the projects, downsizing the manpower or project's size, abandoning the projects for some economic downturn or other reasons, have some value for capital investment decision making (Bowman and Singh, 1993; Busby and Pitts, 1998, 1997). The results of the studies (Trigeorgis, 1999; Copeland and Antikarov, 2001; MacDougall and Pike, 2003; Schwartz and Trigeorgis, 2004) show that the real option tools enable the firm to capture the competitive edge by taking the strategic capital investment decision for the projects that adds value to the firms. Conversely, firms which don't apply the real option analysis tools are reported to have low value (Cheung, 1993; Dixit and Pindyck, 1994; Anderson, 2000). The results of some studies are inconsistent regarding the real option analysis. One group of the researchers (Howell and Jagle, 1997; Bowman and Moskowitz, 2001) observes the excessive application of the Real option tools by the practitioners of the business firms. On the other hand, some studies (see, Denison, 2009; Trigeorgis, 1999) note the low value of these tools by the practitioners of the companies.

Bowman and Moskowitz (2001) portray that the capital investment decisions have critical implications for the future growth of the firms and such decisions are subjected to the variety of internal pressures (Gunther and Nerker, 2004). According to them the investment decision is the result of formalized process which needs different methods of valuation for the appraisal of capital projects (Astley, 1985; Hurry, 1991). They (2001) criticize the traditional DCF methods for the appraisal of capital project investment decisions. They pointed out that under the DCF method of evaluating the projects, the stream of future cash flows is discounted at an appropriate discount rate which is the reflection of the risk by the markets for that project. This kind of higher risk that is attached to the discount rate reduces or eliminates the investors response towards the capital projects as positive NPV values projects are preferred over others projects having negative NPV values. Also, DCF traditional methods of evaluating the capital projects lack the element of 'flexibility'. Flexibility means the adjustment of different factors related to the capital projects. Managers can adjust the production operations according to the demand and size of the projects. This flexibility in the operation units is called real option tool. Corporate financial directors and CFOs consider and value this real option method as a capital budgeting and strategic- decision making tool because it explicitly describes and portrays the future flexibility of the capital projects (see Trigeorgis, 1996; Amram and Kulatilaka, 1999).

2.5.3. Value Chain Analysis

Value chain analysis is a strategy tool used to analyze internal firm activities. Its goal is to recognize, which activities are the most valuable (i.e. are the source of cost or differentiation advantage) to the firm and which ones could be improved to provide competitive advantage. The firm that competes through differentiation advantage will try to perform its activities better than competitors would do. If it competes through cost advantage, it will try to perform internal activities at lower costs than competitors would do. When a company is capable of producing goods at lower costs than the market price or to provide superior products, it earns profits.

M. Porter introduced the generic value chain model in 1985. Value chain represents all the internal activities a firm engages in to produce goods and services. VC is formed of primary activities that add value to the final product directly and support activities that add value indirectly. The concept of value chains as decision support tools, was added onto the competitive strategies paradigm developed by Porter as early as 1979. In Porter's value chains, Inbound Logistics, Operations, Outbound Logistics, Marketing and Sales, and Service are categorized as primary activities. Secondary activities include Procurement, Human Resource management, Technological Development and Infrastructure (Porter 1985, pp. 11–15).

According to the OECD Secretary-General (Gurría 2012) the emergence of global value chain (GVCs) in the late 1990s provided a catalyst for accelerated change in the landscape of international investment and trade, with major, far-reaching consequences on governments as well as enterprises (Gurría 2012).

Salerno et al. (2015) conducted a study of firms to identify linkage between project investment criteria and different determinants. They identified that the value chain analysis describes predefined sequence of phases including idea generation, selection, development and launching of capital projects. They (2015) also observed that VCA describes how does a firm organize and plan resource allocation for those processes which do not fit easily into the traditional models (Silva et al., 2014; O'Connor, 2008).

Fadi and Northcott (2006) suggest the application of the value chain analysis tools for the evaluation of the strategic capital projects' investment decision making. They argue that it is the useful tool to help business identify their strategically value creating activities to develop appropriate competitive strategies (Porter, 1985; Hoque, 2001). According to them (2006), the results of studies (Shank and GovindraJan, 1992; Shank, 1996) show the potential to help the corporate financial executives of the business firms to understand the implications of strategic capital investment criteria of the projects. On the other side, the relative application of this method has been observed in the UK and German business firms (Carr and Tomkins, 1996).

Dekker (2003) also conducted a field survey of business firms to check the inter-firm relationships of value chain analysis and capital projects. He found on the basis of field responses from the corporate managers that it is one of the best methods in management accounting that provide the provision of information for coordination and optimization of activities among the managers at different levels in a firm or across the firms (Mouritsen, 2001; Van der Meer and Vosselman, 2000). Seal et al., 1999; Carr, 1995). He (2003) presented an activity-based costing (ABC) model by large UK retail firms in his this study. He found from the results of his study that ABC model supports the supply chain management (SCM) practices among the corporate managers in connection with the capital projects. He also observed from the results and findings of this field study that capital investment projects are directly correlated with value chain analysis and integrated cost information across the supply chain (supported by Cooper and Slagmulder, 2004; Dekker, 2004; Schmitz, 2005; Miller and Jones, 2010; Humphrey and Schmitz, 2000).

2.5.4. Benchmarking

Benchmarking is the practice of comparing business processes and performance metrics to industry bests and best practices from other companies. Dimensions typically measured are quality, time and cost. Benchmarking is used to measure performance using a specific indicator (cost per unit of measure, productivity per unit of measure, cycle time of x per unit of measure or defects per unit of measure) resulting in a metric of performance that is then compared to others.

In 2008, a comprehensive survey on benchmarking was commissioned by The Global Benchmarking Network, a network of benchmarking centers representing 22 countries. The survey reported after their compilation of data as: Mission and Vision Statements and Customer (Client) Surveys are the most used (by 77% of organizations) of 20 improvement tools, followed by SWOT analysis (strengths, weaknesses, opportunities, and threats) (72%), and Informal Benchmarking (68%). Performance Benchmarking was used by 49% and Best Practice Benchmarking by 39%. The tools that are likely to increase in popularity the most over the next three years are Performance Benchmarking, Informal Benchmarking, SWOT, and Best Practice Benchmarking. Over 60% of organizations that are not currently using these tools indicated they are likely to use them in the next three years. Benchmarking mainly depends on SWOT analysis and will also be using in future for almost 4-5 years.

Benchmarking theory is established upon the performance comparison, gap, and changes in the management process (Watson, 1993). A literature review also shows that majority of benchmarking methodologies perform the same function as performance gap analysis (e.g. Camp, 1989; Kozak, 2002; Watson, 1993). In a context of waste, first rule of benchmarking is to determine the performance gaps with respect to generation and utilization within a management system and to develop method to close them. The gap between internal and external practices reveals the changes and at the same time differentiates benchmarking theory from comparison research and competitive analysis. The author explained further that competitive analysis focus on product or service comparisons but benchmarking examine the operating and management skills that is use to produce goods and services. More also, competitive analysis looks at the characteristic of competitors in the same geographical location whilst benchmarking seeks to find the best practices regardless of location. (Pemberton, 2001).

Fadi and Northcott (2006) also observed the benchmarking strategic criterion for project investment decision making. According to them, benchmarking is the pursuit of industry best practices by the managers for the projects' evaluation and capital investment decision making that ultimately lead to the superior performance of the business firms (Hoque et al., 2001, p.184). Benchmarking criterion assists in the promotion of the awareness of competitiveness among the firms and creates a linkage between the operational tactics of the firms and corporate strategy and vision. It also controls and guide the stepwise changes affecting the performance of companies, and focus on all the concerned fields of the strategic capital investment decision making (Hoque et al., 2001, p.185; Putterill et al., 1996).).

Menachof and Wassenberg (2000) documented that in the capital investment decision making of the road transport companies, the evaluation criterion is also based on the benchmarking. According to them (2000), it is a systematic and continuous measurement process of evaluating the capital projects (see Coopers and Lybrands, 1993) and is capable of continuously measuring and comparing the firm's business process with the business process of the leaders or industry average all over the world to capture the information which enables the corporate financial executives and projects managers to take the necessary actions to improve their performance over time (H Van de Pole, 1992). They also identified that all kinds of activities of the firms are benchmarked including the billing, sales, budget allocation and logistics (Voort and Vries, 1993).

Evans (1997) and Menachof and Wassenberg (2000) noted the areas benchmarked importantly including the financial, customer service and quality, fleet occupancy and other areas. They argue that in these areas when a business firm knows exactly its strengths and weaknesses, then it can compare itself with other "best in class" business firms in the industry, to learn from them and adapt the best possible practices in their own culture. Their results also suggest that financial benchmarking pay off more than other areas as the associated average improvement rate was highest in terms of cost reduction. Barriers in the implementation of the benchmarking also matter in the business firms. According to them, the biggest barrier of conducting an effective benchmarking program appears to be time rather than lack of employees' commitment.

2.5.5. Technology Roadmapping

A technology roadmap is a flexible planning technique to support strategic and long-range planning, by matching short-term and long-term goals with specific technology solutions. It is a plan that applies to a new product or process and may include using technology forecasting or technology scouting to identify suitable emerging technologies. It is a known technique to help manage the fuzzy front-end of innovation. It is also expected that roadmapping techniques may help companies to survive in turbulent environments and help them to plan in a more holistic way to include non-financial goals and drive towards a more sustainable development. Here roadmaps can be combined with other corporate foresight methods to facilitate systemic change.

Developing a roadmap has three major uses. It helps reach a consensus about a set of needs and the technologies required to satisfy those needs, it provides a mechanism to help forecast technology developments, and it provides a framework to help plan and coordinate technology developments. It may also be used as an analysis tool to map the development and emergence from new industries.

Fadi and Northcott (2006) observed the application of the Technology Road Mapping on the limited scale in the business firms. According to them, this is one of the best practices which contribute in something worthwhile & meaningful in the definition of the technology strategy. It displays interaction between products & technologies over time by using charts and graphs to reveal links between the technology and business needs (Groenveld, 1997, p. 48). The main advantage of application of the Road Mapping is its way to capture the right capability at the right time inside and outside business firms to achieve the strategic objectives of the strategic capital projects by the corporate managers (McCarthy, 2003; Miller and O'Leary, 2007). According to Miller and O'Leary (2005, 2007), the investment in different assets are coordinated by different sub-units and it is ensured with the help of the Technology Road Mapping whether investment proposals synchronize and fit with investment taking place within and outside firm in a way that adds value to firms.

Lee et al. (2012) argue that many industrial firms have been able to use roadmapping as an effective process methodology for projecting future technology and for coordinating technology planning and strategy. Firms potentially realize a number of benefits in deploying technology roadmapping (TRM) processes. Roadmaps provide information identifying which new technologies will meet firms' future product demands, allowing companies to leverage R&D investments through choosing appropriately out of a range of alternative technologies. Moreover, the roadmapping process serves an important communication tool helping to bring about consensus among roadmap developers, as well as between participants brought in during the development process, who may communicate their understanding of shared corporate goals through the roadmap. However, there are few conceptual accounts or case studies have made the argument that roadmapping processes may be used effectively as communication tools. Based on their survey results, they documented that 120 different R&D units, this empirical study found that firms need to explore further how they can enable frequent interactions between the TRM development team and TRM participants. A high level of interaction will improve the credibility of a TRM, with communication channels selected by the organization also positively affecting TRM credibility.

2.6. Effect of moderating driver, Firm Age between Predictors and all the three Capital Investment Criteria (RMM, CAM and SAM)

The existing literature shows that the moderating variables have effect on relationship between the determinants (internal and external) and capital investment decision making criteria. The important moderating factor which has been taken in this study is the firm age. Firm age means whether business firms are small, medium or large sized with the passage of time. Firm age is the number of years of the firm from its incorporation (Fadi and Northcott, 2006; Miller and O'Leary, 2007; Afonso and Cunha, 2009).

The selection of firm age has been done on the basis of previous relevant studies and strong theoretical support (Pike, 1982; Mills and Herbert, 1987; Chenhall and Brownell, 1988; Chalos and Poon, 2000). The other moderating drivers including Firm Size, Management Style, Profitability, and D/E ratio could also have been taken in this study. But, we selected only the firm owing to its limited application in this kind of study in Pakistan. Other than this, the firm age plays a contributive role in the selection and attainment of capital projects. The investors' confidence increases with the maturity of firms (Firm Age). It is perceived by the all the stakeholders of capital projects that corporate managers of matured firms are in better position to make healthy investment decisions. The following studies show the impact of the moderating driver on the dependent and independent variables related to capital investment decisions criteria.

Sangster (1993) in a study based on the perceptions of corporate managers of the business firms documented the effect of firm age on firm specific independent factors and capital investment decision making. He found that the firm age acts as a moderating driver for both the internally &externally related factors affecting with the production and services and capital investment decision making methods (Scapens, 1985). He (1993) also identified that more sophisticated decisions are required for the capital investment decision making as the firm age increases. Furthermore, internal and external factors of the firms are adjusted according to the size of firm (market capitalization, number of employees, number of premises) as well (Mills and Herbert, 1987). He highlighted that these adjustments in capital investment decisions are mandatory so that the capability of the firm's business in the markets should be enhanced. The perception based studies of the Hopwood (1990) and Kim et al., (1986) also show the same results in case of firm age and capital investment decision making. Hodder and Riggs (1985) also identified that firm age and firm size act as moderators between capital investment decision making and business factors. They found that size and age of the firms have the moderating linkage with the capital investment decision making and the environmental factors of the firms (Gerwin, 1982; Gold, 1983).

Akalu (2003) recorded the managerial view in a study and found that firm age and management style act as moderators for the capital investment decision making methods and project related factors. He also identified that conventional methods are unable to appraise the soft projects adequately, which lead the management of the corporate level firms to select such projects on intuition, experience and rule of thumb methods (Ross, 1986; Shark, 1996). Fadi and Northcott (2006) also determined in light of the survey responses that firm age and firm size are the moderating drivers which drive the strong relationship between the investment methods and different factors related to the firms (Pike, 1988, 1996; Ho and Pike, 1991). On the other hand, Arnold and Hatzopoulos (2000) identified that firm size only acts as a moderator between the environmental factors and investment decision making.

Afonso and Cunha (2009) noted the managerial view regarding the firms age and firm size and identified the moderating effects of these variables on internal & external determinant and the capital investment (Ryan and Ryan, 2002, Graham and Harvey, 2001, Farragher et al., 2001). Arsaln et al. (2014) in a research study based on responses of the corporate managers also documented the importance of firm age and firm size. They (2014) identified that firm age and firm size have the moderating effects on the dependent and independent factors of the firms (Jenson, 1986). Gul et al. (2013) conducted a survey to record the managerial views and observed that firms' age acts as moderator between corporate governance and the firm's efficiency.

By taking a critical and thorough review of all of the above mentioned studies focusing on the managerial view and perception of the corporate level managers of the business firms, it can be argued that Capital Investment Decision Making Criteria has been deeply investigated all over the world. In these studies, different predicted and predictors relevant to the capital investment are discussed requiring investigation at more specific level in view of the pertinent moderators serving the desired objectives. Also, their results and findings identify the guidelines for the future researches and provide a platform for the scalars who are keenly involved in the research area of Capital Investment Decision Making Criteria to develop and test innovative frameworks related to the capital investment for the sake of better firm performance. Moreover, in these past survey based studies, different theoretical frameworks were taken for investigation with main reliance on the questionnaire as the data collection tool.

The above discussion also entails that most of the primitive studies discuss only the theatrical concepts while lacking the empirical evidence supported and collected through the relevant data collection techniques. But the recent studies conducted have duly quantified the managerial response to assert empirical justification and test the built-in hypothesis considering investment criteria. Furthermore, most of the researchers applied the questionnaire survey and electronic mails to capture the responses of the corporate managers of the sample business firms to determine their preferences for the capital investment decision making methods.

Through the questionnaires, they researchers tested the relationship among variables such as related to the risk management and strategic appraisal rooted in different theories which determine the generalized facts about the capital investment decision making of the capital projects. Similarly, there are different studies which describe the strategic alliance and firm's efficiency based methods for the capital investment decisions. Despite all these evidences, still more work is needed to investigate the linkages among the respective variables in relation to the capital projects decision making.

In this study the moderation effect of firm age has been checked on the predictors and predicted determinants of the Model-1 and Model-2 and Model-3. Furthermore, its findings and results will contribute towards the growth of the business firms through projects initiation and implementation. They will also help the corporate business executives to effectively evaluate the capital projects in terms of the best criteria determined based on the managerial perception.

2.7. Theoretical Framework

Many qualitative and quantitative studies based on primary and secondary data have been conducted by many researchers in the past. This study is the variant of many of the perception based studies of the researchers who have contributed in the area of capital investment decision making through theoretical and empirical evidence. In this regard, the pertinent work of different researchers is already discussed in the literature review section of the study. On the basis of the predictor, predicted and moderating variables, the proposed conceptual frameworks for the study are as followed:-

2.7.1. Determinants of Capital Investment Decision Making

Criterion based on RMM with effect of moderating variable, Firm Age

Econometric Equation: $CIDC_{RMM} = \beta_0 + \beta_1(CGS) + \beta_2(MF) + \beta_3(WE) + \beta_4(RO) + \beta_5(EV) + \beta_6(EUC) + \beta_7(ECF) + \beta_8(ITA) + \beta_9(VC) + \beta_{10}(AC) + \varepsilon_i$

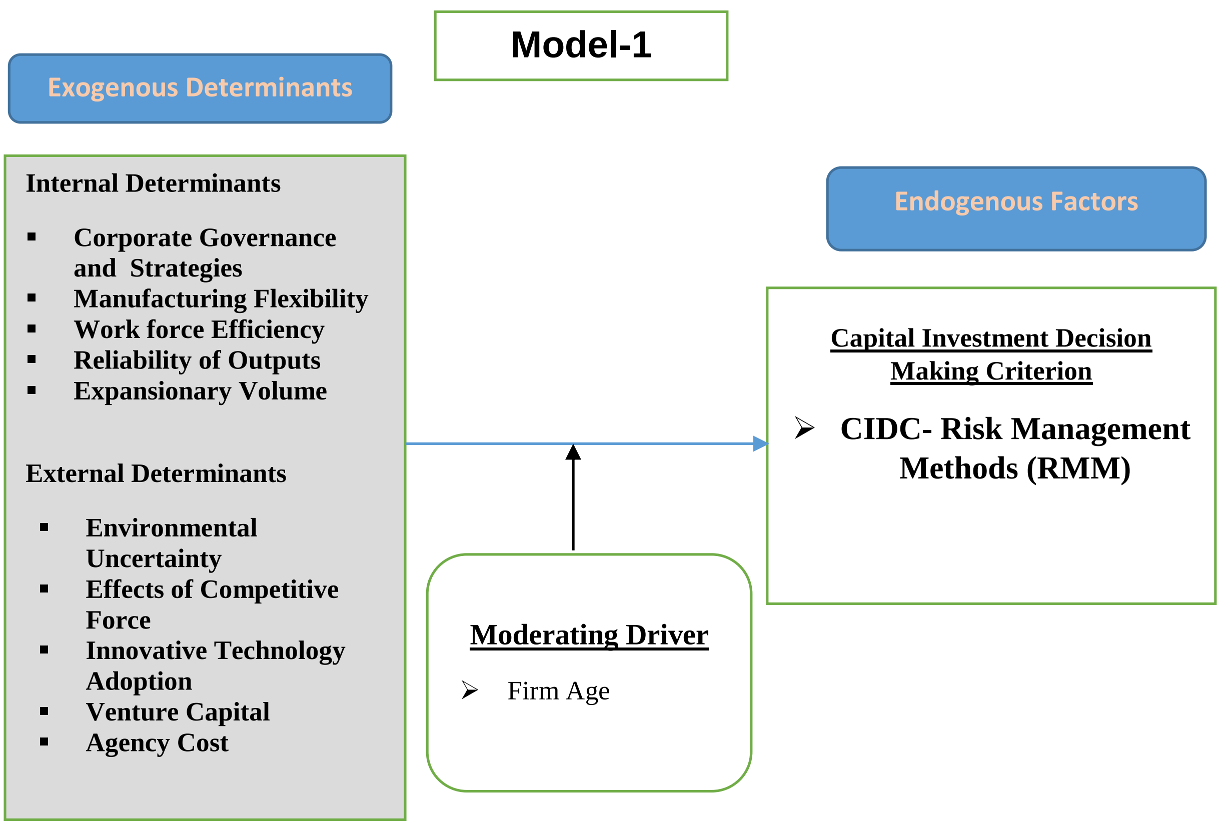

Figure 2A-1: Theoretical Framework for Capital Investment Decision making Criterion based on Model-1

Note: In the Model-1 the Capital Investment Decision Making is measured by the Risk Management Methods criterion. The capital investment decision making criterion based on RMM is regressed on all of the five internal determinants and five external determinants (i.e. 10 in total). The effect of internal and external determinants on the capital investment criteria are discussed in chapter-4 of data analysis section in details.

2.7.1.1. Hypotheses for Capital Investment Decision Making Criterion and Exogenous Determinants based on Model-1

Many empirical hypotheses which are testable can be structured for the Model-1 based on the Capital Investment Decision Making criteria. According to Afzal et al. (2012), Creswell (2013) and Gull et al., (2015) the hypotheses are non-directional and true hypotheses can be developed after the estimated results. That is why only alternative hypotheses have been described below. This perception based study is supposed to test the following main empirical hypotheses in relation to the Capital Investment Decision Making Criteria pertaining to the companies listed on Pakistan Stock Exchange (PSX):

These hypotheses are based on internal and external determinants of the Model-1

H1: Corporate Governance and Strategy has the significant effect on Capital Investment Decision Making criterion based on RMM.

H2: Manufacturing Flexibility is a significant predictor of Capital Investment Decision Making criterion based on RMM.

H3: Workforce Efficiency has the significant effect on Capital Investment Decision Making criterion based on RMM.

H4: Reliability of Outputs has the significant effect on Capital Investment Decision Making criterion based on RMM.

H5: The Expansion in Volume is a significant predictor of Capital Investment Decision Making criterion based on RMM.

H6: Environmental Uncertainty has the significant effect on Capital Investment Decision Making criterion based on RMM.

H7: Competitive Force has the significant effect on Capital Investment Decision Making criterion based on RMM.

H8: Innovative Technology is a significant predictor of Capital Investment Decision Making Criterion based on RMM.

H9: Venture Capital has the significant effect on the Capital Investment Decision Making criterion based on RMM.

H10: Agency Cost is a significant predictor of Capital Investment Decision Making criterion based on RMM.

H11: Firm Age is a significant moderator in the relationship between RMM and all the factors (Internal and External).

2.7.2. Determinants of Capital Investment Making Decision Criterion based on CAM with effect of moderating variable, Firm Age

Econometric Equation: $CIDC_{CAM} = \beta_0 + \beta_1 (CGS) + \beta_2 (MF) + \beta_3 (WE) + \beta_4 (RO) + \beta_5 (EV) + \beta_6 (EUC) + \beta_7 (ECF) + \beta_8 (ITA) + \beta_9 (VC) + \beta_{10} (AC) + \varepsilon_i$

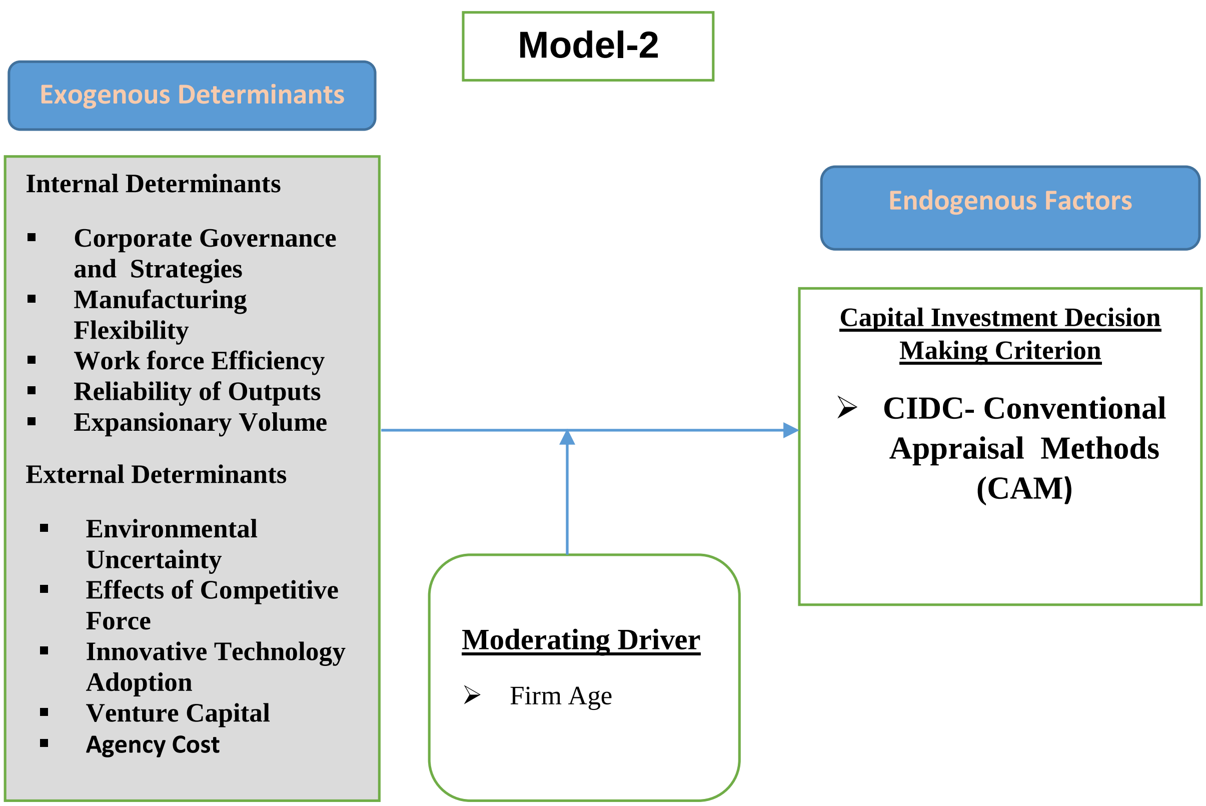

Figure 2A-2: Theoretical Framework for Capital Investment Decision making Criterion based on Model-2

Note: In the Model-2 the Capital Investment Decision Making is measured by the Conventional Appraisal Methods criterion. The capital investment decision making criterion based on CAM has been regressed on all of the five internal determinants and five external determinants (i.e. 10 in total) mentioned in Model-1. The effect of internal and external determinants on capital investment decision making criteria have been mentioned in the chapter-4 of data analysis section.

2.7.2.1. Hypotheses for Capital Investment Decision Making Criterion and External Determinants based on Model-2

These hypotheses are based on internal and external determinants of the Model-2.

H1: Corporate Governance and Strategy has the significant effect on Capital Investment Decision Making criterion based on CAM.

H2: Manufacturing Flexibility is a significant predictor of Capital Investment Decision Making criterion based on CAM.

H3: Workforce Efficiency has the significant effect on Capital Investment Decision Making criterion based on CAM.

H4: Reliability of Outputs has the significant effect on Capital Investment Decision Making criterion based on CAM.

H5: The Expansion in Volume is a significant predictor of Capital Investment Decision Making criterion based on CAM.

H6: Environmental Uncertainty has the significant effect on Capital Investment Decision Making criterion based on CAM.

H7: Competitive Force has the significant effect on Capital Investment Decision Making criterion based on CAM.

H8: Innovative Technology is a significant predictor of Capital Investment Decision Making Criterion based on CAM.

H9: Venture Capital has the significant effect on the Capital Investment Decision Making criterion based on CAM.

H10: Agency Cost is a significant predictor of Capital Investment Decision Making criterion based on CAM.

H11: Firm Age is a significant moderator in the relationship between RMM and all the factors (internal and external).

2.7.3. Determinants of Capital Investment Making Decision

Criterion based on SAM with effect of Moderating Variable, Firm Age

Econometric Equation: $CIDC_{SAM} = \beta_0 + \beta_1 (CGS) + \beta_2 (MF) + \beta_3 (WE) + \beta_4 (RO) + \beta_5 (EV) + \beta_6 (EUC) + \beta_7 (ECF) + \beta_8 (ITA) + \beta_9 (VC) + \beta_{10} (AC) + \varepsilon_i$

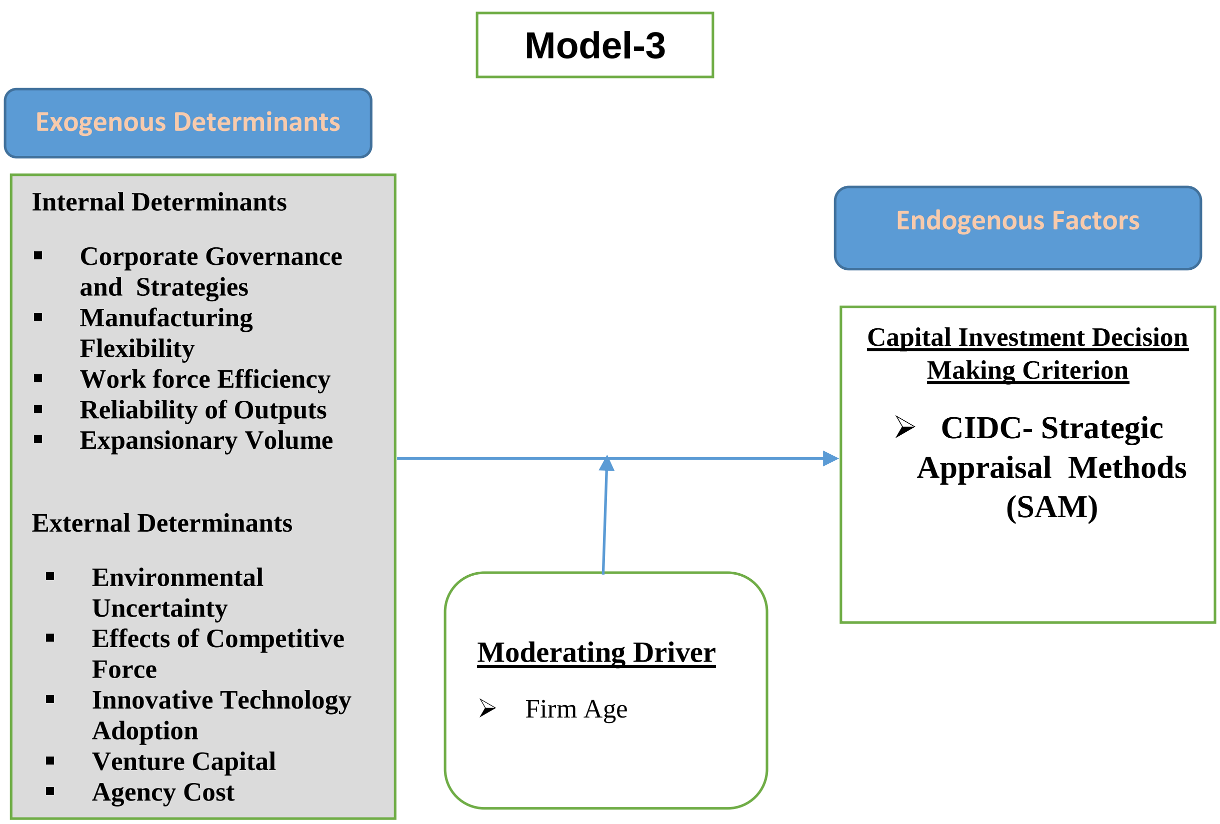

Figure 2A-3: Theoretical Framework for Capital Investment Decision making Criterion based on Model-3

Note: In the Model-3 the Capital Investment Decision Making is measured by the sub-criterion, Strategic Appraisal Methods. The capital investment decision making criterion based on SAM has been regressed on all of the five internal determinants and five external determinants. The effect of internal and external determinants on capital investment criteria have been mentioned in the chapter-4 of data analysis section.

2.7.3.1. Hypotheses for Capital Investment Decision Making Criterion and External Determinants based on Model-3

These hypotheses are based on Internal and External Determinants of the Model-3.

H1: Corporate Governance and Strategy has the significant effect on Capital Investment Decision Making criterion based on SAM.

H2: Manufacturing Flexibility is a significant predictor of Capital Investment Decision Making criterion based on SAM.

H3: Workforce Efficiency has the significant effect on Capital Investment Decision Making criterion based on SAM.

H4: Reliability of Outputs has the significant effect on Capital Investment Decision Making criterion based on SAM.

H5: The Expansion in Volume is a significant predictor of Capital Investment Decision Making criterion based on SAM.

H6: Environmental Uncertainty has the significant effect on Capital Investment Decision Making criterion based on SAM.

H7: Competitive Force has the significant effect on Capital Investment Decision Making criterion based on SAM.

H8: Innovative Technology is a significant predictor of Capital Investment Decision Making Criterion based on SAM.

H9: Venture Capital has the significant effect on the Capital Investment Decision Making criterion based on SAM.

H10: Agency Cost is a significant predictor of Capital Investment Decision Making criterion based on SAM.

H11: Firm Age is significant in the relationship between SAM and all the factors (internal and external).

Note: The RMM, CAM and SAM has been regressed on all of the five internal independent variables/determinants and five external determinants; by simple OLS-method and Multiple Regression Analysis.

CHAPTER-3

RESEARCH METHODOLOGY

3.1. Introduction

To provide solutions to the problems which have been identified in the problem statement and to achieve the targeted objectives that have been stated in the first chapter, the questionnaire instrument for the data collection, based on the empirical and theoretical support, has been adopted in this perception based study. Following this method, data was collected through electronic mailed and self-administered questionnaire from the corporate level senior managers of the companies listed on PSX in order to measure the effects of different internal and external determinants on the selected dimensions of the Capital Investment Decision Making Criteria with moderating effect of firm age in line with the existing theoretical literature.

This chapter is aimed to present the scheme of the data analysis methods in order to achieve the goals of the study stated in the problem statement. First of all, this chapter will identify the research design of the study in view of the responses of corporate managers for the capital investment decision making criteria. Next, it explains the target population and sampling technique in order to select the appropriate sample size of the companies and corporate managers. Afterwards, the appropriate sample size will be discussed in line with the empirical references which are provided to support and justify the sample size. In the next section, the data collection sources, methods and instruments which have been used in this study are discussed. In the last section, data analysis methods, statistical tests, econometric equations of all the models, data analysis tools and softwares which have been used to empirically test the hypotheses of the study.

3.2. Research Design of the Study

The research design describes the general and specific plan how to meet the objectives of the research task and solutions to the problems of the underlined issues. It is the appropriate research design through which the researchers can answer all the questions related to the objectives of the research work (Sekaran, 2000; Cooper et al., 2006; Bryman and Bell, 2015). According to

Asteriou and Hall (2006, 2007, and 2011), Fadi and Northcott (2006) and Saunders & Thornhill (2011), the sample size, data collection and sources, sampling techniques, research instruments, and the data estimation methods and tools are best described by the appropriate and pragmatic research design method. On the other hand, researchers like Asteriou and Hall (2006, 2007, and 2011), Ander et al., (2013) and Sreejesh et al., (2014) describe that a true research design acts like a formal framework which facilitates the researchers to conduct the research task details through a formal procedure. The research questions and the research objectives which are structured at the initial stage of the research task are applicable in the research design frame work (see Asteriou and Hall, 2006, 2007, 2011; Afonso and Cunha, 2009; Gull et al., 2015).

In line with deductive approach, this study proceeds from the general theoretical justifications of the past researchers to the specific direction by using the practical and applied research in line with the quantitative data, so that objectives of the study can be met. The questionnaire administered for this study is based on the questionnaires of many past researchers, with the inclusions of some reworded and rectified questions which are in line with the problem statement and objectives of our study (for example, see Fadi and Northcott, 2006; Akalu, 2006; Afonso and Cunha, 2009; Andor et al., 2013). The questionnaire composed of different Window sections which are modified and reworded according to the recommendations of reviewers. ***The questionnaire is annexed in Appendix-3 of this dissertation in the last section.***

The data was gathered through the direct visits, and electronic mails from the corporate managers of the companies listed on PSX. These companies are incorporated and regulated by the SECP. Through Pilot testing, the data regarding the capital investment decision making criteria of the 50 companies, was collected from the corporate level executives. The distribution of questionnaires and arrangement of interviews were made in the months of April, May, June and July, 2016 to collect the final data of the remaining 200 sample business firms. The said companies are traded on Pakistan Stock Exchange (PSX), the representative stock exchange of the country; whereas, Islamabad Stock Exchange (ISE-15) and Lahore Stock Exchange (LSE-25) are now merged into PSX (formerly known as Karachi Stock Exchange). Therefore, the accuracy level of the empirical data is above board as these companies from 35 sectors of the economy. The companies of these sectors are listed on the PSX and are also regulated by the SECP.

In summary, The questionnaire (Appendix-3) used for this study is basically intended to measure the perceptions, preferences and beliefs of corporate managers on five point likert scale targeting the specific relationship among the internal and external determinants, moderating factor and the capital investment decision making criteria. Some reverse coded questions are also included to ensure that questionnaires are properly filled by the respondents who are corporate executives of the sampled business firms (see pages 11-13 of the Appendix-3).

3.3. Target Population and Sampling

The population of the study consists of corporate level managers of the companies which are listed on the PSX (Pakistan Stock Exchange) covering 35 sectors. These 35 sectors consist of 582 registered companies. Therefore, the target population is these 582 registered and listed companies. These companies have been allowed to trade their shares on the PSX and regulated by the SECP. In this study, the response based survey data has been gathered through the questionnaire from the corporate level senior executives of the above companies. A single executive is not involved in the Capital Investment Decision Making rather this process involves the corporate managers at different levels. Therefore, at least four corporate level managers at different levels from each company, have been targeted for the survey responses.

The following table summarizes the composition of the population of the study.

Table 3-A

Registered companies in the PSX from 35 Sectors

Sector No.	Sector Name	No. of Registered companies in PSX
1.	AUTOMOBILE ASSEMBLER	12
2.	AUTOMOBILE PARTS & ACCESSORIES	10
3.	CABLE & ELECTRICAL GOODS	8
4.	CEMENT	21
5.	CHEMICAL	29
6.	CLOSE - END MUTUAL FUND	8
7.	COMMERCIAL BANKS	24
8.	ENGINEERING	19
9.	FERTILIZER	7
10.	FOOD & PERSONAL CARE PRODUCTS	21
11.	GLASS & CERAMICS	10
12	INSURANCE	32
13	INV. BANKS / INV. COS. / SECURITIES COS.	29
14.	JUTE	3

15.	LEASING COMPANIES	10
16	LEATHER & TANNERIES	5
17.	MISCELLANEOUS	22
18.	MODARABAS	29
19.	OIL & GAS EXPLORATION COMPANIES	4
20.	OIL & GAS MARKETING COMPANIES	8
21	PAPER & BOARD	10
22	PHARMACEUTICALS	10
23	POWER GENERATION & DISTRIBUTION	19
24.	REAL ESTATE INVESTMENT TRUST	1
25.	REFINERY	4
26.	SUGAR & ALLIED INDUSTRIES	36
27.	SYNTHETIC & RAYON	11
28.	TECHNOLOGY & COMMUNICATION	10
29.	TEXTILE COMPOSITE	56
30	TEXTILE SPINNING	84
31.	TEXTILE WEAVING	15
32.	TOBACCO	3
33.	TRANSPORT	5
34.	VANASPATI & ALLIED INDUSTRIES	5
35.	WOOLLEN	2
	Total Number of Companies	582

The sampling approach is based on Abdul Qadir and Dugdale (1998) criteria and consists of corporate level executives and managers involved in capital investment decision making. The corporate level senior managers are expected to make investment decisions in connection with the capital projects (Arnold and Hatzopolous, 2000). The sampling selection of this study is appropriate for answering our key questions of the problem statement and the underlying objectives of the study as well as useful review of the various Capital Investment Decision Making Criteria (Arnold and Hatzopolous, 2000; Fadi and Northcott, 2006)).

3.4. Sample Size

The companies which have been selected as a sample are listed on the PSX (Pakistan Stock Exchange) and stocks of these companies are being actively trading in the capital markets. At present, there are 582 companies listed on Pakistan Stock Exchange covering 35 sectors. Using the 5% significant level (i.e. 95% confidence level), 250 companies (financial and non-financial) were selected as a sample by running the financial calculator for sample selection. The same calculation of the sample size of the listed companies is also supported by the other relevant studies wherein the similar procedure was applied to calculate the sample size (see Yin, 1994; Sauders, Lewi, and Thornhill, 1999; and Sekaran, 2000).

Owing to the involvement of different levels of corporate managers in the capital investment decision making process, four executives from each company are selected in the sample who are involved in the capital projects' investment decision (supported by Akalu, 2003; Fadi and Northcott, 2006, Afonso and Cunha, 2009; Gul et al., 2013; and Yin, 2013). Therefore, the actual sample size is 1000 (i.e. 250 × 4) corporate managers at different levels from 250 selected sample companies (i.e. four corporate managers from each of the company). This sample is selected with the purpose to properly represent the population as if the study has an appropriate sample size, the findings obtained can be generalized (Abdul Qadir and Dugdale, 1998; Sauders, Lewi, and Thornhill, 1999; Sekaran, 2000; Healey and Perry, 2000).

The above selected sample size is greater than the sample size of Daunfeldt and Hartwig (2014) who recorded the responses of 193 corporate managers of the 193 business firms; Holmén and Pramborg (2009) who conducted interviews of 143 corporate level employees of 143 business firms; Mendes-Da-Silva and Saito (2014) who arranged interviews of 91 corporate level senior managers of 91companies; and Bennouna et al. (2010) who recorded the survey responses of 88 corporate managers of 88 companies. But , the sample size of companies selected by all the above mentioned researchers is below the sample size of companies which were selected by Graham et al., (2005) who selected 401 corporate level managers from 401 business firms; Graham and Harvey (2001) who selected 392 CFOs from 392 business firms; Brav et al., (2005) who selected 384 financial executives from 384 companies; Brounen et al., (2004) who selected 313 CFOs from 313 business firms; and Moore and Reichert (1983) who selected 298 large firms from 298 business firms belong to different sectors of the economy. It is evident from all the above cited studies that sample size of companies selected in this survey study is greater than all of the above mentioned studies. But on the other hand, sample size of this study is below the sample size of study conducted by Graham et al., (2010) who selected more than 1000 CEOs and CFOs as a sample of his study to reach at the appropriate capital investment criteria.

Table 3-B

Break Down of the Sample Size

Composition of the Research Instrument		
Particulars	No of Questionnaires	Percentage
Total Questionnaires Distributed	1000	100
Questionnaires Received Back	850	85
Questionnaires Incomplete	40	4
Questionnaire Discarded Due to Outliers	10	1
Total Correct Questionnaires	800	80

3.5. Sampling Technique

In this study, it was ensured that company from each sector has chances to be selected randomly so that findings of the study may better be generalized. In this regard, the stratified random sampling and purposive sampling have been used. In the first phase of stratified random sampling, the entire population makes the strata/sectors. The members of such strata share common attributes. In the next stage, a random sample of companies was taken from each of the stratum representing the number in proportion to each stratum's size in comparison to the target population (strata/sectors). Then purposive sampling of four corporate managers from each company has been done out of the random companies selected from each stratum to target only the corporate level managers who are involved in the capital investment decision making criteria. In this way, the number of respondents are totaled which equals to 1000 representing sample of the study.

3.6. Data Sources and Data collection Methods

In this managerial level capital investment decision making criteria related study, evidence about capital investment decision making criteria have been gathered through the questionnaire instrument of data collection based on the perceptions and practices of corporate managers of 250 sample companies listed on PSX, (Fadi and Northcott, 2006; Afonso and Cunha, 2009). The data was collected in two phases; first, mailed (electronic version) questionnaires, since target corporate firms listed on PSX are geographically scattered and it's humanly not possible to approach them personally. Therefore, electronic questionnaire were mailed to the corporate executives of sample business firms having corporate offices in specified cities of Pakistan. 2. Self-administered questionnaires through direct meeting with corporate managers. It was also necessary to design the structure of questionnaire before sending and direct delivering. The confidentiality of data provided by managers was ensured during the direct meetings with executives and in mails as well.

The questionnaire (Appendix-3) was developed in the light of the existing studies to record the responses of the corporate managers regarding three dimensions of capital investment decision making criteria which include the Risk Management Methods, Conventional Appraisal Methods, and Strategic Appraisal Methods. Moreover, the questionnaire is also administered to check the effects of internal and external determinants on the above criteria with effect of moderating factor, firm age. The questions are also adapted from previous studies. The details of questions related to each dimension/variable is given below in the form of table.

Table 3-C

The description of the questionnaire of the study

S. No.	**Main variables of the study**	**Sub-dimensions/Sub-variables**	**Sources from where the questions of these sub-dimensions/sub-variables were adopted**
1	Internal determinants	Corporate Governance and Strategies	Miles and Snow, 1978; Gosselin, 1997; Kotha, 2000; Bhujraj and Sengupta, 2003; Afonso and Cunha, 2009
		Manufacturing Flexibility	Miles and Snow, 1978 Nicolaou, 2002; Afonso and Cunha, 2009
		Work force Efficiency	Miles and Snow, 1978; Fadi & Northcott, 2006; Afonso and Cunha, 2009
		Reliability of Outputs	Miles and Snow, 1978; Segelod, 1997; Fadi & Northcott, 2006; Afonso and Cunha, 2009
		Expansionary Volume	Gitman and Forrester, 1977; Miles and Snow, 1978; Gosselin, 1997; Fadi and Northcott, 2006; Afonso and Cunha, 2009

2	External determinants	Environmental Uncertainty	Nicolaou, 2002; Fadi and Northcott, 2006; Afonso and Cunha, 2009
		Effects of Competitive Force	Porter, 1985; Nicolaou, 2002; Fadi and Northcott, 2006; Afonso and Cunha, 2009
		Innovative Technology Adoption	Kotha, 2000; Fadi & Northcott, 2006; Afonso and Cunha, 2009
		Venture Capital	Afonso and Cunha, 2009; Croce et al, 2013
		Agency Cost	Gitman and Forrester, 1977; Jenson, 1986; Afonso and Cunha, 2009
3	Capital Investment Decision Making Criteria/Endogenous Variable	Risk Management	Ryon and Ryon, 2002; Afonso and Cunha, 2009)
		Conventional Appraisal	Ryon and Ryon, 2002; Afonso and Cunha, 2009
		Strategic Appraisal	Ryon and Ryon, 2002; Fadi and Northcott, 2006
4	Moderating Variables		
		Firm's Age	Sorenson, 2007; Bottazzi et al., 2008; Afonso and Cunha, 2009

Moreover, the Factor Analysis has been conducted to scrutinize the most relevant factors related of the Capital Investment Decision Making Criteria. Simple, and Multiple Analysis have been run to observe the effects of the external and internal determinants on the capital investment decision making criteria. The use of the electronic questionnaire through the mails has a number of advantages namely; the low cost, the speed with which the questionnaires' responses are received, and the possibility of using the data collected as the straight input for the statistical software packages. To gather the required data, a window based questionnaire shown in the appendix-3, was used, these types of windows are expected to ensure validation of the answers in the data collection process (Nicolaou, 2002; Akalu, 2003; Fadi and Northcott, 2006). A five point Likert scale developed by Fantazy et al., (2009) was applied to gather information and responses from the subjects who were the corporate managers.

3.7. Questionnaire Design of the Study (Appendix-3)

According to the Malhotra et al., (2010) and Kumar et al., (2006) questionnaire of any descriptive research task is the way through which the direction of the data can be measured and collected. Following the pattern of the past studies (for example, see Akalu, 2003; Fadi and Northcott, 2006; Afonso and Cunha, 2009; Hussain and Shafique, 2013; Gull et al., 2013), in the current study the managerial views of the targeted corporate level managers were gathered and measured. Normally, the questionnaires for the data collection are of two types; structured and unstructured. Questionnaires are normally preset and preplanned series of questions or statements which are adjusted in different sections (Fadi and Northcott, 2006) or different windows (see, Akalu, 2003, 2006, 2009). Through items or dimensions of questionnaire the ground issues of the problem statement and objectives of study can be met.

The main purpose of the questionnaire designed for this study is to capture the perception, preferences and beliefs about the investment decisions criteria on the basis of perceptions, experiences and positions of the corporate managers of the sample companies listed on PSX, in relation to the healthy capital investment decision making criteria along with effects of determinants (internal and external) and moderating driver. This questionnaire has been designed with the assistance of the research task of the past researchers in the fields of capital investment decision making criteria. The details of the questionnaire is given below:-

3.7.1. Questionnaire Model-1: Capital Investment Decision Making based on RMM

Risk Management is the dependent factor of Model-1 that represents capital investment decision making criterion. The Risk Management has five sub-dimensions (i.e. Probability Analysis, Quantitative Risk Analysis, Beta Analysis, Sensitivity Analysis and Risk Adjusted Discount Rate) which have been described in the literature review section in details. The Risk Management decision criterion for the capital investment decision making in the Risk Management Model (Model-1) is affected by the five internal determinants and five external determinants based on the empirical literature which has been properly cited in the reference section of the study.

The Model-1, RMM describes the descriptive statistics of all independent and dependent determinants. In this model, the dependent factor is regressed on independent internal & external determinants and results have been observed. The descriptive statistics, OLS results, multiple regression and moderation results are provided in the chapter-4. The dependent variable of the Model-1, Risk Management investment dimension is explained in Window-3; Section-1 (Page: 11/13) of the questionnaire which is attached in the Appendix-3 section. On Likert scale (from A Great Deal to Never), five questions are related to Risk Management Methods which were twelve but reduced to five after pilot testing. These questions have been adapted from the past studies (Lerner and Merges, 1999; Robinson and Stuart, 2007; Lindsay 2008; Fadi and Northcott, 2006).

Independent determinants are mentioned in Window-1 and Window-2 of the questionnaire. The internal independent variables of the Model-1; Corporate governance and Strategy, Manufacturing Flexibility, Workforce Efficiency, Reliability of Outputs, and Expansionary Volume are given in Window-1; Section 1-5 (Page: 1-5/13) of the questionnaire attached in the appendix section.

Independent Internal Determinants of Model-1

1. Corporate Governance and Strategy

On Likert scale (from Never to Always), seven questions are related to Corporate Governance and Strategy, one question has been selected for each of the query. There were 12 questions but after the pilot testing[1] of the questionnaire and opinions of the respondents, these questions are reduced to 7 items only. These 7 questions are adapted from the past studies **(Miles and Snow, 1978; Gosselin, 1997; Kotha, 2000; Bhujraj and Sengupta, 2003)**

2. Manufacturing Flexibility

On Likert scale (from Strongly Disagree to Totally Agree), five questions are related to Manufacturing Flexibility. There were eight questions in the beginning stage but after the pilot testing of the questionnaire and feedback of experts, these questions were reduced to 5 items only. These questions are adapted from the past studies **(Miles and Snow, 1978; Kotha, 2000; Nicolaou, 2002; Milis and Mercken, 2003).**

1. The results of the Pilot Study ***(Reliability Testing and Validity Testing)*** are described in the Appendix-2 in the last section of this dissertation.

3. Workforce Efficiency

On Likert scale (from Never to Always), six questions are related to Workforce Efficiency. The ten questions were reduced to 6 after the pilot testing of the questionnaire and experts' opinions. These questions are adapted from the past studies **(Miles and Snow, 1978; Fadi and Northcott, 2006; Thorbjornsen and Mouritsen, 2003).**

4. Reliability of Outputs

On Likert scale (from Completely Disagree to Totally Agree), five questions are related to Reliability of Outputs where one question has been selected for each of the query. The 4 questions were removed after pilot testing of the questionnaire and respondents' feedback. After removal, the questions were reduced to 5. These questions are adapted from the past studies **(Miles and Snow, 1978; Segelod, 1997; Gosselin, 1997; Fadi and Northcott, 2006; Stevenson and Jarillo, 2007).**

5. Expansionary Volume

On Likert scale (from Never to Always), five questions are related to Expansion in Volume. At initial stage of pilot testing, there were ten questions but after the pilot testing of questionnaire and expert opinion, these questions were reduced to 5. These questions are adapted from past studies **(Gitman and Forrester, 1977; Miles and Snow, 1978; Gosselin, 1997; Fadi and Northcott, 2006; Stevenson, 2007).**

The external independent variables of the Model-1

The questions related to the Environmental Uncertainty, Effects of Competitive Force, Innovative Technology Adoption, Venture Capital, and Agency Cost have been given in Window-2; Section 1-5 (Page: 6-10) of the questionnaire which is attached in the appendix-3 section of this capital investment decision making criteria related study.

6. Environmental Uncertainty

On Likert scale (from Never to Always), five questions are related to Environmental Uncertainty, one question has been selected for each of the query. At initial stage of pilot testing, there were eight questions, but after the pilot testing of the questionnaire and opinions of the financial and business experts, they were reduced to 5. These questions are adapted from the past studies **(Nicolaou, 2002; Akalu, 2003; Davilla and Foster, 2005Fadi and Northcott, 2006)**

7. Effects of Competitive Force

Nine questions on Likert scale (from Strongly Disagree to Totally Agree) were selected for the Competitive Force. These questions were reduced to 5 after pilot testing of the questionnaire and experts' opinions. These questions are adapted from the past studies **(Porter, 1985; Graham and Harvey, 2001; Nicolaou, 2002; Brounen, 2004; Fadi and Northcott, 2006)**

8. Innovative Technology Adoption

On Likert scale (from Never to Always), ten questions were related to Innovative Technology Adoption. After pilot testing and respondents' feedback, they were reduced to 5. These questions are adapted from past studies **(Kotha, 2000; Fadi and Northcott, 2006; Lindsey, 2008; Ozmel et al., 2013).**

9. Venture Capital

In all eight questions were selected on Likert scale related to Venture Capital which were reduced to 5 after pilot testing of questionnaire and expert opinion. These questions are also adapted and modified from past studies **(Davila et al., 2003; Stuart and Sorensen, 2007; Bottazzi et al., 2008; Croce et al., 2013).**

10. Agency Cost

On Likert scale (from Never to Always), 10 questions were related to Agency Cost, one question was selected for each of the query. After pilot testing of the questionnaire and opinions of the respondents, the above questions were reduced to 5. These questions are adapted from the past studies **(Bhujraj and Sengupta, 2015; Carpenter and Guariglia, 2008; Gitman and Forrester, 1977; Jenson, 1986).**

Note: Moderation of Firm Age: The six moderation questions are stated in the end of questionnaire (Page-13) which were eight before the Pilot test results but were reduced to six.

3.7.2. Questionnaire Model-2: Capital Investment Decision Criteria based on CAM

Conventional Appraisal is the dependent factor of model-2 that represents the capital investment decision making criterion. The use of conventional appraisal method has four dimensions (NPV, IRR, PBP, and ARR) which are described in the literature review in details. The

Conventional Appraisal investment decision making in the Model-2 is affected by the five internal and external determinants related to the selected companies listed on PSX based on the empirical literature discussed in chapter-2. The Model-2, CAM also states the descriptive statistics of all independent and dependent determinants and in this model, the dependent factor is regressed on independent internal & external determinants and regression results have been collected.

The descriptive statistics, OLS results, and multiple regression results are given in the chapter- 4. The dependent variable of the Model-2, Conventional Appraisal Criterion is given in the Window-3; Section-2 (Page: 11-12/13) of the questionnaire. On Likert scale (from Always to Never), six questions are related to the Conventional Appraisal Methods. There were 9 questions, but after the pilot testing of the questionnaire and opinions of the financial and business experts, these questions are reduced to 6 (Lefley, 1997; **Lerner and Merges, 1999; Robinson and Stuart, 2007; Lindsay 2008; Ryon and Ryon, 2002; Fadi and Northcott, 2006; Ahmad et al., 2015**).

Note: The independent internal and external factors of the Model-2 are the same as of internal and external determinants of Model-1 RMM. Therefore, details of questions about these variables are already given in the section - 3.7.1.

3.7.3. Questionnaire Model-3: Capital Investment Decision Criteria based on SAM

Strategic Appraisal is the dependent sub-variable that represents capital investment decision making criterion. The Strategic Appraisal has five dimensions (i.e. Balanced Scorecard, Real Option Analysis, Value Chain Analysis, Benchmarking and Technology Road mapping) which are described in the literature review section in details. The Model-3, SAM delineates the descriptive statistics of all independent and dependent determinants. With the help of questionnaire, the dependent factor SAM is regressed on independent internal & external determinants and regression results are generated. The descriptive statistics, OLS results, multiple regression results and moderation results, are provided in the chapter-4. The dependent variable of Model-1, Strategic Appraisal Criterion is stated in the Window-3; Section-3 (Page: 12/13) of the questionnaire. On Likert scale (from Always to Never), five questions are related to Strategic Appraisal Methods which were nine before the pilot testing but reduced to five after pilot testing. These questions are adapted from the past studies **(Lefley and Morgan, 1998; Canedo and Almeida, 2010; Schwartz and Trigeorgis, 2004; Lindsay 2008; Ryon and Ryon, 2002; Fadi and Northcott, 2006)**.

Note: The independent internal and external variables of the Model-3 SAM are the same as given in the Model-1 SAM. Therefore, the description of the questions related to these variables is given in the section- 3.7.1.

3.8. Data Analysis Methods

All the variables mentioned in the theoretical framework and measured through the questionnaires, are analyzed through the relevant techniques. The purpose of data analysis is to understand and investigate the problem of the study and to provide related recommendations in view of the results of this study which is based on the determinants of capital investment criteria. The steps and techniques of data analysis process is as under:-

3.8.1. Factor Analysis

In this study, the effects of the drivers on the CIDC (Capital Investment Decision Making Criteria) have been determined and evaluated. These drivers consisted of corporate strategy & governance, flexibility level of manufacturing, workforce efficiency, future expansion volume, Reliability of outputs, environmental uncertainty, Effect of competitive force, innovative technology adoption, venture capital and agency cost. The problem statement states a number of factors and the relationship among these factors. Interview data is reduced to a limited number of factors through factor analysis (Duke, 2004; Pizzani, 2006). To properly explain the relationship between/among the variables, the available literature recommends the data reduction techniques (Lelli, 2001; Boyacioglu et al., Gelman et al., 2014; Kim and Swanson2014). These methods or techniques are used to identify underlying variables or factors that explain the pattern of correlations within a set of observed variables.

The most favored such technique is the factor analysis. Factor analysis approach examines the pattern of correlation among variables which are significant. Survey data is reduced to a limited number of factors through factor analysis (Duke, 2004; Pizzani, 2005, 2010). Most frequent method used for extraction of the factors is the Principal Component Analysis. This method is a statistical multivariate method that makes it possible to transform a group of initial variables correlated between themselves (X1, X2, ---------Xp) into a new group with a reduced number of un-correlated variables (orthogonal) which are identified and designated by principal components (Y1, Y2, -----, Yp). The new set of reduced variables minimizes the initial complexity of the data. By making uncorrelated linear combination of the observed values, Factor Analysis technique forms successive components which progressively, explain smaller portion of the variance, thus the first component has the maximum variance, whereas second component has the lower variance than the first component and so on (Fadi and Northcott, 2006).

As a rule of thumb, it is assumed that a coefficient value higher than 0.7 reveals a good internal consistency whereas, the values higher than 0.9 mean that factors internal consistency is very good. (Cooper, 2006; Maindonald, 1984). Analysis of the Chronbach's alpha can also be used to identify the variables that should be eliminated in order to improve internal consistency of the factors which are crucial to be fitted into the model to find the accurate results (Bland and Altman, 1997; Hoque, 2005; Hassan and Mohammed, 2007; Hung and Parker, 2009).

3.9. Regression Analysis

Regression Analysis is a statistical tool for the investigation of the relationship between the variables. When it is assumed that the dependent variable depends on more than one independent variable, it is referred to the Multiple Regression Analysis. In multiple regression, the additional factors (two or more than two) are entered into the model simultaneously for the statistical analysis so that the effect of each independent factor on the dependent factor can be estimated (Fadi and Northcott; 2006; Asteriou and Hall, 2011).

3.9.1. Econometric Equations of Regression Model-1

Regression lines based on Internal and External Determinants.

1. Simple Regression Analysis based on Risk Management Methods

$$\mathbf{CIDC_{RMM} = \beta_0 + \beta_1 (CGS) + \varepsilon_i} \text{ --------- } \mathbf{1.}$$

$$\mathbf{CIDC_{RMM} = \beta_0 + \beta_1 (MF) + \varepsilon_i} \text{ ----------- } \mathbf{2.}$$

$$\mathbf{CIDC_{RMM} = \beta_0 + \beta_1 (WE) + \varepsilon_i} \text{ ---------- } \mathbf{3.}$$

$$\mathbf{CIDC_{RMM} = \beta_0 + \beta_1 (RO) + \varepsilon_i} \text{ ----------- } \mathbf{4.}$$

$$\mathbf{CIDC_{RMM} = \beta_0 + \beta_1 (EV) + \varepsilon_i} \text{ ----------- } \mathbf{5.}$$

$$\mathbf{CIDC_{RMM} = \beta_0 + \beta_1 (EUC) + \varepsilon_i} \text{ --------- } \mathbf{6.}$$

$$\mathbf{CIDC_{RMM} = \beta_0 + \beta_1 (ECF) + \varepsilon_i} \text{ ----------} \mathbf{7.}$$

$$\mathbf{CIDC_{RMM} = \beta_0 + \beta_1 (ITA) + \varepsilon_i} \text{ ---------- } \mathbf{8.}$$

$$\mathbf{CIDC_{RMM} = \beta_0 + \beta_1 (VC) + \varepsilon_i} \text{ ----------- } \mathbf{9.}$$

$$\mathbf{CIDC_{RMM} = \beta_0 + \beta_1 (AC) + \varepsilon_i} \text{ ----------- } \mathbf{10.}$$

Where, $\mathbf{CIDC_{RMM}}$ is the capital investment decision making criterion based on the Risk Management Methods (RMM) of the model-1. CGS is the Corporate Governance and Strategy, MF is the Manufacturing Flexibility, WE is the Workforce Efficiency, RO is the Reliability of Outputs, and EV is the Expansionary Volume, ECU is the Environmental Uncertainty, ECF is the Effect of Competitive Force, ITA is the Innovative Technology Adoption, VC is the Venture Capital and AC is the Agency Cost.. Whereas, β_0 and $\beta 1$ are the coefficients of the regression lines shown above and ε_i is the error term or residual of the above regression equations.

2. Multiple Regression (Variant) Analysis of Model-1

$$Y_i = CIDC_{RMM} = \beta_0 + \beta_1 (CGS) + \beta_2 (MF) + \beta_3 (WE) + \beta_4 (RO) + \beta_5 (EV) + \beta_6 (EUC) + \beta_7 (ECF) + \beta_8 (ITA) + \beta_9 (VC) + \beta_{10} (AC) \quad \varepsilon_i \text{ ----------------------------------- } 20$$

Where, **$CIDC_{RMM}$** is the capital investment decision making criterion based on Risk Management Methods (RMM) of Model-1 whereas, β_0 and $\beta 1$------ $\beta 10$, are the coefficients of the above regression line and ε_i is the error term or residual of the regression equation.

3.9.2. Econometric Equations of Regression Model-2

Regression lines based on Internal and External Determinants.

1. Simple Regression Analysis based on Conventional Appraisal Methods

$$CIDC_{CAM} = \beta_0 + \beta_1 (CGS) + \varepsilon_i \text{ --------- } 1.$$

$$CIDC_{CAM} = \beta_0 + \beta_1 (MF) + \varepsilon_i \text{ ----------- } 2.$$

$$CIDC_{CAM} = \beta_0 + \beta_1 (WE) + \varepsilon_i \text{ ---------- } 3.$$

$$CIDC_{CAM} = \beta_0 + \beta_1 (RO) + \varepsilon_i \text{ ----------- } 4.$$

$$CIDC_{CAM} = \beta_0 + \beta_1 (EV) + \varepsilon_i \text{ ----------- } 5.$$

$$CIDC_{CAM} = \beta_0 + \beta_1 (EUC) + \varepsilon_i \text{ --------- } 6.$$

$$CIDC_{CAM} = \beta_0 + \beta_1 (ECF) + \varepsilon_i \text{ ----------}7.$$

$$CIDC_{CAM} = \beta_0 + \beta_1 (ITA) + \varepsilon_i \text{ ---------- } 8.$$

$$CIDC_{CAM} = \beta_0 + \beta_1 (VC) + \varepsilon_i \text{ ----------- } 9.$$

$$CIDC_{CAM} = \beta_0 + \beta_1 (AC) + \varepsilon_i \text{ ----------- } 10.$$

$CIDC_{CAM}$ is the capital investment decision making criterion based on the Conventional Appraisal Methods (CAM) of Model-2. Whereas, β_0 and $\beta 1$------ $\beta 10$, are the coefficients of the above regression line and ε_i is the error term or residual of the regression equations.

2. Multiple Regression (Variant) Analysis of Model-2

$$CIDC_{CAM} = \beta_0 + \beta_1 (CGS) + \beta_2 (MF) + \beta_3 (WE) + \beta_4 (RO) + \beta_5 (EV) + \beta_6 (EUC) + \beta_7 (ECF) + \beta_8 (ITA) + \beta_9 (VC) + \beta_{10} (AC) \quad \varepsilon_i \text{ --------------------------------- } 20$$

Where, **$CIDC_{CAM}$** is the capital investment decision making criterion based on Conventional Appraisal Methods (CAM) of Model-2. The β_0 and $\beta 1$------ $\beta 10$, are the coefficients of the regression lines shown above and ε_i is the error term or residual of regression equation.

3.9.3. Econometric Equations of Regression Model-3

Regression lines based on Internal and External Determinants.

1. Simple Regression Analysis based on Strategic Appraisal Methods

$$\mathbf{CIDC_{SAM} = \beta_0 + \beta_1 (CGS) + \varepsilon_i} \text{ --------- } \mathbf{1.}$$

$$\mathbf{CIDC_{SAM} = \beta_0 + \beta_1 (MF) + \varepsilon_i} \text{ ---------- } \mathbf{2.}$$

$$\mathbf{CIDC_{SAM} = \beta_0 + \beta_1 (WE) + \varepsilon_i} \text{ ---------- } \mathbf{3.}$$

$$\mathbf{CIDC_{SAM} = \beta_0 + \beta_1 (RO) + \varepsilon_i} \text{ ----------- } \mathbf{4.}$$

$$\mathbf{CIDC_{SAM} = \beta_0 + \beta_1 (EV) + \varepsilon_i} \text{ ----------- } \mathbf{5.}$$

$$\mathbf{CIDC_{SAM} = \beta_0 + \beta_1 (EUC) + \varepsilon_i} \text{ --------- } \mathbf{6.}$$

$$\mathbf{CIDC_{SAM} = \beta_0 + \beta_1 (ECF) + \varepsilon_i} \text{ ----------} \mathbf{7.}$$

$$\mathbf{CIDC_{SAM} = \beta_0 + \beta_1 (ITA) + \varepsilon_i} \text{ ---------- } \mathbf{8.}$$

$$\mathbf{CIDC_{SAM} = \beta_0 + \beta_1 (VC) + \varepsilon_i} \text{ ----------- } \mathbf{9.}$$

$$\mathbf{CIDC_{SAM} = \beta_0 + \beta_1 (AC) + \varepsilon_i} \text{ ----------- } \mathbf{10.}$$

Where, **$CIDC_{SAM}$** is the capital investment decision making criterion based on the Strategic Appraisal Methods (SAM) of the Model-3. The β_0 and $\beta 1$ are the coefficients of the regression lines which have been shown above and ε_i is the error term or residual of the regression equations.

2. Multiple Regression (Variant) Analysis of Model-2

$$\mathbf{CIDC_{SAM} = \beta_0 + \beta_1 (CGS) + \beta_2 (MF) + \beta_3 (WE) + \beta_4 (RO) + \beta_5 (EV) + \beta_6 (EUC) + \beta_7 (ECF) + \beta_8 (ITA) + \beta_9 (VC) + \beta_{10} (AC) \quad \varepsilon_i} \text{ -------------------------------- } \mathbf{20.}$$

Where, **$CIDC_{SAM}$** is the capital investment decision making criterion based on Strategic Appraisal Methods (CAM) of Model-2. The β_0 and $\beta 1$------ $\beta 10$, are the coefficients of the regression lines shown above and ε_i is the error term or residual of regression equation.

3.9.4. Regression Analysis of Moderator, Firm Age with Predictors and RMM

The following equations are estimated to check the effect of FA as moderator with the independent factors and CAM.

$$\textbf{CIDC}_{\textbf{RMM}} = \boldsymbol{\beta_0 + \beta_1 (Z\text{- CGS}) + \beta_2 (Z - FA) + \beta_3 (CGS*FA) + \varepsilon_i} \text{ ----------------------- } \textbf{1.}$$

Whereas, $CIDC_{RMM}$ is the capital investment decision making criterion based on RMM; Z-CGS is the Z-value of the CGS; Z-FA is the Z-score of the moderator, FA; and CGS*FA is the interaction term between CGS and FA; $\beta_{1,}$ $\beta_{2\&}$ β_3 are respective slopes of this regression equation.

$$\textbf{CIDC}_{\textbf{RMM}} = \boldsymbol{\beta_0 + \beta_1 (Z\text{- MF}) + \beta_2 (Z - FA) + \beta_3 (MF*FA) + \varepsilon_i} \text{ ------------------------- } \textbf{2.}$$

Whereas, $CIDC_{RMM}$ is the capital investment decision making criterion based on RMM; Z-MF is the Z-value of the MF; Z-FA is the Z-score of the moderator, FA; and MF*FA is the interaction term between MF and FA; $\beta_{1,}$ $\beta_{2\&}$ β_3 are the respective slopes of this regression equation.

$$\textbf{CIDC}_{\textbf{RMM}} = \boldsymbol{\beta_0 + \beta_1 (Z\text{- WE}) + \beta_2 (Z - FA) + \beta_3 (WE*FA) + \varepsilon_i} \text{ ------------------------ } \textbf{3.}$$

Whereas, $CIDC_{RMM}$ is the capital investment decision making criterion based on RMM; Z-WE is the Z-value of the WE; Z-FA is the Z-score of the moderator, FA; and WE*FA is the interaction term between WE and FA; $\beta_{1,}$ $\beta_{2\&}$ β_3 are the respective slopes of this regression equation.

$$\textbf{CIDC}_{\textbf{RMM}} = \boldsymbol{\beta_0 + \beta_1 (Z\text{- RO}) + \beta_2 (Z - FA) + \beta_3 (RO*FA) + \varepsilon_i} \text{ ------------------------- } \textbf{4.}$$

Whereas, $CIDC_{RMM}$ is the capital investment decision making criterion based on RMM; Z-RO is the Z-value of the RO; Z-FA is the Z-score of the moderator, FA; and RO*FA is the interaction term between RO and FA; $\beta_{1,}$ $\beta_{2\&}$ β_3 are the respective slopes of this regression equation.

$$\textbf{CIDC}_{\textbf{RMM}} = \boldsymbol{\beta_0 + \beta_1 (Z\text{- EV}) + \beta_2 (Z - EV) + \beta_3 (EV*FA) + \varepsilon_i} \text{ ------------------------- } \textbf{5.}$$

Whereas, $CIDC_{RMM}$ is the capital investment decision making criterion based on RMM. Z-EV is the Z-value of the EV; Z-FA is the Z-score of the moderator, FA; and EV*FA is the interaction term between EV and FA; $\beta_{1,}$ $\beta_{2\&}$ β_3 are the respective slopes of this regression equation.

$$\textbf{CIDC}_{\textbf{RMM}} = \boldsymbol{\beta_0 + \beta_1 (Z\text{- EUC}) + \beta_2 (Z - FA) + \beta_3 (EUC*FA) + \varepsilon_i} \text{ -------------------- } \textbf{6.}$$

Whereas, $CIDC_{RMM}$ is the capital investment decision making criterion based on RMM. Z-EUC is the Z-value of the EUC; Z-FA is the Z-score of the moderator, FA; and EUC*FA is the interaction term between EUC and FA; $\beta_{1,}$ $\beta_{2\&}$ β_3 are the respective slopes of this regression equation.

$$\textbf{CIDC}_{\textbf{RMM}} = \boldsymbol{\beta_0 + \beta_1 (Z\text{- ECF}) + \beta_2 (Z - FA) + \beta_3 (ECF*FA) + \varepsilon_i} \text{ --------------------- } \textbf{7.}$$

Whereas, $CIDC_{RMM}$ is the capital investment decision making criterion based on RMM; Z-ECF is the Z-value of the ECF; Z-FA is the Z-score of the moderator, FA; and ECF*FA is the interaction term between ECF and FA; $\beta_{1,}$ $\beta_{2\&}$ β_3 are respective slopes of this regression equation.

$CIDC_{RMM} = \beta_0 + \beta_1 (Z\text{- } ITA) + \beta_2 (Z - FA) + \beta_3 (ITA*FA) + \varepsilon_i$ ---------------------- 8.

Whereas, $CIDC_{RMM}$ is the capital investment decision making criterion based on RMM; Z-ITA is the Z-value of the ITA; Z-FA is the Z-score of the moderator, FA; and ITA*FA is the interaction term between ITA and FA; $\beta_{1,}$ $\beta_{2\&}$ β_3 are respective slopes of this regression equation.

$CIDC_{RMM} = \beta_0 + \beta_1 (Z\text{- } VC) + \beta_2 (Z - FA) + \beta_3 (VC*FA) + \varepsilon_i$ ----------------------- 9.

Whereas, $CIDC_{RMM}$ is the capital investment decision making criterion based on RMM; Z-VC is the Z-value of the VC; Z-FA is the Z-score of the moderator, FA; and VC*FA is the interaction term between VC and FA; $\beta_{1,}$ $\beta_{2\&}$ β_3 are the respective slopes of this regression equation.

$CIDC_{RMM} = \beta_0 + \beta_1 (Z\text{- } AC) + \beta_2 (Z - FA) + \beta_3 (AC*FA) + \varepsilon_i$ ---------------------- 10.

Whereas, $CIDC_{RMM}$ is the capital investment decision making criterion based on RMM; Z-AC is the Z-value of the AC; Z-FA is the Z-score of the moderator, FA; and AC*FA is the interaction term between AC and FA; $\beta_{1,}$ $\beta_{2\&}$ β_3 are the respective slopes of this regression equation.

3.9.5. Regression Analysis of Moderator, Firm Age with Predictors and CAM

The following equations are estimated to check the effect of FA as moderator with the independent factors and CAM.

$CIDC_{CAM} = \beta_0 + \beta_1 (Z\text{- } CGS) + \beta_2 (Z - FA) + \beta_3 (CGS*FA) + \varepsilon_i$ ----------------------- 1.

Whereas, $CIDC_{CAM}$ is the capital investment decision making criterion based on CAM; Z-CGS is the Z-value of the CGS; Z-FA is the Z-score of the moderator, FA; and CGS*FA is the interaction term between CGS and FA; $\beta_{1,}$ $\beta_{2\&}$ β_3 are respective slopes of this regression equation.

$CIDC_{CAM} = \beta_0 + \beta_1 (Z\text{- } MF) + \beta_2 (Z - FA) + \beta_3 (MF*FA) + \varepsilon_i$ ------------------------- 2.

$CIDC_{CAM} = \beta_0 + \beta_1 (Z\text{- } WE) + \beta_2 (Z - FA) + \beta_3 (WE*FA) + \varepsilon_i$ ------------------------ 3.

$CIDC_{CAM} = \beta_0 + \beta_1 (Z\text{- } RO) + \beta_2 (Z - FA) + \beta_3 (RO*FA) + \varepsilon_i$ ------------------------- 4.

$CIDC_{CAM} = \beta_0 + \beta_1 (Z\text{- } EV) + \beta_2 (Z - FA) + \beta_3 (EV*FA) + \varepsilon_i$ ------------------------- 5.

$CIDC_{CAM} = \beta_0 + \beta_1 (Z\text{- } EUC) + \beta_2 (Z - FA) + \beta_3 (EUC*FA) + \varepsilon_i$ -------------------- 6.

$CIDC_{CAM} = \beta_0 + \beta_1 (Z\text{- } ECF) + \beta_2 (Z - FA) + \beta_3 (ECF*FA) + \varepsilon_i$ --------------------- 7.

$CIDC_{CAM} = \beta_0 + \beta_1 (Z\text{- } ITA) + \beta_2 (Z - FA) + \beta_3 (ITA*FA) + \varepsilon_i$ ---------------------- 8.

$CIDC_{CAM} = \beta_0 + \beta_1 (Z\text{- } VC) + \beta_2 (Z - FA) + \beta_3 (VC*FA) + \varepsilon_i$ ----------------------- 9.

$CIDC_{CAM} = \beta_0 + \beta_1 (Z\text{- } AC) + \beta_2 (Z - FA) + \beta_3 (AC*FA) + \varepsilon_i$ ---------------------- 10.

3.9.6. Regression Analysis of Moderator, Firm Age with Predictors and SAM

The following equations are estimated to check the effect of FA as moderator with the independent factors and CAM.

$$\mathbf{CIDC_{SAM} = \beta_0 + \beta_1 (Z\text{- }CGS) + \beta_2 (Z - FA) + \beta_3 (CGS^*FA) + \varepsilon_i} \text{ ----------------------- } \mathbf{1.}$$

Whereas, $CIDC_{SAM}$ is the capital investment decision making criterion based on SAM; Z-CGS is the Z-value of the CGS; Z-FA is the Z-score of the moderator, FA; and CGS*FA is the interaction term between CGS and FA; $\beta_{1,}$ $\beta_{2\&}$ β_3 are respective slopes of this regression equation.

$$\mathbf{CIDC_{SAM} = \beta_0 + \beta_1 (Z\text{- }MF) + \beta_2 (Z - FA) + \beta_3 (MF^*FA) + \varepsilon_i} \text{ ------------------------- } \mathbf{2.}$$

$$\mathbf{CIDC_{SAM} = \beta_0 + \beta_1 (Z\text{- }WE) + \beta_2 (Z - FA) + \beta_3 (WE^*FA) + \varepsilon_i} \text{ ------------------------ } \mathbf{3.}$$

$$\mathbf{CIDC_{SAM} = \beta_0 + \beta_1 (Z\text{- }RO) + \beta_2 (Z - FA) + \beta_3 (RO^*FA) + \varepsilon_i} \text{ ------------------------- } \mathbf{4.}$$

$$\mathbf{CIDC_{SAM} = \beta_0 + \beta_1 (Z\text{- }EV) + \beta_2 (Z - FA) + \beta_3 (EV^*FA) + \varepsilon_i} \text{ ------------------------- } \mathbf{5.}$$

$$\mathbf{CIDC_{SAM} = \beta_0 + \beta_1 (Z\text{- }EUC) + \beta_2 (Z - FA) + \beta_3 (EUC^*FA) + \varepsilon_i} \text{ -------------------- } \mathbf{6.}$$

$$\mathbf{CIDC_{SAM} = \beta_0 + \beta_1 (Z\text{- }ECF) + \beta_2 (Z - FA) + \beta_3 (ECF^*FA) + \varepsilon_i} \text{ --------------------- } \mathbf{7.}$$

$$\mathbf{CIDC_{SAM} = \beta_0 + \beta_1 (Z\text{- }VC) + \beta_2 (Z - FA) + \beta_3 (VC^*FA) + \varepsilon_i} \text{ ----------------------- } \mathbf{9.}$$

$$\mathbf{CIDC_{SAM} = \beta_0 + \beta_1 (Z\text{- }AC) + \beta_2 (Z - FA) + \beta_3 (AC^*FA) + \varepsilon_i} \text{ ---------------------- } \mathbf{10.}$$

3.10. Data Analysis Tools and Softwares

The Statistical Package for Social Sciences (SPSS) is used to analyze the collected data in the view to resolve the problems of the study, to meet the underlying objectives stated in chapter 1, to apply the research methodology in the appropriate way, and to test the hypotheses of the study. For tabulating the data sheets, the Microsoft Excel has been used to make easy the process of data entry. The Microsoft Excel can also calculate different statistics such as the mean and standard deviation. But in this study, these statistics are calculated using the SPSS. Reliability of the data was checked through the Chronbach's Alpha test and Intra-Class correlation coefficient test, whereas validity of data was checked through KMO test and Bartlett's test of Sphericity.

Outliers in the data were removed from the data with the help of Box-Plot test. All the assumptions of OLS regression models were checked including the linearity of the data, no multicollinearity in the data, homoscedasticity in the data, no autocorrelation in the data, and normal distribution of the error term. The assumption of autocorrelation is applicable in case of time series data. As in the current study, no time series data is collected, therefore, the assumption of autocorrelation is relaxed. All these assumptions are tested through SPSS by applying the different tests which have been suggested by the previous researchers in this field of research task. The results of these tests are shown in the chapter-4.

The data collected through the questionnaires was imported from the excel sheets and then was inserted into the SPSS after which the multiple tests were run. Through SPSS, all the relevant descriptive statistics such as Mean, Median, Mode, Standard Deviation, Frequency Distribution Minimum and Maximum values, were calculated. The Skewness and Kurtosis were also calculated so as to duly ensure running the regression models. Other than all these descriptive statistics, the inferential statistical tests also have been used in the SPSS to test the hypotheses of the study with the purpose to draw out the future pragmatic directions for the entire population (all the companies listed on the Pakistan Stock Exchange (PSX) covering 35 sectors). According to Sekaran & Bougie (2010) and Asteriou & Hall (2006, 2007, 2011), the hypotheses can be tested more accurately with the help of OLS regression model and multiple regression model which are very basic and suitable techniques for these kinds of perception based studies.

3.11. Summary of Chapter Three

In the nut shell, the methods used in this study are supported by the previous empirical studies which have been conducted by many researchers in this field of capital investment criteria (see Afonso and Cunha, 2009; Fantazy et al., 2009; Pizzini, 2006; Fadi and Northcott, 2006; Akalu, 2003;Sandahl & Sjogren, 2003; Malhotra et al., 2003; Rayon and Rayon, 2002; Nicolaou, 2002; Graham and Harvey, 2001; Abdel-Kader and Dugdale, 1998;Segelod, 1997; Pike, 1996; and Porter, 1985). In the methodology section, the best experiences and the observations of the past researchers were relied on who used the quantitative measures to determine the best capital investment decision making criteria and to adopt the best practices for the evaluation of the capital projects by the corporate financial and non-financial executives of the business firms of the world. The Descriptive Analysis, OLS Regression Model and Multiple Regression Models are used in the study which seems to be very simple in their applications but these models and analysis have deep and profound effects for significance of the study, and for the testing of hypotheses stated in chapter 2 on the basis of the problem statement. In this chapter, the data collection procedures also have been depicted in details. The Primary data based on the questionnaire (Perceptions of managers), was gathered from the large sample of the respondents who were the corporate business executives who are involved in the evaluation and selection of the capital investment projects.

Chapter 4

Results and Discussion

4.1. Introduction.

This chapter consists of results and findings of study related to all of above three stated models (Risk Management model, Conventional Appraisal model, and Strategic Appraisal model). The survey questionnaire was used to collect the data for the sake of checking perceptions of corporate managers in connection with capital investment criteria and the factors which affect this criteria. The research instrument was prepared on the basis of the previous studies in this area. Before finalizing the questionnaire, a pilot-testing survey was conducted. The final draft of the questionnaire was prepared after the recommendations of the subject experts in this field, by taking the counsels from the industry experts and corporate financial executives, and from the future recommendations of the past studies which are conducted on the capital investment decision making.

In the first part of this chapter, the validity for all the dimensions of the research instrument was checked through different tests including, KMO and Bartlett's tests and Component Matrix findings. After that, the reliability of the research instrument (questionnaire) has been checked through different tests including Chronbach's Alpha for all the three models including RMM (Risk Management Model), CAM (Conventional Appraisal Model), and SAM (Strategic Appraisal Model). To measure the internal consistency of all the parameters, the Intra-Class correlation coefficients for all the three models have been also checked. In the second phase of this chapter, the data collected through the research instrument have been tested for all the regression assumptions for all the three models; RMM, CAM and SAM.

In the next part, results of descriptive statistics and Pearson's correlation coefficients for all the three models, RMM, CAM and SAM are presented. The results of regression lines for all predictor variables and predicted variables are given using the simple, and multiple regression analysis. The results of moderation effects of all the three models are also presented. At the end, results and discussion of responses from senior managers of different companies listed on PSX, are provided.

4.2. Validity of the Research Instrument

Malhotra et al. (2009), and Guajarati (2006) state that the validity of the research describes the extent to which a reliable instrument measures what it purposes to measure. The other researchers including Copeland and Howe (2002), Bhujraj and Sengupta (2015) and Gul et al., (2013) argue that a valid instrument should be reliable. According to Guajarati (2009) and Fadi and Northcott (2006), an instrument can also reliable even if it is not valid. But in this capital investment related study, the reliability of the Questionnaire will be questioned if it is not attested by the validity testing. There are three main types of validity which are part of statistical books and pertinent literature.

1. Construct Validity
2. Content Validity, and
3. Criterion Related Validity.

In the empirical literature of Capital Investment studies, we are concerned mainly to measure the Criterion Related Validity (Arther et al., 2006; Hinkin, 1995).

4.2.1 Criterion Related Validity

Damodar Guajarati (2005), and Fadi and Northcott (2006) state that the Criterion Related Validity describes the fact that how good scores measured by the new research instruments are correlated with the scores of the research instrument with the same construct and content which is also supported theoretically by the past researches in the relevant area. It should be also noted here that the original instrument in itself will be valid. Predictive Validity and Concurrent Validity are the two main types of Criterion related Validity (Bloomberg et al., 2005). This perception based Capital investment related study is descriptive in nature and is based on the primary data collected from the corporate level managers of the companies listed on the Pakistan Stock Exchange (PSX).

The Factor Analysis is conducted after the pilot testing of the survey questionnaire. Though most of the questions in this study are adopted and rectified from the past survey instruments of this area, yet many of the questions were added on the recommendations of the senior financial executives and experts in this field. Therefore, it became necessary to conduct the factor analysis so that through principal component analysis the most important and significant items of the questionnaire can be selected. In the first draft of the survey instrument (i.e. questionnaire), there were more elements / questions included for each of the predictor and predicted factor to measure the final construct of the research work. But, by the application of Factor Analysis (i.e. Principal Component Analysis), the number of items / elements have been reduced to the number mentioned in the last column of table-7, table-9 and table-11. The last draft of questionnaire was finalized after checking the construct validity and content validity of the research instrument.

Through the Principal Component Analysis, only those factors are retained which have the factor loading of greater than 0.4 and Eigen value of greater than one (Cooper et al., 2006; Robertson and Kinder, 1993). According to Kaiser-Meyer-Olkin, the Measure of Sampling Adequacy (KMO-Test) values are greater than 0.65 which shows the acceptable range for the selection of the variables of interest of the study. In the same way, all the values for Bartlett's Test of Sphericity are statistically significant at a 0.01 level of significance which shows that the correlation matrix of the variables is not an identity matrix at all (Martín de Castro et al., 2008; Grable and Lytton, 2003).

Table-1: *KMO and Bartlett's Test: For Model-1, Risk Management Methods*

Variables		CGS	MF	WE	RO	EV	EUC	ECF	ITA	VC	AC	RMM	FA
KMO-Measure of Sampling Adequacy		.74	.76	.66	.65	.74	.75	.72	.77	.77	.75	.74	.62
Bartlett's Test of Sphericity	App. Chi-Square	612.56	628.46	400.25	370.12	403.56	361.73	355.23	665.31	854.50	585.68	472.55	260.35
	Df.	21	10	15	10	10	10	10	10	10	10	10	6

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, RMM= Risk Management Methods, FA= Firm Age

In the above shown table-1, the values of KMO Measure of Sampling Adequacy and Bartlett's test of Sphericity are stated. The most acceptable values of KMO-test are greater than 0.65, but the values closer to 1 are considered very well for the regression estimation (see Ghosh, S., & Jintanapakanont, 2004; Liao, 2011). The values greater than

0.5 are also adequate and shows that sample is reasonable (Guajarati, 2006). Therefore, appropriate range of values should be from 0.5 and 1. Almost all the values for KMO-Measure of Sampling Adequacy of RMM- model are greater than 0.70 except, WE, RO, and FA. However, all the values between 0.5 and 1 and, therefore, are in good and reasonable range. The Chi-square values also have been shown with a degree of freedom for all the variables. Furthermore, all the values of Bartlett's Test of Sphericity are statistically significant at 0.01 level (Pinjala et al., 2006; Awang et al., 2009).

Table-2: *Component Matrix for Risk Management Methods Model-1*

Components and Factor Loadings for all the Variables							
CGS (Corporate Governance & Strategy)							
Components	CGS-1	CGS-2	CGS-3	CGS-4	CGS-5	CGS-6	CGS-7
Factor Loadings	.647	.592	.656	.432	.625	.636	.338
MF (Manufacturing Flexibility)							
Components	MF-1	MF-2	MF-3	MF-4	MF-5		
Factor Loadings	0.764	0.610	0.770	0.681	0.396		
WE (Workforce Efficiency)							
Components	WE-1	WE-2	WE-3	WE-4	WE-5	WE-6	
Factor Loadings	0.618	0.646	0.582	0.615	0.296	0.562	
RO (Reliability of Outputs)							
Components	RO-1	RO-2	RO-3	RO-4	RO-5		
Factor Loadings	0.711	0.217	0.698.	0.616	0.670		
EV (Expansionary Volume)							
Components	EV-1	EV-2	EV-3	EV-4	EV-5		
Factor Loadings	0.709	0.616	0.604	0.678	0.573		
EUC (Environmental Uncertainty)							
Components	EUC-1	EUC-2	EUC-3	EUC-4	EUC-5		
Factor Loadings	0.680	0.569	0.684	0.597	0.610		
ECF (Effect of Competitive force)							
Components	ECF-1	ECF-2	ECF-3	ECF-4	ECF-5		
Factor Loadings	0.338	0.697	0.623	0.689	0.686		
ITA (Innovative Technology Adoption)							
Components	ITA-1	ITA-2	ITA-3	ITA-4	ITA-5		
Factor Loadings	.717	.774	.715	.624	.556		
VC (Venture Capital)							
Components	VC-1	VC-2	VC-3	VC-4	VC-5		
Factor Loadings	.644	.708	.655	.770	.757		
AC (Agency Cost)							

Components	AC-1	AC-2	AC-3	AC-4	AC-5
Factor Loadings	0.713	0.688	0.618	0.581	0.733
		RMM (Risk Management Methods)			
Components	RMM-1	RMM-2	RMM-3	RMM-4	RMM-5
Factor Loadings	0.608	0.670	0.668	0.671	0.628
			FA (Firm Age)		
Components	FA-1	FA-2			
Factor Loadings	0.794	0.794			

In table-2, factor loadings of all the items of each variable of RMM model are stated. The accepted value of the factor loading of each element is greater than 0.4 (Jolliffe, 1986; Wold et al., 1987; Dogan, 1995; Parker, 2014). It is clear from table-2 that all values of factor loadings are greater than 0.4 except tCGS-7, MF-5, WE-5, RO-2and ECF-1. The values of factor loading closer to one are considered excellent (Miller and Bromiley, 1990; Mudambi, 1995; McNeil et al., 2015). The factors having loading value less than 0.4 are removed from the original data set which are also highlighted in the table-2.

Table-3: *KMO and Bartlett's Test: For Model-2, Conventional Appraisal Methods*

Variables		CGS	MF	WE	RO	EV	EUC	ECF	ITA	VC	AC	CAM	FA
KMO-Measure of Sampling Adequacy		.74	.76	.66	.65	.74	.75	.72	.77	.77	.75	.81	.62
Bartlett's Test of Sphericity	App. Chi-Square	612.56	628.46	400.25	370.12	403.56	361.73	355.23	665.31	854.50	585.68	375.23	260.35
	Df.	21	10	15	10	10	10	10	10	10	10	5	6

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, CAM= Conventional Appraisal Methods, FA= Firm Age

In the above shown table-3, almost all the values for KMO-Measure of Sampling Adequacy of CAM- model are greater than 0.70 except, WE, RO, and FA. But again, overall all the values are in good and reasonable range. The Chi-square values have also been shown with a degree of freedom for all the variables. Furthermore, all the values of Bartlett's Test of Sphericity are also statistically significant at 0.01 level.

In the given table-4, factor loadings of complete items of each of the variable of CAM model are stated. It is clear that all the values of factor loadings are greater than the acceptable value of 0.4 except CGS-7, MF-5, and WE-5, RO-2, ECF-1 and CAM-2. The factors having the loading values less than 0.4 are removed from the original data set and the same are also highlighted in the table-4.

Table-4: *Component Matrix for Conventional Appraisal Methods Model-2*

Components and Factor Loadings for all the Variables							
CGS (Corporate Governance & Strategy)							
Components	CGS-1	CGS-2	CGS-3	CGS-4	CGS-5	CGS-6	CGS-7
Factor Loadings	.647	.592	.656	.432	.625	.636	.338
MF (Manufacturing Flexibility)							
Components	MF-1	MF-2	MF-3	MF-4	MF-5		
Factor Loadings	0.764	0.610	0.770	0.681	0.396		
WE (Workforce Efficiency)							
Components	WE-1	WE-2	WE-3	WE-4	WE-5	WE-6	
Factor Loadings	0.618	0.646	0.582	0.615	0.296	0.562	
RO (Reliability of Outputs)							
Components	RO-1	RO-2	RO-3	RO-4	RO-5		
Factor Loadings	0.711	0.217	0.698.	0.616	0.670		
EV (Expansionary Volume)							
Components	EV-1	EV-2	EV-3	EV-4	EV-5		
Factor Loadings	0.709	0.616	0.604	0.678	0.573		
EUC (Environmental Uncertainty)							
Components	EUC-1	EUC-2	EUC-3	EUC-4	EUC-5		
Factor Loadings	0.680	0.569	0.684	0.597	0.610		
ECF (Effect of Competitive force)							
Components	ECF-1	ECF-2	ECF-3	ECF-4	ECF-5		
Factor Loadings	0.338	0.697	0.623	0.689	0.686		
ITA (Innovative Technology Adoption)							
Components	ITA-1	ITA-2	ITA-3	ITA-4	ITA-5		
Factor Loadings	.717	.774	.715	.624	.556		
VC (Venture Capital)							
Components	VC-1	VC-2	VC-3	VC-4	VC-5		
Factor Loadings	.644	.708	.655	.770	.757		
AC (Agency Cost)							

Components	AC-1	AC-2	AC-3	AC-4	AC-5	
Factor Loadings	0.713	0.688	0.618	0.581	0.733	
		CAM (Conventional Appraisal Methods)				
Components	CAM-1	CAM-2	CAM-3	CAM-4	CAM-5	CAM-6
Factor Loadings	0.528	0.403	0.743	0.713	0.740	.734
			FA (Firm Age)			
Components	FA-1	FA-2				
Factor Loadings	0.794	0.794				

In the following table-5, almost all the values of KMO-Measure of Sampling Adequacy of SAM- model are greater than 0.70 except, WE, RO, FS, FA and MS. But all the values are in good and reasonable range. The Chi-square values have also been shown with a degree of freedom for all the variables. All the values of Bartlett's Test of Sphericity are also statistically significant at 0.01 level. In table-6, the factor loadings of all the items of each variable of SAM model are mentioned. The table-6 shows that all the values of factor loadings are greater than the acceptable value of 0.4 except the CGS-7, MF-5, WE-5, RO-2 and ECF-1 which verifies the reliability test of Chronbach's Alpha. The factors which are having the factor loading value less than 0.4 are removed from the original data set which is also highlighted in the table-6.

Table-5: *KMO and Bartlett's Test: For Model-3, Strategic Appraisal Methods*

Variables		CGS	MF	WE	RO	EV	EUC	ECF	ITA	VC	AC	SAM	FA
KMO-Measure of Sampling Adequacy		.74	.76	.66	.65	.74	.75	.72	.77	.77	.75	.74	.62
Bartlett's Test of Sphericity	App. Chi-Square	612.56	628.46	400.25	370.12	403.56	361.73	355.23	665.31	854.50	585.68	375.23	260.35
	Df.	21	10	15	10	10	10	10	10	10	10	5	6

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, SAM= Strategic Appraisal Methods, FA= Firm Age

Table-6: *Component Matrix for Strategic Appraisal Methods Model-3*

Components and Factor Loadings for all the Variables							
CGS (Corporate Governance & Strategy)							
Components	CGS-1	CGS-2	CGS-3	CGS-4	CGS-5	CGS-6	CGS-7
Factor Loadings	.647	.592	.656	.432	.625	.636	.338
MF (Manufacturing Flexibility)							
Components	MF-1	MF-2	MF-3	MF-4	MF-5		
Factor Loadings	0.764	0.610	0.770	0.681	0.396		
WE (Workforce Efficiency)							
Components	WE-1	WE-2	WE-3	WE-4	WE-5	WE-6	
Factor Loadings	0.618	0.646	0.582	0.615	0.296	0.562	
RO (Reliability of Outputs)							
Components	RO-1	RO-2	RO-3	RO-4	RO-5		
Factor Loadings	0.711	0.217	0.698.	0.616	0.670		
EV (Expansionary Volume)							
Components	EV-1	EV-2	EV-3	EV-4	EV-5		
Factor Loadings	0.709	0.616	0.604	0.678	0.573		
EUC (Environmental Uncertainty)							
Components	EUC-1	EUC-2	EUC-3	EUC-4	EUC-5		
Factor Loadings	0.680	0.569	0.684	0.597	0.610		
ECF (Effect of Competitive force)							
Components	ECF-1	ECF-2	ECF-3	ECF-4	ECF-5		
Factor Loadings	0.338	0.697	0.623	0.689	0.686		
ITA (Innovative Technology Adoption)							
Components	ITA-1	ITA-2	ITA-3	ITA-4	ITA-5		
Factor Loadings	.717	.774	.715	.624	.556		
VC (Venture Capital)							
Components	VC-1	VC-2	VC-3	VC-4	VC-5		
Factor Loadings	.644	.708	.655	.770	.757		
AC (Agency Cost)							
Components	AC-1	AC-2	AC-3	AC-4	AC-5		
Factor Loadings	0.713	0.688	0.618	0.581	0.733		
SAM (Strategic Appraisal Methods)							
Components	SAM-1	SAM-2	SAM-3	SAM-4	SAM-5		
Factor Loadings	0.767	0.793	0.778	0.705	0.771		
FA (Firm Age)							
Components	FA-1	FA-2					
Factor Loadings	0.794	0.794					

4.3. Reliability of the Research Instrument

The reliability of research instrument is the statistical technique which produces the similar results on the repeated trials and yields consistent findings through the data analysis (Easterby-Smith et al., 2002). According to Fantasy et al., (2002), the reliability can be evaluated by understanding the following three key facts:

1. The measures of data collection process should yield almost the similar results for the similar nature of research studies.
2. The researchers of same research field should observe the similar kinds of observations from their target respondents.
3. There should be complete transparency while shifting the processed data from raw excel sheets to final sheets for the data analysis process.

Bush (2007) in his statistical research defines the three most applied types of reliability. The first type is the Test re-Test that is obtained by correlating the data with the data collected through the same questionnaire under the conditions that are equivalent to first presented questionnaire of the targeted study. Therefore, the similar questionnaire is presented to the respondents twice which however can create difficulty most of the time due to busy and tough schedules of the executives (see Devaus, 2002). In addition to it, longer the time period between the presentations of the questionnaire, more the probable it is to find the same kind of responses from the target samples of the underlying study (Bloomberg et al., 2005; Field, 2005).

The next approach to test the reliability of the research instrument is the Alternative-Form reliability which is also suggested by Guajarati (2006) and Asteriou and Hall (2011). It is sense for reliability within your questionnaire through comparing responses of your research questionnaire with other questionnaire used to collect data in the similar kind of research studies. In the longer questionnaires, these types of questions are called check questions. But, on the other hand, most of the time it is difficult to identify whether these questions are substantially similar or equivalent.

The third type that is mostly applied by the researchers in the field of Social Sciences is the Internal Consistency approach, the details of which are given below:

4.3.1. Internal Consistency of Research Instrument

According to Bush (2007) and Guajarati (2006), the internal consistency measures the consistency of the responses across either all the questions or items of the questionnaire. We can say that internal consistency is the parameter of equivalence used to correlate the items of research instrument with each other. Asteriou and Hall (2011) assert on the assumption that internal consistency facilitates estimation for reliability of measurement and the items or dimensions of the same construct must be correlated with one another.

The method which is mostly applied by the researchers in the field of social sciences to check the internal consistency of the reliability of the research instrument is the Chronbach's Alpha values whereas Chronbach's alpha is the function of the mean inter-correlations of items/dimensions and the number of items in the likert- scale as a whole. It is stated that higher the number of items of the construct/variables, greater would be the Alpha value showing the good correlation of all the items. The most accepted values of Chronbach's Alpha is 0.6 or greater than 0.6 in case of capital investment related study (Abdul Qadir and Dugdale, 1998; Robinson and Stuart, 2007).

Intra-class correlation (ICC) measures the reliability of ratings or measurements for clusters-data which has been collected as groups or sorted into groups. Pearson's correlation is usually used for inter-rater reliability when you only have one or two meaningful pairs from one or two raters. For more pairs, we use the ICC. Like most correlation coefficients, the ICC ranges from 0 to 1.The ICC is also applied to check the internal consistency of the items of questionnaire. (Fleiss and Cohen, 1973; Bartko, 1976; Shrout and Fleiss, 1979; Weir, 2005).

In this study the estimated values of both Chronbach's alpha and Intra-Class Correlation Coefficients are calculated whereas the split-haves method is not used because of its inherent limitations for those it is applied scarcely.

In split-half reliability, a test for a single knowledge area is split into two parts and then both parts are given to one group of students at the same time. The scores from both parts of test are correlated. A reliable test will have high correlation, indicating that a student would perform well on both halves of test.

Split-half testing is a measure of internal consistency - how well the test components contribute to the construct that is being measured. It has common usage for multiple choice questions and can also be used for essay type questions (see Drost, 2011; Carmines and Zeller, 1979).

It only works for a large set of questions which all measure the same construct/area of knowledge. For example, personality inventory test measures the introversion, extroversion, depression and a variety of other personality traits. This is not a good candidate for split-half testing (Marx et al., 2003; Miller, 1995).

4.3.2. Internal Consistency of Risk Management Model.

Table-7: *Chronbach's Alpha Statistics for Risk Management Model*

S. No.	Variable	Chronbach's Alpha	Chronbach's Alpha Based on Standardized Items	No. of Items
1.	CGS	0.66	0.66	6
2.	MF	0.70	0.70	4
3.	WE	0.58	0.58	5
4.	RO	0.61	0.61	4
5.	EV	0.63	0.63	5
6.	EUC	0.62	0.62	5
7.	ECF	0.62	0.62	4
8.	ITA	0.71	0.71	5
9.	VC	0.75	0.75	5
10.	AC	0.67	0.67	4
11.	RMM	0.65	0.65	5
12.	FA	0.62	0.62	6

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, RMM= Risk Management Methods, FA= Firm Age

In the above shown table-7, the values of simple Chronbach's Alpha and Chronbach's Alpha based on standardized items have been shown. It can be observed through these values that Chronbach's Alpha for all the variables is greater than 0.60 except the WE whose value is less than 0.60 but greater than 0.5. According to Abdul Qadir and Dugdale (1998), the Chronbach's values greater than 0.6 are fitted for the model and are within the acceptable range for these kinds of capital investment decision making studies. Fadi and Northcott (2006), Robinson and Stuart (2007), Afonso and Cunha (2009), Ozmel et al., (2013), and Bhujraj and Sengupta (2015) argue that Chronbach's value of Alpha greater than 0.7 is very good but the value of Alpha greater than 0.6 is also reasonable for the capital investment related studies. According to Graham and Harvey (2001), Ryon and Ryon (2002), Duke (2004), Pizzani (2006), and Malhotra et al., (2009), the values of Chronbach's Alpha greater than 0.5 are good to estimate the models, but the values greater than 0.6 are reasonably good to calculate the results of those studies which are related to the capital investment projects' decision making criteria. In the light of findings of these studies, Chronbach's Alpha for the Risk Management Model are within ran.

Table-8: *Intra-Class Correlation Coefficient for RMM Model (Average Measures)*

S. No.	Variables	Intra-Class Correlation	95 % Confidence Interval Lower Bound	Upper Bound	t-value	Sig
1.	CGS	.66*	.62	.69	2.93	0.000
2.	MF	.70*	.66	.73	3.32	0.000
3.	WE	.57*	.53	.62	2.37	0.000
4.	RO	.61*	.56	.65	2.55	0.000
5.	EV	.63*	.59	.67	2.71	0.000
6.	EUC	.62*	.57	.66	2.60	0.000
7.	ECF	.62*	.58	.66	2.63	0.000
8.	ITA	.71*	.68	.741	3.46	0.000
9.	VC	.75*	.73	.78	4.02	0.000
10.	AC	.67*	.63	.71	3.04	0.000
11.	RMM	.65*	.61	.69	2.85	0.000
12.	FA	.62*	.64	.61	2.75	0.000

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, RMM= Risk Management Methods, FA= Firm Age; (*) *represents significance at 5% level*

In table-8, values of Intra-Class correlation coefficients are shown. Here, once again, we can notice that all these values are reasonably good to estimate all models for regression analysis. Only the Chronbach's Alpha values of WE and FS and MS are less than 0.6, while all the remaining values are greater than 0.6. These values are reported on the basis of lower and upper boundaries at 95% confidence level. F-Test values for all variables are significant showing the internal consistency among all variables of RMM.

4.3.3. Internal Consistency of Conventional Appraisal Model.

Table-9: *Chronbach's Alpha Statistics for Conventional Appraisal Model*

S. No.	Variable	Chronbach's Alpha	Chronbach's Alpha Based on Standardized Items	No. of Items
1.	CGS	0.66	0.66	6
2.	MF	0.70	0.70	4
3.	WE	0.58	0.58	5
4.	RO	0.61	0.61	4
5.	EV	0.63	0.63	5
6.	EUC	0.62	0.62	5
7.	ECF	0.62	0.62	4
8.	ITA	0.71	0.71	5
9.	VC	0.75	0.75	5
10.	AC	0.67	0.67	4
11.	CAM	0.76	0.76	4
12.	FA	0.62	0.62	6

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, CAM= Conventional Appraisal Methods, FA= Firm Age

In the above shown table-9, the values of simple Chronbach's Alpha and Chronbach's Alpha based on standardized items are given. It can be observed that Chronbach's Alpha for all the variables is greater than 0.60 except the WE which has value less than 0.60 but greater than 0.5. Some of the studies also describe that factors which have Chronbach's Alpha values greater than 0.5 are also good to estimate the models (see Graham and Harvey, 2001; Duke, 2004; Pizzani, 2006; and Malhotra et al., 2009).

As discussed above, the Chronbach's values greater than 0.6 are fitted for the model and are within the acceptable range. Therefore, the Chronbach's Alpha for the Conventional Appraisal Model are also within acceptable range.

Table-10: *Intra-Class Correlation Coefficient for CAM Model (Average Measures)*

S. No.	Variables	Intra-Class Correlation	95 % Confidence Interval			
			Lower Bound	Upper Bound	t-value	Sig
1.	CGS	.66*	.62	.69	2.93	0.000
2.	MF	.70*	.66	.73	3.32	0.000
3.	WE	.57*	.53	.62	2.37	0.000
4.	RO	.61*	.56	.65	2.55	0.000
5.	EV	.63*	.59	.67	2.71	0.000
6.	EUC	.62*	.57	.66	2.60	0.000
7.	ECF	.62*	.58	.66	2.63	0.000
8.	ITA	.71*	.68	.741	3.46	0.000
9.	VC	.75*	.73	.78	4.02	0.000
10.	AC	.67*	.63	.71	3.04	0.000
11.	CAM	.76*	.73	.78	4.13	0.000
12.	FA	.62*	.64	.61	2.75	0.000

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, CAM= Conventional Appraisal Methods, FA= Firm Age; (*) *shows significance at 5% level*

In table-10, the values of Intra-Class correlation coefficients have been shown. Here, once again, we can notice that all these values are reasonably good to estimate all the models for regression analysis. Only the values of WE, is less than 0.6, while all the remaining values are greater than 0.6. These values are reported on the basis of lower and upper boundaries at 95% confidence level. TF-Test values for all variables is significant which shows that there is internal consistency among all the variables of CAM model.

4.3.4. Internal Consistency of Strategic Appraisal Model.

Table-11: *Chronbach's Alpha Statistics for Strategic Appraisal Model*

S. No.	Variables	Chronbach's Alpha	Chronbach's Alpha Based on Standardized Items	No. of Items
1.	CGS	0.66	0.66	6
2.	MF	0.70	0.70	4
3.	WE	0.58	0.58	5
4.	RO	0.61	0.61	4
5.	EV	0.63	0.63	5
6.	EUC	0.62	0.62	5
7.	ECF	0.62	0.62	4
8.	ITA	0.71	0.71	5
9.	VC	0.75	0.75	5
10.	AC	0.67	0.67	4
11.	SAM	0.82	0.82	5
12.	FA	0.62	0.62	6

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, SAM= Strategic Appraisal Methods, FA= Firm Age

The table-11 shows values of simple Chronbach's Alpha and Chronbach's Alpha based on standardized items. Chronbach's Alpha for all the variables are greater than 0.60 except WE, which has value less than 0.60 but greater than 0.5. The Chronbach's values greater than 0.6 are also within the acceptable range (Pizzani, 2006)

Table-12: *Intra-Class Correlation Coefficient for SAM Model (Average Measures)*

S. No.	Variables	Intra-Class Correlation	95 % Confidence Interval			
			Lower Bound	Upper Bound	t-value	Sig
1.	CGS	.66*	.62	.69	2.93	0.000
2.	MF	.70*	.66	.73	3.32	0.000
3.	WE	.57*	.53	.62	2.37	0.000
4.	RO	.61*	.56	.65	2.55	0.000
5.	EV	.63*	.59	.67	2.71	0.000
6.	EUC	.62*	.57	.66	2.60	0.000
7.	ECF	.62*	.58	.66	2.63	0.000
8.	ITA	.71*	.68	.741	3.46	0.000
9.	VC	.75*	.73	.78	4.02	0.000
10.	AC	.67*	.63	.71	3.04	0.000
11.	SAM	.82*	.80	.84	5.57	0.000
12.	FA	.62*	.64	.61	2.75	0.000

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, SAM= Strategic Appraisal Methods, FA= Firm Age; (*) *shows that significance is at 5% level*

In table-12, the values of Intra-Class correlation coefficients are given. Here, once again, we can notice that all these values are reasonably good to estimate all models for regression analysis. Only the value of WE, is less than the 0.6, while all the remaining values are greater than 0.6. These values are reported on the basis of lower and upper boundaries at 95% confidence level. The F-Test values for all variables is significant that shows that there is internal consistency among all the variables of SAM model.

4.4. Descriptive Statistics for the Risk Management Model

Table-13: *Descriptive Statistics for Risk Management Model*

Variables	N	Minimum Statistics	Maximum Statistics	Mean Statistics	Mean St. Error	Std. Deviation
CGS	800	2.50	5.00	3.8504	.01767	.49989
MF	800	2.20	5.00	3.7974	.01988	.56227
WE	800	2.20	5.00	3.8245	.01935	.54733
RO	800	2.75	5.00	4.0183	.01834	.51871
EV	800	2.95	5.00	4.0333	.01653	.46740
EUC	800	2.20	5.00	3.8501	.01947	.55064
ECF	800	2.20	5.00	3.8423	.01991	.56307
ITA	800	2.20	5.00	3.8710	.02062	.58336
VC	800	2.20	5.00	3.8503	.02092	.59181
AC	800	2.20	5.00	3.8575	.02061	.58301
RMM	800	2.20	5.00	3.7801	.02006	.56745

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, RMM= Risk Management Methods

In the table-13, the descriptive statistics of all the ten variables and RMM of the Risk Management Model are stated. The average value of the variables on the five point Likert-Scale is three. The Mean-Statistics of all the variables are greater than three which suggests that all these variables have good effect on RMM. If the mean statistical value on likert scale data is greater than three, then it is good enough to be accepted (Allen and Seaman, 2007; Norman, 2010). It is also evident, that the values of the Standard Deviation statistics of all the predictors are also low and are less than the + (-), 0.60, which is a good sign of these variables related to the Model-1 (Gliem and Gliem, 2003; Boone and Boone, 2012).The Minimum and Maximum statistics of all the variables are also shown in the above table. The minimum is simply the lowest observation, while the maximum is the highest observation. The finding the minimum and maximum values help us understand the total span of our data. Minimum and Maximum values are also used to calculate the range of a dataset (Sullivan and Artino, 2013; Allen and Seaman, 2007).

Table 14: *Pearson Correlation Coefficients for Internal Factors of Risk Management Model*

	CGS	MF	WE	RO	EV	RMM
CGS	1					
MF	.435**	1				
WE	.541**	.507**	1			
RO	.504**	.482**	.602**	1		
EV	.492**	.381**	.520**	.564**	1	
RMM	.322**	.288**	.348**	.419**	.307**	1

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, RMM= Risk Management Methods &

'**' shows that the significance is at 1% level (i.e. ***p< .01)***

In the above shown, Table-14, the correlation coefficients for all the five internal variables with RMM of Model-1 are stated which shows that all these five variables are positively correlated with RMM and are statistically significant at 0.01 significant level.

In the table-15 given below, the correlation coefficients for all the five external variables with RMM of the Model-1 are given which shows that all the variables are positively correlated with RMM and are statistically significant at 0.01 significant level.

Table 15: *Pearson Correlation Coefficients for External Factors of Risk Management Model*

	EUC	ECF	ITA	VC	AC	RMM
EUC	1					
ECF	.594**	1				
ITA	.546**	.554**	1			
VC	.542**	.483**	.570**	1		
AC	.527**	.475**	.538**	.537**	1	
RMM	.318**	.341**	.380**	.319**	.346**	1

Note: EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, RMM= Risk Management Methods

'**' shows that the significance at 1% level (i.e. ***p< .01)***

4.5. Empirical Hypothesis Testing of the Risk Management Model

4.5.1. Risk Management Model Simple-Regression Results

In table-16, the values of R, R^2, and Adjusted R^2 of the all the predictors related to RMM Models are given. R^2 is the coefficient of determination which shows up to what extent variation in the dependent variable of the regression model of RMM is due to the independent variables and outside factors which are not taken into consideration by the model. It should also be noted that significance level throughout taken is 0.01 (*i.e. p<1%*)

Table-16: *Model Summary for all Predictors and RMM*

Model	R	R-Squared	Adjusted R^2	Predictors	Dependent Variable
1	.357	.128	.126	CGS	RMM
2	.332	.111	.109	MF	RMM
3	.343	.118	.117	WE	RMM
4	.393	.154	.153	RO	RMM
5	.338	.115	.113	EV	RMM
6	.349	.122	.121	EUC	RMM
7	.407	.165	.164	ECF	RMM
8	.423	.179	.178	ITA	RMM
9	.370	.137	.136	VC	RMM
10	.400	.160	.159	AC	RMM

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, RMM= Risk Management Methods

The following table-17 summarizes the results of R^2 for all the predictors of RMM Model in view of variation in the dependent variable.

Table-17: *Variation in the dependent variable of the RMM model*

Name of Independent variable	Variation in the dependent variable of the regression model of RMM due to the independent variable	Remaining variation in the dependent variable of the regression model of RMM due to the other factors which are not taken into account by the model
CGS	12.8%	87.2%
MF	11.10%	89.9%
WE	11.80%	88.2%
RO	15.40%	84.60%
EV	11.50%	88.50%
EUC	12.20%	87.80%
ECF	16.50%	83.50%
ITA	17.90%	82.10%
VC	13.70%	86.30%
AC	16.00%	84.00%

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, Dependent Factor: RMM= Risk Management Methods

The following table-18 shows the F-Statistics related to all the predictors and dependent variables of the regression model of RMM Model. The mean square value of the Regression and mean square value of the Residuals result in the F-values. It can be seen that F-values in all cases is significant which shows overall fitness of the model. Also, the 0.01 significant level shows that R^2 is a true value and not a chance value and also note resulted due to the sampling error. (Gujarati, 2005; Wooldridge, 2010).

Table-18: *ANOVA- Statistics for all Predictors and RMM*

Model	Sum of Squares	df	Mean Square	F. Statistics	Sig.	Predictor	Dependent Variable
1	32.825	1	32.825	116.704	(**)	CGS	RMM
2	28.442	1	28.442	99.184	(**)	MF	RMM
3	30.259	1	30.259	106.367	(**)	WE	RMM
4	39.684	1	39.684	145.540	(**)	RO	RMM
5	29.461	1	29.461	103.199	(**)	EV	RMM
6	31.362	1	31.362	110.783	(**)	EUC	RMM
7	42.565	1	42.565	158.197	(**)	ECF	RMM
8	46.087	1	46.087	174.145	(**)	ITA	RMM
9	35.292	1	35.292	126.872	(**)	VC	RMM
10	41.203	1	41.203	152.171	(**)	AC	RMM

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, RMM= Risk Management Methods; (*) represents significance at 1% level **(*i.e. p*< *.01*)**

The following table-19 shows the regression coefficients for all predictors and RMM. Here, the unstandardized Beta coefficient is relevant because this perception based study fulfills the assumptions of linear and multiple regression (Hair et al., 1998; Barros and Hirakata, 2003; Cohen et al., 2013). The standardized Beta coefficient are also stated. The unstandardized coefficient of Beta and standard error result in t-statistics at 0.01 level of significance. It can be observed that the t-values in all cases are significant which supports the acceptance of hypotheses of study or alternate hypotheses for all predictors in chapter-2 which infers that all ten determinants are significant predictors of RMM.

Table-19: *Coefficients Table for Predictors and RMM*

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t-stats	Sig.
1	Corporate Governance and Strategy	.405	.038	.357**	10.803	0.000
2	Manufacturing Flexibility	.336	.034	.332**	9.959*	0.000
3	Workforce Efficiency	.356	.034	.343**	10.313	0.000
4	Reliability of Outputs	.430	.036	.393**	12.064	0.000
5	Expansionary Volume	.411	.040	.338**	10.159	0.000
6	Environmental Uncertainty	.360	.034	.349**	10.525	0.000
7	Effect of Competitive Force	.410	.033	.407**	12.578	0.000
8	Innovative Technology Adoption	.412	.031	.423**	13.196	0.000
9	Venture Capital	.355	.032	.370**	11.264	0.000
10	Agency Cost	.390	.032	.400**	12.336	0.000

Dependent Variable: RMM

Note: RMM= Risk Management Methods, & '*' represents significance at 1% level **(*i.e. p< .01*)**

4.5.2. Risk Management Model Multiple-Regression Results

In Table-20, the values of R, R^2, and Adjusted R^2 of all the predictors of the model including CGS, MF, WE, RO, EV, EUC, ECF, ITA, VC, AC, are given. The R^2 is the value of the coefficient of determination, which shows that the overall 28 % variation in the dependent variable of the regression model of RMM is owing to all of the predictor variables in combined form whereas remaining 72 % variation in the model is due to the other factors which are not taken into account by the model. Though this variation due to all the variables is not much high in value, yet this is satisfactory variation statistic for all the predictors of this model.

Table-20: *Model Summary for All Predictors (Multiple) and Risk Management Methods*

Model	R	R Square	Adjusted R Square .
RMM	.529	.280	0.271

Note: in this table the predictors are CGS, MF, WE, RO, EV, EUC, ECF, ITA, VC, AC and dependent variable is Risk Management Methods

Table-21: *ANOVA Statistics for All Predictors (Multiple) and Risk Management Methods*

Model		Sum of Squares	Df	Mean Square	F	Sig.
RMM	Regression	72.007	10	7.201	30.666	(**)
	Residual	185.267	789	.235		
	Total	257.274	799			

Note: in this table the predictors are CGS, MF, WE, RO, EV, EUC, ECF, ITA, VC, AC and Dependent variable is Risk Management Methods; (*) represents significance at 1% level ***(i.e. p<.01)***

The F-Statistic in the table-21 is 30.666 which is accepted value and is significant at 0.01 significance level. The F- value shows the overall fitness of the model due to the presence of all the ten predictors of the model. The 0.01 significant level shows that the value of the coefficient of determination, R^2 is a true value and not a chance value, and not resulted due to the biased sampling error (Wooldridge, 2010; Gujarati and Porter, 1999). The mean square value of the regression of all the predictors including CGS, MF, WE, RO, EV, EUC, ECF, ITA, VC and AC, is 7.201 whereas, the mean square value of the Residuals of the regression is 0.285 which resulted in the F-value of 30.666. The sum of squares of the Regression is 72.007, while the residual sum of squares is the 185.267.

The Total of the regression and residual sum of square is 257.274. The residual sum of squares is a statistical technique used to measure the amount of variance in a data set which is not explained by the regression model. We can also say that it measures the overall difference between actual data and the values predicted by an estimation model. The degree of freedom for the regression is 10 and for residuals it is 789 resulting in total degree of freedom to799. Degrees of freedom (DF) of an estimate is the number of independent pieces of information that went into calculating the estimate like mean. It is not quite the same as the number of items in the sample. In order to get DF for estimate, we subtract 1 from the number of items (Cox and Cochran, 1957; Draper, 2014).

Table-22: *Coefficients for All Predictors (Multiple) and Risk Management Methods*

Model	Standardized Beta	Std. Error	t-stats	sig	Tolerance	VIF
(Constant)	.963	.179	5.367	.000		
CGS	**.093***	.046	2.022	**0.032**	.556	1.798
MF	**.075***	.038	1.974	**0.045**	.634	1.578
WE	-.049	.045	-1.087	0.277	.488	2.048
RO	**.243***	.041	5.956	**0.000**	.659	1.518
EV	-.018	.050	-.360	0.712	.542	1.846
EUC	-.007	.046	-.144	0.885	.454	2.204
ECF	**.100***	.047	2.104	**0.036**	.412	2.425
ITA	**.139***	.043	3.215	**0.001**	.462	2.166
VC	**.082***	.040	2.050	**0.043**	.512	1.953
AC	**.098***	.043	2.279	**0.019**	.477	2.096

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, RMM= Risk Management Methods; * represents significance at 5% level (***i.e. p< .05)***

The Table-22 shows the regression coefficients for all of the predictor variables and RMM. Here, the standardized Beta coefficient is relevant because this perception based study fulfills the assumptions of linear and multiple regression (Preacher et al., 2006; Montgomery, 2015; Darlington and Hayes, 2016).The significance level throughout taken is 0.05. The t-value for CGS is 1.278 as part of the multiple regression and it is significant. For this t-statistic, the standardized Beta coefficient is 0.052. The standardized Beta coefficient is 0.059 and the standardized coefficient of standard error is 0.046. The significant t-value supports the first hypothesis of the study related to RMM. Therefore, the alternate hypothesis for CGS in chapter-2 is accepted. Similarly, the t-value for MF is 1.924 and it is also significant which calls for acceptance of the second hypothesis of the study, the alternate hypothesis for MF. The t-value for WE is -1.087 and it is insignificant due to which we may reject the third hypothesis of the study, the alternate hypothesis for WE. On the other hand, the t-value for RO is 5.956 as part of the multiple regression and it is significant. For this reason, the fourth hypothesis of the study, the alternate hypothesis for RO may be accepted undoubtedly.

The t-value for EV is - 0.360 and it is insignificant. Therefore, the fifth hypothesis of the study, the alternate hypothesis for EV is rejected. The t-value for EUC is -.144 that is insignificant which results in the rejection of the sixth hypothesis, the alternate hypothesis of EUC. The t-value for ECF is 2.104 which is significant and hence supports the seventh hypothesis, the alternate hypothesis for ECF. The t-value for ITA is 3.215 which is also significant and so backs the acceptance of the eighth hypothesis or the alternate hypothesis for ITA. The t-values for VC and AC are 2.050 and 2.279 respectively which are also significant and therefore, these t-values supports the ninth and tenth hypotheses of the study. Therefore, we may accept the alternate hypotheses for VC and AC as significant predictors of RMM. In the light of above discussion, it can be concluded that overall RMM is a good model wherein most of the results are significant. In simple regression, all the variables were significant whereas in multiple regression the seven predictors out of ten are significant.

4.5.3. Empirical Hypothesis Testing of Moderator, Firm Age with Independent Factors and Risk Management Methods (RMM)

Table-23: *Model Summary for All Predictors' Regression Results with FA as a Moderator*

Before Moderation		After Moderation			Change Statistics				
R^2- Value	F-Value	R^2-Value	F- Value	S.E of Estimate	R^2 Change	F Change	df1	df2	Sig. F Change
.128	116.704	.232	80.333	.49809	.104	-36.371	3	796	(**)
.111	99.184	.226	77.564	.50010	.115	-21.62	3	796	(**)
.118	106.367	.232	80.088	.49827	.114	-26.279	3	796	(**)
.154	145.540	.248	87.484	.49302	.094	-58.056	3	796	(**)
.115	103.199	.221	75.454	.50164	.106	-27.745	3	796	(**)
.122	110.783	.233	80.682	.49784	.111	-30.101	3	796	(**)
.165	158.197	.258	92.152	.48979	.093	-66.045	3	796	(**)
.179	174.145	.264	94.980	.48786	.085	-79.165	3	796	(**)
.137	126.872	.255	90.940	.49062	.118	-35.932	3	796	(**)
.160	152.171	.263	94.605	.48812	.103	-57.566	3	796	(**)

Note: (**) represents significance at 1% level **(*i.e. p< .01*)**

In table-23, Model summary of regression results with the moderation effect has been stated. This table-23 describes the values of R^2, R^2 change, F-Statistic, F change, S.E and sig. F-change by using the simple linear regression method to check the effect of FA as moderator for the RMM and independent variables. This effect has been calculated one by one through simple linear regression method whose results have been summarized in the table-24. The list below the table shows the order in which the predictors have been added to the model. The results of the table-23 show that when RMM is regressed on the interaction term CGS_FA, Z- CGS and Z-FA, the R-square value becomes 23.20 % as shown in model-1 of above table which was 12.8 % in the table 23, which concludes that when moderator FA is introduced in the model, the R^2 is increased by 10.40 % resulting into R^2 change of 0.104, but the F-value is decreased and becomes 77.564 when FA is introduced into the model-1, which was 116.704 before the entrance of moderator, FA in table-18 showing that variance is increased, despite all this the F-stat is significant.

When RMM is regressed on the interaction term MF_FA, Z-MF and Z-FA, R-square value becomes 22.60 % as shown in model-2 of above table which was 11.10 % in table-16, which concludes that when moderator FA is introduced in the model, R^2 is increased resulting into R^2 change of 11.50%, but F-value is decreased to 77.564 when FA is introduced into RMM-model, which was 99.184 in table-18 before entrance of moderator, FA in model-2 of table-24 showing that variance is increased but overall fitness of RMM-model is decreased, despite all this F-stat is also significant. When RMM is regressed on the interaction term WE_FA, Z-WE and Z-FA, R-square value becomes 23.20% as shown in model-3 of the above table which was 11.80 % in the table 23, which concludes that when moderator FA is introduced in RMM model, R^2 is increased by 11.40 % resulting into R^2 change of 0.114, but F-value becomes 80.088 when FA is introduced into RMM-model, which was 106.367 in table-18 before the entrance of moderator, FA in the model-3 of table-24 showing that variance is increased but overall fitness of model is decreased but still F-stat is significant.

When RMM is regressed on the interaction term RO_FA, Z-RO and Z-FA, R-square value becomes 24.80 % as shown in model-4 of above table which was 15.40 % in table-16, which concludes that when moderator FA is introduced in the model, R^2 is increased by 9.40 % resulting into R^2 change of 0.094, but F-value is decreased to 87.484 when FA is introduced into the RMM-model, which was 145.540 in table-16 before the entrance of moderator, FA in the model-4 of table-24 showing that variance is increased but overall fitness of RMM model is decreased, despite all this F-stat is still significant. When RMM is regressed on the interaction term EV_FA, Z-EV and Z-FA, R-square value becomes 22.10 % as shown in the model-5 of the above table which was 11.50 % in the table-16, which concludes that when moderator FA is introduced in RMM model, R^2 is increased by 10.60 % resulting into R^2 change of 0.106, but F-value is decreased that is 75.454, which was 103.199 in table-18 before the entrance of moderator, FA in the model-5 of table-24, all which is showing that variance is increased but overall fitness of RMM model is decreased but the F-stat is still significant. When RMM is regressed on the interaction term EUC_FA, Z-EUC and Z-FA, R-square value becomes 23.30 % as shown in model-6 of the above table which was 12.20 % in table-16, which concludes that when moderator FA is introduced in the model, the R^2 is increased by 11.10 % resulting into R^2 change of 0.111, but the F-value is decreased to 92.152 when FA is introduced into RMM-model, which was 110.783 in table-18 before the entrance of moderator, FA in the model-6 of table-24 showing that variance is increased but the overall fitness of the model is decreased despite all this the F-stat is still significant.

When RMM is regressed on interaction term ECF_FA, Z-ECF and Z- FA, R-square becomes 25.80 % as shown in model-7 of above table which was 16.50 % in table-16, which concludes that when moderator FA is introduced in model-7, R^2 is increased by 9.3 % resulting into R^2 change of 0.093, but the F-value is decreased to 92.152 when FA is introduced into the RMM-model, which was 158.197 in table-18 before the entrance of moderator, FA in model-7 of table-24 showing that variance is increased but overall fitness of RMM model is decreased but the F-stat is still significant despite all these changes. When RMM is regressed on interaction term ITA_FA, Z- ITA and Z- FA, R-square becomes 26.40% as shown in model-8 of above table which was 17.90 % in table-16, which concludes that when moderator FA is introduced in the model-8, R^2 is increased by 8.50 % resulting into R^2 change of 0.085, but F-value is decreased to 94.980 when FA is introduced into RMM-model, which was 174.145 in table-18 before the entrance of moderator, FA in model-8 of table-24 showing that variance is increased but overall fitness of model is decreased despite all this F-stat is still significant.

When RMM is regressed on interaction term VC_FA, Z-VC and Z- FA, R-square value becomes 25.50 % as shown in the model-9 of above table which was 13.70 % in table-16, which concludes that when moderator FA is introduced in model-9, R^2 is increased by 11.80 % resulting into R^2 change of 0.118, but F-value is decreased to 90.94 when FA is introduced into RMM-model, that was 126.872 in table-18 before the entrance of moderator, FA in model-9 of table-24 showing that variance is increased but overall fitness of the model is decreased despite all these changes F-statistics is still significant. When RMM is regressed on interaction term AC_FA, Z-AC and Z- FA, R-square value becomes 26.30 % as shown in model-10 of the above table which was 16.00 % in table-16, which concludes that when moderator FA is introduced in model-10, the R^2 is increased by 10.30 % resulting into R^2 change of 0.103, but F-value is decreased to 94.605 when FA is introduced into RMM-model, which was 152.171 in table-18 before entrance of moderator, FA in model-10 of table-24 showing that variance is increased but overall fitness of model is decreased, despite all these, F-stat is still significant.

The Table-24 describes the ANOVA statistics for the Z-statistics of all the predictors, Z-stats of moderator, FA and interaction term between the independent variables and moderator-FA, and also the RMM. The description of all the F-stats have been explained already in the table-23, model summary. The mean square values of the regression and mean square values of the residuals have also been tabulated in the table-24. All these F-values in comparison with the F-values of linear regression results, show that the FA has good significant moderation effect between the all the independent variables of the study and RMM. But almost all the F-stats are decreased with the entrance of the moderator, FA into the RMM model and model fitness is decreased, showing that FA is significant and is having semi-strong moderation effect for the RMM-model. But, overall the moderation effect due to FA is significant at medium level.

Table-24: *ANOVA Statistics for All Predictors with FA as Moderator and RMM*

Model	Sum of Squares	df	Mean Square	F. Statistics	Sig.
CGS	59.791	3	19.930	80.333	(**)
MF	58.196	3	19.399	77.564	(**)
WE	59.650	3	19.883	80.088	(**)
RO	63.793	3	21.264	87.484	(**)
EV	56.963	3	18.988	75.454	(**)
EUC	59.990	3	19.997	80.682	(**)
ECF	66.320	3	22.107	92.152	(**)
ITA	67.819	3	22.606	94.980	(**)
VC	65.670	3	21.890	90.940	(**)
AC	67.621	3	22.540	94.605	(**)

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, FA= Firm Age, RMM= risk management Methods; (**) represents significance at 1% level

In table-25 given below, the coefficients of the regression for the moderation effect of Firm Age (FA) has been stated to check the relationship between the independent variables and RMM. To check the moderation, first of all Z-values of all the predictors were calculated as well as Z-value of moderator, FA was calculated. Then interaction term or moderation of each predictor and FA was calculated. It can be observed from the first model of table-25 that t-values for all the three values Z-CGS, Z-FA and interaction term (CGS_FA) are significant showing the good and favorable moderation effect of FA in the RMM-model as a whole. In the second model of table-25, t-values for Z-MF, Z-FA and interaction term (MF_FA) are also significant showing that there is good and significant moderation effect of FA in the RMM-model as a whole. In the third model of table-25, t-values for Z-WE, Z-FS and interaction term (WE_FA) are also significant showing the good and significant moderation effect of FA in the RMM-model as a whole. In the fourth model of table-25, t-values for Z-RO, Z-FA are significant but t-stats for interaction term (RO_FA) is insignificant showing that there is no moderation effect of FA in the RMM-model as a whole (t-value is significant).

In the fifth model of table-25, t-values for Z-EV, Z-FA and interaction term (EV_FA) are also significant showing that there is good and significant moderation effect of FA in the RMM-model as a whole. In the sixth model of table-25, t-values for Z-EUC, Z-FA and interaction term (EUC_FA) are also significant showing that there is good and favorable moderation effect of FA in the RMM-model as a whole. In the seventh model of table-25, t-values for Z-ECF, Z-FA and interaction term (ECF_FA) are also significant showing the overall low but significant moderation effect of FA in the RMM -model as a whole (low moderation because R^2-value is low than 10%). In the eighth model of table-25, t-values for Z-ITA, Z-FA and interaction term (ITA_FA) are also significant showing that there is low but significant moderation effect of FA in the RMM-model as a whole (low moderation because R^2-value is low than 10%).

In the ninth model of table-25, t-values for Z-VC, Z-FA and interaction term (VC_FA) are showing the significant results which results in that there is good and favorable moderation effect of FA in the RMM-model as a whole. In the tenth model of table-25, t-values for Z-AC, Z-FA and interaction term (AC_FA) are also significant showing that there is favorable moderation effect of FA in the RMM-model as a whole. The values of all the constants are significant. But it is also noticeable that all those equations and models in which constants have either small values or these are statistically insignificant, are considered good as compared to those equations and well-built models in which the values of the constants are either very high or these constants are significant statistically. The Values of the VIF and Tolerance level are also within the acceptable range when the moderator, Firm Age is introduced into the model.

Table-25: *Coefficients for Predictors, Moderator, FA and Moderation Term for RMM-Model*

Model		Unstandardized Coefficients		Standardized Coefficients	t-stats	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.772	.018		206.99	.000		
	Z-CGS	.156	.019	.275	8.393	.000	.896	1.116
	Z-FA	.190	.018	.336	10.364	.000	.920	1.087
	CGS_FA	.035	.017	**.057***	2.058	**.044**	.958	1.044
2.	(Constant)	3.772	.018		207.05	.000		
	Z-MF	.143	.018	.251	7.815	.000	.940	1.064
	Z-FA	.199	.018	.350	10.861	.000	.934	1.070
	MF_FA	.0355	.018	**.060***	1.972	**.049**	.989	1.011
3.	(Constant)	3.756	.018		203.50	.000		
	Z-WE	.139	.019	.245	7.435	.000	.891	1.122
	Z-FA	.199	.019	.351	10.562	.000	.871	1.148
	WE_FA	.073	.017	**.135***	4.273	**.000**	.961	1.041
4.	(Constant)	3.773	.018		208.34	.000		
	Z-RO	.173	.018	.305	9.403	.000	.900	1.112
	Z-FA	.183	.018	.323	9.958	.000	.899	1.112
	RO_FA	.024	.017	.044	1.417	**.157**	.959	1.043
5.	(Constant)	3.765	.019		203.48	.000		
	Z-EV	.140	.019	.247	7.405	.000	.882	1.134
	Z-FA	.192	.019	.339	10.247	.000	.894	1.119
	EV_FA	.048	.017	**.092***	2.881	**.004**	.964	1.037
6.	(Constant)	3.755	.018		203.32	.000		
	Z-EUC	.144	.019	.253	7.584	.000	.865	1.156
	Z-FA	.197	.019	.348	10.344	.000	.853	1.172
	EUC_FA	.073	.016	**.146***	4.569	**.000**	.942	1.062
7.	(Constant)	3.750	.019		202.37	.000		
	Z-ECF	.168	.019	.296	8.971	.000	.855	1.169
	Z-FA	.183	.019	.322	9.568	.000	.824	1.213
	ECF_FA	.078	.017	**.141***	4.502	**.000**	.957	1.045
8.	(Constant)	3.760	.018		205.15	.000		
	Z-ITA	.189	.019	.333	10.148	.000	.860	1.163
	Z-FA	.175	.019	.309	9.367	.000	.852	1.173
	ITA_FA	.058	.017	**.104***	3.316	**.001**	.942	1.062
9.	(Constant)	3.751	.018		206.90	.000		
	Z-VC	.160	.018	.281	8.656	.000	.885	1.130
	Z-FA	.193	.019	.339	10.401	.000	.879	1.138
	VC_FA	.088	.016	.170*	5.462	**.000**	.968	1.033
10.	(Constant)	3.762	.018		209.78	.000		
	Z-AC	.183	.018	.322	10.025	.000	.896	1.116
	Z-FA	.183	.018	.322	10.081	.000	.907	1.102
	AC_FA	.061	.016	**.115***	3.710	**.000**	.971	1.030

Note: 1. Predictors: CGS_FA, Z-CGS, Z-FA; 2. Predictors: MF_FA, Z-MF, Z-FA; 3. Predictors: WE_FA, Z-WE, Z-FA; 4. Predictors: RO_FA, Z-RO, Z-FA; 5. Predictors: EV_FA, Z-EV, Z-FA; 6. Predictors: EUC_FA, Z-EUC, Z-FA; 7. Predictors: ECF_FA, Z-ECF, Z-FA; 8. Predictors: ITA_FA, Z-ITA, Z-FA; 9. Predictors: VC_FA, Z-VC, Z-FA; 10. Predictors: AC_FA, Z-AC, Z-FA; Dependent Variable: RM**M; '*' represents significance at 5% (i.e. p< .05)**

4.6. Discussion for Results of Risk Management Model

4.6.1. Corporate Governance & Strategy and RMM

According to Jenson (1986), "Corporate Governance is the governance mechanism of the management inclined towards shareholders' interests, corporate securities decisions and the strategic goals for the long term benefits of the firms". Gul et al. (2013) & Kotha and Swamidass (2000) are of the view that CGS has direct linkage with the Risk Management Methods (RMM).The results and findings of this perception based capital investment study also support this view. The CGS, also has the good expected relationship with RMM as both these variables are significantly correlated with each other (table-21) which is consistent with other studies including Bhujraj and Sengupta (2015), Gul et al., (2013), Coombes and Watson (2000).

The results of these studies (2015, 2013, and 2000) also depict that firms' value can be enhanced if there is strong relationship between governance mechanism regarding corporate affairs and applications of risk management methods. The significant correlation coefficient between CGS and RMM in this study, in line with these past supporting studies, contributes to meet the objective of this study in view of the relationship of CGS and capital investment decision making criteria (RMM). On the other hand, the results of Coleman (2008) and Sivakumar (2015) contradict the results of this study stating that production management has direct linkage with risk management because production availability fulfills the demands of customer with the application of good risk evaluation criteria. It is also identified through the results of this study that securities issues and corporate disclosure have strong relationship with Probability Analysis and CAPM model because these two evaluation techniques best reflect the outputs of securities issues in the form of return measures and interest to the investors as a whole.

The mean value of CGS is good and S.D is also in limits as has been shown in table-13 of chapter-4. The mean value of CGS shows the average response of the corporate managers for all the enquiries of CGS. Moreover, the results of simple and multiple linear regressions are also significant. The individual t-statistic is significant (table-19). The F-value is also significant (table-18). This all suggest that CGS is the good predictor of RMM. These results and findings support the studies of Afonso and Cunha (2009), Brealey and Meyer (1998), Ryan and Ryan (2002), Graham and Harvey (2001), Farragher et al., (2001), and Kotha and Swamidass (2000) because these studies also state the significant values of statistics which all shows that risk management methods are the best criteria wherever corporate governance related issues are concerned. But, on the other hand the results of Stevenson (2009) and Srinivasan and Millen 1986) are different from results of this study who asserted more about the effect of technology reforms on risk management applications while the results of this study are more focused on corporate mechanism as decisions involving this mechanism can induce technology reforms.

In summary, the results of this study in line with previous studies indicate that good governance by the corporate management enable the company to capture more investment in the future as risk of the underlying projects is adjusted by the application of some pragmatic methods which in details have been discussed in chapter-3. The significant and positive Beta value as shown in table-19 of chapter-4 also supports the results of Afonso and Cunha (2009) and Arsaln et al., (2014) in relation to effects of CGS on RMM. The results of these studies also state the positive significant Beta value which highlights that strong governance policies and corporate decisions have strong effect on risk management methods to determine the most appropriate criteria for capital investment decision making of projects. The significant individual and multiple regression results in compliance with the results of these studies suggest the strong effect of CGS on RMM. In the light of these significant regression results pertaining to the linkage between CGS and RMM, it can be suggested that corporate managers may take into account the CGS elements while shaping capital investment decision criteria and using the same to evaluate the capital projects.

In case of moderation when Firm Age (FA) is included into CGS and RMM-model, the R^2 value also increases and F-value decreases though it is still significant after moderation (table-24). It is also to be noted that change in R^2-value is 10.4 % (table-24), which is about 10%, indicating the good moderation of Firm Age between CGS and RMM. The Beta value for moderation term is positive whereas the t-value is significant (table-18) which suggests that the Firm Age (FA) significantly affects the relationship between CGS and RMM. These results are in line with those of other studies (see Bierman and Smidt, 2012; Baker, 2010; Boaden and Dale, 1990). The results of these studies also show that the firm age significantly moderates relationship between RMM and CGS. These results also recommend that the firm age may be favorably employed to reach at the value maximizing risk based criterion. The reason for the application of firm age as a moderator in our study is actually based on the assumption that older firms normally take the matured risk based investment decisions than the newly born or nourished firms.

4.6.2. Manufacturing Flexibility and RMM

In the words of Hodder (2001) manufacturing flexibility defines the manufacturing processes of business firms with respect to time and place. This flexibility is also related to the production of the goods and services outside the factories' premises". The correlation results (table-

21) indicate that the Manufacturing Flexibility (MF) has direct significant relationship with Risk Management Methods (Pike, 1988; 1996, Ho and Pike, 1991; and Arnold and Hatzopoulos, 2000). The descriptive results (table-13) show that the mean statistic and S.D for MF are in the acceptable range. These results are akin to those noted by Li et al., (2013), Arnold and Hatzopoulos (2000) and Canedo and Almeida (2010) in the similar type of studies.

It is also observed through the correlation analysis that fifth part of manufacturing flexibility (i.e. manufacturing of many units of the same product) has strong relationship with third part of risk management methods (i.e. probability analysis). As regards the significant and positive Beta value related to the MF (table-19), the same was also noticed by the Carpenter and Guariglia (2008), Fadi and Northcott (2006) and Slagmulder (1997). Overall, the above results pertaining to MF support the results of other past studies (see Kyereboah-Coleman, 2008; Meredith and Mantel, 1995; Srinivasan and Millen, 1986). In contrast to results of this study, Key (1999) and Key et al. (1999) observed the mixed results. They noted that simulation methods (RMM) have no connection with manufacturing flexibility rather risk based methods are more related to the reliability of products. In their view, simulation models can only produce desired results if elements of reliable products may reduce uncertainty involved in the capital projects.

In the light of all these similarities and differences, the results of this study imply that the Manufacturing Flexibility may facilitate the decision side of the capital investment decision making criteria in terms of the Risk Management Methods to control the risk side of the capital investment decision making to add the value of firms through projects.

On the other hand correlation and descriptive results of this study counter the results of Jensen (2001) and Kannan & Tan (2005), who observed no relationship between MF and Probability Analysis (RMM), by putting the arguments that probability analysis identifies the importance of technology application rather than manufacturing flexibility, because technology adoption involves the risk that is identified and ultimately measured through probability analysis (RMM). Overall, keeping in view all these similarities and differences regarding correlation and descriptive results of this study, it is recommended that the corporate managers and academicians may consider manufacturing flexibility while evaluating capital projects through risk based criteria. It can be observed from the results of simple and multiple linear regressions that t-value (table-19) and F-value (table-18) are also significant t-value (tabe-26) depicts that MF is good predictor of RMM. The same effect and results were noted in other studies such as by Dean and Snell (1996), Gerwin (1993) Parthasarthy and Sethi (1993) and Dean et al., (1992).

In the case of Firm age (FA) as a moderator in the MF and RMM model, R^2 value increases and F-value decreases but remains significant. These results are shown in the table-24. It can be seen that change in R^2-value is 11.5% due to the inclusion of moderator, firm age (table-24), which is also greater than 10%, indicating the good moderation of Firm Age between MF and RMM. On the other side, the Beta value for the interaction (moderation) term is positive and t-value is significant (table-18) which supports the notion that FA significantly moderates the relationship between MF and RMM and this is line with Boyacioglu et al., (2009), Fadi and Northcott, 2006, Dailami and Lipkovich (1999), Crosby (1973) who also noted the similar significant moderating effect of firm age in their respective studies.

In summary, the results of this study recommend the corporate managers, financial executives and academicians to consider the firm age as a moderating factor, to evaluate the risk criteria. Overall, the significant moderation of FA in this study conform the moderation results of the above affirmative studies. But, contrary to this significant moderation effect of firm age in these studies, Ozmel et al. (2013) and Pike (1988) determined the insignificant moderating effect of firm age in their corresponding studies. They argue that firms of all age brackets are exposed to the same risk elements asserting no moderation effect of the firm age.

4.6.3. Workforce Efficiency and RMM

Workforce Efficiency (WE) defines the extent to which the workforce at different levels in the job tasks is efficient for the growth of the companies. The significant correlation value (table-21) shows that WE is related with RMM which is in line with results of other studies (Lim et al., 2009 and Lin and Wang,2005) to imply that the skilled and efficient workforce mitigate the uncertainty related with the capital investment decision making. The results of these studies also show that workforce efficiency is related with sensitivity and probability analysis (RMM) in way that the efficient workforce may result in favorable cash flows which in turn reduce the risk exposure of underlying projects.

The similar results are observed in this study supporting the same conviction of the said studies. Furthermore, it is also identified through the results of this study that third and fifth part (low compensation advice and trainings & workshops) of Workforce efficiency are in strong relationship with second and third part (sensitivity and probability analysis) of RMM. The significant correlation between W-E and RMM in this study is in line with results of above studies. On the other hand, the results of Reimer and Nieto (1995) & Stevenson and Jarillo (2007) contradict the results of this study due to non-compliance of managers' practices and expertise with probability and sensitivity analysis methods (RMM).

The mean value and S.D value for the Work Efficiency (table-13) are also in the acceptable limits and aligned with the results of other studies (Argyris and Schon, 1978; Forrester, 2000; and Lewis et al., 2004).The individual results of simple regression are also significant which asserts that WE is the good predictor of RMM and is supported from the significant F-value (table-18) and significant t-value (table-19). The same results were noted by Narain et al. (2006), Lin and Wang (2005), Boxall (2003), Ryan and Ryan (2002), and Graham and Harvey (2001) in the related capital investment perception based studies. Hence, it may be argued that the Workforce Efficiency may aid the capital investment decision in terms of better control on the Risk Management Methods. The Beta value is also positive and significant (table-19) to support the relationship between WE and RMM. On the other hand, the results of multiple linear regression analysis show that WE has the insignificant effect on RMM as shown in table-32, which shows that t-stat is negative due to the negative Beta value.

These results are contradictory to what were noted by Ryan and Ryan (2002), Graham and Harvey (2001), Forrester (2000), and Lewis et al (2004). Contrary to the results correlation and simple regression results, the results of Tayler (2010) and Truong et al. (2008) show the counter side. They are of the view that efficient workforce has no direct effect on the application of risk based investment criteria. In their context related to capital projects, only managers not the workforce, are concerned about the application of risk related criteria like probability analysis, risk adjusted discount rate and RRR through beta estimation. Therefore, performance of workforce do not affect the risk related criteria, rather risk management criteria may have implications for the workforce to react and behave in accordance with maximizing capital projects' gains. The insignificant multiple regression results also support the above counter view. Therefore, the mixed results pertaining to WE and RMM warrants reconsideration and revaluation of the results through the future research endeavors. Overall, based on all the above respective results with having tilt to the link between WE and RMM, it may be recommended that corporate managers should consider efficient workforce in view of the associated favorable future projects' outcomes which may in turn affect the outcomes of the capital investment decision making criteria and so their selection as a tool to evaluate the feasibility of capital projects.

In case of inclusion of Firm Age (FA) into the WE and RMM-model, again R^2 value and F-value decreases but remains significant as shown in table-33. It can be noted that change in R^2-value is 11.4 % (table-24), which is greater than 10%, indicating the good moderation of Firm Age between WE and RMM. The standardized Beta coefficient for moderation term is also positive and corresponding t-value is significant (table-18). Chalos and Poon (2000), Hopwood (1990) and Kim et al., (1986) also hold the view that FA significantly moderates the relationship between W-E and RMM as they also found the same results in their studies.

The results of this study highlight that age of firms favorably induces the experienced and efficient workforce to better undertake the capital projects and contribute to the projects' benefits such as the desired cash flow patterns which further have corresponding effect on the results of criteria wherein such cash flows were factored in as inputs. But, on the other side, results of Holmen and Pramborg (2009) and Hoque (2005) counter the results of this study related to firm age as a moderator. In their view, firms of all age have capacity to make a linkage between workforce and risk related criteria. However, overall, keeping in view all the above results we may conclude that the firm age can be regarded as positive and significant moderator in the relationship between 'WE' and RMM methods to evaluate and select the projects.

4.6.4. Reliability of Outputs and RMM

According to Stevenson (2007), reliability of outputs defines the extent to which goods and services are reliable and trustworthy in the eyes of customers and stakeholders of the business firms in utilization and application". The results of this capital investment criteria related study highlight the linkage between RO and RMM as correlation coefficient is significant (table-21). The results of other studies (for example: Chang, 2003; Pike, 1996, Ho and Pike, 1991; and Arnold and Hatzopoulos, 2000) also depict the similar kind of linkage in their studies between RO and RMM. It is also observed from the results of this study that future capital investment projects opportunities (third part of RO in the questionnaire) have highly significant relationship with CAPM model and quantitative analysis (fourth and fifth parts of RMM in questionnaire), which all shows that reliable goods and services lead to expected rate of return of capital projects by decreasing the risk which is prevailing at different stages of capital projects. On the other hand, correlation results of other studies including Ittner et al. (2003) and Coombes & Watson (2000) partially support and counter the results of this study in connection with capital investment criteria.

These studies (2003, 2000) highlight that reliability of goods and services directly affect the sensitivity analysis and probability analysis (RMM) while it has no direct relationship with expected return. They noticed that the reliable goods may enhance the probability of success of different projects and therefore in a way reduces the uncertainty elements so positively affecting the outcomes of the selected capital investment decision making criteria. On the whole, the significant correlation coefficient value in this study in conformance to past studies suggests the linkage between reliability of output and RMM.

The descriptive statistics (table-13) related to RO show that mean value and S.D of reliability of outputs, are in acceptable limits. Normally, the mean value greater than three and less than five is considered well, whereas, the S.D value between 0 and 1 is preferably accepted in these kinds of studies. The similar kinds of results have been documented by Li et al. (2013), Fadi and Northcott (2006) and Arnold and Hatzopoulos (2000) and all of them are of the view on the basis of their results that reliable goods and services can be regarded as favorable factors to induce the corporate executives to select a good evaluation criteria ensuring the project success. In contrast to results of this study, Cooper and Slagmulder (1997) observed the higher values of descriptive statistics, and challenged the pre-set mean and S.D values which shows the contradicting results. However, overall, the descriptive results are supported by the above studies to assert the consideration of reliability of goods factor in capital projects.

From simple and multiple linear regression results of this study, it can also be identified that RO is considered a good predictor of RMM. In this regard, significant t-value (table-19) and significant F-value (table-18) are consistent with the results of Fadi and Northcott (2006), Milis and Mercken (2003), and Hoque (2001), who observed similar kinds of significant regression results to suggest the significant effect of RO on RMM. In this study, the multiple regression results in table-32 also indicate that the standardized Beta coefficient is positive and corresponding t-value is significant which suggests that increase in reliability of outputs positively affects the capital investment decision making criteria in term of RMM. The same findings are also documented by Fadi and Northcott (2006) and Copeland and Howe (2002). But on the other hand, Chrisman and Patel (2012), and Cooper et al. (2002) observed the mixed results. They pointed out that considering the link between RO and RMM, t-value and F-value were found significant for probability analysis (RMM), whereas they were noted insignificant for sensitivity analysis and risk adjusted discount rate which shows the lower effect of RO on risk related investment selection criteria. In light of the above comparing results, we can summarize that overall RO creates the significant effect in the choice of appropriate risk related criteria due to the significant results in case of both simple and multiple linear regressions generated values.

When the moderator, Firm age (FA) is entered into RO and RMM-model, R^2 value increases and F-value decreases but still is significant (table-24). It is noticeable that change in R^2-value is just 9.4% (table-39), which is low than 10%, indicating the weak moderation of Firm Age between RO and RMM. The t-statistic for moderation term is insignificant and standardized Beta coefficient is positive. This insignificant t-value indicates no moderation of Firm Age in the RO and RMM model. These results were also noted by the Johnstone et al., (2011), Truong et al., (2008) and Fadi and Northcott (2006) with the same assertion of low positive and insignificant moderation. Contrary to this, Dekker (2004) and Davila & Foster (2007) observed the significant, positive moderating effect of FA with RO and RMM. They determined that firm age role is favorable in producing the reliable goods and selecting the appropriate risk related criteria including the sensitivity analysis and risk adjusted discount rate. This unexpected insignificant moderation of FA in this study is an indicator for the corporate managers to also consider other moderating factors while selecting the risk related criteria.

4.6.5. Expansionary Volume and RMM

According to Stevenson (2007), Expansion in volume (EV) is increase in the size of the business firms in terms of products and services which are increasing continuously and are expected to increase in future as well. The results of this study show that Expansionary Volume has direct linkage with Risk Management Methods (RMM). The significant value of correlation coefficient in table-21 also indicates positive relationship between EV and RMM. The results of other studies including Butler et al. (1991) and Mills and Herbert (1987) also noticed the similar kind of relationship between Expansionary Volume and Risk Management Methods (RMM). They are of the view if business is expanded and more products are introduced, it can mitigate the uncertainty involving into capital investment projects and will lead to more capital investment opportunities. The results of this study also verify the similar kind of results. It is also observed that fourth part of EV (shareholders' interest in questionnaire) has strong relationship with third and fourth part of RMM (CAPM and probability analysis in questionnaire), which indicates that CAPM based Beta and Required Rate of Return are applied for capital projects decision making if there are expectations of reliable goods and services out of projects.

It is also noticeable from the statistical results of this study that mean value of EV is favorable and S.D is also in limits (table-13). The results of simple linear regressions for EV and RMM are also significant which further calls for strong relationship between the two factors. The F-value of the model is significant (table-18) and the related t-value is also significant (table-19) showing that EV is the good predictor of RMM. Anand (2002) Graham and Harvey (2001), and Gitman and Vandenberg (2000) identified the similar results in their studies targeted the managerial view regarding the capital investment decision making criteria. Therefore, in line with results of these studies we may argue that business expansion enables the company to capture more investment projects in the future by the adjustment of the risks of these projects through the application of better risk related criteria to select an investment proposal.

The positive Beta value in table-19 also shows the significant effect of Expansionary Volume on RMM due to corresponding significant t-value, all which is in line with the results of Fadi and Northcott (2006), and Suzette and Howard (2011). In contrast to simple regression results, the results of multiple linear regression (table-32) show that EV has insignificant negative effect on RMM because of negative standardized Beta coefficient and corresponding insignificant t-value. It can be generalized on the basis of this unexpected insignificant t-value that EV along with other factors is not the good determinant in finding the best fitted risk related criteria for capital projects. On the other hand, the individual linear regression results of this study contradict with results of other studies (see Scott and Petty, 1984; Mills and Herbert, 1987; Slagmulder et al., 1995; Pike, 1996; Forrester, 2000; and Fadi and Northcott, 2006). These studies demonstrate that Expansion in volume is more linked to DCF based criteria (CAM) rather than the risk related criteria (RMM), because NPV and IRR present the more vivid and pertinent picture of expansion in terms of acceptance or rejection based on pre-set values. Therefore, it can be generalized from all the above discussion, that results of this study partially support the results of past studies.

It is also clear from table-24 that when Firm age (FA) is included into EV and RMM-model as a moderator, R^2 value increases but F-value decreases but still is significant. It can be seen that change in R^2-value is 10.6 % (table-24), which is greater than 10%, indicating the good moderation of Firm Age between EV and RMM. The corresponding t-statistic for moderation term is significant and standardized Beta coefficient is positive (table-18) indicating that FA significantly moderates the relationship between expansions in volume of the products and RMM. These significant moderation results support the moderation results as were found by Rebiasz, B. (2007), Chang (2003), and Abdel-Kader and Dugdale (1998).

4.6.6. Environmental Uncertainty and RMM

According to Fadi and Northcott (2006), “Environmental uncertainty (EUC) is the distortion in the political and economic environment that affects the capital investment decision making criteria for projects of business firms”. The results of this study and the existing literature suggest the direct linkage of EUC with Risk Management Methods (see Afonso and Cunha, 2009; Fadi and Northcott, 2006; and Porter, 1980).

The results in this study pertaining to EUC and RMM in table-13 show that the mean value of EUC is good while S.D is also at normal level. Furthermore, the correlation between EUC and

RMM is also positively significant (table-22) which is in line with what was also noted in other studies (see for example: Li et al., 2013; Fadi and Northcott, 2006; Graham and Harvey, 2001; Arnold and Hatzopoulos, 2000). It is also identified through the results of this study that third part of EUC (changes in product or process technology) is strongly positively correlated with first and second part of RMM (Risk Adjusted Discount Rate and Sensitivity Analysis), which highlights that discount rate are sensitive towards changes in economic and political stability.

On the basis of above significant linkage between EUC and RMM in this study, it can be generalized that corporate managers should consider the role of environmental uncertainty in shaping the risk related project selection criteria. On the other hand, quantitative studies including Wu and Ford (2005) and Chrisman and Patel (2012) noticed the contrasting results to this study. They determined that EUC has more linkage with Real Option Analysis and Benchmarking as compared to RMM. As regards the individual linear regression, the F-value is significant (table-18) and corresponding t-value is also significant (table-19) which asserts that EUC may be regarded a good predictor of RMM. The same regression results were also documented by Gatti et al. (2007), Milis and Mercken (2003), and Hoque (2001).

Besides, the value of standardized Beta coefficient is positive (table-19) to support the favorable relationship between EUC and RMM. The similar Beta results / values were noted by Fadi and Northcott (2006), Copeland and Howe (2002) and Pindit and Dixit (1995). For the most part, the significant regression results in this study are in compliance with the regression results of these corresponding studies. On the other hand, the results of multiple linear regression in table-32 show that Beta value is low and negative while corresponding t-value is insignificant which contradicts the results of Gatti et al. (2007) and Fadi and Northcott (2006) and Afonso and Cunha (2009). This insignificant and low beta and t-value in terms of multiple regression highlight that when EUC along with other factors is tested with Risk related criteria, it does not produce the expected significant results in case of EUC and RMM. These insignificant results suggest that other factors may be investigated in relation to RMM besides EUC.

In case of moderation, when we add moderator, Firm age (FA) into EUC and RMM-model, again R^2 value increases and F-value decreases but remains significant as shown in table-24. It can be noticed that change in R^2-value is just 11.1% (table-24), which is greater than 10%, indicating the good moderation of Firm Age between EUC and RMM. The t-value for moderation term is also significant and standardized beta Coefficient is positive (table-18) which in this case highlights the good and significant moderating effect of FA between EUC and RMM. These significant moderating results support the results of Froot et al., (1993), Finnerty (1996) and Hurley (1998) pertaining to the moderator, Firm Age in capital investment type studies.

4.6.7. Effect of Competitive Force and RMM

Effect of Competitive Force on capital investment criteria also has been discussed in literature review section of chapter-2. According to Fisher (1998), Effect of competitive force is the effect of environment and competitive business rivals on capital investment decision making criteria of business firms. The results of this study show that ECF has direct linkage with Risk Management Methods (supported by Copeland and Howe, 2002; Verbeeton, 2000; Pike, 1996, Ho and Pike, 1991). These studies also notice the similar linkage of ECF with risk related criteria (RMM) in their respective results.

It can be observed from the descriptive results of this study that mean statistics and S.D are almost within accepted limits (table-13). The accepted mean value indicates that ECF is the significant factor which maintains the true significant linkage with RMM. It can also be noticed from the correlation analysis of this study that ECF, has significant positive relationship with RMM (table-22), which is in line with results of other studies including Truong et al., (2008), Fadi and Northcott (2006), Brounen (2004) and Arnold and Hatzopoulos (2000). Furthermore, this significant relationship between ECF and RMM highlights that consideration of rivalry force enables the corporate managers to adjust the tasks of their projects accordingly which is further helpful to understand and better apply the quantitative analysis and sensitivity analysis (RMM) for future capital projects decision making. It is also determined from this positively, significantly relationship that first and third part of ECF in questionnaire is strongly correlated with second and third part of RMM (Probability Analysis and Sensitivity Analysis).

Contrary to significant correlation results of this study, the results of other studies including Crosby (1973) and Davies and Kochhar (2002) assert on the significant relationship of ECF with Conventional Appraisal Methods (CAM). They noticed from the results of their studies that ECF leads to adjust the hurdle rate for the projects which is applied to measure the NPV and IRR. Overall on the basis of above comparative results, it is recommended to the corporate managers and project practitioners to record ECF in their serious evaluation note book as a chronic issue and also relate it with the best fitted risk related criteria.

To our observation of results for simple and multiple linear regressions, t-stat is significant (table-19) and F-value (table-18) is also statistically significant showing that ECF is good determinant of RMM. Other than this, the standardized Beta value is significant (table-32), and the corresponding t-value is also significant as shown in table-32 which supports the relationship between ECF and RMM. The similar Beta and t-values are also noticed by the other studies (see Narain et al., 2006; Copeland and Howe, 2002; Mills and Herbert; and Black and Scholes, 1973) which verifies the results of this study. But on the other hand, Denison (2009) and Dugdale and Jones (1995) noticed the different results depicting the insignificant Beta and t-value. In relation to linkage between ECF and RMM. However, by and large, it can be generalized that ECF plays a significant role and corporate managers of business firms needs to understand the pertinent value of ECF in the implementation of risk related criteria for the decision making of capital projects.

In case of inclusion of moderating factor, when we include Firm age (FA) into ECF and RMM- model as a moderator, again R^2 value increases, but F-value being still significant, decreases as shown in table-24. It is also notable that change in R^2-value is 19.3% (table-24), which is less than 10%, indicating the weak moderation of Firm Age between ECF and RMM. The standardized Beta coefficient is positive and t-value for the moderation term is significant (table-18) which calls for significant moderating effect of firm age between ECF and RMM. Mendes-Da-Silva and Saito (2014), Hung Lau (2011), Hoque (2005) and Meredith (1995) also observed the similar kind of weak but significant moderation results due to firm age in their respective studies. It can be summarized from the moderation results of firm age that corporate managers and academicians should be acquainted with the application of firm age as a moderator which they may apply in their quantitative models to suggest the suitable risk related investment criteria to the industry.

4.6.8. Innovative Technology Adoption and RMM

The Innovative Technology Adoption (ITA) has significant effect on capital investment decision making criteria which has already been explained in the literature review section of chapter-2. According to Ozmel et al., (2013) ITA is the adoption of modern technology including computerized machines, networks and computerized modes which has effect on the capital projects. The results of this study show that it has direct linkage with the Risk Management Methods. The same kind of linkage also has been noticed in other studies (see Ozmel et al., 2013, Afonso and Cunha, 2009; Fadi and Northcott, 2006; Nicolaou, 2002).

It can also be noticed from the descriptive results of this study that mean and S.D values are satisfactory and in acceptable range (table-13). In addition to it, the significant value of correlation coefficient (Pearson's value) in table-22, also indicate the positive relationship between ITA and RMM. The results of other studies including Lindsey (2008), Bottazzi et al. (2008), Verbeeton (2006), Davila et al. (2003) and Kotha and Swamidass (2000) also observed the similar kind of significant positive relationship between ITA and RMM. It is also identified from the correlation analysis of this study that third and fourth part of ITA (Logistic Planning Technology and Information Exchange Technology) are strongly correlated with third and fifth part of RMM (Probability analysis and Quantitative Analysis Methods).

On the other hand, the results of other studies including Dunning (2012) and Eckel & Grossman (2008) noticed the negatively significant relationship (correlation) between ITA and RMM (simulation methods and sensitivity analysis), depicting increase in the uncertainty factor (risk related criteria) with the adoption of new and modern technology. After taken into account all the above comparative results, overall the results of this study favor the relationship between ITA and Risk related criteria. Hence, it can also be recommended to practitioners and corporate managers to consider this relationship between ITA and RMM to enhance the value of projects in order to increase the owners' value.

As regards the individual linear regressions results, F-value is significant (table-18) whereas corresponding t- value is also significant (table-19), which indicates that ITA may be a good predictor of RMM and supports the relationship between ITA and RMM. The similar kind of regression results were also noted by Afonso and Cunha (2009), Bottazzi et al. (2008), Verbeeton (2006), and Davila et al. (2003). In addition to it, the individual values of standardized Beta coefficients are positive (table-19), which depicts the positively amicable relationship between ITA and RMM. The similar kind of individual Beta values were also noted by Afonso and Cunha (2009), Fadi and Northcott (2006), Copeland and Howe (2002) and Pindit and Dixit (1995) in their respective results of regression analysis. Besides, the results in terms of multiple linear regression (table-32) highlight that Standardized Beta value is positive, and corresponding t-value is significant as shown in table-32. These results are consistent with the results of Estabrooks (2006), Hellmann and Puri (2002) and Kotha and Swamidass (2000), who also noticed the similar kind of multiple regression results in their pertinent studies.

These positive and significant results related to ITA and RMM suggest that corporate managers may consider the risk related criteria for its linkage with ITA to ensure added value of capital projects. On the other hand multiple regression results in this study contradicts with the results of Gatti et al. (2007), Fadi and Northcott (2006) and Afonso and Cunha (2009). All of them noticed the insignificant multiple regression results in their respective studies. In view of the above results, we may in general summarize that that ITA is the significant and affirmative predictor of risk related criteria for capital projects. Therefore, corporate managers and practitioners should be facilitated to identify and explore the linkage between these two factors (ITA and RMM), because increase in wealth of ownership is dependent on the effective decisions of managers.

In case of inclusion of moderator, Firm age (FA) into ITA and RMM-model, R^2 value increases as shown in table-24, but F-value decreases but remains significant (table-24). It can be seen that change in R^2-value is just 8.5% (table-24), which is low and less than 10%, indicating the weak moderation of Firm Age between ITA and RMM. It is also noticeable that Standardized Beta coefficient is high, positive and significant as backed by the significant t-value. These values are shown in table-18. These significant results highlight the significant moderation of FA between ITA and RMM. Bottazzi et al. (2008), Fichman (2004), and Davila et al. (2003) also observed the same kind of weak but significant moderating effect of FA between ITA and RMM in their respective studies, which supports the significant moderating results of this study.

4.6.9. Venture Capital and RMM

Venture Capital has already been explained in the literature review section of chapter-2. According to Davila et al., (2003), Venture Capital (VC) is raised for new ventures by issuing of debt and equity in the capital markets with the assistance of investment bankers through Initial Public Offering. The positive results of this study indicate that VC has direct linkage with Risk Management Methods (RMM). The similar kind of linkage between VC and RMM were also noted in other studies (see Afonso and Cunha, 2009; Bottazzi et al., 2008; Davila et al., 2003).

In the same manner, the descriptive results of this study are significant and acceptable (table-13), indicating the mean and S.D values in range. The significant value of correlation coefficient also describes the positive relationship between VC and RMM (table-22). The descriptive values and significant positive correlation coefficient in this study verify the results of other studies including Sorensen (2007), Fadi and Northcott (2006), Amit et al. (1995) and Jain and Kini (1995), who also observed the similar kind of relationship between VC and RMM. The results of this study also indicate that third and fifth part of venture capital (future capital projects financing and firm manuals for record) are strongly correlated with first and fifth part of RMM (Risk Adjusted Discount Rate and Quantitative Analysis).

On the other hand, Abernethy and Lillis (1995) and Hurry et al., (1992) noted the dissimilar results than to this study, indicating the negatively weaker relationship between venture capital and CAPM (RMM), which does not favor the results of this study in terms of correlation analysis. These contrasted results depict that increase in systematic risk (beta) decreases the opportunities to finance the new venture through venture capital because investor lose confidence on the investment in those companies with high Beta-values (systematic risk).

As for as the individual linear regression is concerned, F-value is significant as shown in table-18 and corresponding t-value is also significant (table-19), which advocates the VC to be a significant predictor of RMM. In the same way, similar kind of linear regression results were also identified in other studies (Croce et al., 2013; Arsaln et al., 2013; Afonso and Cunha, 2009; Lindsey, 2008, Holmes, 1998), which all depicts the direct effect of VC on risk related investment criteria. In contrast to these results, Gatti et al. (2007), Milis and Mercken (2003), and Hoque (2001) observed the insignificant F-value and t-value. They noticed that VC is more linked with capital budgeting methods (NPV and IRR) than their affiliation with Risk related investment criteria. Besides, the values of standardized Beta coefficient are positive (table-19), which is favorable to strengthen the relationship between VC and RMM. The similar Beta results were noted by Fadi and Northcott (2006), Copeland and Howe (2002).

As regards the multiple regression results, the Beta value of VC is significantly high which causes increase in the corresponding t-value (table-32). Estabrooks (2006), Hellmann and Puri (2002) and Kotha and Swamidass (2000) also noted the similar kinds of multiple regression results in their corresponding studies. These significant multiple regression results in this study indicate the affirmative effect of VC on the risk related criteria to evaluate the capital projects. In addition to it the individual linear regression and multiple regression results may be helpful to corporate managers in determination of appropriate RMM related criteria in relation to the favorable impact of VC. But, contrary to results of this study, McCarthy (2003) and Miller and O'Leary (2007), observed the insignificant results for the effect of VC on RMM in terms of individual and multiple regression. They noted that VC is not the good predictor of RMM because of its implications in finding the risk related criteria rather it has more favorable effect on CAM. However, keeping in view all the comparative similarities and differences of this study with past studies, generally we may argue that that application of VC should never be ignored in the determination of risk related criteria of the capital projects by the managers of the firms.

When moderator, Firm age (FA) is added into VC and RMM-model, R^2-value becomes greater as shown in table-24, while F-value being still significant decreases (table-24). It can be seen that change in R^2-value is 11.8% (table-24), which is greater than 10%, indicating the favorable moderation of Firm Age between VC and RMM. It is also noticeable that t- value for moderation is highly significant along with positive value of standardized Beta coefficient (table-18). These significant results in terms of moderation of FA support the results of other studies

(Croce et al., 2013; Cassar and Holmes, 2003; Lerner and Merges, 1998), which all also depict the same kind of significant moderation of FA. It can be generalized on the basis of this significant moderation that Firm Age (FA) has good and strong moderating effect between VC and RMM. Furthermore, these results also suggest that the corporate managers may apply the pragmatic risk related criteria which has direct effect with VC and moderator firm age.

4.6.10. Agency Cost and RMM

The effect of Agency Cost on capital investment criteria has already been explained in capter-2, literature review section. According to Jensen (1986) Agency cost (AC) are the expenses that the company or business firm affords to ensure smooth running of its operations for sake of production and delivery of services. The results of this study describe the direct linkage of Agency Cost with Risk Management Methods (RMM).

It can be observed from the significant correlation coefficient (table-22) that AC has positive relationship with RMM which verifies the linkage between AC and RMM. It is also noticeable that second and fourth part of AC (compensation of managers and shareholders' interests) are strongly positively correlated with third and fourth part of RMM (Probability Analysis and CAPM). The results of other studies (Gul et al, 2013; Fazzari et al., 1988; Jensen, 1986; Myers and Majluf, 1984; Stiglitz and Weiss, 1981; Jensen and Meckling, 1976), also indicate the similar kind of relationship between AC and risk related criteria. This significant linkage between AC and RMM suggest that the corporate managers should always take into account the AC while selecting any risk related criteria for picking up a capital investment projects. On the other hand, the results of Moussawi et al. (2006) and Pfeffer and Salancik (2003) are different from results of this study, depicting the insignificant relationship between AC and risk related criteria. According to results of these studies, AC has more linkage with strategic investment selection methods rather than Risk Management Methods for the evaluation of capital projects.

It can also be noticed from the descriptive results of this study that mean statistics and S.D are at accepted level (table-13) because all the mean values are greater than three and variation also lies between 0 and 1. The results of other studies including Fama and Jensen (1983), Jensen (1986) and Bhujraj and Sengupta (2015) also noted the similar descriptive values. As regards the individual linear Regression, F-value is highly significant (table-18) and corresponding t-value is also significant as shown in table-19. In addition to it, the value of standardized Beta coefficient is positive (table-19) which confirms the significant relationship between AC and RMM. Other than this, the results of multiple linear regression (table-32) indicate that Standardized Beta coefficient is positive and corresponding t-value is also significant (table-32).

Gul et al. (2013) and Nicolaou (2002) also noted the similar kind of individual and multiple regression results in their respective studies, who all supports the results of this study, depicting the view that AC may be regarded as a good predictor of RMM. On the other side, the results of Parthasarthy and Sethi (1993), Power and Nielsen (2010) noted the different dissimilar results, noticing the unfavorable relationship between AC and RMM. They observed the favorable relationship between Agency Cost and traditional investment methods (CAM) rather than between AC and RMM. In view of the above overall supporting results of this study, it can be generalized that Agency Cost should be considered and evaluated by the corporate managers to select a pragmatic risk related investment criteria for the capital projects.

In case of inclusion of moderator, Firm age (FA) into AC and RMM-model, R^2 value increases (table-24), and F-value decreases but still it is significant as shown in table-24. It is considerable that change in R^2-value is 10.3% (table-24), which is greater than 10%, indicating the favorable moderation of Firm Age between AC and RMM. It is also noticeable that t-value for the moderation term is highly significant and Standardized Beta Coefficient is positive (table-18) that calls for positive and significant moderating effect of FA between AC and RMM. Bhujraj and Sengupta (2015), Arsaln et al., (2014), Carpenter and Guariglia (2008), and Cassar and Holmes (2003), also observed the similar kind of significant moderation results in their respective studies. On the basis of these significant moderation results it can be generalized that Firm Age has good and significant moderation effects in the relationship between AC and RMM- model to recommend the best fitted capital investment decision making criteria to the investors.

4.7. Descriptive Statistics for the Conventional Appraisal Model

Table-26: *Descriptive Statistics for Conventional Appraisal Model*

Variables	N	Minimum Statistics	Maximum Statistics	Mean Statistics	Mean St. Error	Std. Deviation
CGS	800	2.50	5.00	3.8504	.01767	.49989
MF	800	2.20	5.00	3.7974	.01988	.56227
WE	800	2.20	5.00	3.8245	.01935	.54733
RO	800	2.75	5.00	4.0183	.01834	.51871
EV	800	2.95	5.00	4.0333	.01653	.46740
EUC	800	2.20	5.00	3.8501	.01947	.55064
ECF	800	2.20	5.00	3.8423	.01991	.56307
ITA	800	2.20	5.00	3.8710	.02062	.58336
VC	800	2.20	5.00	3.8503	.02092	.59181
AC	800	2.20	5.00	3.8575	.02061	.58301
CAM	800	1.80	5.00	3.6429	.02283	.64582

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, CAM= Conventional Appraisal Methods

In the Table-26, the descriptive statistics of all the ten variables and CAM of the Conventional Appraisal Model are given. The average value of the variable on the five point Likert-Scale is three. The Mean-Statistics of all the variables are greater than three which implies that all these variables affect the CAM (Wooldridge. 2010; Sullivan et al., 2013). The table also shows that the values of the Standard Deviation statistics of all the predictors are also low and are less than the + (-), 0.60 except CAM which is a good sign of these variables into the Model-2 (Allen and Seaman, 2007; Montgomery, et al., 2015). Minimum and Maximum statistics of all the variables are also shown in above table.

The Appendix-1: Table-A shows correlation coefficients for all the five internal variables of Model-2 and CAM. The statistics of all the variables show that they are positively correlated with CAM and are statistically significant at 0.01 significant level. The higher and significant correlation values of the independent variables show that there is no Multicollinearity problems in the data as the VIF and Tolerance level values are also within the acceptable range while checking the regression assumptions.

In Appendix-1: Table-B, the correlation coefficients' statistics for all the five external variables of Model-2 and CAM are stated which indicates that all of them are positively correlated with CAM and are statistically significant at 0.01 significant level. Higher and significant correlation values of independent variables show that there is no Multicollinearity problems in data as VIF and Tolerance level values are also within acceptable range while checking the regression assumptions.

4.8. Empirical Hypothesis Testing of Conventional Appraisal Model

4.8.1. Conventional Appraisal Model Simple-Regression Results

Table-27: *Model Summary for all Predictors and CAM*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Predictors	Dependent Variable
1	.398	.158	.157	.59282	CGS	CAM
2	.319	.102	.101	.61248	MF	CAM
3	.425	.181	.180	.58482	WE	CAM
4	.303	.092	.091	.61581	RO	CAM
5	.384	.147	.146	.59667	EV	CAM
6	.429	.184	.183	.58381	EUC	CAM
7	.469	.220	.219	.57088	ECF	CAM
8	.448	.201	.200	.57778	ITA	CAM
9	.395	.156	.155	.59363	VC	CAM
10	.456	.208	.207	.57516	AC	CAM

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, CAM= Conventional Appraisal Methods

The above shown table-27 explains the values of R, R^2, and Adjusted R^2 of the all the predictors related to CAM Model are given. R^2 highlights the extent to which the dependent variable of the regression model of CAM is varied by the independent variable and other factors outside the model or not considered by the model. It should be noticeable that significance level selected throughout is 0.01 (*i.e. $p<1\%$*)

The following table summarizes the results of R^2 for all the predictors of RMM Model in view of variation in the dependent variable.

Table-28: *Variation in the dependent variable of the CAM model*

Name of Independent variable	Variation in the dependent variable of the regression model of CAM due to the independent variable	Remaining variation in the dependent variable of the regression model of CAM due to the other factors which are not taken into account by the model
CGS	15.8%	84.2%
MF	10.20%	89.80%
WE	18.10%	81.90%
RO	. 9.20%	90.80%
EV	14.70%	85.30
EUC	18.40%	81.60%
ECF	22.00%	78.00%
ITA	20.10%	79.90%
VC	15.60%	84.40%
AC	20.80%	79.20%

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, Dependent Factor: CAM= Conventional Appraisal Methods

In the below given table-29, F-Statistics related to all the predictors and dependent variables of the regression model of CAM Model are stated. The mean square value of the Regression and mean square value of the Residuals result in the F-values. Overall model in all cases may be considered to be the fit as all the F-values are significant. Moreover, the 0.01 significant level indicates that R^2 is a true value and not a chance value and not resulted due to sampling error (Gujarati, 2005; Boone and Boone, 2012)

Table-29: *ANOVA- Statistics for all Predictors and CAM*

Model	Sum of Squares	df	Mean Square	F. Statistics	Sig.	Predictors	Dependent Variable
1	52.800	1	52.800	150.240	(**)	CGS	CAM
2	33.890	1	33.890	90.341	(**)	MF	CAM
3	60.321	1	60.321	176.372	(**)	WE	CAM
4	30.629	1	30.629	80.769	(**)	RO	CAM
5	49.149	1	49.149	138.055	(**)	EV	CAM
6	61.263	1	61.263	179.745	(**)	EUC	CAM
7	73.174	1	73.174	224.523	(**)	ECF	CAM
8	66.848	1	66.848	200.245	(**)	ITA	CAM
9	52.038	1	52.038	147.669	(**)	VC	CAM
10	69.261	1	69.261	209.367	(**)	AC	CAM

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, CAM= Conventional Appraisal Methods; (**) represent significance at 1% level **(*i.e. p< .01*)**

In the following table-30, the regression coefficients for all predictors and CAM are given. As discussed, the unstandardized Beta coefficient is relevant owing to the reason that this study fulfills the assumptions of linear and multiple regression (Chatterjee and Hadi, 2015; Vaughn, 2008). The standardized Beta coefficients, the unstandardized coefficient of Beta and standard results of t-statistics at 0.01 level of significance are also stated. The table-30 also shows that all the t-values are significant. Therefore, all the ten hypotheses of the study, the alternate hypotheses for all predictors in chapter-2 may be accepted which suggest that all ten determinants significantly affect the CAM.

Table-30: *Coefficients Table for Predictors and CAM*

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t-stats	Sig.
1	Corporate Governance and Strategy	.514	.042	.398**	12.257	0.000
2	Manufacturing Flexibility	.366	.039	.319**	9.505	0.000
3	Workforce Efficiency	.502	.038	.425**	13.281	0.000
4	Reliability of Outputs	.377	.042	.303**	8.987	0.000
5	Expansionary Volume	.531	.045	.384**	11.750	0.000
6	Environmental Uncertainty	.503	.038	.429**	13.407	0.000
7	Effect of Competitive Force	.537	.036	.469**	14.984	0.000
8	Innovative Technology Adoption	.496	.035	.448**	14.151	0.000
9	Venture Capital	.431	.035	.395**	12.152	0.000
10	Agency Cost	.505	.035	.456**	14.470	0.000

Dependent Variable: CAM

Note: CAM (Conventional Appraisal Methods) ;(*) represents significance at 1% level **(*i.e. p< .01*)**

4.8.2. Conventional Appraisal Model Multiple-Regression Results

The table-31 on the next page, shows the values of R, R^2, and Adjusted R^2 of all the predictors of the model including CGS, MF, WE, RO, EV, EUC, ECF, ITA, VC, AC. The R^2 indicates that the 30.8 % variation in the overall Model-CAM is due all of the predictor variables in combined form whereas remaining 69.2 % change in the overall model is due to the other factors which are not taken into consideration by the model.

Table-31: *Model Summary for All Predictors (Multiple) and Conventional Appraisal Model*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
CAM	.555	.308	.299	.54060

Note: in this table the predictors are CGS, MF, WE, RO, EV, EUC, ECF, ITA, VC, AC and dependent variable is Conventional Appraisal Methods (CAM)

Table-32: *ANOVA Statistics for All Predictors (Multiple) and Conventional Appraisal Model*

Model		Sum of Squares	df	Mean Square	F	Sig.
CAM	Regression	102.667	10	10.267	35.131	(**)
	Residual	230.580	789	.292		
	Total	333.248	799			

Note: in this table the predictors are CGS, MF, WE, RO, EV, EUC, ECF, ITA, VC, AC and dependent variable is Conventional Appraisal Methods (CAM); (**) shows *p< .01*

The value of F-Statistic in the table-32 is 35.131 which is significant at 0.01 level of significance and indicates that overall the model may be regarded as the fit. The selected 0.01 significant level also shows that the value R^2 is a true value and not a chance value, and not resulted due to the biased sampling error (Draper and Smith, 2014; Cohen et al., 2014). The mean square value of the Regression of all the predictors including CGS, MF, WE, RO, EV, EUC, ECF, ITA, VC and AC is 10.267 while the mean square value of the Residuals of the regression is 0.292 which result in the F-value of 35.131. The sum of squares of the Regression is 102.667 and the residual sum of squares is the 230.580. The Total of the regression and residual sum of square is 333.248. Moreover, the degree of freedom for the regression is 10 and for the residuals it is 789 resulting in total degree of freedom to 799.

Table-33: *Coefficients for All Predictors (Multiple) and Conventional Appraisal Model*

Model	Unstandardized Coefficients		Standardized Coefficients	t-stats	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.410	.200		2.048	.041		
CGS	.081	.041	**.076***	1.976	**0.042**	.556	1.798
MF	-.010	.043	-.009	-.239	0.811	.634	1.578
WE	.104	.050	**.098***	2.071	**0.039**	.488	2.048
RO	.088	.045	**.030***	1.955	**0.029**	.659	1.518
EV	.083	.056	.080	1.494	0.136	.542	1.846
EUC	.066	.052	.056	1.276	0.202	.454	2.204
ECF	.163	.053	**.142***	3.090	**0.002**	.412	2.425
ITA	.117	.048	**.106***	2.432	**0.025**	.462	2.166
VC	.083	.042	**.079***	1.976	**0.044**	.512	1.953
AC	.159	.047	**.144***	3.349	**0.001**	.477	2.096

Dependent Variable: CAM

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, CAM= Conventional Appraisal Methods; (*) represents significance at 5% level **(*i.e. p< .05*)**

The Table-33 shows the regression coefficients for all of the predictor variables and CAM. Here, the unstandardized Beta coefficient is appropriate owing to the reason that this study fulfills the assumptions of linear and multiple regression (Darlington and Hayes, 2016; Preacher et al., 2006).The significance level throughout taken is 0.05. The t-value for CGS is 1.400 as part of the multiple regression which is significant. The standardized Beta coefficient for CGS is 0.056. The unstandardized coefficient of Beta is 0.072 and unstandardized coefficient of standard error is 0.051 which brings the t-statistics equal to 1.400. The significant t-value also calls for acceptance of the first hypothesis of the study related to the CAM or the alternate hypothesis for CGS in chapter-2. The t-value for MF is -0.239 as part of the multiple regression which is insignificant.

The standardized Beta coefficient for ME is -0.010. The unstandardized coefficient of Beta is -0.009 and unstandardized coefficient of standard error is 0.043. The insignificant t-value does not support the second hypothesis of the study. Therefore, the alternate hypothesis for MF is rejected. The t-value for WE is 2.071 and it is significant. The significant t-value supports the third hypothesis of the study. Therefore, the alternate hypothesis for WE is accepted. The t-value for RO is 1.955and it is significant which supports the acceptance of fourth hypothesis of the study or the alternate hypothesis for RO. The t-value for EV is 1.494 which is insignificant and so does not support the fifth hypothesis of the study. Therefore, the alternate hypothesis for EV is rejected.

The t-value for EUC is 1.276 which is insignificant and therefore, we may reject the sixth hypothesis of the study or, the alternate hypothesis of EUC. The t-value for ECF is 3.090and it is significant and accordingly it backs the acceptance of the seventh hypothesis of the study, the alternate hypothesis for ECF. The t-value for ITA is 2.432which is significant and hence we may accept the eighth hypothesis of the study, the alternate hypothesis for ITA. The t-values for VC and AC are 1.976 and 3.349 which are significant and therefore the ninth and tenth hypotheses of the study or the alternate hypothesis for VC and AC may be accepted. By considering the above discussion on the basis of results, we may conclude that overall CAM is good model owing to the reason that most of the results are significant. All the variables are significant in simple regression and in multiple regression the seven predictors out of ten are significant.

4.9. Empirical Hypothesis Testing of Moderator, Firm Age (FA) with Independent Factors and Conventional Appraisal Methods

Table-34: *Model Summary for All Predictors' Regression Results with FA as a Moderator*

Before Moderation		After Moderation		Change Statistics					
R^2- Value	F- Value	R^2- Value	F- Value	S.E of Estimate	R^2 Change	F Change	df1	df2	Sig. F Change
.158	150.240	.271	98.774	.55234	.113	-51.466	3	796	(**)
.102	90.341	.219	74.480	.57175	.117	-15.861	3	796	(**)
.181	176.372	.266	96.071	.55440	.085	-80.301	3	796	(**)
.092	80.769	.191	62.673	.58194	.099	-18.096	3	796	(**)
.147	138.055	.246	86.780	.56167	.099	-51.275	3	796	(**)
.184	179.745	.266	96.140	.55435	.082	-83.605	3	796	(**)
.220	224.523	.281	103.722	.54863	.061	-120.80	3	796	(**)
.201	200.245	.275	100.562	.55099	.074	-99.683	3	796	(**)
.156	147.669	.251	89.049	.55987	.095	-58.62	3	796	(**)
.208	209.367	.305	116.524	.53935	.097	-92.843	3	796	(**)

Note: (**) represents significance at 1% level **(*i.e. p< .01*)**

In Table-34, model summary of regression results with the moderation of FA, has been stated. This table describes values of R^2, R^2 change, F-Statistic, F change, S.E and sig. F-change by using the simple linear regression method to check the effect of firm age as moderator for the CAM and independent variables. This effect has been calculated one by one through simple linear regression method whose results have been summarized in the table-34. The list below the table shows the order in which the predictors have been added to the model. The results of the table-34 show that when CAM is regressed on the interaction term CGS_FA, Z- CGS and Z-FA, the R-square value becomes 27.10 % as shown in model-1 of above table which was 15.8 % in the table-27, which concludes that when moderator FA is introduced in the model, the R^2 is increased by 11.30 % resulting into R^2 change of 0.113, but the F-value is decreased and becomes98.774when

FA is introduced into the model-1, which was 150.24 before the entrance of moderator, FA in model 1 of table-34 showing that variance is increased, despite all this the F-stat is significant.

When CAM is regressed on the interaction term MF_FA, Z-MF and Z-FA,R-square value becomes 21.90 % as shown in model-2 of above table which was 10.20 % in table-27, which concludes that when moderator, FA is introduced in the model, R^2 is increased by 11.70 % resulting into R^2 change of .117, but F-value is decreased to74.480when FA is introduced into CAM-model, which was 90.341 in table-29 before entrance of moderator, FA in model-2 of table-34 showing that variance is increased but overall fitness of CAM-model is decreased, despite all this F-stat is still significant. When CAM is regressed on the interaction term WE_FA, Z-WE and Z-FA, R-square value becomes 26.60 % as shown in model-3 of the above table which was 18.10 % in the table-27, which concludes that when moderator FA is introduced in CAM model, R^2 is increased by 8.50 % resulting into R^2 change of 0.085, but F-value becomes 96.071when FA is introduced into CAM-model, which was 176.372 in table-29 before the entrance of moderator, FA in the model-3 of table-34 showing that variance is increased but overall fitness of the CAM model is decreased but still F-stat is significant.

When CAM is regressed on the interaction term RO_FA, Z-RO and Z-FA, R-square value becomes 19.10 % as shown in model-4 of above table which was 9.2 % in table-27, which concludes that when moderator FA is introduced in the model, R^2 is increased by 9.9 % resulting into R^2 change of 0.099, but F-value is decreased that is 62.673when FA is introduced into the CAM-model, which was 80.769 in table-29 before the entrance of moderator, FA in the model-4 of table-34 showing that variance is increased but overall fitness of CAM model is decreased, despite all this F-stat is still significant. When CAM is regressed on the interaction term EV_FA, Z-EV and Z-FA,R-square value becomes 24.60 % as shown in the model-5 of the above table which was 14.70 % in the table-27, which concludes that when moderator FA is introduced in CAM model, R^2 is increased by 9.9 % resulting into R^2 change of 0.099, but F-value is decreased that is 86.780, which was 138.055 in table-29 before the entrance of moderator, FA in the model-5 of table-34, all which is showing that variance is increased but overall fitness of CAM model is decreased but F-stat is still significant.

When CAM is regressed on the interaction term EUC_FA, Z-EUC and Z-FA, R-square value becomes 26.60 % as shown in model-6 of the above table which was 18.40 % in table-27, which concludes that when moderator FA is introduced in the model, R^2 is increased by 8.20 % resulting into R^2 change of 0.082, but the F-value is decreased to 96.140when FA is introduced into CAM-model, which was 179.745 in table-29 before the entrance of moderator, FA in the model 6 of table-34 showing that variance is increased but the overall fitness of the model is decreased despite all this F-stat is still significant.

When CAM is regressed on interaction term ECF_FA, Z-ECF and Z-FA, R-square becomes 28.10 % as shown in model-7 of above table which was 22.00 % in table-27, which concludes that when moderator FA is introduced in model-7, R^2 is increased by 6.1 % resulting into R^2 change of 0.061, but the F-value is decreased to 103.722when FA is introduced into the CAM-model, which was 224.523 in table-29 before the entrance of moderator, FA in model-7 of table-34 showing that variance is increased but overall fitness of CAM model is decreased but F-stat is still significant despite all these changes.

When CAM is regressed on interaction term ITA_FA, Z- ITA and Z- FA, R-square becomes 27.50 % as shown in model-8 of above table which was 20.10 % in table-27, which concludes that when moderator FA is introduced in the model-8, R^2 is increased by 7.40 % resulting into R^2 change of 0.074, but F-value is decreased to 100.562 when FA is introduced into CAM-model, which was 200.245 in table-29 before the entrance of moderator, FA in model-8 of table-34 showing that variance is increased but overall fitness of model is decreased despite all this F-stat is still significant.

When CAM is regressed on interaction term VC_FA, Z-VC and Z- FA, R-square value becomes 25.10 % as shown in the model-9 of above table which was 15.60 % in table-27, which concludes that when moderator FA is introduced in model-9, R^2 is increased by 9.50 % resulting into R^2 change of 0.095, but F-value is decreased to 89.049when FA is introduced into CAM-model, which was 147.669 in table-29 before the entrance of moderator, FA in model-9 of table-34 showing that variance is increased but overall fitness of model is decreased despite all these changes F-stat is still significant. When CAM is regressed on interaction term AC_FA, Z-AC and Z- FA, R-square value becomes 30.50 % as shown in model-10 of the above table which was 20.80 % in table-27, which concludes that when moderator FA is introduced in model-10, R^2 is increased by 9.7 % resulting into R^2 change of 0.097, but F-value is decreased to 116.524when FA is introduced into CAM-model, which was 209.367 in table-29 before entrance of moderator, FA in model-10 of table-34 showing that variance is increased but overall fitness of model is decreased, despite all these changes, F-stat is still significant.

Table-35: *ANOVA Statistics for All Predictors with FA as Moderator and CAM*

Model	Sum of Squares	df	Mean Square	F. Statistics	Sig.
CGS	90.403	3	30.134	98.774	(**)
MF	73.041	3	24.347	74.480	(**)
WE	88.587	3	29.529	96.071	(**)
RO	63.674	3	21.225	62.673	(**)
EV	81.130	3	27.377	85.780	(**)
EUC	82.130	3	27.377	86.780	(**)
ECF	93.658	3	31.219	103.722	(**)
ITA	91.589	3	30.530	100.562	(**)
VC	83.738	3	27.913	89.049	(**)
AC	101.691	3	33.897	116.524	(**)

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, CAM= Conventional Appraisal Methods is dependent factor

(**) represents significance at 1% level ***(i.e. p< .01)***

The Table-35 describes the ANOVA statistics for the Z-statistics of all the predictors, Z-stats of moderator FA and interaction term between independent variables and moderator-FA, and also the CAM. The description of all the F-stats have been explained already in the Table-34, model summary. The mean square values of the regression and mean square values of the residuals have also been tabulated in the table-35. All these F-values in comparison with the F-values of linear regression results, show that the FA has good significant moderation effect between the independent variables and CAM. But almost all the F-stats are decreased with the entry of the moderator, FA and model fitness is slightly decreased with the addition of moderation and interaction terms, showing that FA is significant and having semi-strong moderation effect for the CAM-model. But, overall the moderation effect due to FA is statistically significant at 1% level.

In table-36 given below, the coefficients of the regression for the moderation effect of Firm Age (FA) has been stated to check the relationship between the independent variables and CAM. To check the moderation, first of all Z-values of all the predictors were calculated as well as Z-value of moderator, FA was calculated. Then interaction term or moderation of each predictor and FA was calculated. It can be observed from the first model of table-36 that t-values for all the three values Z-CGS, Z-FA and interaction term (CGS_FA) are significant showing the significant moderation effect of FA in the CGS and CAM-model as a whole. In the second model of table-36, t-values for Z-MF, Z-FA and interaction term (MF_FA) are insignificant showing that there is no moderation effect of FA in the CAM-model as a whole.

In the third model of table-36, t-values for Z-WE, Z-FA and interaction term (WE_FA) are also significant showing the weak (because R2-value is low) but favorable moderation effect of FA in the WE and CAM-model. In the fourth model of table-36, t-values for Z-RO, Z-FA are significant but t-stats for interaction term (RO_FA) is insignificant showing that Firm Age does not moderate the relationship between RO and CAM. In the fifth model of table-36, t-values for Z-EV, Z-FA and interaction term (EV_FA) are also significant showing that there is weak (because R2-value is low) but significant moderating effect of FA in the CAM-model as a whole.

In the sixth model of table-36, t-values for Z-EUC, Z-FA and interaction term (EUC_FA) are also significant showing that there is weak and favorable moderation effect of FA in the EUC and CAM-model as a whole. In the seventh model of table-36, t-values for Z-ECF, Z-FA and interaction term (ECF_FA) are all significant showing the overall weak but significant moderation of FA in the ECF and CAM -model. In the eighth model of table-36, t-values for Z-ITA, Z-FA and interaction term (ITA_FA) are also significant showing that there is significant moderating effect of FA in the ITA and CAM-model.

In the ninth model of table-36, t-values for Z-VC, Z-FA and interaction term (VC_FA) are significant showing that there is favorable moderation of FA in the VC and CAM-model. In the tenth model of table-36, t-values for Z-AC, Z-FA and interaction term (AC_FA) are also significant showing that there is significant moderation effect of FA in the CAM-model as a whole. The values of all the constants are significant. But it is also noticeable that all those equations and models in which constants have either small values or these are statistically insignificant, are considered good as compared to those equations in which the values of the constants are either very high or these constants are significant statistically. The Values of the VIF and Tolerance level are also within the acceptable range when the moderator, FA is introduced into the model.

Table-36: *Coefficients for Predictors, Moderator-FA & Interaction-Term for CAM-Model*

	Model	Unstandardized Coefficients		Standardized Coefficients	t-stats	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.613	.020		178.80	.000		
	Z-CGS	.224	.021	.347	10.857	.000	.896	1.116
	Z-FA	.200	.020	.310	9.827	.000	.920	1.087
	CGS_FA	.108	.019	**.179***	5.777	**.000**	.958	1.044
2.	(Constant)	3.635	.021		171.41	.000		
	Z-MF	.210	.021	.326	9.851	.000	.919	1.088
	Z-FA	.150	.021	.233	7.064	.000	.928	1.078
	MF_FA	.028	.021	.043	1.350	**.177**	.991	1.009
3.	(Constant)	3.617	.021		176.11	.000		
	Z-WE	.222	.021	.344	10.683	.000	.891	1.122
	Z-FA	.193	.021	.299	9.183	.000	.871	1.148
	WE_FA	.079	.019	**.130***	4.199	**.000**	.961	1.041
4.	(Constant)	3.633	.021		169.95	.000		
	Z-RO	.138	.022	.214	6.374	.000	.900	1.112
	Z-FA	.214	.022	.332	9.867	.000	.899	1.112
	RO_FA	.033	.020	.055	1.695	**.090**	.959	1.043
5.	(Constant)	3.615	.021		174.49	.000		
	Z-EV	.202	.021	.313	9.541	.000	.882	1.134
	Z-FA	.198	.021	.306	9.399	.000	.894	1.119
	EV_FA	.089	.019	**.149***	4.760	**.000**	.964	1.037
6.	(Constant)	3.615	.021		175.79	.000		
	Z-EUC	.227	.021	.351	10.760	.000	.865	1.156
	Z-FA	.189	.021	.293	8.903	.000	.853	1.172
	EUC_FA	.080	.018	**.142***	4.545	**.000**	.942	1.062
7.	(Constant)	3.617	.021		174.25	.000		
	Z-ECF	.243	.021	.377	11.601	.000	.855	1.169
	Z-FA	.171	.021	.265	7.997	.000	.824	1.213
	ECF_FA	.068	.019	**.108***	3.507	**.000**	.957	1.045
8.	(Constant)	3.614	.021		174.61	.000		
	Z-ITA	.240	.021	.372	11.435	.000	.860	1.163
	Z-FA	.181	.021	.280	8.570	.000	.852	1.173
	ITA_FA	.081	.020	**.128***	4.130	**.000**	.942	1.062
9.	(Constant)	3.614	.021		174.68	.000		

	Z-VC	.203	.021	.315	9.649	.000	.885	1.130
	Z-FA	.197	.021	.306	9.347	.000	.879	1.138
	VC_FA	.088	.018	**.150***	4.804	**.000**	.968	1.033
10	(Constant)	3.612	.020		182.29	.000		
	Z-AC	.257	.020	.398	12.738	.000	.896	1.116
	Z-FA	.185	.020	.286	9.234	.000	.907	1.102
	AC_FA	.104	.018	**.172***	5.727	**.000**	.971	1.030

Note: 1. Predictors: CGS_FA, Z-CGS, Z-FA; 2. Predictors: MF_FA, Z-MF, Z-FA; 3. Predictors: WE_FA, Z-WE, Z-FA; 4. Predictors: RO_FA, Z-RO, Z-FA; 5. Predictors: EV_FA, Z-EV, Z-FA; 6. Predictors: EUC_FA, Z-EUC, Z-FA; 7. Predictors: ECF_FA, Z-ECF, Z-FA; 8. Predictors: ITA_FA, Z-ITA, Z-FA; 9. Predictors: VC_FA, Z-VC, Z-FA; 10. Predictors: AC_FA, Z-AC, Z-FA; DV is CAM; and '*' represents significance at 5% level **(*i.e. p< .05*)**

4.10. Discussion for Results of Conventional Appraisal Model

4.10.1. Corporate Governance & Strategy and CAM

The results of this study indicate that CGS has direct linkage with CAM. The significant value of correlation coefficient (Table-A: Appendix-1) also highlights the positive relationship between CGS and CAM. The results of other studies including Bhujraj and Sengupta (2015), Gul et al., (2013) and Coombes and Watson (2000) also noticed the similar kind of significant relationship between CGS and CAM. It is also identified from the correlation analysis (Table-A: Appendix-1) that third part of CGS (weightage of securities issues) is strongly positively correlated with first part of CAM (application of DCF methods, especially NPV).

By and large, the significant correlation coefficient in this study confirming to past respective studies, meets the objective of this study. On the other hand, Rebiasz (2007) and Sangster (1993) found the insignificant correlation coefficients in their respective studies, which are dissimilar to results of these studies, depicting the stronger relationship between CGS and RMM rather than between CGS and CAM. The significant results of correlation analysis in this study suggest that the corporate managers should value the linkage between corporate strategies and DCF based investment evaluation criteria to pick up the right kind of project to maximize the owners' value. The results also assert that the managers still apply traditional evaluation methods more than other methods to evaluate a project investment proposal. The descriptive statistics also show that the mean and S.D values (table-26) are satisfactory and accepted because these values are in limits. Gul et al., (2013) & Kotha and Swamidass (2000) also noted the similar type of descriptive results in their respective studies pertaining to CGS and CAM.

As long as, individual linear regression is concerned, F-value is significant (table-29). On the other hand, corresponding t-value is also significant (table-30), stressing on application of CGS for the estimation of CAM. The similar kind of regression results were also documented by Maquieira et al., (2012), Al-Ajmi et al., (2011), Ryan and Ryan (2002), Farragher et al., (2001), and Kotha and Swamidass (2000), and Brealey and Meyer (1998), who also pointed out that CGS may be regarded a valuable predictor of CAM. Besides, the value of standardized Beta coefficient is positive (table-30) to support the relationship between CGS and CAM.

The similar positive Standardized Beta values were also observed by Fadi and Northcott (2006), Copeland and Howe (2002) and Pindit and Dixit (1995). In the same way, the results of multiple linear regression (table-33) indicate that Standardized Beta value is positive and corresponding t-value is significant as shown in table-33. The similar kind of regression results were also documented by the studies including Arsaln et al., (2014), Andor et al., (2013) and Maquieira et al., (2012) to support the relationship between CGS and CAM. On the other side, the results of Gatti et al. (2007), Fadi and Northcott (2006) and Afonso and Cunha (2009) contradict with the results of this study, depicting the insignificant regression results pertaining to the linkage between CGS and CAM. Overall, the results of this study elaborate that healthy governance mechanism of companies by affecting the outcomes of different criteria may enable the corporate level managers to duly apply the pragmatic project selection criteria including the DCF and Non-DCF methods (CAM).

In case of inclusion of moderator, Firm Age (FA) into CGS and CAM-model, the R^2 value increases as shown in table-34 and F-value decreases although it is still significant (table-34). It can be noticed that change in R^2-value is just 11.3% (table-34), which is good and greater than 10%, indicating the favorable moderation of Firm Age between CGS and CAM. It is also noted that t-value of moderation term is highly significant and Standardized Beta Coefficient is positive (table-36), which affirms the significant moderation of FA between CGS and CAM. Brunzel et al., (2013), Chazi et al., (2007), Serageldin et al., (2005) Brounen, de Jong, and Koedijk (2004) also documented the similar favorable and significant moderation results of FA in their respective studies related to the linkage between CGS and CAM. One of the underlying reasons may be that older firms are generally characterized with sound corporate governance practices to affect a project’s outcomes such as the cash flow patterns which influence the evaluation and selection of a suitable pragmatic criterion for picking up a project.

4.10.2. Manufacturing Flexibility and CAM

The results of this study depict that Manufacturing Flexibility has direct linkage with Conventional Appraisal Methods. From correlation analysis of this study, the significant relationship between MF and CAM can be observed because of positive correlation between these two variables, which indicates the strong linkage between MF and RMM. The similar type of positive correlation between MF and CAM was also noted in other studies (Li et al., 2013; Chazi et al., 2007; Fadi and Northcott, 2006; Cullinane and Panayides; 2000), wherein the strong relationship between MF and CAM was also noted. It is also noticeable that fifth part of MF (manufacturing of many units of same product) is strongly correlated with the third part of CAM (i.e. application of IRR).

On the other hand, Schall and Sundem (1978) and Sengupta and Zhang (2015) found the different results than this study, indicating the insignificant relationship between MF and CAM due to low and negative correlation coefficient. But by and large, the comparison of results indicates that the linkage between MF and CAM should not be neglected in the capital investment decision making process. As regards the individual linear regression, F-value is significant (table-29) and respective t-value is also significant due to the positive Standardized Beta Coefficient as shown in table-30, which shows the contributing effect of MF to determine the best fitted CAM based criteria. Besides, the value of Standardized Beta Coefficient also supports the favorable relationship between MF and CAM.

The same individual regression results were also documented by Hussain and Shafique (2013), Fadi and Northcott (2006), Dean and Snell (1996), Parthasarthy and Sethi (1993), and Dean et al., (1992), who all also noticed the strong linkage between MF and CAM in their pertinent studies. But, contrary to results of simple regression, the results of multiple linear regression show the negative and low and Standardized Beta value and insignificant corresponding t-value. These values are shown in table-33. The similar kind of insignificant multiple regression results were also noted in other studies including Fadi and Northcott (2006), Drury (2004), Slagmulder (1997), Mills (1988) and Kim et al., (1986). This shows that MF is not a significant factor in affecting the CAM which may further warrant the undertaking of future researches to explore the link of MF and CAM from different perspectives.

In case of inclusion of moderator, Firm Age (FA) into MF and CAM-model, R^2 value increases as shown in table-34, and F-value decreases but it is still significant (table-34). It can be observed that change in R^2-value is 11.7% (table-34), which is greater than 10%, indicating the favorable moderation of Firm Age between MF and CAM. But contrary to this, Standardized Beta coefficient is low and positive and t-value for moderation term is insignificant (table-36), which indicates the weak positive but insignificant moderation of FA between MF and CAM (no moderation in fact). Andor et al., (2015), Prather et al., (2009), Fadi and Northcott (2006), and Lazaridis (2004), also observed no moderation effect of Firm Age in their respective studies. Therefore, the future studies should be undertaken to study the role of FA with varying samples and context in view of the above insignificant moderation results.

4.10.3. Workforce Efficiency and CAM

The results of this perception based study related to capital investment criteria in terms of Conventional Appraisal Methods describe the direct linkage of Workforce Efficiency (WE) with CAM. It is also noticeable from correlation analysis that Workforce Efficiency has significant relationship with CAM because the correlation coefficient between these two variables is positive (Table-A: Appendix-1). The results of other studies (see Argyris and Schon, 1978; Forrester, 2000; Lewis et al., 2004) also show the similar positive and significant correlation. It is also worth mention here that second part of WE (managers hierarchy and teams) is strongly positively correlated with first and second part of the CAM (NPV and IRR).

On the other side, Sengupta and Zhang (2015) and Shank (1996) found in their respective correlation analysis that there is no significant relationship between W-E and CAM. Rather they identified that Workforce Efficiency is more precisely related with the Strategic Appraisal Methods (real option analysis and value chain analysis) rather than CAM. Therefore, such results are contradictory to this study. However, overall the argument is tilted towards the favorable linkage of W-E with CAM as WE may ensure efforts to generate the positive cash flows which are used as inputs in the CAM based investment selection criteria (NPV and IRR). Therefore, it is recommended that the corporate managers of the business firms should include workforce element in their projects evaluation models to add the value of their projects.

The descriptive results show that mean and S.D values (table-26) are in desired limits. Lim et al., (2009) and Lin and Wang (2005) also noted the similar descriptive results in their studies pertaining to WE and CAM. As regards the individual linear regression, it is observable that F-value is significant (table-29) and corresponding t-value is also significant (table-30) which ascertains that WE might be a good determinant of CAM. The same regression results were also documented by Lin and Wang (2005), Boxall (2003), Ryan and Ryan (2002), and Graham and

Harvey (2001) pertaining to WE and CAM. Besides, the value of standardized Beta coefficient is positive (table-30) which also supports the significant relationship between W-E and CAM.

The similar kind of Beta values were also documented by Fadi and Northcott (2006), Lin and Wang (2005), Boxall (2003), and Ryan and Ryan (2002), which all support the positive relationship between W-E and CAM. The multiple linear regression results highlight that Beta value is high and corresponding t-value is significant as shown in table-33. These results are similar to the results of other studies including Arsaln et al., (2014), and Graham Harvey (2001), and Maher et al., (1997), which also noticed the same multiple regression results. However, Silva and Bagno (2014) and Slagmulder (1997) found the insignificant multiple regression results for W-E and CAM linkage, rather they identified management strategy as the significant determinant of CAM than WE. In view of the above comparative results we may hold that generally WE may affect the CAM related criteria through affecting the inputs of the underlying criteria used for selecting the projects.

By adding the moderator, Firm Age (FA) into WE and CAM-model, increase in R^2 value is observed (table-34) and F-value being significant, decreases as shown in table-34. It is noticeable that change in R^2-value is 8.5% (table-34), which is less than 10%, indicating the weak moderation of Firm Age between W-E and CAM. On the other hand, the Standardized Beta Coefficient is positive as shown in table-36 and corresponding t-value for moderation is highly significant (table-36), which again indicates the weak positive and significant moderation of Firm Age between W-E and CAM. These moderation results are consistent with other studies (Hussain and Shafique, 2013; Fadi and Northcott, 2006; Anand, 2002; Arnold and Hatzopolous, 2000; and Steiner, 1996), wherein the similar moderating effect of FA between W-E and CAM was noted. This suggests that older firms as a whole with favorable element of WE may have high ratio of successful projects accompanied with positive project outcomes hence having effect on the capital investment decision making criteria based on Conventional appraisal Methods (CAM).

4.10.4. Reliability of Outputs and CAM

The results of this study indicate that Reliability of Outputs (RO) also has direct linkage with the Conventional Appraisal Methods (CAM). The significant value of correlation coefficient (Table-A: Appendix-1) highlights the positive relationship between RO and CAM. The results of other studies (Li et al., 2013; Fadi and Northcott, 2006; Gitman and Vandenberg, 2000; Ryan and Ryan, 2002; and Kester et al., 1999) also noted the similar kind of correlation in their studies between RO and CAM. It is also noticeable that fourth part of the RO (centralized investment decisions in terms of RO) is strongly correlated with fifth part of the CAM (DPBP for risky projects), which ensues the linkage between RO and CAM. On the other hand, Snell and Dean (1992) and Stevenson and Jarillo (2007), noticed the insignificant correlation between RO and CAM. They identified that reliability of goods has more linkage with SAM (real options and value chain) than its linkage with NPV and PBP (CAM).

But, overall by considering the argument of correlation results, we may say that the corporate managers should give due weightage to RO in shaping and selecting a particular CAM related criterion. The descriptive results related to RO (table-26) highlight that Mean and S.D values are accepted because they are in the desired limits. The similar descriptive results were also noted in other capital investment related studies (Pike, 1996, Ho and Pike, 1991; and Arnold and Hatzopoulos, 2000; Abdel Kader and Dugdale, 2001; and Prather et al., 2009). As regards the individual linear regression, the F-value is significant (table-29) and corresponding t-value is also significant (table-30) which asserts that RO may be regarded a good predictor of CAM.

The same regression results were also documented Raza and Mohsin (2011), Afonso and Cunha (2009), Milis and Mercken (2003). Besides, the value of standardized Beta coefficient is positive (table-30) to support the favorable relationship between RO and CAM. The similar Beta values were noted by Fadi and Northcott (2006), Lazaridis (2004), and Hoque (2001). Besides, the results of multiple linear regression (table-33) highlight that Beta value is high and corresponding t-value is significant as shown in table-33. These results are consistent with the results of Suzette and Howard (2011), Fadi and Northcott (2006), Copeland and Howe (2002), Ahmad and Hassan (2006), and Akalu (2001), who all also noticed the similar kind of multiple regression results in their pertinent studies of capital investment criteria for the projects.

On the other hand, Suchman (1995) and Triantis (2005) observed the contrasted results of simple and multiple regressions, depicting the insignificant regression coefficients related to link of RO with CAM. They determined that RO is the key predictor of Real Option Analysis and Probability Analysis instead of Conventional Appraisal Methods. Overall, considering the significant regression results we may infer that the corporate managers should give due consideration to ensure reliability of outputs in improving the capital investment selection criteria related outcomes (CAM) and so inducing a desired choice for the CAM related criteria as project evaluation and selection tools to increase the value of the firms.

In case of inclusion of moderator, Firm Age (FA) into RO and CAM-model, R^2 value increases (table-34) and F-value decreases but it is still significant (table-34). It can be noticed that change in R^2-value is 9.9% (table-34), which is less than 10%, indicating the weak moderation of

Firm Age between RO and CAM. It can also be noted that t-value for moderation is insignificant due to low positive Standardized Beta Coefficient (table-36), depicting the weaker and no significant moderating effect of FA between RO and CAM. These insignificant moderation results in case of FA are similar to those found by the studies including Fadi and Northcott (2006), Akalu (2003), Graham & Harvey (2001), Mills and Herbert (1987), and Pike (1982). Future research may be conducted to refine the moderating role of Firm Age in this regard.

4.10.5. Expansionary Volume and CAM

The results of this study show that Expansionary Volume also has direct linkage with Conventional Appraisal Methods. The similar kind of linkage between EV and CAM was also documented by other studies (Bottazzi et al., 2008; Fadi and Northcott, 2006; and Davila et al., 2003). In the same manner, the descriptive results of this study including mean and S.D in acceptable range (table-26).The significant value of correlation coefficient also describes the positive relationship between EV and CAM (Table-A: Appendix-1).

The descriptive values and positive correlation coefficient value in this study are similar to the results of other studies including Sorensen (2007), Andor et al., (2015), Anand (2002), and Scapens (1985), which also noted the relationship between EV and CAM. The results of this study also highlight that first and fourth part of Expansionary Volume (ability to expand in the future and protection of shareholders' interests) are strongly correlated with first and fifth part of CAM (NPV and Discounted PBP). On the other hand, Verbeeten (2006) and Clemons (1991) documented the contrasting results, by noticing the negative and weak relationship between EV and CAM, which does not favor the results of this capital investment criteria related study.

As long as the individual linear regression is concerned, it is noticeable that F-value is significant (table-29) and respective t-value is also significant (table-30) which ascertains that EV may be regarded a good determinant of CAM. The same regression results were also noted by Pike (1982), Scapens (1985), and Mills and Herbert (1987). In addition to it, the value of standardized Beta coefficient is positive (table-30) to support the favorable relationship between EV and CAM. The similar Beta results were also documented by Fadi and Northcott (2006)), and Suzette and Howard (2011) in their respective studies. In contrast to individual regression results, the results of multiple linear regression in table-33 indicate that Standardized Beta value is low and corresponding t-value is insignificant which contradicts the results of Scott and Petty (1984), Mills and Herbert (1987), Slagmulder et al., (1995) Pike (1996), Forrester (2000), and Fadi and Northcott (2006). This insignificant t-value and low beta value highlight that EV does not affect the CAM.

However, overall role of EV should not be underestimated as large volume may be accompanied with economies of scale which can positively affect the projects' outcomes and hence the entire capital investment decision making criteria (CAM).

After adding moderator firm age (FA) into EV and CAM-model, R^2 value increases and F-value decreases but still it remains significant. These values are documented in table-34. It can be noticed that change in R^2-value is 9.9% (table-34), which is less than 10%, indicating the weak moderation of Firm Age between EV and CAM. The t-value for moderation of FA is significant and standardized beta Coefficient is positive (table-36) which in this case highlights the favorable moderating effect of FA between EV and CAM. The similar moderation results were also noted by Slagmulder et al., (1995), Lefley (1996), Putterill et al., (1996), and Adler (2000) pertaining to the moderator, FA. This highlight that to some extent the old firms may affect the EV which in turn may influence the project selection criteria outcomes and accordingly their choice as a selection tool to pick up the capital projects after the process of their evaluation.

4.10.6. Environmental Uncertainty and CAM

The results of this study show that Environmental Uncertainty (EUC) has direct linkage with Conventional Appraisal Methods (CAM). The results of other studies (Afonso and Cunha, 2009; Almazan et al., 2010, and Fadi and Northcott, 2006) also highlight the similar kind of linkage between EUC and CAM in their corresponding studies. It can be noted that the correlation coefficient is positively significant (table-B: Appendix-1), which shows the relationship between EUC and CAM. The results of other studies (Li et al., 2013; Fadi and Northcott, 2006; Graham and Harvey, 2001; Arnold and Hatzopoulos, 2000), also indicate the similar kind of positive relationship between EUC and CAM.

The results of this study also point out that fourth part of EUC (fiduciary duty of corporate managers in protecting shareholders' interests in case of uncertain environment) has strong positive linkage with third part of CAM (application of IRR for capital projects), which favors the relationship between EUC and CAM. On the other hand, Ittner al. (2003) and Coombes & Watson (2000) observed the insignificant correlation coefficients between EUC and CAM, rather they noted the strong relationship between EUC and SAM (real options analysis). It is also observable through descriptive analysis that mean value of EUC is good and value of S.D is also in limits (table-26), which are similar to the descriptive results of other studies including Fadi and Northcott (2006), Graham and Harvey (2001) and Arnold and Hatzopoulos (2000). Regarding individual linear regression, F-value is significant (table-29) and t-value is also significant while Standardized

Beta Coefficient value is positive (table-30), which highlights that EUC is the significant predictor of Conventional Appraisal Methods (CAM).

The similar kind of individual regression results were also documented by Fadi and Northcott (2006), Copeland and Howe (2002) and Pindit and Dixit (1995) in their corresponding studies, supporting the positive relationship between EUC and CAM. Hence, the EUC component may be taken to affect the inputs of a particular capital investment selection criterion and their use as an evaluation too. On the other hand, the individual regression results of other studies (Malhotra and Temponi, 2010; Dean and Snell, 1996); Parthasarthy and Sethi, 1993; and Dean et al., 1992) are not in compliance with the results of this study, showing the insignificant F-value and t-value, in their pertinent studies. Moreover, the results of multiple linear regression (table-33) depict that Standardized Beta is low and corresponding t-value is insignificant which contradicts the linear regression results of this study. But, these multiple regression results otherwise are similar to the results noted by Liggett et al., (1992), Lelli (2001) and in general may have implications for the corporate managers to reconsider the role of EUC in relation to CAM.

The moderation due to firm age depicts that when it is added into the EUC and CAM-model, R^2 value increases and F-value decreases but still it is significant. These results are given in table-34. It can also be noticed that change in R^2-value is 8.2% (table-34), which is less than 10%, indicating the weak moderation of Firm Age between EUC and CAM. The standardized Beta Coefficient is positive and t-value is significant (table-36) which calls for favorable moderation of FA between EUC and CAM. This weak and significant moderation results are similar to those found by Al-Ajmi et al., (2011), Ahmad and Hassan (2006), Abdel Kader and Dugdale (2001), and Scott et al., (1998). This highlights that old firms with experienced managerial and corporate experience may control the EUC components which in turn affect the capital investment selection criteria related outcomes and their selection for assessing a project.

4.10.7. Effect of Competitive Force and CAM

The results of this perception based study depict the direct linkage between Effect of Competitive Force (ECF) and Conventional Appraisal Methods (CAM). The same linkage has also been noted by other studies (Copeland and Howe, 2002; Verbeeton, 2000; Pike, 1996, Ho and Pike, 1991). The significant value of correlation coefficient (table-B: Appendix-1) also indicates the positive relationship between ECF and CAM. Fadi and Northcott (2006), Brounen (2004), and Arnold and Hatzopoulos, (2000) also observed the similar correlation in their studies pertaining to linkage between ECF and CAM. It is also noticeable that fifth part of ECF (strong position of buyers and suppliers of your rivals) has positive strong relationship with third and sixth part of CAM (i.e. ARR and PBP).

On the contrary, Lefley (1996), Kannan & Tan (2002) and Hung et al. (2009) noted the divergent results than this study, observing the insignificant correlation coefficient pertaining linkage between ECF and CAM, in their pertinent studies. The results of linear regressions show that F-value (table- 47) is significantly high and t-stat is also significant (table-30), which highlights that ECF may be considered a significant predictor of CAM. Besides, the value of standardized Beta coefficient is positive (table-30) to support the affirmative relationship between ECF and CAM. The similar Beta values were also noted by Fadi and Northcott (2006), Copeland and Howe (2002) and Pindit and Dixit (1995).

The multiple regression results show that the standardized Beta value is significant (table-33), and the corresponding t-value is also significant as shown in table-33, indicating positive effect of ECF on CAM. The similar Beta and t-values are also documented by other studies (Fadi and Northcott, 2006; Copeland and Howe, 2002; Black, F., Scholes, M., 1973), which depict ECF as a significant predictor of CAM. Hence, the competitive forces may play a good role in affecting the projects' benefits and outcomes and accordingly their selection criteria. On the other hand, Holmes (1998) and Herath & Park (2002) noted the insignificant multiple regression results in their respective studies pertaining to linkage between ECF and CAM, depicting the unfavorable effect of ECF to determine the best fitted CAM based investment criteria. This may have managerial implications control the aspects related to ECF in order to favorably affect the CAM.

In case of moderation, when we add moderator, Firm Age (FA) into ECF and RMM-model, R^2 value increases and F-value decreases though it is still significant. These values are shown in table-34. It can be observed that change in R^2-value is 6.1% (table-34), which is also very low and less than 10%, indicating the weak moderation of Firm Age between ECF and CAM. The t-value for moderation term is highly significant and Standardized Beta Coefficient is positive (table-36), which highlights the positive and significant moderating effect of FA between ECF and CAM. The similar moderation results were also documented by other studies (Fadi and Northcott, 2006; Akalu, 2003; Graham & Harvey, 2001; and Sangster, 1993). This again also implies that older firms with good corporate practices may duly deal with the competitive forces to be capitalized in order to favorably affect the use of a capital investment criterion after having an effect on its outcomes.

4.10.8. Innovative Technology Adoption and CAM

The results of this study describes that Innovative Technology Adoption (ITA) has direct linkage with Conventional Appraisal Methods (CAM). The similar linkage between ITA and CAM also has been documented by other studies (Ozmel et al., 2013; Afonso and Cunha, 2009; Fadi and Northcott, 2006; Nicolaou, 2002).Besides, it can be ascertained from the significant correlation coefficient (table-B: Appendix-1) that ITA has positive relationship with CAM which signifies the strong linkage between ITA and CAM. Moreover, it is also notable that fifth part of ITA (adoption of ITA and its impact on financial and non-financial projects) has positive correlation with first and third part of CAM (NPV and ARR).

Ozmel et al. (2013), Afonso and Cunha (2009), Fadi and Northcott (2006), Lindsey (2008), Arnold and Hatzopoulos (2000), and Kotha and Swamidass (2000) also noticed the similar positive correlation coefficients in their respective studies to support the relationship between ITA and CAM. On the contrary, Hamid and Sarmad (2009), and Gul et al. (2013) noticed the contradictory correlation results than this study noting the weak and insignificant linkage between ITA and CAM. The descriptive results show that the mean value is good and S.D is also in accepted limits (table-26) because all the mean values are greater than three and S.D also lies between 0 and 1.

The results of other related studies (Ozmel et al., 2013; Afonso and Cunha, 2009; Fadi and Northcott, 2006; Nicolaou, 2002)) also show the similar descriptive results. As regards the individual linear regression results, F-value is significant (table-29) and the corresponding t-value is also significant (table-30) which predicates that ITA may be regarded a good predictor of CAM. Other than this, the value of standardized Beta Coefficient is positive (table-30) to support the relationship between ITA and CAM. The similar significant regression values were also documented by Afonso and Cunha (2009), Copeland and Howe (2002) and Kotha and Swamidass (2000) in their respective studies pertaining to linkage between ITA and CAM. The multiple linear regression results highlight that Standardized Beta Coefficient is positive and corresponding t-value is also significant that statistically supports the feasibility of capital projects.

These regression values are shown in table-33. Arsaln et al. (2014), and Graham Harvey (2001), and Maher et al., (1997) also found the similar multiple regression results in their pertinent studies, supporting the relationship between ITA and CAM. The above results indicate that the innovative technology adoption besides supporting the operation may also favorably the impact projects' success in terms of better project estimates such as profitability and cash flows and hence the particular CAM related criterion as a desired choice to evaluate a capital investment proposal.

In contrast to regression results of this study, Silva and Bagno (2014) and Slagmulder (1997), found the insignificant linear and multiple regression results, depicting that ITA is insignificant predictor of CAM. Instead they noted CGS the significant determinant of CAM.

In case of moderation, when we add moderator, Firm Age (FA) into ITA and CAM-model, R^2 value increases while F-value being still significant, decreases. These values are shown in table-34. It is also considerable that change in R^2-value is 7.4% (table-34), which is less than 10%, indicating the weak moderation of Firm Age between ITA and CAM. The t-value for moderation term is also significant and Standardized Beta Coefficient is positive (table-36) which in this case highlights the weak, positive and significant moderating effect of FA between ITA and CAM. These moderation results support the results of other studies (Fadi and Northcott, 2006; Akalu, 2003; Graham & Harvey, 2001; and Sangster, 1993), which also noticed the similar significant moderation of firm age between ITA and CAM. This highlights that older firms just like larger firms induce the use of Innovative Technology Adoption to positively affect the use of CAM related criteria by affecting the estimates of a particular criteria used.

4.10.9. Venture Capital and CAM

The results of this perception based study manifest that Venture Capital (VC) has direct linkage with Conventional Appraisal Methods. The similar connection was also noted by other related studies (Afonso and Cunha, 2009; Bottazzi et al., 2008; Davila et al., 2003), pertaining to linkage between VC and CAM. It can also be noticed that there is a significant positive correlation between VC and CAM (table-B: Appendix-1). Sorensen (2007), Fadi and Northcott (2006), Amit et al., (1995), and Jain and Kini (1995), also have documented the similar positive correlation depicting the significant linkage between VC and CAM. It is also identified in this study that third part of Venture Capital (financing of future capital projects through VC) has strong significant linkage with second part of CAM (application of IRR for capital projects).

On the contrary, Sengupta and Zhang (2015), Carry (2008) and Chadwell et al. (1996) in their corresponding studies, documented the insignificant positive correlation between VC and CAM indicating no linkage between VC and CAM. The descriptive results show that mean and S.D values related to VC are in accepted limits (table-26). Lim et al., (2009) and Lin and Wang (2005) also documented the similar descriptive results in their relevant studies pertaining to VC and CAM. The individual linear regression results show that the F-value is significant (table-29) and corresponding t-value is also significant whereas Standardized Beta Coefficient is plosive (table-30) which suggests that VC is the significant predictor of CAM. In addition, positive Standardized Beta Coefficient, support the affirmative relationship between VC and CAM.

The similar individual regression results were also found in other related studies (Croce et al., 2013; Arsaln et al., 2013; Afonso and Cunha, 2009; Lindsey, 2008; and Holmes, 1998 to support the positive relationship between VC and CAM. In contrary, the individual regression results of other studies (Malhotra and Temponi, 2010; Dean and Snell, 1996); Parthasarthy and Sethi, 1993; and Dean et al., 1992) are not in compliance with the results of this study, indicating the insignificant F-value and t-value.

Besides, the multiple linear regression results show that Standardized Beta value is positive and respective t-value is significant. These values are shown in table-33. These results are similar to the results of other studies including Croce et al. (2013), Fadi and Northcott (2006) and Lindsey (2008), which also noticed the favorable multiple regression results. This all imply that the venture capital may favorably impact the long-term growth prospects which in turn can affect the estimates of capital investment selection criteria (CAM). Therefore, the corporate managers should give due consideration to the role of VC in this regard to select the optimal criteria to ensure projects' success. On the contrary, the multiple regression results in this study do not match with the results of Gatti et al. (2007), Fadi and Northcott (2006) and Afonso and Cunha (2009), which all documented the insignificant multiple regression results in their pertinent studies related to the relationship between VC and CAM.

In the same way, when we add moderator, Firm age (FA) into VC and CAM-model, again R^2 value increases (table-34), and F-value decreases though still it is significant (table-34). It is also notable that change in R^2-value is 9.5% (table-34), which is less than 10%, indicating the weak moderation of Firm Age between VC and CAM. The t-value for moderation term is also significant and standardized beta Coefficient is positive (table-36) which in this case highlights the weak, positive and significant moderating effect of FA between VC and CAM. These results support the results of Darlington and Hayes (2016), Arsaln et al., (2014), Damodaran (2012), and Preacher et al., (2006) pertaining to the moderator, FA. This highlights that old firms with good corporate history and reputation may stimulate the availability of VC and in turn can favorably affect the estimates of capital investment decision making criteria (CAM).

4.10.10. Agency Cost and CAM

The results of this study show that Agency Cost has direct linkage with Conventional Appraisal Methods (CAM). It can be noted from the correlation analysis of this study that correlation coefficient being significant ascertains the positive relationship of AC with CAM (table-B: Appendix-1), which is in compliance with the significant correlation coefficients found by other studies including Fama and Jensen (1983), Jensen (1986), and Bhujraj and Sengupta (2015), depicting the positive relationship between AC and CAM. It is also identified from the positive relationship between AC and CAM that second part of AC in questionnaire (fair compensation to managers and outside agents) is strongly correlated with first and third part of CAM (NPV and ARR), which ensures the significant relationship between AC and CAM.

Contrary to significant correlation results of this study, other studies including Choong and Lim (2009), Davies and Kochhar (2002), and Chalos and Poon (2000), noted the insignificant correlation between AC and CAM. The descriptive statistics indicate that mean and S.D are in acceptable limits (table-26). The similar kind of descriptive statistics were also noted in other related studies (Gul et al, 2013; Fazzari et al., 1988; Jensen, 1986; Myers and Majluf, 1984; Stiglitz and Weiss, 1981; Jensen and Meckling, 1976) pertaining to linkage between AC and CAM.

The individual linear regression results show that the F-value is significant (table-29) and corresponding t-value is also significant (table-30) which asserts that AC may be regarded a good predictor of CAM. The same regression results were also found by Fama and Jensen (1983), Jensen (1986), and Bhujraj and Sengupta (2015) in their pertinent studies related relationship between AC and CAM. Other than this, the value of Standardized Beta Coefficient is positive (table-30) to support the affirmative relationship between AC and CAM. The similar Beta values were documented by Fadi and Northcott (2006), Fama and Jensen (1983), Jensen (1986), and Bhujraj and Sengupta (2015).

The multiple linear regression results depict that Beta value is highly positive and the respective t-value is significant as shown in table-33. These results are consistent with the results of Estabrooks (2006), Hellmann and Puri (2002) and Kotha and Swamidass (2000), who noticed the same kind of multiple regression results in their corresponding studies pertaining to AC and CAM. This suggests that the agency cost may be regarded a justified base disguised in terms of fair managerial compensation to have strategic direction in order to expand the firms' project base so that project outcomes may positively be affected and accordingly the CAM related criteria. But, contrary to results of this study, De Massis et al. (2013), McCarthy (2003) and Clemons (1991) noticed the insignificant individual and multiple regression results in their corresponding studies. They indicated that AC is not the good predictor of CAM because of its implications in increasing the cost of capital projects which ultimately may decrease the value of firms.

By adding moderator, Firm Age into AC and CAM-model, R^2 value increases as shown in table-34 and F-value decreases although it is still significant (table-34). It is considerable that change in R^2-value is 9.7% (table-34), which is less than 10%, indicating the weak moderation of Firm Age between AC and CAM. It is also noted that t-value for the moderation term is significant and Standardized Beta Coefficient is positive (table-36), which affirms the significant moderation of firm age AC and CAM. Draper and Smith (2014), Karim et al., (2010), Fadi and Northcott (2006), Horngren et al., (2003), Sangster (1993), and Ashford et al., (1988) also documented the similar significant moderating effect of FA in the relationship between AC and CAM. This implies that old firms may also better use the AC in view of better packages given tied up with performance which in turn may favorably impact the outcomes of capital investment decision making criteria (CAM) and so their choice to pick up a potential project.

4.11. Descriptive Statistics for the Strategic Appraisal Model

Table-37: *Descriptive Statistics for Strategic Appraisal Model*

Variables	N	Minimum Statistics	Maximum Statistics	Mean Statistics	Mean St. Error	Std. Deviation
CGS	800	2.50	5.00	3.8504	.01767	.49989
MF	800	2.20	5.00	3.7974	.01988	.56227
WE	800	2.20	5.00	3.8245	.01935	.54733
RO	800	2.75	5.00	4.0183	.01834	.51871
EV	800	2.95	5.00	4.0333	.01653	.46740
EUC	800	2.20	5.00	3.8501	.01947	.55064
ECF	800	2.20	5.00	3.8423	.01991	.56307
ITA	800	2.20	5.00	3.8710	.02062	.58336
VC	800	2.20	5.00	3.8503	.02092	.59181
AC	800	2.20	5.00	3.8575	.02061	.58301
SAM	800	1.40	5.00	3.5244	.02718	.76876

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, SAM= Strategic Appraisal Methods

In the Table-37, the descriptive statistics of all the ten variables and SAM of the Strategic Appraisal Model are mentioned. The average value of the variables on five point Likert-Scale is three. As shows, the Mean- Statistics of all the variables are greater than three which suggest that all these variables have good effect on SAM(Sekaran and Bougie, 2016; Tayles et al., 2007; Fadi and Northcott, 2006). It is evident from the table, that the values of the Standard Deviation statistics of all the predictors are also low and are less than the + (-), 0.60 excluding SAM which is a good sign of these variables into Model-3. Furthermore, Minimum and Maximum statistics of all variables are also given.

The Table-C of Appendix-1, shows the correlation coefficients for all the five internal variables of the Model-3 and SAM which indicates that all of these are positively correlated with SAM and are statistically significant at 0.01 significant level. There is no Multicollinearity problems in the data as the VIF and Tolerance level values are also within range which are observed while checking the regression assumptions.

In Table-D of Appendix-1, the correlation coefficients statistics for all the five external variables of the Model-3 and SAM are given which highlights that all of these variables are positively correlated with SAM and are statistically significant at 0.01 significant level. Higher and significant correlation values of independent variables show that there is no multicollinearity problems in data as VIF and Tolerance level values are within acceptable range which have been identified through the testing of all the assumptions of linear and multiple regression. .

4.12. Empirical Hypothesis Testing of the Strategic Appraisal Model

4.12.1. Strategic Appraisal Model Simple-Regression Results

In the table-38 shown on the following page, the values of R, R^2, and Adjusted R^2 of all the predictors related to SAM Model are stated. R^2 shows the degree to variation in dependent variables of regression model of SAM that is due to the independent variables and other factors which are not taken into account by the model. It is to be noted that significance level throughout taken is .01 (i.e. (i.e. *p<1%*).

Table-38: *Model Summary for all Predictors and SAM*

Model	R	R^2	Adj. R^2	S.E	Predictors	Dependent Factor
1	.434	.188	.187	.69317	CGS	SAM
2	.344	.119	.118	.72216	MF	SAM
3	.435	.189	.188	.69268	WE	SAM
4	.241	.058	.057	.74663	RO	SAM
5	.313	.098	.097	.73068	EV	SAM
6	.429	.184	.183	.69485	EUC	SAM
7	.485	.235	.234	.67280	ECF	SAM
8	.514	.264	.263	.66005	ITA	SAM
9	.438	.192	.191	.69139	VC	SAM
10	.475	.225	.224	.67713	AC	SAM

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, SAM= Strategic Appraisal Methods

Table-39: *Variation in the dependent variable of the SAM model*

variable	Variation due to IVs	variation due to the other factors
CGS	18.8%	81.2%
MF	11.90%	88.10%
WE	18.90%	81.10%
RO	5.8%	94.2%
EV	9.8%	90.2%
EUC	. 18.40%	81.60%
ECF	23.50%	76.50%
ITA	26.40%	73.60%
VC	19.20%	80.80%
AC	22.50%	77.50%

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, **Dependent Factor**: SAM= Strategic Appraisal Methods

The summary of the results of R^2 for all the predictors of SAM Model is given in the above shown table-39 in relation to variation in the dependent variable. The following table-40 shows F-Statistics related to all the predictors and dependent variables of the regression model of SAM Model. The mean square value of the Regression and mean square value of the Residuals result in the F-values. All the F-values are significant which suggest the overall fitness of the model. Also, the selected 0.01 level of significant level indicates that R^2 is a true value and not a chance value and not resulted due to sampling error (Sekaran and Bougie, 2016; Draper and Smith, 2014).

Table-40: *ANOVA- Statistics for all Predictors and SAM*

Model	Sum of Squares	df	Mean Square	F. Statistics	Sig.	Predictor	Dependent Variable
1	88.778	1	88.778	184.769	(**)	CGS	SAM
2	56.037	1	56.037	107.452	(**)	MF	SAM
3	89.315	1	89.315	186.146	(**)	WE	SAM
4	27.350	1	27.350	49.062	(**)	RO	SAM
5	46.156	1	46.156	86.451	(**)	EV	SAM
6	86.913	1	86.913	180.010	(**)	EUC	SAM
7	110.985	1	110.985	245.188	(**)	ECF	SAM
8	124.541	1	124.541	285.862	(**)	ITA	SAM
9	90.746	1	90.746	189.838	(**)	VC	SAM
10	69.261	1	69.261	209.367	(**)	AC	SAM

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, SAM= Strategic Appraisal Methods

(**) represents significance at 1% level ***(i.e. p< .01)***

The following table-41 shows the regression coefficients for all predictors and CAM for which the unstandardized Beta coefficient is relevant because this study fulfills the assumptions of linear and multiple regression (Chen et al., 2015; Johnson, 2014; Seber and Lee, 2012). The values of standardized Beta coefficient are also stated. The unstandardized coefficient of Beta and standard error result in t-statistics at 0.01 level of significance. As can be seen, all the t-values are significant which support the acceptance of all the ten hypotheses of the study or the alternate hypotheses for all predictors in chapter-2. Therefore, we may say all the ten determinants are significant predictors of Strategic Appraisal Model.

Table-41: *Coefficients Table for Predictors and SAM*

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t-stats	Sig.
1	Corporate Governance and Strategy	.667	.049	.434**	13.593	0.000
2	Manufacturing Flexibility	.471	.045	.344**	10.366	0.000
3	Workforce Efficiency	.611	.045	.435**	13.644	0.000
4	Reliability of Outputs	.357	.051	.241**	7.004	0.000
5	Expansionary Volume	.514	.055	.313**	9.298	0.000
6	Environmental Uncertainty	.599	.045	.429**	13.417	0.000
7	Effect of Competitive Force	.662	.042	.485**	15.658	0.000
8	Innovative Technology Adoption	.677	.040	.514**	16.907	0.000
9	Venture Capital	.569	.041	.438**	13.778	0.000
10	Agency Cost	.626	.041	.475**	15.228	0.000

Note: Dependent Variable: SAM (Strategic Appraisal Methods)

& (**) represents significance at 1% level **(*i.e. p*< *.01*)**

4.12.2. Strategic Appraisal Model Multiple-Regression Results

Table-42: *Model Summary for All Predictors (Multiple) and Strategic Appraisal Model*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
SAM	.593	.352	.343	.62289

Note: in this table the predictors are CGS, MF, WE, RO, EV, EUC,
ECF, ITA, VC, AC and dependent variable is Strategic Appraisal Methods (SAM)

In the Table-42 the values of R, R^2, and Adjusted R^2 of all the predictors of the model including CGS, MF, WE, RO, EV, EUC, ECF, ITA, VC, AC are given. The R^2 shows that overall 35.20 % variation Model of SAM due to all of the predictor variables whereas remaining 64.80 % variation is due to the other outside factors which are not taken into account by the model. The value of the Adjusted R^2 is 0.343 that is 0.009 less than the R-Square value, whereas Standard- Error of the estimate of the overall model is 0.62289.

Table-43: *ANOVA Statistics for All Predictors (Multiple) and Strategic Appraisal Model*

Model		Sum of Squares	df	Mean Square	F	Sig.
SAM	Regression	166.081	10	16.608	42.806	**(**)**
	Residual	166.081	789	.388		
	Total	472.203	799			

Note: in this table the predictors are CGS, MF, WE, RO, EV, EUC,
ECF, ITA, VC, AC and dependent variable is Strategic Appraisal Methods (SAM)

'*' represents significance at 1% level **(*i.e. p*< *.01*)**

The F-Statistic value in the Table-43, is 42.806which is significant at 0.01 level of significance and for this reason overall the model may be considered as fit for all the predictors. The 0.01 significant level also shows that the R^2 is a true value and not a chance value, and not resulted due to the biased sampling error. (Draper and Smith, 2014). The mean square value of the Regression of all the predictors including CGS, MF, WE, RO, EV, EUC, ECF, ITA, VC and AC is 16.608 while the mean square value of the Residuals of the regression is 0.388which result in the F-value of 42.806. The sum of squares of the Regression is 166.081 and the residual sum of squares is the 166.081. The total of the regression and residual sum of square is 472.203. The degree of freedom for the regression and residuals is 10 and 789 resulting in the total degree of freedom of 799.

Table-44: *Coefficients for All Predictors (Multiple) and Strategic Appraisal Model*

Model	Unstandardized Coefficients		Standardized Coefficients	t-stats	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-.106	.231		-.461	.645		
CGS	.152	.059	**.099***	2.570	**0.010**	.556	1.798
MF	.026	.049	.019	.520	0.603	.634	1.578
WE	.115	.058	**.082***	1.997	**0.046**	.488	2.048
RO	-.055	.052	-.037	-1.051	0.294	.659	1.518
EV	-.094	.064	-.057	-1.468	0.143	.542	1.846
EUC	.033	.059	.024	.554	0.580	.454	2.204
ECF	.196	.061	**.143***	3.209	**0.001**	.412	2.425
ITA	.282	.056	**.214***	5.077	**0.000**	.462	2.166
VC	.099	.050	**.074***	1.980	**0.044**	.512	1.953
AC	.199	.055	**.151***	3.629	**0.000**	.477	2.096

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, Dependent Factor: Strategic Appraisal Methods (SAM)

& (*) represents significance at 5% level **(*i.e. p*< *.05*)**

In the Table-44, the regression coefficients for all of the predictor variables and SAM are stated for which the unstandardized Beta coefficient is relevant due to the reason that this perception based study fulfills the assumptions of linear and multiple regression.(Hair et al., 2013). It should be noted that the significance selected throughout is 0.05. As part of the multiple regression, the t-value for CGS is 2.570 which is significant with standard Beta coefficient of 0.999.The unstandardized coefficient of Beta is 0.152 and unstandardized coefficient of standard error is .059 which result in t-statistics of 2.570. On the basis of significant t-value, the first hypothesis of the study, alternate hypothesis for CGS in chapter-2 may be accepted. Similarly, as part of the multiple regression, the t-value for MF is 0.520 which is significant with the standardized Beta coefficient of 0.019 as shown in the table-44.

The unstandardized coefficient of Beta is 0.026 and unstandardized coefficient of standard error is 0.049. Due to the insignificant t-value, the second hypothesis of the study, the alternate hypothesis for MF may be rejected. The t-value of 1.997 for WE is significant which calls for acceptance of third hypothesis of the study, the alternate hypothesis for WE. The t-value for RO, EV and EUC are -1.051, -1.468 and 0.554 respectively which are insignificant. For this reason, the fourth, fifth and sixth hypotheses of the study or the alternate hypothesis for RO, EV and ECF may be rejected owing to the insignificant t-values of these predictors.

The t-value for ECF is 3.209 which is significant and supports the acceptance of seventh hypothesis of study, alternate hypothesis for ECF. The eight hypothesis of study, alternate hypothesis for ITA may also be accepted due to t-value of 5.077 for ITA. Finally, t-values for VC and AC are 1.903 and 3.629 respectively which are also significant, therefore, ninth and tenth hypotheses of study or alternate hypotheses for VC and AC may be accepted. In simple regression all the variables are significant while in multiple regression analysis of SAM, six predictors out of ten independent predictors are significant. In the light of the above discussion, and considering the significant and insignificant results, we may suggest that overall the SAM is a good model at medium level and may be applied by the practitioners of the firms.

4.13. Empirical Hypothesis Testing of Moderator, Firm Age (FA) with Independent Factors and Strategic Appraisal Methods (SAM)

In the table-45, Model summary of regression results with the moderation effect has been stated. This table describes values of R^2, R^2 change, F-Statistic, F change, S.E and sig. F-change by using the simple linear regression method to check the effect of FA as moderator for the SAM and independent variables. This effect has been calculated one by one through simple linear regression method whose results have been summarized in the table-45. The list below the table shows the order in which the predictors have been added to the model.

Table-45: *Model Summary for All Predictors' Regression Results with FA as a Moderator*

Before Moderation		After Moderation			Change Statistics				
R^2- Value	F- Value	R^2- Value	F- Value	S.E of Estimate	R^2 Change	F Change	df1	df2	Sig. F Change
.188	184.769	.293	110.092	.64750	0.105	-74.677	3	796	(**)
.119	107.452	.242	84.826	.67046	0.123	-22.626	3	796	(**)
.189	186.146	.277	101.850	.65473	0.088	-84.296	3	796	(**)
.058	49.062	.186	60.631	.69489	0.128	11.569	3	796	(**)
.098	86.451	.214	72.293	.68279	0.116	-14.158	3	796	(**)
.184	180.010	.277	101.843	.65474	0.093	-78.167	3	796	(**)
.235	245.188	.305	116.367	.64216	0.07	-128.821	3	796	(**)
.264	285.862	.337	135.102	.62696	0.073	-150.76	3	796	(**)
.192	189.838	.286	106.092	.65098	0.094	-83.746	3	796	(**)
.225	231.887	.316	122.815	.63680	0.091	-109.072	3	796	(**)

Note: Dependent Variable is Strategic Appraisal Methods (SAM)

(**) represents significance at 1% level (***i.e. p< .01***)

The results of the table-45 show that when SAM is regressed on the interaction term CGS_FA, Z- CGS and Z-FA, the R-square value becomes 29.30 % as shown in model-1 of above table which was 18.8 % in the table-38, which concludes that when moderator FA is introduced in the model, the R^2 is increased by 10.5 % resulting into R^2 change of 0.105, but the F-value is decreased and becomes110.092 when FA is introduced into the model-1, which was 184.76 in table-40 before the entrance of moderator, FA in model 1 of table-45 showing that variance is increased, despite all this the F-stat is significant.

When SAM is regressed on the interaction term MF_FA, Z-MF and Z-FA,R-square value becomes 24.20 % as shown in model-2 of above table which was 11.90 % in table-38, which concludes that when moderator, FA is introduced in the model, R^2 is increased by 12.30 % resulting into R^2 change of .123 but F-value is decreased to84.826when FA is introduced into SAM-model, which was 107.452 in table-40 before entrance of moderator, FA in model-2 of table-45 showing that variance is increased but overall fitness of SAM-model is decreased, despite all this F-stat is still significant.

When SAM is regressed on the interaction term WE_FA, Z-WE and Z-FA, R-square value becomes 27.70 % as shown in model-3 of the above table which was 18.90 % in the table-38, which concludes that when moderator FA is introduced in SAM model, R^2 is increased by 8.80 % resulting into R^2 change of 0.088, but F-value becomes 101.850when FA is introduced into SAM-model, which was 186.146 in table-40 before the entrance of moderator, FA in the model-3 of table-45 showing that variance is increased but overall fitness of the SAM model is decreased but still F-stat is significant.

When SAM is regressed on the interaction term RO_FA, Z-RO and Z-FA, R-square value becomes 18.60 % as shown in model-4 of above table-45 which was 5.8 % in table-38, which concludes that when moderator FA is introduced in the model, R^2 is increased by 12.80 % resulting into R^2 change of 0.128, and F-value is also increased to 60.631 when FA is introduced into the SAM-model, which was 49.062 in table-40 before the entrance of moderator, FA in the model-4 of table-45 showing that variance and overall fitness of SAM model both are increased, due to which F-stat becomes significant.

When SAM is regressed on the interaction term EV_FA, Z-EV and Z-FA,R-square value becomes 21.40 % as shown in the model-5 of the above table which was 9.8 % in the table-38, which concludes that when moderator FA is introduced in SAM model, R^2 is increased by 11.60 % resulting into R^2 change of 0.116, but F-value is decreased to72.293, which was 86.451 in table-40 before the entrance of moderator, FA in the model-5 of table-45, all which is showing that variance is increased but overall fitness of SAM model is decreased but F-stat is still significant. When SAM is regressed on the interaction term EUC_FA, Z-EUC and Z-FA, R-square value becomes 27.70 % as shown in model-6 of the above table which was 18.40 % in table-38, which concludes that when moderator FA is introduced in the model, R^2 is increased by 9.30 % resulting into R^2 change of 0.093, but the F-value is decreased to 101.843when FA is introduced into SAM-model, which was 180.010 in table-40 before the entrance of moderator, FA in the model 6 of table-45 showing that variance is increased but the overall fitness of the SAM-model is decreased despite all this F-stat is still significant.

When SAM is regressed on interaction term ECF_FA, Z-ECF and Z- FA, R-square becomes 30.50 % as shown in model-7 of above table which was 23.50 % in table-38, which concludes that when moderator FA is introduced in model-7, R^2 is increased by 7.0 % resulting into R^2 change of 0.070, but the F-value is decreased to 116.367when FA is introduced into the SAM-model, which was 245.188 in table-40 before the entrance of moderator, FA in the model-7 of table-45 showing that variance is increased but overall fitness of SAM model is decreased but F-stat is still significant despite all these changes.

When SAM is regressed on interaction term ITA_FA, Z- ITA and Z- FA, R-square becomes 33.70 % as shown in model-8 of above table which was 26.40 % in table-38, which concludes that when moderator FA is introduced in the model-8, R^2 is increased by 7.3 % resulting into R^2 change of 0.073, but F-value is decreased to 135.102when FA is introduced into SAM-model, which was 285.862 in table-40 before the entrance of moderator, FA in model-8 of table-45 showing that variance is increased but overall fitness of model is decreased despite all this the F-stats is still significant at accepted level.

When SAM is regressed on interaction term VC_FA, Z-VC and Z- FA, R-square value becomes 28.60 % as shown in the model-9 of above table which was 19.20 % in table-38, which concludes that when moderator FA is introduced in model-9, R^2 is increased by 9.4 % resulting into R^2 change of 0.094, but F-value is decreased to 106.092when FA is introduced into SAM-model, which was 189.838 in table-40 before the entrance of moderator, FA in model-9 of table-45 showing that variance is increased but overall fitness of model is decreased despite all these changes F-stat is still significant. When SAM is regressed on interaction term AC_FA, Z-AC and Z- FA, R-square value becomes 31.60 % as shown in model-10 of the above table which was 22.50 % in table-38, which concludes that when moderator FA is introduced in model-10, R^2 is increased by 9.10 % resulting into R^2 change of 0.091, but F-value is decreased to 122.815when FA is introduced into SAM-model, which was 231.887 in table-40 before entrance of moderator, FA in model-10 of table-45 showing that variance is increased but overall fitness of model is decreased, despite all this F-stat is still significant.

The Table-46 describes the ANOVA statistics for the Z-statistics of all the predictors, Z-stats of moderator FA and interaction term between independent variables and moderator-FA, and also the SAM. The description of all the F-stats have been explained already in the Table-45, model summary. The mean square values of the regression and mean square values of the residuals have also been tabulated in the table-46. All these F-values in comparison with the F-values of linear regression results, show that the FA has good significant moderation effect between the independent variables and SAM. But almost all the F-stats are decreased with the entry of the moderator, FA and model fitness is slightly decreased with the addition of moderation and interaction terms, showing that FA is significant and having semi-strong moderation effect for the SAM-model. But, overall the moderation effect is y significant.

Table-46: *ANOVA Statistics for All Predictors with FA as Moderator and SAM*

Model	Sum of Squares	df	Mean Square	F. Statistics	Sig.
CGS	138.471	3	46.157	110.092	(**)
MF	114.391	3	38.130	84.826	(**)
WE	130.980	3	43.660	101.850	(**)
RO	87.832	3	29.277	60.631	(**)
EV	101.109	3	33.703	72.293	(**)
EUC	130.974	3	43.658	101.843	(**)
ECF	143.958	3	47.986	116.367	(**)
ITA	159.316	3	53.105	135.102	(**)
VC	134.877	3	44.959	106.092	(**)
AC	149.411	3	49.804	122.815	(**)

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, FA= Firm Age, SAM= Strategic Appraisal Methods

& (**) represents significance at 1% level (***i.e. p< .01***)

In table-47 given below, the coefficients of the regression for the moderation effect of Firm Age (FA) has been stated to check the relationship between the independent variables and SAM. To check the moderation, first of all Z-values of all the predictors were calculated as well as Z-value of moderator, FA was calculated. Then interaction term or moderation of each predictor and FA has been calculated.

Table-47: *Coefficients for Predictors, Moderator-FA & Interaction-Term for SAM-Model*

Model		Unstandardized Coefficients		Standardized Coefficients	t-stats	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.501	.024		147.82	.000		
	Z-CGS	.282	.024	.366	11.637	.000	.896	1.116
	Z-FA	.249	.024	.324	10.429	.000	.920	1.087
	CGS_FA	.083	.022	**.115***	3.778	**.000**	.958	1.044
2.	(Constant)	3.507	.024		143.59	.000		
	Z-MF	.203	.024	.264	8.285	.000	.940	1.064
	Z-FA	.275	.025	.358	11.203	.000	.934	1.070
	MF_FA	.073	.024	**.094***	3.015	**.003**	.989	1.011
3.	(Constant)	3.506	.024		144.53	.000		
	Z-WE	.262	.025	.341	10.697	.000	.891	1.122
	Z-FA	.243	.025	.316	9.806	.000	.871	1.148
	WE_FA	.058	.022	**.079***	2.583	**.010**	.961	1.041
4.	(Constant)	3.520	.026		137.90	.000		
	Z-RO	.102	.026	.133	3.940	.000	.900	1.112
	Z-FA	.290	.026	.377	11.165	.000	.899	1.112
	RO_FA	.015	.024	.020	.624	**.533**	.959	1.043
5.	(Constant)	3.505	.025		139.18	.000		
	Z-EV	.165	.026	.215	6.419	.000	.882	1.134
	Z-FA	.273	.026	.355	10.695	.000	.894	1.119
	EV_FA	.061	.023	**.087***	2.713	**.007**	.964	1.037
6.	(Constant)	3.494	.024		143.89	.000		
	Z-EUC	.261	.025	.339	10.469	.000	.865	1.156
	Z-FA	.246	.025	.320	9.819	.000	.853	1.172
	EUC_FA	.086	.021	**.127***	4.095	**.000**	.942	1.062
7.	(Constant)	3.497	.024		143.91	.000		
	Z-ECF	.295	.025	.384	12.019	.000	.855	1.169
	Z-FA	.220	.025	.286	8.801	**.000**	.824	1.213

	ECF_FA	.073	.023	**.097***	3.226	**.001**	.957	1.045
8.	(Constant)	3.493	.024		148.30	.000		
	Z-ITA	.335	.024	.435	13.992	.000	.860	1.163
	Z-FA	.217	.024	.282	9.031	.000	.852	1.173
	ITA_FA	.089	.022	**.119***	3.995	**.000**	.942	1.062
9.	(Constant)	3.498	.024		145.41	.000		
	Z-VC	.269	.024	.350	10.992	.000	.885	1.130
	Z-FA	.242	.025	.315	9.866	.000	.879	1.138
	VC_FA	.080	.021	**.115***	3.774	**.000**	.968	1.033
10.	(Constant)	3.502	.023		149.69	.000		
	Z-AC	.308	.024	.400	12.924	.000	.896	1.116
	Z-FA	.234	.024	.305	9.907	.000	.907	1.102
	AC_FA	.075	.021	**.104***	3.504	**.000**	.971	1.030

Note: 1. Predictors: CGS_FA, Z-CGS, Z-FA; 2. Predictors: MF_FA, Z-MF, Z-FA; 3. Predictors: WE_FA, Z-WE, Z-FA; 4. Predictors: RO_FA, Z-RO, Z-FA; 5. Predictors: EV_FA, Z-EV, Z-FA; 6. Predictors: EUC_FA, Z-EUC, Z-FA; 7. Predictors: ECF_FA, Z-ECF, Z-FA; 8. Predictors: ITA_FA, Z-ITA, Z-FA; 9. Predictors: VC_FA, Z-VC, Z-FA; 10. Predictors: AC_FA, Z-AC, Z-FA; Dependent Variable: SAM (Strategic Appraisal Methods); & '*' represents significance at 5% level **(*i.e. p< .05*)**

It can be observed from first model of table-47 that t-values for all the three values Z-CGS, Z-FA and interaction term (CGS_FA) are significant showing the weak (because R^2-value is low) but significant moderation of FA in the CGS and SAM-model. In the second model of table-47, the t-values for Z-MF, Z-FA and interaction term (MF_FA) are significant showing that there is high and significant moderation effect of FA in the MF and SAM-model as a whole. In the third model of table-47, t-values for Z-WE, Z-FS and interaction term (WE_FA) are also significant showing the good and favorable moderation effect of FA in the WE and SAM-model.

In the fourth model of table-47, t-values for Z-RO, Z-FA are significant but t-stats for interaction term (RO_FA) is insignificant showing that there is no moderation effect of FA in the RO and CAM-model as a whole. In fifth model of table-47, t-values for Z-EV, Z-FA and interaction term (EV_FA) are also significant showing that there is weak but significant moderation effect of FA in the EV and SAM-model. In the sixth model of table-47, t-values for Z-EUC, Z-FA and interaction term (EUC_FA) are also significant showing that there is weak but favorable moderation effect of FA in the EUC and SAM-model. In the seventh model of table-47, t-values for Z-ECF, Z-FA and interaction term (ECF_FA) are also significant showing that there is significant moderation effect of FA in the ECF and SAM -model.

In the eighth model of table-47, t-values for Z-ITA, Z-FA and interaction term (ITA_FA) are also significant showing that there is favorable moderation effect of FA in the ITA and SAM-model as a whole. In the ninth model of table-47, t-values for Z-VC, Z-FA and interaction term (VC_FA) are also significant showing that there is favorable moderation effect of FA in the VC and SAM-model as a whole. In the tenth model of table-47, t-values for Z-AC, Z-FA and interaction term (AC_FA) are also significant showing that there is favorable moderation effect of FA in the AC and SAM-model.

The values of all the constants are significant. But it is also noticeable that all those equations and models in which constants have either small values or these are statistically insignificant, are considered good as compared to those equations in which the values of the constants are either very high or these constants are significant statistically. The Values of the VIF and Tolerance level are also within the acceptable range when the moderator, firm age is introduced into the model of all the ten predictors and SAM.

4.14. Discussion for the Results of Strategic Appraisal Model

4.14.1. Corporate Governance & Strategy and SAM

The results of this study indicate the direct linkage between CGS and SAM. It is also noticeable from correlation analysis that CGS has significant relationship with SAM because of positive correlation between them (table-C: Appendix-1), which ascertains the significant relationship between CGS and SAM. Other studies including Stewart (2007), Fadi and Northcott (2006), Adler (2000) and Slagmender et al. (1995) also noted the similar positive correlation pertaining to the linkage between CGS and SAM. It is also identified from the survey findings that sixth part of CGS is strongly positively correlated with fourth part of the SAM (Benchmarking).

On the contrary, Dailami and Lipkovich (1999), and Holmen and Pramborg (2009) noticed the insignificant relationship between CGS and SAM, in their respective correlation analysis. It can also be seen that the descriptive values of CGS are satisfactory because mean value is good and S.D also is in limits (table-37). Butler et al., (1991), Fadi and Northcott (2006), and Ahmed et al., (2011), also observed the same kind of descriptive values in their respective studies pertaining to the linkage between CGS and SAM. In case of individual linear regressions results, F-value is significant as shown in table-38 whereas corresponding t-value is also significant (table-41), which all supports the relationship between CGS and SAM.

The similar kind of regression results were also noticed by the studies including Fadi and Northcott (2006), Coughlan et al., (2005), Copeland and Howe (2002), Hoque (2001), Camp (1989), and Cox et al., (1979), which also assert the strong linkage between CGS and SAM. Besides, the value of standardized Beta coefficient is positive (table-41), which is favorable to identify the linkage between CGS and SAM. The similar Beta values were also noted by Hamid and Sarmad (2009), Fadi and Northcott (2006), Stewart (2002), and Kaplan and Norton (2001) in their corresponding studies pertaining to CGS and SAM. In contrast to these results, Gatti et al. (2007), Milis and Mercken (2003), and Hoque (2001) observed the insignificant F-value and t-value. They noticed that CGS is more linked with capital budgeting methods such as NPV and IRR (CAM) rather than its affiliation with SAM.

Furthermore as regards the multiple regression results, t-value is significant and Standardized Beta coefficient is highly positive (table-44). Hamid and Sarmad (2009), Fadi and Northcott (2006), Stewart (2002), and Kaplan and Norton (2001) also noticed the similar multiple regression results in their respective studies, depicting the confirmatory effect of CGS along with other predictors in finding and assessing the suitable SAM based investment criteria to evaluate the capital projects. This suggests that the CG related factors such as the effective boards and role of institutional investors may favorably affect the use and selection of SAM related criteria such as the balance score card analysis, real option analysis and benchmarking in relation to have a due regard for the strategic direction of the company. On the contrary, Estabrooks (2006), Hellmann and Puri (2002) and Kotha and Swamidass (2000) noted different multiple regression results in their corresponding studies pertaining to CGS and SAM. They noticed the insignificant t-value and low positive beta pertaining to the linkage between CGS and SAM.

In case of inclusion, Firm Age (FA) into CGS and SAM-model, R^2 value increases and F-value being still significant, decreases. These values have been shown in table-45. It can be noted that change in R^2-value is 8.8% (table-45), which is less than 10%, indicating the weak moderation of Firm Age between CGS and SAM. It can be also be noticed that Standardized Beta Coefficient is positive and t-value for moderating term FA is significant (table-47) which calls for positive moderation of FS between CGS and SAM. These weak, positive and significant moderating results support the moderating results of other studies Salerno et al., (2015), Ford and Lander (2011), Fadi and Northcott (2006), Benaroch and Kaufmann (1999), Baldwin and Clark (1994), which also documented the similar significant moderating results related to FS as a moderator between CGS and SAM. This highlights that old firms may also affect the CGS related variables to have effect on the capital investment decision making criteria (SAM) in terms of influencing the results of the underlying capital investment criteria study.

4.14.2. Manufacturing Flexibility and SAM

The results of this perception based study depict the direct linkage of Manufacturing Flexibility (MF) with Strategic Appraisal Methods (SAM). The same linkage between MF and SAM is also documented by other related studies including Fadi and Northcott (2006), McCarthy (2003), and Copeland and Howe (2002). The descriptive results show that mean statistics and S.D are nearly in the accepted limits (table-37). The results of this study also illustrate that MF has significant positive relationship with SAM as shown by the significant positive correlation between MF and SAM (table-C: Appendix-1), which is in agreement with correlation results of other studies including Silva et al., (2014), O'Connor (2008), Fadi and Northcott (2006), Lyons et al., (2003), Copeland and Howe (2002), and Shank and GovindraJan (1992) pertaining to linkage between MF and SAM. It is also noticeable from this significant relationship between MF and SAM that third part of MF in questionnaire (flexibility increase opportunity for new ventures) is strongly positively correlated with second and fourth part of SAM (Real Option Analysis and Benchmarking).On the contrary, Crosby (1973) and Davies and Kochhar (2002) observed the insignificant relationship between MF and SAM, while they were expecting to achieve the significant relationship of MF with Conventional Appraisal Methods (CAM).

The individual linear regression results show that the F-value is significant (table-38) and corresponding t-value is also significant (table-41) which points out that MF may be regarded a good predictor of SAM. The same regression results were also documented by other studies Fadi and Northcott; MacDougall and Pike, 2003; Copeland and Howe, 2002; Cornell, 1993; Dixit and Pindyck, 1994; and Cox et al., 1979), which all also noted the similar effect of MF in the determination of SAM based investment criteria. Other than this, value of standardized Beta coefficient is positive (table-41) to support the significant relationship between MF and SAM. The similar Beta values were also noted by Copeland and Howe (2002), Cornell (1993), and Dixit and Pindyck (1994) in the related studies highlighting the linkage between MF and SAM.

On the other hand, the results of multiple linear regression in table-44 indicate that t-value is insignificant and of Standardized Beta value is low and positive which confirm the results of Scott and Petty (1984), Mills and Herbert (1987), Slagmulder et al., (1995), Pike (1996), and Forrester (2000) which calls for exploring other relevant factors affecting the SAM. However, overall we cannot underestimate the role of MF in this regard as better MF related variables such as flexibility to manufacture a product range may favorably affect the different projects' success through influencing the outcomes of project selection criteria such as balanced score analysis, technology road mapping and benchmarking.

In case of moderation effect, when we add moderator, firm age (FA) into MF and SAM-model, R^2 value increases and F-value decreases though it is still significant. These values are exhibited in table-45. It can be identified that change in R^2-value is 12.3% (table-45), which shows the strong moderation of FA between MF and SAM. The t-value for moderation term is highly significant and Standardized Beta Coefficient is positive (table-47), all which depicts the strong positive moderating effect of firm age between MF and SAM. The similar moderation results were also documented by other studies (Hussain and Imran, 2013; Miller and O'Leary, 2007; Graham & Harvey, 2001; and Menachof and Wassenberg, 2000). This implies that older firms may also better apply the MF element to affect the Strategic Appraisal Methods related criteria outcomes and the underlying criteria choice as a project selection tool.

4.14.3. Workforce Efficiency and SAM

The results of this study regarding Capital Investment Criteria show that Workforce Efficiency has direct linkage with Strategic Appraisal Methods (SAM). Copeland and Howe (2002), Park and Son (1988), (2002), Ford et al., (2004) and Fadi and Northcott (2006) also noticed the same linkage between WE with SAM in their corresponding studies. It is also noticeable that the mean value of WE and S.D are in limits (table-37). Besides, the correlation between WE and SAM is also positive and significant (table-C: Appendix-1) which is similar to the correlation results noticed by other studies including Bowman and Moskowitz (2001), Copeland and Howe (2002), Amram and Howe (2002), Lyons et al., (2003) and Fadi and Northcott (2006) pertaining to linkage between WE and SAM.

It is identified from the correlation analysis that third and fourth part of WE (compensation for workforce and role of R&D) are strongly positively correlated with second and fifth part of SAM (Real Option Analysis and Technology Roadmapping), which indicates that if more investment is managed for R&D projects through technology applications and workforce are rewarded above their expectations, real options inherent in the capital projects can be captured in the form of future cashflows. On the contrary, Wu and Ford (2005) and Chrisman and Patel (2012) observed the insignificant relationship between WE and SAM in view of the correlation results between these two variables. Rather they noted that WE has significant linkage with RMM.

In case of individual linear Regression it can be seen that F-value is significant (table-38) (where is F-value in table-38, please check all value with all tables) and corresponding t-value is also significant as shown in table-41. Besides, the value of standardized Beta coefficient is positive (table-41) which asserts the significant linkage between W-E and SAM. In the same way, the multiple linear regression results (table-44) highlight that Standardized Beta coefficient is positive and corresponding t-value is also significant (table-44). Ahmed et al., (2011), Newkirk and Lederer (2006) Belton and Stewart (2002), Copeland (2001) and Trigeorgis (1999) also noted the similar kind of simple and multiple regression results in their corresponding studies pertaining to the linkage between WE and SAM. This highlights that WE related variables such as work teams and effective training and development of workforce may provide a base upon which the managerial decisions may be taken to pursue better long-term strategic projects through using the suitable project selection criteria such as balanced scorecard analysis, benchmarking and value chain analysis besides affecting the various scenarios associated with these criteria. This supports the role of W-E for the managerial implications. However, on the contrary, Coughlan and Power (2005) and Nielsen (2010) observed the contrasting results than this study, indicating the insignificant regression results between W-E and SAM as a whole.

To check the moderation effect of Firm Age, when we add moderator, Firm Age (FA) into WE and SAM-model, it is observed that R^2 value increases (table-45) and F-value being still significant, decreases (table-45). It is notable that change in R^2-value is 8.8% (table-45) which highlights the low moderation of FA between W-E and SAM. It can also be noticed that t-value for moderation FA is significant and Standardized Beta Coefficient is positive as shown in table-47, which indicates the significant moderating effect of FA between WE and SAM. These moderation results in case of FA are identical to the moderating results of FA which were noted by other studies (Newkirk and Lederer, 2006; Mills and Mercken, 2003; Adler, 2000; Chadwell et al., 1996; and Primorse, 1991) pertaining to the relationship between WE and SAM. This also highlights that just like larger firms, the older firms also favorably affect the workforce efficiency specific variables so that to affect the SAM related criteria may be possible.

4.14.4. Reliability of Outputs and SAM

The results of this study related to the capital investment criteria show that Reliability of Outputs has direct linkage with Strategic Appraisal Methods. The similar kind of linkage between RO and SAM was also documented by other studies (see Pike, 1996, Ho and Pike, 1991; Coy, 1999; and Fadi and Northcott, 2006).Similarly, the descriptive results depict that the mean and S.D values are in range. It is also notable that the value of correlation coefficient is significant which indicates the positive relationship between RO and SAM (table-C: Appendix-1). On the whole, the descriptive values and significant positive correlation coefficient in this study, confirm the results of other studies including Baker et al., (2011), Fadi and Northcott (2006), Copeland and Howe (2002), Kaplan and Norton (1997), Shank and GovindraJan (1992), and Cox et al., (1979), which also found the similar kind of relationship between RO and SAM.

The results of this perception based study also highlight that first part of Reliability of Output (quality of reliable outputs) has strong linkage with forth part of SAM (Benchmarking). Taken together, the significant correlation coefficient in this study in agreement with these past affirmative studies, fulfills the objective of this study. On the contrary, Coombes and Watson (2000) and Verbeeten (2006) documented the different results than this study noting the negative insignificant relationship between RO and SAM. As regards the individual linear regression results, F-value is significant (table-38) and corresponding t-value is also significant and Standardized Beta Coefficient is positive (table-41), which points out that RO may be taken as the significant predictor of SAM.

Other than this, positive Standardized Beta Coefficient confirms the affirmative relationship between RO and SAM. The similar individual regression values were also noticed by other studies including Denison (2009), Fadi and Northcott (2006), Copeland and Howe (2002), Trigeorgis (1999) and Cox et al., (1979) to assert the positive relationship between RO and SAM. On the contrary, the simple regression results of other studies (Malhotra and Temponi, 2010; Dean and Snell, 1996); Parthasarthy and Sethi, 1993; and Dean et al., 1992) are not in agreement with the results of this study. They found the insignificant regression between RO and SAM.

On the other side, in case of multiple linear regression (table-44), the Standardized Beta is low and pertinent t-value is insignificant, which contradicts with the linear regression results of this study. But, the results of other studies including Liggett et al. (1992), Lelli (2001) noted the significant multiple regression between RO and SAM. However, overall, the effect of RO should not be ignored in finding the best fitted investment criteria based on Strategic Appraisal Methods. This highlights that the RO related variables such as the relevant procedure manuals and their follow up may affect the firms' strategic orientation to undertake long-term projects by applying the suitable project selection criteria.

In the same manner, when we include moderator, Firm Age (FA) into RO and SAM-model, R^2 value increases (table-45) whereas F-value decreases but it is still significant (table-47). It is also notable that change in R^2-value is 12.8% (table-77), which shows the good moderation of FA between RO and SAM. But on the other hand, the standardized Beta coefficient for moderation term is low and t-statistic is insignificant (table-47), which asserts that there is no moderating effect of firm age between reliability of output and SAM. The similar insignificant moderating results related to RO were also documented by Afonso and Cunha (2009), Fadi and Northcott (2006), Small and Chen (1997), and Chen and Ho (1997), depicting the no moderation of Firm Age between RO and SAM. For this reason, in depth assessment of moderating role of RO recommends the undertaking of more future researches.

4.14.5. Expansionary Volume and SAM

The results of this capital investment decision making criteria based study show the direct linkage of Expansionary Volume (EV) with Strategic Appraisal Methods (SAM). Canedo and Almeida (2010), Camp (1989), and Mills and Herbert (1987) also noticed the similar linkage between EV and SAM in their corresponding studies pertaining to the determination of capital investment criteria. It is notable from the results that correlation coefficient is positive and significant (table-C: Appendix-1), which also asserts the significant relationship between EV and SAM. The results of other studies (Fadi and Northcott, 2006; Copeland and Howe, 2002; Hoque, 2001; Groenveld, 1997; Shank and GovindraJan, 1992; Cox et al., 1979) also noticed in their correlation analysis the similar kind of positive relationship between EV and SAM in their relevant studies targeted to find the suitable investment criteria based on Strategic Methods.

The results of this study also highlight that fourth part of EV (Protection of shareholders' interests) has strong positive linkage with second part of SAM (Real Option Analysis), which on the average supports the relationship between EV and SAM. In contrast to these significant correlation results, Guariglia (2008) and Ittner al. (2003) found the insignificant correlation between EV and SAM by documenting the significant relationship between EV and CAM (real options analysis), which counter the correlation results of this study. It is also notable from the descriptive analysis that mean value of EV is favorable whereas value of S.D is in limits (table-37), which is in line with descriptive results of other studies including Fadi and Northcott (2006), Graham and Harvey (2001) and Arnold and Hatzopoulos (2000) pertaining to the linkage between expansion in volume and Strategic Appraisal Methods.

Considering the individual linear regression results, it is noticeable that F-value is significant (table-38) and corresponding t-value is also significant (table-41), which shows the significant effect of EV on SAM. The similar regression results were also noted by Arsaln et al., (2014), Fadi and Northcott (2006) Chalos and Poon (2000), Pike (1989). Besides, the value of standardized Beta coefficient is positive (table-41) to support the favorable relationship between EV and SAM. The similar Beta values were also documented by Salerno et al., (2015), Afonso and Cunha (2009), Lindsey (2008), Milis and Mercken (2003) in their respective studies related to relationship between EV and SAM. In contrast to individual regression results, the results of multiple linear regression (table-44) indicate that Standardized Beta value is low and negative whereas the corresponding t-value is insignificant.

These results are similar to the multiple regression results of Scott and Petty (1984), Mills and Herbert (1987), Slagmulder et al., (1995) Pike (1996), Forrester (2000), and Fadi and Northcott (2006), which also found the low negative beta values and insignificant t-values in their corresponding studies. This conclude that when EV along with other factors are inserted/taken into the model, the insignificant moderation effect is noted which further requires the due assessment of effect of EV. However, the role of EV should not be underestimated as sound EV elements such as the expansion in business volume to develop and offer new products can have strategic significance and implications to undertake long-term projects using the relevant SAM related criteria besides affecting the outcomes of these criteria.

In case of inclusion of moderator, Firm Age (FA) into EV and SAM-model, R^2 value increases as shown in table-45, but F-value decreases though still it is significant (table-45). It is observed that change in R^2-value is 11.60% (table-45), which indicates good moderation of FA between EV and SAM. On the basis of R-squared value, it can be depicted that Firm Age has good moderation effect in EV and SAM- model. It is also identified that Standardized Beta coefficient is positive and corresponding t-value for the moderation term is significant. These values are shown in table-47 which highlight the positive and significant moderation of FA between EV and SAM. Wu and Ford (2005), Chapman et al., (2006), Ford and Lander (2011), De Massis et al., (2013) also noted the similar moderation of FA between EV and SAM in their respective studies, which supports the significant moderating results of this study. This also implies that old firms with good managerial and corporate experience may stimulate the EV in order to develop and offer demanding products through executing the strategic projects applying the pertinent capital investment decision making criteria (CAM).

4.14.6. Environmental Uncertainty and SAM

The results of this capital investment study show that Environmental Uncertainty has direct linkage with Strategic Appraisal Methods. The similar kind of linkage between EUC and SAM was also documented by other studies including Bottazzi et al. (2008), Fadi and Northcott (2006), and Davila et al. (2003). It is also notable from correlation analysis (table-D: Appendix-1) that relationship between EUC and SAM is significant because of positive significant correlation coefficient (table-D: Appendix-1) which indicates the strong linkage between EUC and SAM. The similar type of positive correlation coefficients between EUC and SAM were also documented by the studies (Fadi and Northcott, 2006; and Porter, 1980; Copeland and Howe, 2002; Hoque, 2001; Groenveld, 1997; Camp, 1989; Cox et al., 1979), which all also observed the strong relationship between EUC and SAM. It is also evident from the results that third part of EUC (Frequent changes in product or process technology) is strongly positively correlated with the fifth part of SAM (i.e. Technology Roadmapping: a dimension for Strategic Appraisal Method).

On the contrary, Guariglia (2008) and Sengupta and Zhang (2015) observed the counter results than this study by noticing the unfavorable relationship between EUC and SAM owing to low and insignificant value of correlation coefficient, rather they noted the significant relationship between EUC and CAM in their respective studies. In case of individual linear regression, the F-value is significant (table-38) and corresponding t-value (table-41) is also significant and Standardized Beta Coefficient is positive (table-41), which all indicates that EUC may be taken as the significant predictor of SAM. Apart from it, the value of Standardized Beta Coefficient, acknowledges the favorable relationship between EUC and SAM. The similar regression results were also documented by Maquieira et al., (2012), Afonso and Cunha (2009), Fadi and Northcott (2006), Milis and Mercken (2003), Dixit and Pindyck (1994), which all also noted the strong linkage between EUC and SAM in their corresponding studies to reach at appropriate capital investment criteria to evaluate and select the feasibility of projects.

On the other side, results of multiple linear regression are different than the simple linear regression results due to low Standardized Beta value and also corresponding t-value is insignificant. These values are shown in table-44. The similar kind of insignificant multiple regression results were also noted by other studies including Hamid and Sarmad (2009), Drury (2004), Gumbus and Bellhouse (2003), and Mills (1988) which explains that EUC along with other factors does not predict the SAM significantly calling for further research endeavors to assess the effect of EUC on SAM. However, considering the individual regression results, we can say that the EUC related factors such as legal, political and economic constraints and technological changes may have effect on the strategic projects of the firms by affecting the outcomes of the project selection criteria on the basis of Strategic Appraisal Methods.

In the same way, when we add moderator, Firm Age (FA) into EUC and SAM-model, it is observed that R^2 value increases (table-45) and F-value being significant, decreases (table-45). It can be noticed that change in R^2-value is only 9.0% (table-45), which is again less than 10%, depicting the weak moderation of FA between EUC and SAM. It is also notable that t-value for moderation of FA is significant and Standardized Beta Coefficient is positive as shown in table-47, which in this case highlights the significant moderating effect of FA between EUC and SAM. These significant moderation results in case of FA are similar to the moderating results of other studies (Baldwin and Clark, 1994; Stewart, 2007; Newkirk and Lederer, 2006; Ford and Lander, 2011), which all also noted the significant moderation of FA in EUC and SAM model. This suggests that just like large firms, old firms may also favorably deal with EUC elements to favorably affect the CAM related criteria to select a strategic project.

4.14.7. Effect of Competitive Force and SAM

The results of this study indicate that ECF has direct linkage with SAM. The significant value of correlation coefficient (table-D: Appendix-1) also highlights the positive relationship between ECF and SAM. The results of other studies including Newkirk and Lederer (2006), Verbeeton (2000), Kaplan and Norton (1997), Pike (1996) and Ho and Pike (1991), also found the similar significant relationship between ECF and SAM. Fadi and Northcott, (2006); Hoque, (2001); and Putterill et al., 1996) also noted positive correlation between ECF and SAM in their respective studies. It is also identified from correlation analysis that second part of ECF (marketing policies of company against the rivals) has strong positive relationship with second and fifth part of SAM (Real Option Analysis and Technology Roadmapping).

On the other hand, Hussain and Shafique (2013), Hamid and Sarmad (2009), and Carry (2008) documented the insignificant relationship in their correlation analysis between ECF and SAM, indicating that there is no linkage between ECF and SAM, which is contradictory to results of this study. It is also evident from the descriptive results that mean and S.D values are in accepted limits (table-37). The individual/simple linear regression results show that the F-value (table- 69) is significantly high and t-value is also significant (table-41), all which indicates that ECF may be considered a significant predictor of SAM. Besides, the value of standardized Beta coefficient is positive (table-41) to support the positive relationship between ECF and SAM. The similar Beta values were also documented by Canedo and Almeida (2010), Holmen and Pramborg (2009), Fadi and Northcott (2006) in their respective studies.

In case of multiple regression results, the standardized Beta Coefficient is significant (table-44), and the respective t-value is also significant as shown in table-44, indicating the favorable impact of ECF on SAM. The similar Beta and t-values are also documented by the other studies including Canedo and Almeida (2010), Holmen and Pramborg (2009), Fadi and Northcott (2006), Stewart (2002), Black and Scholes (1973), which all also noticed that ECF is a significant predictor of SAM. This suggests that the ECF related variables such as the competitive product edge may favorably ensure the success of long-term projects undertaken to serve the firms' strategic objectives as supported by picking up the sound projects using the relevant SAM related criteria such as benchmarking, technology road mapping and value chain analysis through to survive in the face of competition. On the contrary, Lim (2009), Legris et al. (2003), and Herath & Park (2002) observed insignificant results in their respective studies in terms of linkage between ECF and SAM, instead depicting the significant linkage between ECF and CAM.

When moderator, Firm Age (FA) is induced into ECF and SAM-model, a surge in R^2-value is observed (table-45) while F-value decreases though it is still significant (table-45). It can be noticed that change in R^2-value is 7.0% (table-45), again less than 10%, indicating the weak moderation of FA between ECF and SAM. The t-value for moderation term is significant and standardized Beta coefficient is positive (table-47). These significant moderation results Firm Age verify the results of studies (Ford and Lander, 2011; Lim, 2009; Fadi and Northcott, 2006; Akalu, 2003; and Francis, 2002), which also noted the similar weak but significant moderation of FA between ECF and SAM. This also highlights that on the same pattern of large firms, the old firms may also affect the firms' competitive position to opt for projects having the strategic significance applying the pertinent capital investment selection criteria (SAM).

4.14.8. Innovative Technology Adoption and SAM

The results of this study highlight that ITA has direct linkage with SAM. Besides, the significant value of correlation coefficient (table-D: Appendix-1) indicates the positive relationship between ITA and SAM. The correlation results of other studies including Ozmel et al., (2013), Ahmed et al., (2011), Afonso and Cunha (2009), Ward and Chapman (2003), Abel et al., (1996), also noticed the similar significant positive relationship between ITA and SAM. It can also be noticed from the linkage between ITA and SAM that fourth part of ITA (Information Exchange Technology) is highly positively correlated with second and fifth part of SAM (Real Option Analysis). On the contrary, Luehrman (1997), Magni (2009), and Sengupta and Zhang (2015) found the insignificant relationship between ITA and SAM, rather they noted the significant positive correlation between ITA and RMM (CAPM), indicating that risk evaluation criteria can be more precisely determined with the application of innovative technological tools.

It is notable from the descriptive results that that mean and S.D values for ITA are in accepted limits (table-37). The similar descriptive values are also noticed by other studies (Afonso and Cunha, 2009; Fadi and Northcott, 2006; and Milis and Mercken, 2003), which all also observed the favorable linkage between ITA and SAM. In case of individual linear regression, F-value is significant (table-38). Moreover, corresponding t-value is also significant (table-41), indicating that ITA may predict the SAM in a favorable and best fitted manner.

Besides, the value of standardized Beta coefficient is positive (table-41) to ascertain the significant linkage between ITA and SAM. The similar significant t-values and Standardized Beta values were also documented observed by Copeland and Howe (2002), and Lyons et al., (2003), Ng and Bjornson (2004), Fadi and Northcott (2006), to support the positive relation between ITA and SAM. The multiple regression results (table-44) highlight that Standardized Beta value is positive and pertinent t-value is also significant as shown in table-44.

The similar regression results were also found by other studies including Copeland and Howe (2002), and Lyons et al., (2003), Ng and Bjornson (2004), Fadi and Northcott (2006) to confirm the relationship between ITA and SAM. This suggests that the corporate managers may ponder over the linkage between ITA and SAM in their evaluation criteria (SAM) used to select a capital investment project as the same linkage may also affect the outcomes of these criteria. On the other side, the results of Maquieira et al. (2012), Magni (2009), and Gatti et al. (2007) counter the results of this study, by observing the insignificant regression results in their corresponding studies pertaining to the linkage between CGS and CAM.

The moderation indicates when Firm Age (FA) is added into the ITA and SAM-model, R^2 value increases and F-value decreases but still it is significant. These results are given in table-45. It can be noticed that change in R^2-value is just 7.3% (table-45) less than 10%, depicting the weak moderation of Firm Age between ITA and SAM. The standardized Beta Coefficient is positive and t-value for the moderation term is significant (table-47) which calls for favorable and significant moderation of FA between ITA and SAM. These moderation results are similar to those found by other studies including Ford and Lander (2011), Tayler (2010), Triantis (2005), and Yeo and Qiu (2003), which all also documented the weak but significant moderation of Firm Age between ITA and SAM. This highlights that large firms old firms with growth potential may also affect the ITA specific variables to affect the capital investment selection criteria (SAM) in the same way as large firms (FS) affect the relationship between ITA and SAM.

4.14.9. Venture Capital and SAM

The results of this capital investment Criteria study show that Venture Capital (VC) has direct linkage with Strategic Appraisal Methods (SAM). The results of other studies including Afonso and Cunha (2009), Almazan et al. (2010), and Fadi and Northcott (2006) also found the similar linkage between VC and SAM targeted to find the appropriate capital investment selection criteria. It is noticeable from the correlation analysis that correlation coefficient is positive and significant (table-D: Appendix-1), which also indicates linkage of VC with and SAM. Sorensen (2007), Fadi and Northcott (2006), Pizzani (2005), and Amit et al., (1995) also noted the similar positive correlation coefficient between VC and SAM in their corresponding studies, which asserts the significant relationship between VC and SAM.

It has also been inferred from correlation analysis that third part of VC (financing of future capital investment projects with venture capital) has strong positive relationship with second part of SAM (Real Option Analysis), which ultimately supports the significant linkage between VC and SAM. On the contrary, Lindsey (2009), Miller and O'Leary (2007), Narain (2006) found in their correlation analysis, the insignificant linkage between VC and SAM, indicating the strong relationship between EUC and SAM (real options analysis) rather than relationship between VC and SAM, which overall contradicts with results of this study. Besides, it is observable from the descriptive analysis that mean value of VC is good and value of S.D is also in limits (table-37), which are similar to the descriptive results of other supportive studies including Fadi and Northcott (2006), Graham and Harvey (2001) and Arnold and Hatzopoulos (2000).

As regards the individual linear regression results, the F-value is significant (table-38) and corresponding t-value is also significant and Standardized Beta Coefficient is positive as shown in table-41, which denotes that VC may be taken as the significant predictor of SAM based investment selection criteria for capital projects. In addition, this positive value of Standardized Beta Coefficient supports the favorable relationship between VC and SAM. The similar individual regression results were also noted by Croce et al. (2013), Ford and Lander (2011) and Lindsey (2008), which all also documented the strong relationship between VC and SAM in their respective studies in order to suggest the pragmatic investment selection criteria.

The multiple linear regression results indicate that Beta value is positive and corresponding t-value is significant as shown in table-44. These results are similar to those found by Croce et al.

(2013), Ford and Lander (2011), Afonso and Cunha (2009) and Lindsey (2008) in their respective studies to assess the effect of VC along with other factors on SAM. This positive beta value and significant t-value in case of multiple regression analysis depict along with other factors, the favorable linkage between VC and SAM. Overall, the regression results suggest that VC may positively affect the firms' long-term strategic projects by providing a timely capital at attractive terms for these projects. In this way, the VC may results in low cost of capital for the underlying projects besides having a favorable effect on results of these projects and accordingly on the project selection criteria such as balanced score card analysis, benchmarking, value chain analysis and real option analysis (SAM). In contrast to regression results of this study, Silva and Bagno (2014), Newkirk and Lederer (2006), and Slagmulder (1997), documented the insignificant individual (simple) and multiple regression results, depicting that workforce efficiency is the significant predictor of SAM rather than VC and apart from it, they also noted that VC is significant predictor of Conventional Appraisal Methods rather than Strategic Appraisal Methods.

In case of moderation, when we add moderator, firm age (FA) into VC and SAM-model, R^2 value increases and F-value decreases though it is still significant. These values are shown in table-45. It can be noted that change in R^2-value is 9.4% (table-77) which is less than 10%, and indicates the weak moderation of Firm Age between VC and SAM. The t-value for moderation term is significant and Standardized Beta Coefficient is positive (table-47), which highlights the significant moderating effect of FA between VC and SAM. The similar kind of weak but significant moderating effect of FA between VC and SAM was also noted by other studies (Andor et al., 2011; Schmitz, 2005; Cooper and Slagmulder, 2004; Dekker, 2003; Graham & Harvey, 2001; and Menachof and Wassenberg, 2000). This suggests that older firms with effective sales and assets growth strategies also affect the venture capital in the same way as the larger firms to affect the capital investment decision making criteria based on SAM.

4.14.10. Agency Cost and SAM

The results of this capital investment criteria related study show that Agency Cost (AC) has direct linkage with the Strategic Appraisal Methods (SAM). The same kind of linkage also has been documented by other studies including Sarmad (2009), Fadi and Northcott (2006) and Nicolaou (2002). Apart from it, the significant value of correlation coefficient (Pearson's value) in table-D: Appendix-1, also indicate the positive relationship between AC and SAM. The results of other studies (Hamid and Sarmad (2009), Fadi and Northcott (2006), Milis and Mercken (2003), Slagmulder et al., (1995), Slagmulder (1997), and Jensen and Meckling (1976), also show the same kind of significant positive relationship between AC and SAM.

It can also be observed from the correlation analysis of this study that second and fourth part of AC (performance of managers and outside agents by fair compensation and protection of shareholders' interests) are strongly positively correlated with fourth and second part of SAM (Benchmarking and Real Option Analysis). On the other hand, the correlation results of other studies including Dunning (2012), Duke and Geurts (2004), Pfeffer and Salancik (2003), Ford and Lander (2002), and Pike (1996) indicate the negative and insignificant linkage between AC and SAM rather they identified the significant positive relationship between AC and RMM. It can also be noticed from the descriptive results that mean value for AC is good and S.D value is in accepted limits (table-37). These descriptive values are supported by other studies (Gul et al., 2013; Fazzari et al., 1988; Jensen, 1986; Myers and Majluf, 1984; Stiglitz and Weiss, 1981).

The individual linear regression results show that F-value is significant (table-40) and t-value is also significant (table-41) which suggests that AC may be considered a good predictor of SAM. Besides, Standardized Beta Coefficient is positive which also asserts the favorable relationship between AC and SAM. The similar Beta values and significant t-values were also documented by other pertinent studies (Gul et al., 2013; Ford and Lander, 2011; Eckel and Grossman, 2008; Chapman et al., 2006; and Wu and Ford, 2005), all which supports the significant linkage between agency cost and Strategic Appraisal Methods.

On the other hand, the multiple linear regression results show that Beta value is highly positive and the corresponding t-value is significant as shown in table-44. These significant regression results are similar to the regression results found by Gul et al., (2013), Ford and Lander (2011), and Eckel and Grossman (2008), which all also noticed the similar positive beta values and significant t-values in their corresponding studies pertaining to the linkage of AC along with other factors with SAM. On the other hand, Dunning (2012), Duke and Geurts (2004), McCarthy (2003) and Clemons (1991) noted the insignificant individual (simple) and multiple regression results in their respective studies. They documented that AC is not the favorable predictor of SAM due to its likely unfavorable impact on cost of the projects.

In sum, after taking a complete stock of these significant regression results in this study, it can be recommended to the corporate managers involved in capital investment projects decision making criteria, to consider and check the linkage of AC with SAM to suggest the suitable investment criteria for multiple projects. They are also recommended to check the effect of AC individually with SAM, and also the linkage of AC along with relevant factors on SAM in their built while selecting a capital investment project. This also highlights that the Agency Cost (AC) linked with either fair or unfair performance based packages may have strategic implications through affecting the choice of underlying projects having strategic significance besides affecting the outcomes and hence the choice of capital investment selection criteria (SAM). Therefore, it can be generalized that application of AC should never be ignored in the determination of CAM based investment criteria. Besides, corporate managers and practitioners should be facilitated to explore and identify the linkage between AC and CAM for better understanding and application.

In case of inclusion of moderator, firm age (FA) into AC and SAM-model, R^2 value increases and F-value decreases though it is still significant. These values are shown in table-45. It is notable that change in R^2-value is 9.1 % (table-45), which is also less than 10%, indicating the weak moderation of Firm Age between AC and SAM. The t-value for moderation term is significant and Standardized Beta Coefficient is positive (table-47), which highlights the significant moderating effect of FA between AC and SAM. The similar weak and significant moderating effect of FA between AC and SAM was also documented by other related studies (Denison, 2009; Eckel and Grossman, 2008; Fadi and Northcott, 2006; Ward and Chapman, 2003; Graham & Harvey, 2001; and Dugdale and Jones, 1995). This implies that old firms may also favorably deal with AC on the same pattern of large firms (FS) to have effect on the strategic projects and capital investment decision making criteria (SAM).

4.15. Summary of Results

The summary of the results can be well demonstrated and understood by taking a keen observation of the given table-48, table-49 and table-50 about the results of Risk Management Model, Conventional Appraisal Model and Strategic Appraisal Model.

Table-48: *Results Summary of Risk Management Model*

Variables	Results Summary Before Moderation	Results Summary After Moderation of Firm Age	Supporting References
CGS	Pearson Correlation: +(significant); R^2 (.128); F-stat (116.704, Highly significant); t-stat (.032, significant);	R^2 (.232); F-stat (80.333, Highly significant); t-stat (.044, significant)	Sengupta (2015); Ryan and Ryan (2002); Bierman and Smidt (2012); Afonso and Cunha (2009)
MF	Pearson Correlation: +(significant); R^2 (.111); F-stat (99.184, Highly significant); t-stat (.045, significant)	R^2 (.226); F-stat (77.564, Highly significant); t-stat (.049, significant)	Carpenter and Guariglia (2008); Fadi and Northcott (2006); Dean et al., (1992); Lipkovich (1999);
WE	Pearson Correlation: +(significant); R^2 (.118); F-stat (106.367, Highly significant);); t-stat (.277, insignificant)	R^2 (.232); F-stat (80.088, Highly significant); t-stat (.000, Highly significant)	Lin and Wang (2005); Graham and Harvey (2001); Tayler (2010); Hopwood (1990)
RO	Pearson Correlation: +(significant); R^2 (.154); F-stat (145.540, Highly significant);); t-stat (.000, highly significant)	R^2 (.248); F-stat (87.484, Highly significant); t-stat (.157, insignificant)	Ho and Pike (1991); Chang (2003); Li et al. (2013); Milis and Mercken (2003); Truong et al., (2008)
EV	Pearson Correlation: +(significant); R^2 (.115); F-stat (103.199, Highly significant);); t-stat	R^2 (.221); F-stat (75.454, Highly significant); t-stat (.004, Highly significant)	Butler et al. (1991); Anand (2002); Suzette and Howard

	(.712, highly insignificant)		(2011); Rebiasz, B. (2007); Chang (2003)
EUC	Pearson Correlation: +(significant); R^2 (.122); F-stat (110.783, Highly significant); t-stat (.885, highly insignificant)	(.233); F-stat (80.682, Highly significant); t-stat (.000, Highly significant)	Fadi and Northcott (2006); Arnold and Hatzopoulos (2000); Copeland and Howe (2002); Finnerty (1996) Hurley (1998)
ECF	Pearson Correlation: +(significant); R^2 (.165); F-stat (158.197, Highly significant);); t-stat (.036, significant)	R^2 (.258); F-stat (92.152, Highly significant); t-stat (.000, Highly significant)	Verbeeton (2000); Brounen (2004); Mills, Herbert; Black Scholes (1973); Hung Lau (2011)
ITA	Pearson Correlation: +(significant); R^2 (.179); F-stat (174.145, Highly significant);); t-stat (.001, highly significant)	R^2 (.264); F-stat (94.980, Highly significant); t-stat (.001, Highly significant)	Ozmel et al., (2013); Bottazzi et al. (2008); Davila et al. (2003); Fadi and Northcott (2006); Fichman (2004)
VC	Pearson Correlation: +(significant); R^2 (.137); F-stat (126.872, Highly significant);); t-stat (.043, significant)	R^2 (.255); F-stat (90.940, Highly significant); t-stat (.000, Highly significant)	Jain and Kini (1995); Croce et al. (2013); Hellmann and Puri (2002); Cassar and Holmes (2003)
AC	Pearson Correlation: +(significant); R^2 (.160); F-stat (152.171, Highly significant);); t-stat (.019, significant)	R^2 (.263); F-stat (94.605, Highly significant); t-stat (.000, Highly significant)	Gul et al. (2013); Myers and Majluf, (1984); Nicolaou (2002); Bhujraj and Sengupta (2015);

Table-49: *Results Summary of Conventional Appraisal Model*

Variables	Results Summary Before Moderation	Results Summary After Moderation of Firm Age	Supporting References
CGS	Pearson Correlation: +(significant); R^2 (.158); F-stat (150.240, Highly significant); t-stat (.042, significant);	R^2 (.271); F-stat (98.774, Highly significant); t-stat (.000, highly significant)	Bhujraj and Sengupta (2015); Kotha and Swamidass (2000); Copeland and Howe (2002); Fadi and Northcott (2006); Chazi et al. (2007),
MF	Pearson Correlation: +(significant); R^2 (.102); F-stat (90.341, Highly significant); t-stat (.811, insignificant)	R^2 (.219); F-stat (74.480, Highly significant); t-stat (.340, insignificant)	Li et al. (2013); Chazi et al. (2007); Mills (1988); Lazaridis (2004); Prather et al., (2009)
WE	Pearson Correlation: +(significant); R^2 (.181); F-stat (176.372, Highly significant);); t-stat (.039, significant)	R^2 (.266); F-stat (96.071, Highly significant); t-stat (.000, Highly significant)	Argyris and Schon (1978); Forrester, (2000); Lin and Wang (2005); Boxall (2003); Arsaln et al., (2014);; Arnold and Hatzopolous (2000)
RO	Pearson Correlation: +(significant); R^2 (.092); F-stat (80.769, Highly significant);); t-stat (.029, significant)	R^2 (.191); F-stat (62.673, Highly significant); t-stat (.090, insignificant)	Snell and Dean (1992); Jarillo (2007); Howard (2011); Graham & Harvey (2001)
EV	Pearson Correlation: +(significant); R^2 (.147); F-stat (138.055, Highly significant);); t-stat (.136, highly insignificant)	R^2 (.246); F-stat (86.780, Highly significant); t-stat (.000, Highly significant)	Davila et al. (2003); Verbeeten (2006); Suzette and Howard (2011); Mills and Herbert (1987);

			Slagmulder et al. (1995), Lefley (1996)
EUC	Pearson Correlation: +(significant); R^2 (.184); F-stat (179.745, Highly significant); t-stat (.202, highly insignificant)	R^2 (.266); F-stat (96.140, Highly significant); t-stat (.000, Highly significant)	Li et al. (2013); Graham and Harvey (2001); Liggett et al. (1992); Ajmi et al., (2011)
ECF	Pearson Correlation: +(significant); R^2 (.220); F-stat (224.523, Highly significant);); t-stat (.002, highly significant)	R^2 (.281); F-stat (103.722, Highly significant); t-stat (.000, Highly significant)	Brounen (2004); Copeland and Howe (2002); Fadi and Northcott (2006); Akalu (2003); Sangster (1993)
ITA	Pearson Correlation: +(significant); R^2 (.201); F-stat (200.245, Highly significant);); t-stat (.025, significant)	R^2 (.275); F-stat (100.562, Highly significant); t-stat (.000, Highly significant)	Ozmel et al. (2013); Nicolaou (2002); Arsaln et al. (2014); Maher et al., (1997); Graham & Harvey (2001)
VC	Pearson Correlation: +(significant); R^2 (.156); F-stat (147.669, Highly significant);); t-stat (.044, significant)	R^2 (.251); F-stat (89.049, Highly significant); t-stat (.000, Highly significant)	Sorensen (2007); Amit et al. (1995); Croce et al. (2013); Lindsey (2008); Arsaln et al. (2014); Damodaran (2012)
AC	Pearson Correlation: +(significant); R^2 (.208); F-stat (209.367, Highly significant);); t-stat (.001, highly significant)	R^2 (.305); F-stat (116.524, Highly significant); t-stat (.000, Highly significant)	Bhujraj and Sengupta (2015); Estabrooks (2006); Hellmann and Puri (2002); Draper and Smith (2014); Karim et al., (2010)

Table-50: *Results Summary of Strategic Appraisal Model*

Variables	Results Summary Before Moderation	Results Summary After Moderation of Firm Age	Supporting References
CGS	Pearson Correlation: +(significant); R^2 (.188); F-stat (184.769, Highly significant); t-stat (.010, significant);	R^2 (.293); F-stat (110.092, Highly significant); t-stat (.000, highly significant)	Stewart (2007); Slagmender et al. (1995); Gatti et al. (2007); Stewart (2002); Ford and Lander (2011)
MF	Pearson Correlation: +(significant); R^2 (.119); F-stat (107.452, Highly significant); t-stat (.603, highly insignificant)	R^2 (.242); F-stat (84.826, Highly significant); t-stat (.003, highly significant)	McCarthy (2003); Copeland and Howe (2002); Petty (1984); Mills and Herbert (1987); Hussain and Imran (2013)
WE	Pearson Correlation: +(significant); R^2 (.189); F-stat (186.146, Highly significant);); t-stat (.046, significant)	R^2 (.277); F-stat (101.850, Highly significant); t-stat (.010, significant)	Amram and Howe (2002); Belton and Stewart (2002); Newkirk and Lederer (2006)
RO	Pearson Correlation: +(significant); R^2 (.058); F-stat (49.062, Highly significant);); t-stat (.294, highly insignificant)	R^2 (.186); F-stat (60.631, Highly significant); t-stat (.533, highly insignificant)	Ho and Pike (1991); Baker et al. (2011); Liggett et al. (1992); Lelli (2001); Afonso&Cunha (2009); Small and Chen (1997)
EV	Pearson Correlation: +(significant); R^2 (.098); F-stat (86.451, Highly significant);); t-stat (.143, insignificant)	R^2 (.214); F-stat (72.293, Highly significant); t-stat (.007, highly significant)	Canedo and Almeida (2010); Scott and Petty (1984); Mills and Herbert (1987); Ford and Lander (2011)

EUC	Pearson Correlation: +(significant); R^2 (.184); F-stat (180.010, Highly significant); t-stat (.580, highly insignificant)	R^2 (.277); F-stat (101.843, Highly significant); t-stat (.000, Highly significant)	Porter (1980); Hoque, (2001); Maquieira et al. (2012); Hamid and Sarmad (2009); Drury (2004); Ford and Lander (2011)
ECF	Pearson Correlation: +(significant); R^2 (.235); F-stat (245.188, Highly significant);); t-stat (.001, highly significant)	R^2 (.305); F-stat (116.367, Highly significant); t-stat (.001, Highly significant)	Lederer (2006); Kaplan and Norton (1997); Canedo and Almeida (2010); Lim (2009); Akalu (2003)
ITA	Pearson Correlation: +(significant); R^2 (.264); F-stat (285.862, Highly significant);); t-stat (.000, highly significant)	R^2 (.337); F-stat (135.102, Highly significant); t-stat (.000, Highly significant)	Ward and Chapman (2003); Bjornson (2004); Ng and Bjornson (2004); Triantis (2005); Yeo and Qiu (2003)
VC	Pearson Correlation: +(significant); R^2 (.192); F-stat (189.838, Highly significant);); t-stat (.044, significant)	R^2 (.286); F-stat (106.092, Highly significant); t-stat (.000, Highly significant)	Almazan et al. (2010); Croce et al. (2013); Silva and Bagno (2014); Andor et al. (2011)
AC	Pearson Correlation: +(significant); R^2 (.225); F-stat (231.887, Highly significant);); t-stat (.000, highly significant)	R^2 (.316); F-stat (122.815, Highly significant); t-stat (.000, Highly significant)	Milis and Mercken (2003); Gul et al. (2013); Dunning (2012); McCarthy (2003); Denison (2009); Eckel and Grossman (2008)

4.16. General Derivations from the Summary Results' Tables

It can be derived on the basis of results summary table-48 that when RMM is regressed on the given independent factors including CGS, MF, WE, RO, EV, EUC, ECF, ITA, VC and AC, then most of the F-values are highly significant showing that these factors are significant predictors in defining the most suitable and pragmatic capital investment decision making criteria based on Risk Management Methods. This all suggests the corporate managers that fitness of the model is significant, therefore, they should consider all the suggesting factors while they are formulating their professional models in determining how to capitalize and finance the projects and how to increase the profitability out of the cashflows from the projects.

The summary table-48, also shows the significant F-values after the inclusion of the moderator, firm age in the RMM model. It is the statistical principle that F-value is normally decreased after the inclusion of any moderation factor. This is why the F-values in all the ten moderations, are decreased, despite all this the fitness of all the sub-models is significant, again suggesting the corporate managers for the adoption of some kind of moderator in their business models that makes a significant contributive role in the relationship between RMM and all the given predictors.

It is also noteworthy from the results of summary table-48 that t-values of the maximum factors are significant other than the WE, EV and EUC. The significant p-values of the t-stats of the seven factors other than the WE, EV and EUC, suggest the financial and corporate managers to check the credibility of these factors in their business models based on Risk Management Methods, and ultimately adopt those factors in the selection of risk measurement criteria, whose p-value of t-stats is significant. This practice and adoption of the probability statistics (p-value) can increase the wealth of their projects leading towards maximize the status of ownerships through maximum profits, dividends and Retained Earnings, which all contributes to win the trust of the future investors interested towards capital projects and want to gain the knowhow of the Risk Management Methods.

In the same fashion, the results of the summary table-49 on the basis of F-stats, suggest the adoption of all the factors to determine the suitable conventional appraisal

Methods (NPV, IRR, PBP, ARR). This suggestion to corporate managers is typical pragmatic and is based on the significant F-values of all the ten predictors which are determined to select the suitable capital investment criteria. Other than the multiple regression results, the inclusion of the Firm Age in the Conventional Appraisal Model also show the overall fitness of the model, which all again recommends the financial managers to adopt the firm age as a moderation factor because it plays a vital role in creating the relationship between all the factors and conventional appraisal methods (Because the F-values in the moderation are also significant though these are lowered in value after the moderation effect due to firm age into the CAM model.

The coefficient results in the summary table-49, also depict that all the p-values are significant in the CAM model other than the MF, EV and EUC. The significant p-values of the t-stats of CGS, WE, RO, ECF, ITA, VC and AC recommend the corporate managers to construct the projects models on the basis of statistical measurements (p-values, t-stats, Beta, SE etc…) and select those business models which may produce the significant results. The significant p-values of the seven factors are also determined to create the best linkage with NPV, IRR, PBP and ARR and managers should believe on this linkage.

The results of the summary table-50 are also determined to highlight the importance of the given ten factors in the formulation of business models for capital projects based on the strategic appraisal methods which are also in vogue for the selection of capital projects. The most adopted strategic tools for the selection of capital projects by the corporate managers are Real Option Analysis, Balance Score Card and Technology Roadmapping. The highly significant F-values of all the factors recommend the corporate managers to consider the suggested factors in their business models. Even the results of F-values after the inclusion of firm age in the SAM model, are also significant which strengthens the conviction of relationship between these factors and Strategic Appraisal Methods.

The summary results of table-50 on the basis of p-values of t-stats, recommend the corporate managers that CGS, WE, ECF, ITA, VC and AC are the significant predictors to determine the best fitted strategic appraisal method in the selection of their business models for capital projects. The corporate managers of the business firms can enhance the financial position of their firms if they are well equipped with statistical and financial models.

Chapter 5

Main Findings, Pragmatic Applications and Recommendations

This section is comprised of main findings, pragmatic applications, future directions and recommendations of the study where the overall view of the results and discussion are linked with the objectives of this study, significance of the results. Then results and discussion are linked with the problem statement, and hypothesis of study.

From the results and discussion, main findings related to all the three models are as under:-

5.1. Main Findings of the Study

It has been found that corporate policies and governance mechanism have the strong linkage with Risk Management Methods, because there is favorable relationship between these two factors. Furthermore, CGS related factors such the effective boards, sound institutional investors and effective financial reporting and disclosures have favorable impact in finding and determining of suitable RMM criteria which is obvious from the favorable regression results. The significance of results indicate that corporate governance mechanism takes into account the use of Risk adjusted discount rate to discount the future cashflows of the capital projects to better assess the risk element of the underlying projects and to ensure their success. The significant linkage between corporate governance and RMM also suggests the adoption of probability analysis as the investment decision making criteria because corporate top level management conducts the probability analysis of the future cashflows to ascertain the feasibility of different projects.

The adjustment of the future activities of capital projects with the environment changes (political, social and economic) are ensured through the application of sensitivity analysis. The significant effect of corporate policies on sensitivity analysis also indicate that corporate management should consider the sensitivity analysis to evaluate those capital projects which may have abrupt changes due to uncertain environmental changes. The significant relationship between corporate governance mechanism and CAPM model indicates that equity financed based capital projects should be evaluated through Beta analysis because beta analysis identifies well the systematic risk in relation to the cost of capital for such projects and calculates the true required rate of return for equity financing of these projects. Therefore, CGS affects the outcomes of the capital investment decision making criteria (RMM).

Moreover, the significant relationship between CGS and RMM also reveals the important role of corporate decisions which are taken after the application of computer simulation methods. We may find out that corporate management conduct trials and experiments with the help of a developed scale to check the risk adjustment and feasibility of capital projects. Other than this, it is also found from the discussion and analysis, that Manufacturing Flexibility has positive relationship with RMM, which further verifies the favorable effect of MF on RMM by the significant regression values. We may find out from these significant results that manufacturing flexibility is related with the sensitivity analysis in a way that abrupt and uncertain political and economic changes may cause the shifting of manufacturing units somewhere else beyond the factory premises or the existing production units.

Therefore, the manufacturing flexibility sometimes involves the risk because goods are produced outside the factory and services are rendered outside the corporate offices, also it becomes compatible to discount the cashflows of these flexible manufacturing units with some suitable risk adjusted discount rate to make sure the success of the underlying capital project from which these cash flows are being generated. Hence, MF affects the risk parameters and outcomes such as cash flows of the RMM related capital investment selection criteria. The overall particularly the multiple regression results related to WE highlights that WE has no significant role in the determination of suitable RMM based capital investment criteria. It is evident from the results and discussion that RO is also significant predictor of RMM which depicts that reliable goods and services play a pivotal role in the identification and selection of best fitted investment criteria by managers.

From the significant linkage between Reliability of Outputs and RMM, we may also find out that reliable goods and services produce the future cash flows which could have the uncertainty aspect demanding the due determination of required rate of return for the underlying capital projects through beta analysis. This suggests the strong linkage of reliability factor and Beta-analysis. Furthermore, these positive and favorable results in case of reliable goods and services also imply the use of probability analysis to better assess the different outcomes of projects undertaken to provide desired products and services to the customers induced through reliability of outputs.

It is also found from the previous discussion and analysis section that reliability of goods and services may be ascertained with the help of computer simulation methods because the reliability of goods and services can be measured and enhanced by developing the quantitative models through computer simulations adjusted scales. Once the reliable goods are ensured, and risk of the project is adjusted accordingly, then positives cash flows may likely be generated. This denotes the positive linkage between reliable goods & services with and computer simulation. Besides, it is also clear from the results and discussion especially considering the multiple regression results, that the Expansionary Volume (EV) has no favorable part in the determination and selection of suitable investment criteria because the regression values in case of EV and RMM are insignificant. The significant results pertaining to the linkage between ECF and RMM suggest that rivalry pressure plays a very important role to identify suitable investment criteria for the underlying projects. The expected cash flows of the capital projects may better be discounted with the higher risk adjusted discount rate in the presence of strong pressure of competitive products, which ultimately could reduce the risk underlying in the selected projects' cashflows.

The results also highlight the selection of sensitivity analysis due to strong effect of competitors' pressure because different scenarios are adjusted with the changing policies of the rivalry markets to reduce the impact of prevailing uncertainty because of the presence of these competitors. This shows the implicit role of ECF in the selection of RMM. Besides, it can be found from the discussion and analysis that presence of competitive markets also has strong effect in the selection of quantitative models because these quantitative analysis takes into account the effects of different policies which are adopted by the corporate managers of rival firms, and accordingly internal policies are adapted to mitigate the risk of the expected cashflows due to sales of the products. This is why quantitative analysis is also conducted to check the effect of rival forces. For this reason, ECF has effect on the RMM related criteria outcomes and hence their choice to select a capital investment project keeping in view the rivalry effect.

Together with ITA and RMM, it has also been found that modern computerized applications and tools have strong effect in the identification and selection of pragmatic investment criteria in terms of RMM. It can be said considering the significant linkage between ITA and RMM that projects due to adoption of technological involvement are risky in the beginning. Therefore, cash flows of these projects are discounted with risk adjusted discount rate to check the projects feasibility particularly where discounted cash flows exceed the original cost of the capital project. This supports the strong link between ITA and risk adjusted discount rate. The results also indicate that technology related projects are also evaluated on the basis of probability analysis. If the probability of success of different activities or events in associated with future expected cash flows exceed the preset standard of probability, then the underlying capital projects are selected by giving more weightage to probability analysis as an investment criterion.

This shows the significant effect of ITA on probability analysis by considering the prevailing element of uncertainty of the future cashflows. The positive linkage between ITA and RMM also shows that higher required rate of return are used for the selection of those IT related projects involving the equity financing which is more costly as compared to debt so more risk is involved in these kinds of projects and hence this risk is adjusted with higher market premium which is the product of beta and risk premium. In summary, ITA affects the selection of RRR based on beta analysis. The ITA may also favorably impact the estimates of different related projects which are factored in the RMM related criteria and for this reason the use of these criteria is also affected for picking up a project. The results also indicate that VC has positive linkage with required rate of return which is calculated through CAPM model using the Beta. The CAPM is the best criterion to assess the projects as it used Beta to determine the true cost of capital financed though equity based venture capital for the completion of capital projects.

Venture capital may also favorably affect the project risk exposure as equity financing is less risky than debt in relation to the financial risk elements. Therefore, VC in this was may have effect of the capital investment decision making criteria (RMM). In the similar way, the results also show the positive relationship between AC and RMM. It can also be seen that AC may be considered a significant predictor to select the suitable RMM. In addition, the regression values for AC and RMM are also favorable. Therefore, It can be inferred that the involvement of agents internally as well as externally may increase the overall cost of the capital projects which may be adjusted by discounting the cashflows of the projects with higher risk adjusted discount rate to increase the value of projects because higher discount rate may reduce the uncertainty of the recovery of cash inflows from the revenues of projects.

Furthermore, the results depict that agency cost has positive linkage with sensitivity analysis because those capital projects which are sensitive towards uncertain political and financial situation, can better be ascertained by hiring the expert agents who are specialized in the decision making related to capital projects. Their judgments through application of sensitivity analysis may ensure the future cash inflows of the projects which can be truly adjusted by some kind of suitable RMM. Besides, agency cost is also involved in the equity financing based capital projects. It can also be found from the results that RRR for such projects is increased due to the involvement of investment banker and many more agents who have pertinent stakes. The higher beta value definitely shows the element of agency cost in estimating the feasibility of the capital project. In all, agency cost has strong linkage with CAPM required rate of return which hereafter, may ensure the higher cash inflows of each year in the life time of capital projects. Besides, the Agency Cost may also positively affect the outcomes of different projects in terms of better fair compensation to the agents who will ensure to make successful these projects. In respect of moderation of Firm Age (FA) in RMM model, it is found that FA has high and favorable moderation effect between most of the factors (determinants) and RMM. This highlights that older firms perform better than new firms in inducing the determinants to affect the RMM.

In case of Conventional Appraisal Methods model, it has been found that corporate governance and strategy (CGS) have positive relationship with Conventional Appraisal Methods (CAM). Besides, it is also found that CGS affects CAM significantly which can be noted from the individual (simple) and multiple regression results. This suggests that CGS related variables such as the effective boards, sound role of institutional investors and proper corporate reporting and disclosure enable may favorably affect the projects' risk exposure and outcomes such as cash flows which in turn requires the use of relevant RMM criteria in a particular case like risk adjusted discount rate, sensitivity analysis and probability analysis. In case of MF, it has been found from the results and discussion that it has unfavorable linkage with CAM, which does not validate the significant effect of MF on CAM and the same is obvious from the insignificant regression results.

The results indicate that WE plays a significant part in finding of suitable CAM related criteria. This implies that it is the untiring effort of workforce which not only complete the projects within due course of time but also plays a pivotal role in targeting the positive cash inflows and accordingly result in generating the positive NPV of the capital projects. Furthermore, the vigilant and dedicated workforce devote efforts to earn a high value for the firm in the form of net income through better execution of the proposed capital projects which yields in favorable ARR. Therefore, WE may affect the cash flows and profit of the projects and so the CAM related criteria such as NOV, IRR and AARR. It can also be seen that RO plays a favorable role to determine the best fitted capital investment criteria in terms of CAM, which is supported by positive correlation and significant regression results.

The results in case of significant linkage between RO and CAM demonstrate that reliable goods and services after undertaking the projects may favorably impact the customers' perception towards the products and services related with these projects which in turn can also affect the project outcomes such as cash flows and sales and hence the choice of capital investment selection criteria (CAM). It is evident from the results and discussion that Expansionary Volume (EV) does not play a significant role in selection of a suitable investment criteria with respect to CAM, because this is not supported by insignificant multiple regression results pertaining to the linkage between EV and CAM. In respect of ECF and RMM, it has been found from the results and discussion the

Effects of Competitive Force (ECF) has favorable role to suggest the suitable investment criteria for the capital projects in terms of CAM.

The results highlight that rivalry pressure (ECF) compels the corporate managers to identify and select the best fitted investment selection criteria. The corporate managers apply these criteria keeping in view the competitors similar projects and their outcomes and in this way the ECF induce the managers to better plan and execute the projects to get best project results. Moreover, if the managers of the competitive firms are using PBP as an investment criterion for the selection of capital project by cutting down the prices of the products especially in case of risky or seasonal products, then corporate managers of other firms can also adopt PBP to evaluate their own projects of similar nature. Besides, the competitive edge of the firm's products also favorably impacts the future project outcomes. This all suggest that ECF affects the outcomes associated with a project and for that matter different project selection criteria.

In the similar way, the positive relationship between ITA and RMM, indicates the favorable effect of technological support to suggest the CAM related pragmatic investment selection criteria. The results highlight that use of innovative technological methods and Softwares on extensive basis during the life time of capital projects may accelerate the cash revenues which are used as inputs in estimating the NPV and IRR of these projects. Hence, in this way CAM related criteria are affected. The results also depict positive linkage between VC and CAM. This highlight that venture capital has a pivotal role in the determination and selection of CAM investment criteria, because this notion is also supported by favorable regression results.

Furthermore, the significant linkage between VC and CAM also indicates that Venture Capital acquired at attractive terms may favorably improve the cash flows of the underlying project and hence may call for use and selection of relevant criteria such NPV, IRR and DPBP to evaluate those cash flows. The results and discussion indicate the significant linkage between AC and CAM which implies that external agent seeking better returns with varying stakes may overall increase the cost of capital projects resulting in decrease of NPV and AARR owing to changes in the cash flow patterns and profit associated with these projects.

On the other hand, internal agents such as the corporate managers and their incentives may affect the cash flows and profit of the underlying projects which in turn can have effects on the CAM related criteria like NPV, IRR, and ARR. But on the other way round, the fair and performance based packages to the internal agent may favorably affect these criteria in terms of having effects on their outcomes.

The results show the medium moderation of Firm Age, which suggests the older firms to have firms age as moderating effect on the linkage between targeted determinants on CAM.

With respect to SAM model, it has been found that corporate governance and strategy (CGS) have significant effect on the Strategic Appraisal Methods (SAM), because, there exists a positive and significant relationship between CGS and SAM, which is obvious from the results and discussion. Furthermore, it was also found that CGS is highly linked with Balance Scorecard Analysis because this strategic appraisal technique aligns the business activities of the capital projects with vision and strategy of the firm. This evaluation technique also improves communication during the lifetime of the project. Further, it provides feedback to corporate managers to monitor performance of organization and improve investment decisions later on. Besides, it is noted found that CGS has also significant linkage with Benchmarking, because corporate governance mechanism ensures the comparison of project appraisal activities with competitors for the sake better undertaking of a project.

Besides, CGS related variables such as effective board, better role of institutional investors and sound corporate disclosures and reporting may also favorably affect the scenarios and outcomes associated with different SAM related criteria such as Real Option Analysis, Value Chain Analysis and Technology Road Map and in this view the choice as project selection tool. On the contrary, it is found from the results and discussion, that MF has no significant effect on SAM, which does not validate the favorable linkage between MF and SAM specifically owing to the insignificant multiple regression results. Regarding the linkage between W-E and SAM, it has been found that positive and favorable relationship exists between them which indicates that the Workforce Efficiency (WE) is favorable predictor of suitable investment criteria in terms of SAM, because of supporting regression results.

The significant linkage between WE and Benchmarking was also noted which suggests that while apprising a project the aspects related to WE of the competing firms are taken into account to make a sound capital investment decision and if the WE turns out to be good than the competitors, then it is considered a favorable factor. In addition, it can also be found that WE is also strongly linked with real option analysis because efficient workforce can support the managerial decisions to better explore the options tied up with different projects. The WE is also found to be positively linked with Value Chain Analysis which implies good value chains are associated to enhance workforce efficiency and in this view WE stimulate the use of Value Chain Analysis to appraise a project. In summary, WE may have effects on the outcomes of SAM related criteria and so on their selection as appropriate tools for picking up a project.

Taken together, RO, EV, EUC and their linkage with SAM, it has been found from the results and discussion that these factors do not play a pivotal role in the determination and selection of suitable investment criteria in terms of SAM, because their positive linkages with SAM are not well supported by the multiple regression results. Considering the linkage between ECF and SAM, it has been found that rivalry pressure contributes a significant part to indicate best fitted decision making criteria in terms of SAM, which is supported by the favorable regression results. The significant linkage was also noted between ECF and Balanced Scorecard Analysis which highlight that due to competitive pressure, corporate managers focus on strategic planning and pursue long-term projects using the pertinent capital investment selection criteria in line with the vision and goals of the firm to achieve strategic goals.

In this context, the Balanced Scorecard Analysis contributes to evaluate the financial position of the rival firms and their business processes, learning environment and customer base. Through the proper understanding and evaluation of projects applying the Balanced Scorecard Analysis, the corporate managers may acquire the targeted revenues assigned to them during the life span of capital projects. Besides, ECF also facilitates the corporate managers to understand the Benchmarking standard of their peers and formulate their quality and manufacturing standards in accordance with the best performers in the industry. Furthermore, Benchmarking may also enable the corporate managers to improve the tasks and activities of their capital projects by making a comparison with similar projects of the competitors. It can be found from the results and discussion that ECF is also closely linked with Technology Roadmapping.

The results indicate that corporate managers make decisions about the projects by assessing the technological solutions of the competitive firms. They may get the short term and long term benefits by undertaking the related projects in case of new product or process by comparing the firm’s technology road map with competitors for the sake of better technology solutions. Besides, Technological Roadmapping of competitors also provides a mechanism to help forecast technology developments, and it ultimately caters with a framework to help plan and coordinate technology developments conducive to project planning and execution. Moreover, ECF induce the use of suitable and optimal project evaluation techniques to pick a sound projects besides affecting the outcomes of these projects. As regards the ITA and SAM, it has also been found that modern computerized technology tool has significant effect in the determination and selection of pragmatic investment criteria in terms of SAM, owing to the favorable regression results.

The results and discussion respecting significant relationship between ITA and SAM indicate that innovative technology adoption is also closely linked with the Value Chain Analysis

(VCA), a dimension of strategic appraisal methods. The VCA better identifies the valuable activities and estimates the cost of these activities whereas ITA propels the use of innovative technology to better conduct the VCA of the firm such as the due cost estimation and evaluation of each activity in the value chain by the application of innovative technological apparatus and machines in order to select a good project. Besides, the results indicate that ITA is also positively linked with Technology Road mapping, because the ITA may favorably target the short term and long term goals to better match with technology solutions associated with the underlying capital projects. The significant linkage of ITA with Benchmarking was also noted to suggest that corporate managers may compare the IT related tasks in the manufacturing of goods and rendering of services, with the similar tasks of other firms which have strong IT related policies, quality of products, strategic programs, and information to improve performance.

This comparison may help the corporate managers in finding the suitable investment criteria in terms of Benchmarking, dimension of SAM, which in turn may enhance the firm's value through the resulting positive future cash flows. The results also highlight the significant linkage between Venture Capital (VC) and SAM. Regarding the linkage of VC with the real option analysis, we may infer that option of financing the capital projects through equity and debt financing (VC) can be evaluated by the financial managers through the real options in terms of physical and tangible assets, which can add value to the capital projects and ultimately, these options contribute in generating the cash flows of the future capital projects.

Besides, VC may call for duly assessing the different options associated with the projects and in this way requires the use of pertinent SAM related technique such as then real option analysis. VC was also found to have significant positive relationship with the technology road mapping in the view that this technique better justify the use of VC in terms of fitting the technology solutions to achieve project goals. Moreover, VC also demands to look for appropriate SAM related criterion such as technology road mapping to apply the suitable technology for accomplishing the project goals. The results and discussion also show that AC may be considered a significant predictor to select the appropriate SAM related criteria. The regression results also support the positive linkage between AC and SAM.

It is also found form the results that AC has affirmed linkage with Balance Scorecard Analysis (BSC). Balanced Scorecard metrics play a pivotal role to link the cost and activities of internal and external agents with the project outcomes which may have positive effect in generating the cash flows of these capital projects. Further, BSC metrics provides a match between goals of the firms and strategic decisions of external agents & corporate agents. The other way round, AC strengths the agent role to have strategic implications and accordingly may demand the use of BSC to proper assess the strategic directions of the capital investment projects. Therefore, the relationship between AC and BSC evaluation technique is supported by the results and discussion section and literature also supports this relationship explicitly.

Besides, AC also has significant linkage with Real Option Analysis, because these are the managers and agents who through agency cost may better identify and assess the real options and benefits including the desired products and services of the projects. Hence, the AC through in terms of performance based incentives and reward to the agents may favorably impact the scenarios/outcomes associated with the capital investment selection criteria (SAM) such as the Balanced Scorecard Analysis, Real Option Analysis, Value Chain Analysis, Benchmarking and Technology Road Map and accordingly the use these criteria for the selection of a capital project. 0From the results regarding the moderation of FA in SAM model, it is found that the Firm Age (old firms), on the whole, has a favorable and significant high moderation effect between most of the factors (determinants) and SAM

In summary, it has been found that favorable results in RMM, CAM and SAM model, are good enough to contribute to address the problem highlighted in the problem statement, to meet the study objectives and to test and verify the hypotheses of the study in terms of significant linkage between all the determinants and RMM, CAM and SAM. Last but not the least, the results and discussion of this study may also serve to fill gaps in the academic literature by enhancing the understanding revolving the capital investment decision making criteria and their due application.

5.2. Pragmatic Applications of the Study

This study delineates the detailed perceptions and views of the corporate level senior managers of the sample companies listed on the Pakistan Stock Exchange (PSX) covering all the 35 sectors. The pragmatic applications of results and findings of this study are categorized into the following three parts according to the given models, RMM, CAM and SAM.

5.2.1. Applications of the RMM-Model.

The results and findings of this study have implications for the corporate managers involved in capital investment decisions to select the optimum project investment proposals and maximize the shareholders' wealth. The underlying results can also be beneficial to identify and determine the hidden risk factors associated with the capital investment decisions and suggest measures to overcome these risk factors through proper understanding and application of the Risk Management Methods which are applied to measure the risk level of the capital projects. The risk measurement methods selected and reviewed in terms of managerial perceptions, are Beta Analysis, Sensitivity Analysis Probability Analysis, Risk Adjusted Discount Rate and Computer Simulation Methods. Beta analysis (also called CAPM analysis) is a measure of individual stock risk relative to the overall stock market risk. Before investing in a firm's stock, the beta analysis allows an investor to understand if the price of that security has been more or less volatile than the market itself (Fadi and Northcott, 2006; Afonso, 2009).

By and large, the results of this study highlight that corporate Managers' perceptions in the application of Beta Analysis for the project selection are strongly favorable, because the correlation results highlight positive correlation between the determinants and use of Bata Analysis. On the other hand, Probability Analysis is a technique which is used by risk managers for forecasting future events, such as accidental and business losses. (Fadi and Northcott, 2006; Afonso and Cunha, 2009). Similarly, Sensitivity Analysis is a method to predict the outcome of a decision if a situation turns out to be different compared to the key prediction with some level of risk and uncertainty and how to minimize this risk (Fadi and Northcott, 2006; Akalu, 2003).

In case of Probability Analysis and Sensitivity Analysis, the corporate managers' perceptions are again encouraging which can be observed through a keen study of results, which also indicates the favorable relationship of these two risk management methods with the selected internal and external determinants. Besides, Risk Adjusted Discount Rate is the rate established by adding an expected risk premium to the risk-free rate in order to determine the present value of a risky investment or project's cash flows (Damodaran, 2001; Fadi and Northcott, 2006). The corporate managers' perceptions related to the Risk Adjusted Discount Rate are also supportive due to its positive significant linkage with internal and external determinants of the study.

The extent of preference by the managers towards the application of Risk Adjusted Discount Rate is lower as compared to Beta Analysis, Sensitivity Analysis and Probability Analysis, yet is has sufficient impact to and hence its use in capital investment selection decisions should not be ignored. The least preferred Risk Management Method by the managers to appraise the capital projects is computer Simulation Methods. In Simulation Models, the evaluators simulate many experiments or trials, and collect statistics about the results of the firms' success/ failure normally related to the company's business models. The Microsoft Excel is an ideal tool for creating such a model (Lefley, 1998; Fadi and Northcott, 2006). As regards the computer simulation investment method, managers' perceptions are less favorable; despite it has positive relationship with all the internal and external determinants, which are obvious from the results of this study.

Therefore, the managers involved in project appraisal, selection and performance may better apply these methods in varying extent depending upon its relevancy to undertake, implement and monitor the undertaken project. The most significant predictors of the Risk Management Methods of the Capital Investment Decision Making Criteria in this study are corporate governance & strategy, manufacturing flexibility, reliability of outputs, effects of competitive force, innovative technology adoption, venture capital and agency cost. It is notable that institutional owners and outside board members, competition activities for capital investment, weightage of securities issues and corporate disclosure for capital investment, fiduciary duty of corporate boards to monitor and protect the shareholders' interests, effect of corporate governance on lower rated securities for capital investment decision making, and undertaking of strategic capital investment decision making by few management hands (expert hands/person) regarding the capital investment are the key corresponding dimensions of corporate governance & strategy which have direct effect on the Risk Management Methods of projects' decision making.

In sum, the corporate managers may properly appraise and select a capital project by relying on the suitable capital investment decision making criteria (RMM) by understanding and taking into consideration the linkage between these dimensions with the Risk Management Methods. The results pertaining to MF shows that flexibility in manufacturing after capital investment, consistent performance in flexible working hours, flexibility in manufacturing process to accelerate new capital investment, flexibility related to selling and bargaining capacity and manufacturing of many units of the same product are the pertinent dimensions which have direct effect on RMM. Hence, the linkage between these dimensions and RMM may be taken into account while selecting the optimal RMM related criteria to pick up a capital project.

In case of linkage between Reliability of Output and RMM it has been found that quality and reliability of outputs, selling of goods/services without authority's approval, linkage between existing reliability of products and services and future projects, centralization of capital investment decisions to maintain the reliability and maintenance of manuals to improve the outputs reliability are the respective dimensions of Reliability of Outputs which are related with RMM. Therefore, the relationship between these dimensions and Risk Management Methods (RMM) is of significance in the determination of relevant capital investment selection criteria (RMM) to select a healthy project for the growth of the business firms.

The results related to the link between Effects of Competitive Force (ECF) and RMM highlight that survival to compete with new firms in the industry, effective marketing policies of the firm to accelerate the capital investment against the rival firms, the degree to which product or service of the firm can be substituted, consideration of strong position of the buyers and suppliers of the rival firms in the capital investment decision making process, are the relevant dimensions of ECF which have effect on RMM which may require the due managerial consideration to give due weightage to the linkage between these dimensions and RMM in their capital investment proposal selection. As regards innovative technology adoption (ITA) and RMM, it was noted that the product design technologies for capital projects along with process technologies, use of logistic planning technology for dealing with different raw inventories and information exchange technology to better exchange information among the process product and logistic, and effect of annotative technology on capital investment related capital projects are the important factors/dimensions of ITA which impact the Risk Management Methods.

Hence, the linkage of these factors with RMM is of very importance in the determination of fitted RMM related capital investment selection criteria. As regards the Venture Capital (VC) and RMM, the results indicate that the impact of venture capital on productivity growth, venture capital availed by the firm in the last decade, financing of future projects with venture capital, provision of value added services tied up with venture capital and proper maintenance of record or documentation of venture capital to facilitate the capital investment decision making, are the respective factors affecting the RMM and accordingly demanding the due attention of managers to consider the linkage of these factors with RMM in picking up the relevant risk management criteria to evaluate and select a healthy capital project.

Considering the Agency Cost (AC) and Risk Management Methods (RMM), the results depicts that the due focus of agency cost to locate projects expansion in the firms, increase in fair compensation to managers and outside agents, taking into account the strategic implications of the agency cost and enhancing impact of capital projects expansionary decisions on the agency cost, are the important dimensions which affect the RMM. Hence, the linkage of VC with RMM should be taken into account by the corporate managers involved in project selection in the determination of optimum capital investment decision making criteria to select a sound project in order to increase the firm’s value. Furthermore, the inclusion of the moderator, firm age, into the RMM model, targeted to create the expected favorable moderation effect of this moderator between RMM and all the determinants (internal and external), generates overall the significant moderating results. However, few of the moderation results are unfavorable.

By and large, the favorable moderation results suggest the significant moderating effect of FA, between these determinates (internal and external) and RMM (Capital Investment Decision Making Criteria). This in turn may call for use of this moderator as guidelines and stimulators by the companies' top management to shape or mold the effect of selected determinants on the capital investment decision making criteria (RMM). In summary, the above results and findings suggest that the corporate managers particularly those involved in capital decisions should consider and give due weightage to the internal & external determinants, risk management methods and selected moderators while making capital investment decisions. This may also contribute to fulfill the objectives of this capital investment criteria related study.

5.2.2. Applications of the CAM-Model.

The results related to the Conventional Appraisal Methods (CAM) also have managerial implications. The conventional appraisal methods include Net Present Value (NPV), Internal Rate of Return (IRR), Payback Period (PBP) and Accounting Rate of Return (ARR). Most of these methods are used by the corporate level senior managers of the companies all over the world in general and in Pakistan in particular for the selection of capital investment projects. These methods are also grouped as the Discounted Cash flow Methods (DCF; NPV and IRR) and Non-Discounted Cash flow Methods (N-DCF; PBP and ARR). The corporate managers apply these methods owing to their easy calculation. They are also applied to evaluate the feasibility reports and project appraisal financing of the capital investment projects.

The dimensions/sub-criteria of the CAM including NPV, IRR, PBP and ARR are discussed in details in literature review section of this study. The results of this perception based study highlight that excluding manufacturing flexibility other determinants including corporate governance & strategy, reliability of outputs, effects of competitive force, innovative technology adoption, venture capital and agency cost have effect on CAM. These same determinants were noted to also have impact on RMM and their dimensions in details have already been mentioned above, therefore, the managerial focus is required to better apprehend and understand the linkage of these determinants and their dimensions in selection of fitted CAM criteria to pick up a right capital investment proposal.

However, in case of CAM, the work efficiency is additional determinant which has effect on CAM. Its dimensions include better performance of employees in the capital projects with defined and set jobs, hierarchical levels and workforce teams in the capital projects, effect of low workforce compensation in the capital projects, role of Research & Development (R&D) in creating of efficient workforce, effect of trainings and workshops on enhancing the efficiency of workforce in the capital projects and the effect of sudden changes in workforce on the capital investment decisions. Therefore, along with other above determinants, the workforce efficiency should also be considered by the corporate managers in link with CAM in the determination of suitable capital investment decision making criteria (CAM) like NPV, IRR, MIRR, PBP, BPBP and AARR for selecting a good capital project.

Furthermore, the inclusion of firm age, into the CAM model, produce overall the favorable (significant) results which may suggest that the corporate managers should consider the effect of these moderators during the selection of suitable capital investment selection criteria in terms of their moderating effect on the relationship between the targeted determinants and the CAM (capital investment decision making criteria). Last but not the least, the above discussion summarizes the view that the corporate level senior managers should have due understanding and practical exposure to take into consideration the effect of selected determinants on the application of Conventional Appraisal Methods along with effect of moderators to moderate the relationship between them. This may also aid to fulfill study objectives.

5.2.3. Applications of the SAM-Model.

The important strategic appraisal methods used in the capital investment decisions are Balanced Score Card, Real Option Analysis, Value Chain Analysis, Benchmarking and Technology Roadmapping. The corporate managers apply these methods frequently in their evaluation of project investment proposals. Overall, the results and findings of this study support the application of these methods owing to their impact on the capital investment decision making criteria. The Balanced Score Card is used and recommended by the senior corporate managers for the projects' investment decision making due to the reason that this method links financial measures with non-financial measures of the business firms.

The Real Option Analysis tool recognizes different valued options associated with some capital projects. The Value Chain Analysis is a useful tool to help business identify their value creating activities which have the strategic significance and results in competitive edge. The Benchmarking is a search for the industry's best practices that lead to superior performance. It promotes competitive awareness, links operational tactics to corporate vision and strategy. The Technology Roadmapping displays interaction between products & technologies over time by using charts and graphs to reveal links between technology and the business needs. The results and findings of this study support the application of all these Strategic Appraisal Methods as they have effects on the capital investment decision making criteria.

The application of these tools is limited in Pakistani firms. For example, most of the corporate managers are not well acquainted as how to use the actual real options to evaluate the capital projects, even they are unable sometimes which of the company has to adopt as a Benchmark due to insufficient knowledge about the industry, further they don't even adopt the technology road mapping tools because they are not well trained about their applications, yet, the use of these methods in Pakistani companies cannot be denied because most of the projects in different sectors are evaluated on the basis of these pragmatic strategic appraisal methods.

In addition, it is also notable from the results that excluding reliability of outputs other determinants including the corporate governance & strategy, workforce efficiency, effects of competitive force, innovative technology adoption, venture capital and agency cost are the favorable predictors of Strategic Appraisal Methods (SAM). These determinants were also noticed to have effect on CAM and the dimensions of these determinants have already been discussed above. Hence, being having the impact of these determinants on SAM, it is suggested that the corporate managers may consider them in relation to SAM to suitably determine the SAM criteria for selecting the optimal project.

In addition to all this, the moderation results also depict that the moderator, firm age, has effects on relationship between the determinants and SAM which asserts that the role of this moderator may be considered to favorably induce the effect of the above determinants on SAM. By and large, in view of all the above results and discussion, it may be argued that the corporate managers in evaluating and selecting the capital investment proposal should pragmatically apply these suggested determinants along with due consideration for the role of moderators in affecting the relationship between the determinants and capital investment decision making criteria (SAM). This may also serve to fulfill objectives of this study.

5.3. Recommendations of the study.

The recommendations of this capital investment criteria related study are generally and specifically derived keeping in view the results and findings to reach at the appropriate conclusion. There are in all three models in this study. Therefore, in view of the each model, the separate recommendations have been reported in the understated remarks.

5.3.1. Recommendations of the RMM-Model.

In view of findings of RMM-model, the following recommendations are pointed out;

- It is highly recommended to the corporate managers to formulate such policies regarding the manufacturing processes as has the less uncertainty to be failure. The production managers, the floor managers, supply chain managers and other manufacturing related corporate staff should also participate in the decision making meetings for the capital projects. If they highlight the uncertainty of the capital projects, the risk managers can adjust the risk adjusted discount rate of the cashflows which is expected from the sales of the products of the underlying firms. The probability analysis to carry on the projects can be redone to check the alternative success or failure of the projects. It is also recommended to financial analyst to estimate the adjusting expected return based on CAPM for those capital projects whose manufacturing processes are sometimes uncertain and also suggest the remedies to produce significant results through the flexible manufacturing activities. This can reduce the effort and wastage of resources for projects.

- There is another recommendation to corporate managers at all levels in view of the expansions of the given volume of projects leading towards the expansion in the products. It is cordially recommended to the corporate managers to expand those capital projects whose expected cashflows are no more uncertain. There should be expansion of only those products which have direct effect on the risk management methods. The reason is this, if expansion is insignificant or it is unable to produce the desired cashflows to meet the goals of the project, the risk evaluation tools will be no more beneficial. It is strongly recommended to marketing, sales and production heads to reconcile the expansionary decisions with risk methods.
- The recommendation to corporate managers, policy makers of the firms and other stakeholders of the organization with respect to uncertain environment is also considerable on solid grounds. It is recommendation for the investment managers and decision makers that they should avoid the decisions of capital projects in those regions where there is uncertainty in surroundings and chaos is there. This is also highly recommendation to take a stck of future weather conditions because many of the projects are delayed due to water deficiency, rains abundance, storms and other these kind of odds. The insignificant environment may reduce the efficiency of the risk measurement methods to appraise the capital projects.

5.3.2. Recommendations of the CAM-Model.

The stated recommendations based on the CAM-model are as followed;

- It is positively recommended to the business and finance managers of firms having corporate culture, to select the feasible and accessible capital projects because in this competitive and business oriented arena the flexibility concerned a lot for all the stakeholders. Normally, those projects which are flexible in their production and manufacturing processes, are more inclined to show the positive NPV, and IRR can also boost up more than the required return or pre-settled hurdle rate. The cashflows from the flexible manufacturing products are more expected to cross the targeted flows. Accounting profits of those projects which are flexible are also increased that is the indicator for positive increase in price of share as well. The insignificant manufacturing processes can reduce the NPV of the projects.
- Keeping in view the insignificant finding of Expansionary Volume in CAM-model, it is solemnly recommended to the corporate managers, CFO and CEO, to approve the expansions of only those capital projects, which are expected to increase the maximum cashflows in the future. This activity ultimately can increase the NPV and IRR of the projects. It is also recommended to business managers to appraise the risky projects with PBP if the projects are of maximum five years. If Expansion needs mandatory action to be taken, then this expansion should have direct effect on NPV and IRR. Only with maximum cashflows, positive NPV and IRR>RRR is possible. To conclude, expansion of only healthy products should be undertaken.
- Keeping in view the highly insignificant effect of EUC on CAM, it is strongly recommended to the corporate managers, production managers, CFO and CEO, to view always the uncertainty prevailing in the surroundings whenever, they are committed to opt a capital projects with the objective of increasing the value of the firms so that ownerships rights may be more empowered. It is recommended also to all stakeholders to take a stock of weather, public and administrative distortion as well while investing or dealing in the capital projects before in time. There are many anticipated measures and surveys and news which can predict the future in hand. The uncertain environment is expected to decrease the cashflows which may in turn may reduce the NPV of the projects and IRR below the expected level.

5.3.3. Recommendations of the SAM-Model.

The key recommendations in view of the SAM-model are as followed;

- It is keenly recommended to the corporate managers, marketing and sales heads, and production managers to cope with the problems in the way of manufacturing flexibility of goods and services. The insignificant regression value of the flexible manufacturing goods and services points out the serious attention of the top management of firms to cope with the problems facing towards flexible manufacturing of the products of the companies.
- It is highly recommended to the corporate managers, production managers, and policy makers, to take a serious and keen concern for reliable products. The reason is this that perception of the customers matters only for the success of products which are the positive indicator towards the expected success of capital projects. These are the reliable products which may avail the real options which increase the revenue from selling activities leading to enhance the worth of the capital projects. It is also recommended to the CFO and CEO to take a continual stock of the technology Roadmapping for production activities and counsel at the weak stages to improve the quality of products. These are only the reliable goods which can produce the maximum cashflows to target of the real options inherent in the projects. It is also recommended to the customers to give a justified feedback after using the products of the firms so that efficiency level of products may be improve the technology Roadmapping, value chain process and key real options.
- As regards the recommendation for the Expansionary Volume (EV) is concerned. It is advised to the managers in view of the insignificant effect of EV on the real options and technology road mapping that they should expand the projects for new or existing products only if solid real options are in hand and there is a well knitted network of technology understanding among different stakeholders of the firms.
- This is also recommended to the top level managers to cope with the uncertain environmental factors while appraising the projects through strategic appraisal methods like real options, technology road mapping, Balance scorecards and Benchmarking. Real options and Technology road mapping are effective appraisal tool to check and predict the future uncertainty towards projects.

Chapter 6

Conclusion and Future Directions

The concluding remarks and of this capital investment related study are derived from the results and discussion of this study.

6.1. Conclusion

To conclude the results, this study was conducted to gather corporate managerial view regarding the effects of internal and external determinants on the capital investment decision making criteria with moderating role of selected moderators. In this regard, three models were used as discussed in chapter-2 namely, the Risk Management Model, Conventional Appraisal Model, and the Strategic Appraisal Model. These models have the same five internal and five external independent determinants and moderating variables. But the dependent Capital investment Decision Making criterion in each of the model is separate which is selected on the basis of the empirical and theoretical evidence.

The target population was all companies listed on the Pakistan Stock Exchange. The sample companies are 250 selected from each sector relying on stratified sample technique to represent each sector (stratum), and number of sample corporate executives are 1000 as applying the purposive sample technique, four corporate managers from each of the sample company were target respondents, who were involved in capital projects investment decision making.

The data analysis portion states descriptive statistics and correlation coefficients. The simple regression, multiple regression moderation was also applied. Before running regression, the regression assumptions were also tested. Overall there was no violation of these assumptions. The reliability and validity of data was tested and in this regard all the values were in the acceptable range, however, few item/questions were deleted in the confirmatory factor analysis. The results and discussion of this study have been reported in the chapter-4

The results related to RMM Model indicate that all the determinants are positively correlated with RMM. The simple regression results also show that these determinants are significant predictors of RMM. However, the multiple regression results depicts that corporate governance & strategy, manufacturing flexibility, reliability of outputs, effects of competitive force, innovative technology adoption, venture capital and agency cost are the significant predictors of RMM whereas workforce efficiency, expansionary volume, and environmental uncertainty are the insignificant predictors showing the low effect of these determinants on RMM.

The moderation results are overall significant. Because high moderating effect of firm age was noted on the relationship between all determinants and RMM. Overall all the above results are in line with the previous studies in this area.

The results of CAM Model show the positive correlation between all the determinants and CAM. In case of simple regression results, all the determinants significantly affect the CAM. As regards the multiple regression results, only manufacturing flexibility, expansionary volume, and environmental uncertainty are insignificant predictors of CAM which shows their low effect on CAM whereas the rest of seven were found significant.

Considering the moderation, it was noted that again that the moderation results are almost significant. Firm Age significantly moderates at medium level on the relationship between the determinants and CAM. All the above stated results and discussion may again be regarded as consistent with results and discussion of the past studies in this area of capital investment decision making.

The results of SAM Model also depict that there is positive correlation between all the determinants and SAM. The simple regression results show that all the determinants are the significant predictors of SAM. The multiple regression results highlight that manufacturing flexibility, reliability of outputs, expansionary volume, and environmental uncertainty are insignificant predictors of SAM which suggest that they weakly affects the SAM while the remaining six determinants were noted as significant predictors.

The moderation results are overall significant. Firm Age has strong moderating effect on the relationship between all the determinants and SAM. All the results pertaining to SAM model are in line with results of previous studies. In summary, results may have implications for corporate managers to duly consider the impact of targeted determinants on capital investment decision making criteria along with effect of selected moderator on relationship between them in order to properly determine the relevant criteria for the capital investment selection to evaluate and select a sound capital project.

6.2. Future Directions

Future directions of this study are based on delimitations of this research work. This study may be regarded as the first of its kind which has investigated the effects of target determinants on the capital investment decision making criteria with moderating role of selected moderators specifically in the context of Pakistani companies. However, there are and can be much gap for undertaking the future related researches. In this regard, the following future directions are recommended to academicians, professionals and corporate managers involved in capital investment decisions.

The sample in this study consisted of 250 companies listed on Pakistan Stock Exchange. The future studies may be conducted using the large sample size including the non-listed companies to refine results of this study and further enhance understanding of the overall phenomena.

Moreover, the results and discussion of this study are based on the responses of 1000 corporate level managers who are involved in the capital investment decision making process covering the sample 250 companies. Future studies can be conducted by increasing the number of managers selected from each company and hence the overall sample size. Also corporate level senior managers were particularly targeted in this study. In future researches, it is recommended that middle level managers should also be included in the sample as they can also be involved in capital investment decisions to varying degrees specifically, it is practice in some companies that a major part of the activities of the top decision making bodies pertaining to capital investment decisions are delegated to the middle management. Therefore, they also know how to carry out the feasibility of the capital projects and their entire evaluation.

It is notable that results of this pragmatic capital investment related study, are based on three models namely RMM, CAM, and SAM which are worked out and researched in the existing literature. The future research can also be conducted by considering other relevant models such as those involving Firm’s Efficiency and Strategic Alliance. The future researchers can also be undertaken with other factors relevant to be included in the three models of capital investment decision making criteria selected for this study.

Furthermore, apart from moderator firm age used in this study, other factors like firm size, profitability, D/E ratio and management style may be taken as moderating variables in future studies of this kind to extend the moderating results of this study. Also, the corporate managers of the business firms are of the view that firm size, firm age and management style play a pivotal role for the capital investment decision making.

In this study, the capital investment criteria has been measured through interviews of the corporate managers at all levels (four top executives from each company) by taking the proportionate sample of each sector and then analyzing the reactions of all managers in combined format. But in future, the academicians and scholars can undertake the sectoral analyses (separate analysis of each sector) owing to the reasons that capital projects of each sector are different in nature. Therefore, the responses of the managers from each sector are not aligned. The sectoral analysis is directed in future for adding the value in the results of this study.

This study is descriptive in nature and no effort is done to manipulate or control variables. In future, studies may be undertaken to control the different associated variables such as through the lab-experiential testing to investigate the inter variables relationship in a refined manner. Last but not the least, future researches may be undertaken with mixed samples of corporate business managers at different levels involved in capital investment decisions along with academicians who have better understanding and knowledge of theoretical and empirical work related to the capital investment decision making criteria for the sake of better results, findings and recommendations on the subject matter of the whole study under discussion.

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Appendix-1: Correlations Statistics of CAM and SAM Models.

Table-A: *Pearson Coefficients for internal factors of Conventional Appraisal Model (CAM)*

	CGS	MF	WE	RO	EV	CAM
CGS	1					
MF	.435**	1				
WE	.541**	.507**	1			
RO	.504**	.482**	.602**	1		
EV	.492**	.381**	.520**	.564**	1	
CAM	.395**	.284**	.433**	.411**	.354**	1

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, CAM= Conventional Appraisal Methods & '**' shows that the significance level is 1% (*i.e.<.01)*

Table-B: *Pearson Coefficients for external factors of Conventional Appraisal Model (CAM)*

	EUC	ECF	ITA	VC	AC	CAM
EUC	1					
ECF	.594**	1				
ITA	.546**	.554**	1			
VC	.542**	.483**	.570**	1		
AC	.527**	.475**	.538**	.537**	1	
CAM	.389**	.401**	.412**	.352**	.403**	1

Note: EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, CAM= Conventional Appraisal Methods & '**' shows that the significance level is 1% (*i.e. p<.01*)

Table - C: *Pearson Coefficients for internal factors of Strategic Appraisal Model (SAM)*

	CGS	MF	WE	RO	EV	SAM
CGS	1					
MF	.435**	1				
WE	.541**	.507**	1			
RO	.504**	.482**	.602**	1		
EV	.492**	.381**	.520**	.564**	1	
SAM	.439**	.352**	.434**	.363**	.294**	1

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, SAM= Strategic Appraisal Methods & '**' shows that the significance level is 1% (*i.e. p<.01*)

Table-D: *Pearson Coefficients for external factors of Strategic Appraisal Model (SAM)*

	EUC	ECF	ITA	VC	AC	SAM
EUC	1					
ECF	.594**	1				
ITA	.546**	.554**	1			
VC	.542**	.483**	.570**	1		
AC	.527**	.475**	.538**	.537**	1	
SAM	.389**	.401**	.412**	.352**	.403**	1

Note: EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, SAM= Strategic Appraisal Methods & '**' shows that the significance level is 1% (*i.e. p<.01*)

Appendix-2

Results of Pilot Study

Validity Testing of the Research Instrument (Criterion Related Validity)

Table-1: *Component Matrix for Risk Management Methods Model-1*

Components and Factor Loadings for all the Variables

CGS (Corporate Governance & Strategy)												
Component	CGS-1	CGS-2	CGS-3	CGS-4	CGS-5	CGS-6	CGS-7	CGS-8	CGS-9	CGS-10	CGS-11	CGS-12
Factor Loading	.334	.562	.568	.465	.638	.685	.338	0.237	0.647	0.376	0.532	0.474
MF (Manufacturing Flexibility)												
Component	MF-1	MF-2	MF-3	MF-4	MF-5	MF-6	MF-7	MF-8				
Factor Loading	0.569	0.276	0.770	0.225	0.396	0.764	0.623	0.729				
WE (Workforce Efficiency)												
Component	WE-1	WE-2	WE-3	WE-4	WE-5	WE-6	WE-7	WE-8	WE-9	WE-10		
Factor Loading	0.475	0.636	0.562	0.615	0.296	0.598	0.618	0.336	0.448	0.586		
RO (Reliability of Outputs)												
Component	RO-1	RO-2	RO-3	RO-4	RO-5	RO-6	RO-7	RO-8	RO-9			
Factor Loading	0.765	0.324	0.679	0.568	0.670	0.396	0.256	0.654	0.672			
EV (Expansionary Volume)												
Component	EV-1	EV-2	EV-3	EV-4	EV-5	EV-6	EV-7	EV-8	EV-9	EV-10		
Factor Loading	0.728	0.597	0.354	0.725	0.545	0.296	0.676	0.518	0.245	0.732		
EUC (Environmental Uncertainty)												
Component	EUC-1	EUC-2	EUC-3	EUC-4	EUC-5	EUC-6	EUC-7	EUC-8				
Factor Loading	0.732	0.404	0.567	0.687	0.632	0.545	0.243	0.386				
ECF (Effect of Competitive force)												
Component	ECF-1	ECF-2	ECF-3	ECF-4	ECF-5	ECF-6	ECF-7	ECF-8	ECF-9			
Factor Loading	0.338	0.697	0.623	0.689	0.686	0.325	0.728	0.223	0.389			
ITA (Innovative Technology Adoption)												
Component	ITA-1	ITA-2	ITA-3	ITA-4	ITA-5	ITA-6	ITA-7	ITA-8	ITA-9	ITA-10		
Factor Loading	.685	.727	.715	.334	.543	0.287	0.714	0.229	0.547	0.454		

					VC (Venture Capital)							
Component	VC-1	VC-2	VC-3	VC-4	VC-5	VC-6	VC-7	VC-8				
Factor Loading	.686	.237	.655	.753	.264	0.376	0.574	0.645				
					AC (Agency Cost)							
Component	AC-1	AC-2	AC-3	AC-4	AC-5	AC-6	AC-7	AC-8	AC-9	AC-10		
Factor Loading	0.543	0.726	0.564	0.298	0.387	0.748	0.356	0.589	0.657	0.476		
					RMM (Risk Management Methods)							
Component	RMM-1	RMM-2	RMM-3	RMM-4	RMM-5	RMM-6	RMM-7	RMM-8	RMM-9	RMM-10	RMM-11	RMM-12
Factor Loading	0.656	0.623	0.587	0.298	0.324	0.453	0.276	0.345	0.675	0.575	0.265	0.512
					CAM (Conventional Appraisal Methods)							
Component	CAM-1	CAM-2	CAM-3	CAM-4	CAM-5	CAM-6	CAM-7	CAM-8	CAM-9			
Factor Loading	0.587	0.423	0.675	0.338	0.710	.734	0.317	0.678	0.543			
					SAM (Strategic l Appraisal Methods)							
Component	SAM-1	SAM-2	SAM-3	SAM-4	SAM-5	SAM-1	SAM-7	SAM-8	SAM-9			
Factor Loading	0.718	0.677	0.225	0.610	0.337	0.728	0.673	0.564	0.623			
					FA (Firm Age)							
Component	FA-1	FA-2	FA-3	FA-4	FA-5	FA-6	FA-7	FA-8				
Factor Loading	0.675	0.785	0.398	0.0.345	0.245	0.654	0.725	0.546				

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, FA= Firm Age, RMM= Risk Management Methods, CAM= Conventional Appraisal Methods, and SAM= Strategic Appraisal Methods

Internal Consistency Testing of Research Instrument (Reliability Testing)

Table-2: *Chronbach's Alpha Statistics for RMM, CAM, SAM and All Predictors*

S. No.	Variable	Chronbach's Alpha	Chronbach's Alpha Based on Standardized Items	No. of Items
1.	CGS	0.64	0.64	12
2.	MF	0.63	0.63	8
3.	WE	0.55	0.55	10
4.	RO	0.69	0.69	9
5.	EV	0.56	0.56	10
6.	EUC	0.67	0.67	8
7.	ECF	0.58	0.58	9
8.	ITA	0.73	0.73	10
9.	VC	0.68	0.68	8
10.	AC	0.63	0.63	10
11.	FA	0.60	0.60	8
12.	RMM	0.71	0.71	12
13.	CAM	0.73	0.73	9
14.	SAM	0.76	0.76	9

Note: CGS= Corporate Governance & Strategy, MF= Manufacturing Flexibility, WE= Workforce Efficiency, RO= Reliability of Outputs, EV=Expansionary Volume, EUC= Environmental Uncertainty, ECF= Effect of Competitive force, ITA= Innovative Technology Adoption, VC= Venture Capital, AC= Agency Cost, FA= Firm Age, RMM= Risk Management Methods, CAM= Conventional Appraisal Methods, and SAM= Strategic Appraisal Methods