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Capital Investment Decision Making and Risk Management Methods: Evidence From Listed Companies on Pakistan Stock Exchange

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ABSTRACT

Capital Investment projects are evaluated and appraised by the corporate managers of business firms listed on PSX through different pragmatic methods, tools and techniques. The complexity of the application of all the methods simultaneously including traditional financial methods, strategic pragmatic methods and risk management methods, urge the corporate managers to apply at least one of the pragmatic methods so that projects' capital investment decision making criterion or criteria may be reached at to measure the appropriate capital investment decision making. Keeping all this in view, this paper aims to study the risk management techniques rather than studying and measuring all the traditional methods. This paper examines the effect of financial and non-financial factors on risk management methods which are supported by different theories and empirical background with proper references and citations. The responses of the corporate managers of 250 listed business firms on PSX through regression analysis show that almost 80% of the factors have a direct relationship with Risk Management Methods. The maximum significant results of the study point out that the capital investment projects are also evaluated by the corporate managers through risk management methods but the application of the financial and strategic methods cannot be ignored. As many of the project financial experts apply the risk management methods simultaneously with the collaboration of other methods as well. The results also show that effect of firm size as a moderator is also partial significant.

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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 criteria. Capital investment decision making means the investment decisions by the corporate managers regarding the new projects or business, expansion of the existing projects, and

the replacement of the existing business or infrastructure for the long term survival of the business firms. 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). Jenson (2001) studied the capital investment decision making process and identified that corporate planning managers must have a criterion or criteria for evaluating the performance and decisions to make alternative courses of action. Capital projects are not free from the risk of the underlying factors. Therefore, the empirical literature discusses the risk management dimensions of the capital investment decision making process. Akalu (2001) identified in the light of survey responses that risk focuses on the uncertain set of circumstances that affects the performance of a strategic project while making capital Investment decision making. Akalu (2001) is also of the view that the practice of handling project risk varies from firm to firm as it does from project to project. 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 capital investment decision making (Fadi and Northcott, 2006; Afonso and Cunha, 2009). There has been criticism on the use of discounted cash flow techniques like NPV and IRR for evaluating investments in manufacturing and services facilities (Gerwin, 1982; Hayes and Wheelwright, 1984). Reimer & Nieto (1995) identified the different capital budgeting tools for the evaluation of projects in business firms. Lefley (1998) documented that ARR also has the practical weaknesses like the PBP and ignores the time and patterns of the profits of projects. Hodder (2001) also determines that NPV and IRR are biased against long term projects and have inability to evaluate strategic investments with future growth opportunities (Gerwin, 1982; Gold, 1983).

1.2 Objectives of the study

This capital investment study is aimed to analyze the key role of Internal and external Factors on Capital Investment Decision Making Criteria of the firms with reference to perception and beliefs of corporate managers. Keeping in view the firm's value, parameters of risk analysis are examined to reach at appropriate Capital Investment Decision Making Criteria to facilitate the practitioners with the help of financial and non-financial determinants together with the inclusion of the moderator factor, firm size to check the relationship of this factor (FS) with the RMM and independent determinants. There is hardly any study in Pakistan that focuses this issue of capital investment criteria in so much depth.

2. Literature Review

2.1 Risk Management Methods

Lefley (1998) conducted a study to justify the new pragmatic approach to capital investment decision making which they named Financial Appraisal Profile (FAP). There is an argument that most of the business firms for the capital projects' investment, 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 and Tayles, 1996; Chadwell et al., 1996; Lefley, 1997). Fadi and Northcott (2006) estimated that managers of the 72.7% of Australian business firms apply CAPM to calculate the equity cost of capital that is based on firm's estimated beta while only 6 % of the Malaysian business firms apply CAPM method for evaluating the risk factor inherent in the projects' life time, whereas, in Hong Kong just 26.9 % managers of the business firms apply the CAPM model to calculate the cost of equity. g. Graham and Harvey (2001) observe that 73% of the corporate financial managers of the respondents' investment firms are inclined mainly towards the use of CAPM (Gitman and Vandenberg, 2000; Ryan and Ryan, 2002; Lazaridis, 2004). Fadi and Northcott (2006) observe that risk analysis methods are almost the same for strategic and non-strategic projects. Lefley and Morgan (1998) show that the risk analysis measures financial sensitivity to variations and by the identifications of capital investment type project's PBP. Fadi and Northcott (2006) also observe that risk analysis (sensitivity analysis) methods are almost the same in both kinds of the capital projects decision making. Arnold and Hatzopoulos (2000) suggest identify that popularity of sensitivity analysis is derived from its perceived simplicity and intuitive appeal. The results show that managers of 89% of firms, apply this method for projects' investment decision making. Lefley and Morgan (1998) argue that identification of the risk can be achieved through the analysis of the chances of success / failure embedded to capital projects. Fadi and Northcott (2006) found that Probability Analysis is widely applied tool for the assessment for decision making of capital investment. The results of their study are consistent with the study of Abdel-Kader and Dugdale (1998) and show that 77 % of the business firms apply probability analysis for both kinds of capital projects' investment decision making. Lefley and Morgan (1998) stress on Risk analysis for the continuation of capital investment projects. They argue that identification of the risk which is embedded to the investment projects and projects appraisal, can be achieved by the analysis of financial data related to the capital projects. They view that through the computer simulation analysis different values can be simulated and risk of the capital investment type projects

is adjusted accordingly. Hussain and Shafique (2013) observe that Discounted Payback Period (DPBP) is the simplest and widely used method in the industry as it considers the required time to recover the original investment (Suzette Vivers and Howard Cophen, 2011). But unlike the simple PBP it calculates the Recovery time period by discounting the cashflows with some pre-set cost of capital (Peterson and Fabozzi, 2002). Al-Ajmi et al., (2011) surveyed the 34 business firms in the Gulf Cooperation Council (GCC) and observed that project managers are inclined towards capital evaluation methods with the inclusion of non DCF methods like PBP, DPBP and ARR.

2.2 The Linkage of Exogenous Factors with Capital Investment Criteria

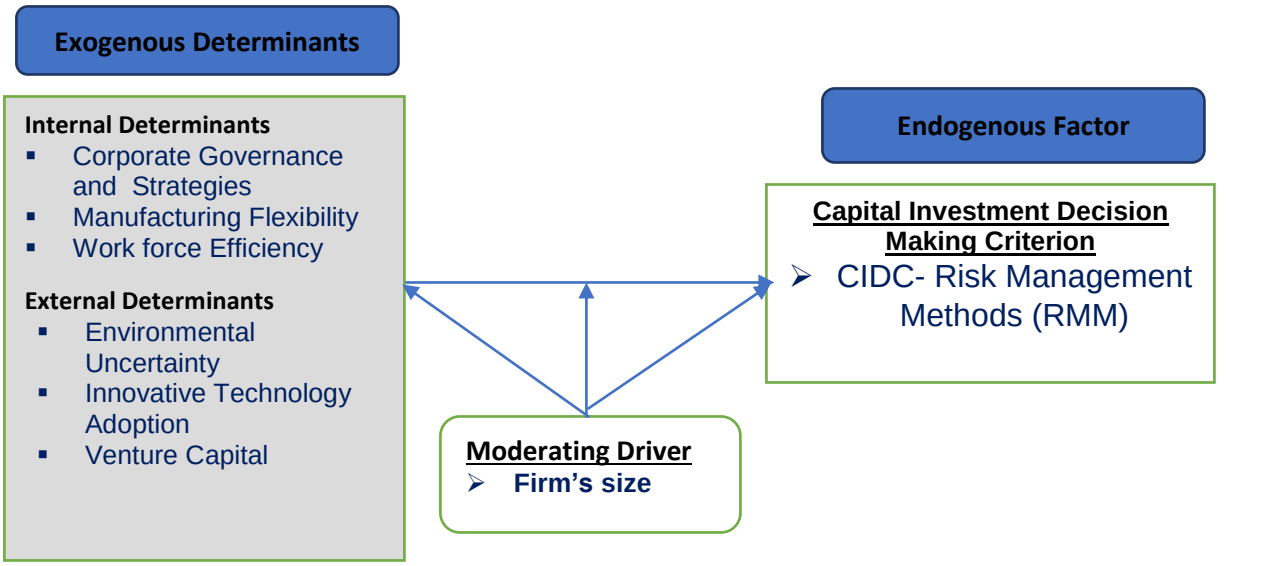
Corporate Governance is the mechanism of the management inclined towards shareholders' interests, for the long term benefits of the firms (Gul et al., 2013; Kotha and Swamidass, 2000; Jensen, 1986) which may enhance the capital investment opportunities for the companies in the future. Afonso and Cunha (2009) identified the link of corporate strategy with capital investment decision making methods based on risk management methods (Pike, 1996; Brealey and Meyer, 2012; Verbeeton, 2006). Manufacturing flexibility is also concerned with the production of goods outside the factories' premises (Afonso and Cunha, 2009; Snell and Dean, 1991, 1996; Gerwin, 1993; Parthasarthy and Sethi, 1993; Snell and Dean, 1992). Fadi and Northcott (2006) found that the flexibility in manufacturing process has direct relationship with capital investment decision making criteria (Butler et al., 1991; Slagmulder et al., 1995; Slagmulder, 1997; Cooper and Slagmulder, 1997). Two Factor Theory (Herzberg, 1967; House and Wigdor, 1967) also 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 Contingency Theory (1915) 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) found that workforce is the human capital that enhances the efficiency of the organization through sales and employment level (Bruggen et al., 2009; Eckel and Grossman, 2008). Environmental uncertainty is the distortion in the political and economic environment that affects the effective capital investment decision making (Afonso and Cunha, 2009; Fadi and Northcott, 2006; Caves and Porter, 1980). Miller's General Environmental Uncertainties Theory describes the five major environmental uncertainties which impede the capital investment decision making which include the, Political Uncertainty, Government Policy Uncertainty, Macroeconomic uncertainty, Social Uncertainty, and natural uncertainty. Davilla and Foster (2005) identified that uncertainty has the direct relationship with the conventional and strategic methods while found that environmental uncertainty has the negative relationship with risk management methods (e.g. Davilla and Foster, 2005; Ryan and Ryan, 2002). The Diffusion of Innovation Theory or the Multi-step flow theory (Rogers, 1995) also strengthens the linkage between different stakeholders of the capital investment projects through communication with the help of innovative technological instruments like computerized networking stations. Afonso and Cunha (2009) highlighted that modern technology has effect on Risk Management Methods due to its risk alleviation quality (Copeland and Howe, 2002; Ryan and Ryan, 2002; Graham and Harvey, 2001; Black, F., Scholes, M., 1973). Venture Capital also affects the investment decision making process (Bottazzi et al., 2008; Davila and Foster, 2007). Stuart and Sorensen (2007) observed the effect of venture capital on RMM. Amit et al., (1998) also 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 (Tyebjee and Bruno, 1984, 1984; Jain and Kini, 1995; Hellmann and Puri, 2002).

2.3 Exploring Capital Investment Criteria based on Risk: Key Research Questions

The major key task of this research oriented study is to explore the key questions on the basis of the problem statement of the study. The problem here is to identify the appropriate capital investment criterion based on the internal and external factors.

- How do the internal factors affect the capital investment criteria of firms listed on PSX?
- To what extent external factors affect the capital investment criteria of firms listed on PSX?
- How does firm size as a moderator, affect the relationship between all factors and Capital Investment Decision Making Criteria

2.3 Exploring the Risk Management based Theoretical Framework.



THEORETICAL FRAMEWORK FOR CAPITAL INVESTMENT DECISION MAKING CRITERION BASED ON RISK-

The following hypothesis are developed based on the above stated theoretical framework:
H1: Corporate Governance and Strategy has the significant effect on RMM.
H2: Manufacturing Flexibility is the significant predictor of RMM.
H3: Workforce Efficiency has the significant effect on RMM.
H4: Environmental Uncertainty is the significant predictor of RMM.
H5: Innovative Technology Adoption has the significant effect on RMM.
H6: Venture Capital is the significant predictor of RMM.
H7: Firm size has significant effect on the relationship between RMM and all determinants.

3. Research Methodology

3.1 Target Population and Sampling

The population of this perception based study consists of the corporate level managers of companies listed on PSX (Pakistan Stock Exchange) covering 35 sectors. These 35 sectors consist of 584 registered companies on PSX. Therefore, the target population is the 584 companies listed on PSX.

It is the general phenomena that Capital Investment Decision Making is not driven by any single executive, rather the corporate managers at different levels are concentrated jointly in a meeting towards the Capital Investment Decision Making. Therefore, in this current perception based study we included at least four executives from each company who are actively involved in the Capital Investment Decision Making Criteria (Fadi and Northcott, 2006, Afonso and Cunha, 2009; Gul et al., 2013). Therefore, the actual sample size is the 1000 (i.e. 250*4) corporate managers at different levels from 250 selected sample companies

3.2 Data collection Methods and Analysis

In this managerial level study, the research evidence have been collected from the perceptions and verdicts of corporate managers of 250 sample companies listed on PSX, by using two methods (Fadi and Northcott, 2006; Afonso and Cunha, 2009); 1. A mailed (electronic version); 2. Self-administered questionnaire. This questionnaire was in English and a covering letter was also attached to each of the questionnaire, which served as an introduction to the purpose of this perception based study. After data collection, it was tabulated in Excel sheets for statistical analysis. Multiple Regression Analysis (Multi-Variant Analysis) has been run to observe the effect of external and internal determinants on capital investment criteria. Through SPSS, all the descriptive values are estimated so that all the values should be reviewed. The moderation effect of the firm size with the independent factor and RMM was also found.

3.3 Econometric Equations of Regression Model

$$Yi = CIDC\ RMM = \beta 0 + \beta 1\ (CGS) + \beta 2\ (MF) + \beta 3\ (WE) + \beta 4\ (EUC) + \beta 5\ (ITA) + \beta 6\ (VC) + \varepsilon i \text{ ------- 7.}$$

Where, CIDCRMM is the capital investment decision making criterion based on Risk Management Methods (RMM) of Model-1. Whereas, β0 and β1------ β6, are the coefficients of the regression lines shown above, Ɛi is the error term or residual of the regression equations.

To check the moderation effect of the firm's size with the independent factors and CIDM criteria, the following equations has been built up.

$$Yi = CIDC\ RMM = \beta0 + \beta1\ (Z- CGS) + \beta2\ (Z - FS) + \beta3\ (CGS*FS) + Ɛi \quad \text{---------- 1A.}$$

$$Yi = CIDC\ RMM = \beta0 + \beta1\ (Z- MF) + \beta2\ (Z - FS) + \beta3\ (MF*FS) + Ɛi \quad \text{---------- 2A.}$$

$$Yi = CIDC\ RMM = \beta0 + \beta1\ (Z- WE) + \beta2\ (Z - FS) + \beta3\ (WE*FS) + Ɛi \quad \text{---------- 3A.}$$

$$Yi = CIDC\ RMM = \beta0 + \beta1\ (Z- EUC) + \beta2\ (Z - FS) + \beta3\ (EUC*FS) + Ɛi \quad \text{---------- 4A.}$$

$$Yi = CIDC\ RMM = \beta0 + \beta1\ (Z- ITA) + \beta2\ (Z - FS) + \beta3\ (ITA*FS) + Ɛi \quad \text{---------- 5A.}$$

$$Yi = CIDC\ RMM = \beta0 + \beta1\ (Z- VC) + \beta2\ (Z - FS) + \beta3\ (VC*FS) + Ɛi \quad \text{---------- 6A.}$$

4. Survey Results

4.1 Descriptive Statistics

In the table-1, the Mean- Statistics of all the variable are greater than three. This leads to the assumption that all these variables have good effect on RMM. It is also evident from the above shown table, that the values of the St. Deviations statistics of all the predictors are also low and are less than the + (-), 0.60, that is good sign of these variables into the Model.

Table-1: Descriptive Statistics for Risk Management Model

	N	Minimum Statistics	Maximum Statistics	Mean Statistics	St. Error	S.D
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
EUC	800	2.20	5.00	3.8501	.01947	.55064
ITA	800	2.20	5.00	3.8710	.02062	.58336
VC	800	2.20	5.00	3.8503	.02092	.59181
RMM	800	2.20	5.00	3.7801	.02006	.56745

Table 2: Correlation Coefficients for Risk Management Model (Internal Factors)

		CGS	MF	WE	RMM
CGS	Pearson Correlation	1	.435**	.541**	.322**
	Sig. (2 - tailed)		.000	.000	.000
MF	Pearson Correlation	.435**	1	.507**	.288**
	Sig. (2 - tailed)	.000		.000	.000
WE	Pearson Correlation	.541**	.507**	1	.348**
	Sig. (2 - tailed)	.000	.000		.000

		CGS	MF	WE	RMM
CGS	Pearson Correlation	1	.435**	.541**	.322**
	Sig. (2 - tailed)		.000	.000	.000
MF	Pearson Correlation	.435**	1	.507**	.288**
	Sig. (2 - tailed)	.000		.000	.000
WE	Pearson Correlation	.541**	.507**	1	.348**
	Sig. (2 - tailed)	.000	.000		.000
RMM	Pearson Correlation	.322**	.288**	.348**	1
	Sig. (2 - tailed)	.000	.000	.000	

In Table-2, the Pearson's correlation coefficients' statistics for all the three internal variables and RMM show that these are positively correlated with RMM and are statistically significant at 0.01 significant level. In the Table-3, the correlation coefficients' statistics for all the three external variables of and RMM have been stated show that these are positively correlated with RMM and are statistically significant at 0.01 significant level.

Table 3: Correlation Coefficients for Risk Management Model (External Factors)

		EUC	ITA	VC	RMM
EUC	Pearson Correlation	1	.546**	.542**	.318**
	Sig. (2 - tailed)		.000	.000	.000
ITA	Pearson Correlation	.546**	1	.570**	.380**
	Sig. (2 - tailed)	.000		.000	.000
VC	Pearson Correlation	.542**	.570**	1	.319**
	Sig. (2 - tailed)	.000	.000		.000
RMM	Pearson Correlation	.318**	.380**	.319**	1
	Sig. (2 - tailed)	.000	.000	.000	

4.2 Multi-Variant Analysis and Results

In Table-4, the values of R, R2, and Adjusted R2 of all the predictors of the model including CGS, MF, WE, EUC, ITA, and VC, have been stated. The value of R2 shows that the 12.8 % variation in the overall risk management methods is owing to all of the six predictor variables in combined The Adjusted R2 is 0.27. The F-Statistic in Table-4, is 30.666 and is significant at 0.01 level of significance and shows the overall fitness of the model at appropriate level. The Table-5 shows the regression coefficients for all of the predictor variables and RMM. The t-value for CGS (1.278) is significant at 5% level of significance. The significant t-value supports the first hypothesis of study. The t-value for MF (1.924) is also significant and supports the second hypothesis. The t-value for WE (-1.087) and is insignificant at 5% significant level and rejects the third hypothesis of study. The t-value for EUC (-.144) is insignificant at 5% level and rejects the fourth. The t-value for ITA (3.215) is significant at 5% level of significance and supports the fifth hypothesis. The t-values for VC (2.025) is also significant at 5% significant level and supports the sixth hypothesis of study. The all this discussion concludes that overall RMM is a good model and is best fitted.

Table-4: Model Summary for All Predictors (Multiple) and Risk Management Model

Model	R	R Square	Adjusted R2	F-Value	Sig
1	.529a	.280	.271	30.666	.000

a. Predictors: (Constant), CGS, MF, WE, EUC, ITA, VC; b. Dependent Variable: RMM

Table-5: Coefficients for All Predictors (Multiple) and Risk Management Model

Model		Unstandardized Coefficients		Standardized Coefficients	t-stat	sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.963	.179		5.367	.000		
	CGS	.059	.046	.052	1.278	.032.556		1.798
	MF	.074	.038	.073	1.924	.045.634		1.578
	WE	-.049	.045	-.047	-1.087	.277.488		2.048
	EUC	-.007	.046	-.006	-.144	.885.454		2.204
	ITA	.139	.043	.143	3.215	.001.462		2.166
	VC	.082	.040	.085	2.025	.043.512		1.953

a. Dependent Variable: Risk Management Methods

In Table-6, model summary of regression results with moderation effect of firm size with RMM and independent factors has been stated. The results of the table-6 show that when the interaction term CGS_FS, is explained by RMM, R-square value becomes 27.00 % which shows that when moderator FS is introduced in the model, R2 is increased by 14.2 % resulting into R2 change of 0.142, but the F-value is decreased to 97.969 which was 116.704 before the entrance of moderator, FS showing that variance is increased, but overall fitness of the model is decreased. Similarly, when interaction term WE_FS, is regressed on RMM, the R2 is increased by 15.20 % resulting into R2 change of 0.1520, but the F-value is decreased to 98.058 showing that variance is increased but overall fitness of the model is decreased. In the same manner, the depiction of interaction term EUC_FS by RMM, the explanation of ITA_FS by RMM, and the depiction of interaction term VC_FS on RMM, due to which the respective changes in the R2 and F-stats are given in table-6. The presence of moderator, FS shows that it has partial effect on the fitness of model.

Table-6: Model Summary for All Predictors Regression Results with FS as a Moderator

Before Moderation		After Moderation		Change Statistics				
R2- Value	F- Value	R2-Value	F- Value	R2 Change	F - change	df1	df2	Sig. F- change
.128	116.704	.270 a	97.969 a	.142	-18.735	3	796	.000
.111	99.184	.278 b	101.924 b	.167	2.74	3	796	.000
.118	106.367	.270 c	98.058 c	.152	-8.309	3	796	.000
.122	110.783	.281 d	103.785 d	.159	-6.998	3	796	.000
.179	174.145	.320 e	124.660 e	.141	-49.485	3	796	.000
.137	126.872	.300 f	113.863 f	.163	-13.009	3	796	.000

It is observed from the table-7 that t-values for interaction terms, CGS_FS, MF_FS, ITA_FS, and VC_FS are insignificant, all which show no moderation effect of Firm Size with CGS, MF, and VC in the RMM model. But, on the other hand, the t-values for interaction terms, WE_FS, and EUC_FS are significant, showing that Firm Size play a good role as a moderator in W-E and EUC models with RMM. But, overall Firm Size has weak moderation in RMM model. The multicollinearity statistics, VIF and Tolerance level have also been tabulated in the table-7.

Table-7: Coefficients for Z-Values of all Predictors, Moderator-FS & Interaction for RMM-Model

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t-stat	sig		
							Tolerance	VIF
1	(Constant)	3.778	.018		213.74	.000		
	CGS_FS	.008	.016	.015	.489	.625	.991	1.009
2.	(Constant)	3.782	.017		218.15	.000		
	MF_FS	-.012	.018	-.021	-.689	.491	.999	1.001
3.	(Constant)	3.768	.018		212.59	.000		
	WE_FS	.045	.017	.081	2.653	.008	.984	1.016
4.	(Constant)	3.770	.017		216.62	.000		
	EUC_FS	.043	.016	.081	2.697	.007	.993	1.007
5.	(Constant)	3.778	.017		222.81	.000		
	ITA_FS	.010	.016	.018	.620	.535	1.000	1.000
6.	(Constant)	3.778	.017		221.68	.000		
	VC_FS	.012	.017	.021	.692	.489	.998	1.002

5. Discussion and Analysis

According to Gul et al (2013) & Kotha and Swamidass (2000), CGS has direct linkage with Risk Management Methods (RMM). The results and findings of this capital investment study also support the convictions of the above mentioned authors. The results of multiple linear regressions are almost significant, t-stat is significant, and F-value is good showing that CGS is the good predictor of RMM as shown in tables-5 of section-4. These results and findings support the studies of Afonso and Cunha (2009), Brealey and Meyer (1998), Ryan and Ryan (2002), Graham and Harvey (2002). In case of inclusion of moderator factor, Firm size into CGS and RMM-model, the F-value retains at appropriate level, but t-stat is insignificant showing that standardized Beta coefficient is low as shown in table-7 of section-4. The significant results of this study show that Manufacturing Flexibility has the direct linkage with Risk Management Methods (Pike and Ho, 1991, Ho and Pike, 1991; and Arnold and Hatzopoulos, 2000). The mean value of MF and SD are satisfactory as shown in table-1. The MF, also has the significant relationship with RMM, as shown in table-2. These results and findings support the studies (Li et al., 2013; Fadi and Northcott, 2006; Arnold and Hatzopoulos, 2000). The results of multiple linear regressions are accepted; t-stat is significant, and F- value is good enough depicting that MF is the good predictor of RMM as shown in tables 4 and 5. These results and findings support the studies (Afonso and Cunha, 2009; Fadi and Northcott, 2006; Snell and Dean, 1992; Gerwin, 1993). In case of inclusion of Firm size into the model, F-value retains at appropriate level as shown in table-6, also t-stat is significant shown in table-7. These results support the studies (Fadi and Northcott, 2006; Graham & Harvey, 2001; and Sangster, 1993; and Hodder and Riggs, 1985). The WE, also has the good expected significant relationship with RMM, as shown in table-2. The results of multiple linear regression are significant, t-stat is significant, and F- value is good showing that WE is good predictor of RMM as shown in table-5. These results and findings support the studies of Lin and Wang (2005), Boxall (2003), and Ryan and Ryan (2002). The results of multiple linear regression analysis show that W-E has the insignificant results with RMM as shown in table-5, which contradicts the results of Ryan and Ryan (1986), Graham and Harvey (2001), Forrester (2000), Sauders and Lewis (2004). When the moderator, FS is introduced into the WE and RMM, the F-value becomes low as shown in table-6, but t-stat is significant shown in table-7 which shows good moderation effect of firm size. These results partially support the studies (see Fadi and Northcott, 2006; Akalu, 2003; Graham & Harvey, 2001). The results and findings of multiple linear regression show that EUC has insignificant results with RMM as shown in table-5, which shows that t-stat is negative but F-stats is significant as shown in table-4. In the case of moderation, Firm size into the EUC and RMM model, results of the F-value is

significant as shown in table-6, and the t-stats for interaction term, EUC_FS is significant, as shown in tables-7, which all depicts that firm size plays a pivot role to strengthen the relationship between EUC and RMM. The results of multiple linear regressions for ITA are accepted; t-stats are significant, and F- values are also acceptable all which is shown in table-4 and 5. These results and findings support the findings of above mentioned studies. The VC also has significant positive relationship with RMM, as shown in table-3. These results and findings support the studies (Sorensen, 2007; Fadi and Northcott, 2006; Amit et al., 1995; Jain and Kini, 1995). The results of multiple linear regressions are significant and accepted; t-stat is significant, and F-value is also statistically significant as shown in tables-4 and 5. These results and findings support the studies (Croce et al., 2013; Arsaln et al., 2013; Afonso and Cunha, 2009; Lindsey, 2008, Holmes, 1998). In the case of inclusion of moderator, Firm size into the VC and RMM-model, F-value is statistically at good level as shown in table-6, but the t-stats for the interaction term, FS_VC is insignificant as shown in table-7, which depicts no moderation of firm size between VC and RMM.

6. Conclusion and Future Recommendations

It is concluded from the results, findings and analysis of the study as have described in section-4 and section-5, that all the predictors are statistically significant when these factors are tested separately on RMM, all which shows that these factors have the direct effect on the RMM, which is the technique to appraise the capital projects investment decision making. But it's also concluded from the multiple regression results and findings of section-4 and section-5 that corporate governance & strategy, manufacturing flexibility, innovative technology adoption, and venture capital are significant predictors of RMM, which shows that these factors statistically affect the RMM and contribute towards the percentage changes in RMM. The results of Risk Management Model conclude that workforce efficiency and environmental uncertainty are the insignificant predictors, showing the less effect of these exogenous determinants on RMM. The results of the RMM-model also conclude that all the predictors are positively correlated with one another and RMM, which shows the strong relationship of all these predictors and predicted variable, RMM. The results of moderation effect of Firm Size on the RMM conclude that FS has the low moderation effect between all the predictors and RMM. But, we conclude that the overall results are consistent with the past studies as was described in section-5.

In future, different criteria like Firm's Efficiency can be taken for capital investment decision making. Furthermore, the results of this capital investment study can be compared with the results and findings of future studies by taking sample of foreign and local business firms and the further future directions can be recommended to the researchers.

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