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Capital Budgeting Practices in Indian Power Generation Projects

Abhishek Jha[1] and Gaurav Aggarwal[2]

[1,2]Dr. APJ Abdul Kalam Technical University, Lucknow
E-mail: [1]abhishekjhajk@gmail.com, [2]aggarwalgaurav1980@yahoo.co.in

Abstract—*In this paper an enquiry has been made into the Capital Budgeting Practices of Indian Central, State and Private Power Generation Projects. These projects include only thermal and hydroelectric power projects for comparison. Effort has been made to identify the relative importance of different Capital Budgeting methods among these groups. Data have been analyzed using Anova and Kruskal Wallis Test methods as suitable. Finally, theoretical soundness of the individual Capital Budgeting methods has been discussed and their most likely application among the three groups has been analyzed. Finally, suggestions have been made to the three groups on how to improve upon their employment of different Capital Budgeting methods. In addition, few open ended questions were also asked to experts about other general problems encountered in capital budgeting. Their answers were recorded and critically analyzed. They have been summarized towards the end of data analysis.*

Index Terms - *Power, Anova, Budgeting, Kruskal, EVA, Levene*

1. INTRODUCTION.

Concerns have been raised about financial performance of Public Sector Undertakings or PSUs in India. It is believed that sound Capital Budgeting practices can have a sound effect on improving the performance of PSUs in India. It is also widely assumed that private sector enterprises usually perform better when it comes to making Capital Budgeting decisions. The present study aims to first compare Capital Budgeting practices among Central, State and Private sector enterprises in the Indian power sector.

Then, analysis is done whether there is a significant difference among Capital Budgeting practices or not. Financial soundness of these practices is analyzed from the point of view of established financial theory.

Capital Budgeting decisions affect long term profitability of a company. Their relations with fixed assets go a long way in establishing efficiency and a competitive position in the industry. Fixed Assets are said to be the most valuable assets of the company. They help in increasing production and earning profits. Furthermore, substantial funds are needed for acquiring and executing Capital Budgeting decisions. The burden of bearing unviable fixed assets remains till the investment is liquidated completely.

Hence, even one minor bad investment has the potential of ruining a well performing enterprise. Compared to it, a good investment can change the fortunes of a poorly performing enterprise. Current government policy requires PSUs to be self-sufficient and also in a position to generate enough economic surpluses. Hence, judicious approach is required for these Capital Budgeting decisions. In the present study, an effort has been made to understand the Capital Budgeting methods of Power Generation Projects.

2. LITERATURE REVIEW

Study about Capital Budgeting Practices particularly in Indian Power sector has been limited. A quick look at the following global studies on Capital Budgeting methods revealed the following insights. Bierman (1993) finds that majority of the Fortune 100 firms use discounted cash flow (DCF) techniques.

Internal Rate of Return (IRR) is preferred over Net Present Value (NPV). The payback period method also remains a very popular method in practice but it is not used as a primary technique.

Drury, Braund and Tayles' (1993) completed a survey of 300 manufacturing companies which identifies that payback (86%) and IRR (80%) are the most widely used project appraisal methodologies. The most widely used project risk analysis technique is sensitivity analysis. Also a majority of respondents (95%) never used either CAPM or Monte Carlo simulations.

A review of Capital Budgeting Practices in Indian companies revealed few interesting insights. Cherukuri's (1996) completed a survey of 74 Indian companies which reveals that 51 per cent use IRR as project appraisal technique. The ARR and payback period methods are employed as secondary decision making criteria. Thirty-five per cent of the respondents utilize WACC as discount rate or required rate of return in appraising the projects. Chadwell-Hatfield et al.'s (1997) study confirms the results of previous surveys that firms utilize more than one criterion or technique in project choice. More than 70 per cent of the studied firms consider a high IRR an important criterion in decision making. About 84

per cent of the firms surveyed used NPV as either primary or secondary method in appraising projects. Nearly two-thirds of the firms believe that while accepting a project, shorter payback period in addition to either high IRR or NPV is an important criterion. The discount rate used in the project evaluation is based on the individual project risk.

Kester and Chang (1999) survey 226 CEOs from Australia, Hong Kong, Indonesia, Malaysia, Philippines, and Singapore. It was found that DCF techniques such as NPV and IRR are the most significant techniques for future project appraisal. Exceptions were in Hong Kong and Singapore. Sensitivity analysis and scenario analysis were thought to be the most important tool for project risk assessment in all the countries studied. Almost 72 per cent of the respondents in Australia use CAPM to calculate the cost of equity. The risk premium method where risk premium is added to cost of debt is most popular in Indonesia (53.4%) and Philippines (58.6%). The dividend yield plus growth rate method is the most famous method in Hong Kong (53.8%).

Eyster and Geller (1981) compared the usage and development of Capital Budgeting techniques employed by firms between 1975 and 1980. Their study included both Boarding/Lodging and Food Service companies. They concluded that even though the industry utilized more sophisticated methods in 1980 than it did in 1975, the capital budgeting techniques used in the hospitality industry were somewhat misleading and comparatively naive to other industries.

Jain & Yadav (2005) identified that 76 percent of manufacturing PSUs studied utilized IRR as an evaluation technique. Payback method with 32 percent and NPV with 28 percent came second and third respectively in the case of manufacturing PSUs. 50 percent of service PSUs studied used Payback period. IRR and ARR came second and third respectively with 43.75 percent and 31.25 percent. Weighted Average Cost of the long term source of finance is taken as the cost of capital by 58.33 percent of the manufacturing PSUs studied. This drops to 33.33 percent in the case of service PSUs studied. 52.38 percent manufacturing PSUs studied used market value weights in determining cost of capital. This is contrasted with 57.14 percent of the service PSUs using book value weights in determining cost of capital.

Petry (1975) surveyed Fortune 500 and Fortune 50 Retailing, Transportation and Utility firms and found out that IRR was the most popular Capital Budgeting tool and NPV was the least popular.

Ross (1986) described that the degree of financial constraints affect the type of Capital Budgeting method and mechanism utilized within the firm.

Schall and Sundem (1980) indicated that there is an increase in application of sophisticated Capital Budgeting measures.

Petry and Sprow's (1993) did a study of 151 firms which indicates that about 60 percent of the firms use the traditional payback period for capital budgeting decisions. 90 percent of the firms use NPV and IRR either as a primary or as a secondary capital budgeting decision technique. Most of the respondents involved in senior financial management indicated that either they had not heard of the problems of IRR like multiple rates of return or a conflict between NPV and IRR or such problems rarely occurred.

Graham and Harvey (2002) did a survey of 392 CFOs and found that large firms utilized NPV and CAPM to a large extent. Smaller firms on the other hand utilized Payback method to a great extent. There is maximum likelihood of firms with high debt ratios to use NPV and IRR than firms with low debt ratios. They find that CEOs with MBA qualification are more likely than non-MBA CEOs to use NPV technique.

3. RESEARCH METHODOLOGY.

The survey planned to identify Capital Budgeting practices in India and mainly concerned with the main method utilized for making capital budgeting decision. For this purpose, a rough draft questionnaire was prepared based on an elaborate review of the existing literature. It was circulated to a group of prominent academics and power project experts for feedback. Their suggestions were duly incorporated and the questionnaire was revised accordingly.

The survey asked the power project experts to respond to most of the questions on capital budgeting method utilized for power projects on a Likert scale of 0 to 5 (where 0 means "not used", 1 means "unimportant and rarely used", 2 means “Slightly unimportant and sometimes used”, 3 means “neither unimportant nor important and fairly used”, 4 means “important and frequently used” and 5 means "very important and most often used"). This approach provided relevant and quantifiable data on the Capital Budgeting method used and relative significance of each method in the decision making process. These values were then analyzed using Anova and Kruskal Wallis test as suitable according to Levene’s test of homogeneity of variances. Few open ended questions were asked to the experts regarding other problems plaguing the power generation industry and which is related to capital budgeting and related aspects. Summary of these insights by power experts have been presented towards the end of data analysis and briefed up again in findings.

4. DATA ANALYSIS.

The responses were collected for 240 power projects through 78 top level Directors and Power experts. The responses were collected from 72 Central, 90 State and 78 Private power projects. The questions relate with use of Capital Budgeting techniques in Central, State and Private projects. The simple question asked is whether the project utilized NPV or other

technique and then they were asked to rate its importance. We have used the same Likert scale from 0 to 5 as discussed above. (where 0 means "not used", 1 means "unimportant and rarely used",2 means “Slightly unimportant and sometimes used”, 3 means “neither unimportant nor important and fairly used”, 4 means “important and frequently used” and 5 means "very important and most often used").

NPV Use: Let H_0 and H_1 be defined as follows:-

H_0 :All Central, State and Private sector projects view and use NPV in a similar fashion.

H_1 : Central, State and Private sector projects do not view and use NPV in a similar fashion.

Anova was envisaged to be applied with the help of MATLAB onto the available data and results analyzed. In addition, Multiple Comparison tests using Tukey Kramer procedure were designed to be applied if rejection of null hypothesis happens. Group 1 referred to NPV Use pattern of Central PSU projects whereas Group 2 and 3 correspond to NPV Use Pattern of State and Private power projects respectively.

Assumptions for applying Anova Test are:-

1) The individual observations are independent of each other.
2) The distribution of residuals should be normal.
3) There should be equality or homogeneity of variances in groups.
4) There should be no significant outliers.

The first assumption is taken care of by our approach of collecting data. The responses of other projects are not presented to respondents. Anova is fairly robust to violations of normality provided sample sizes are greater than 30 and not highly unequal. Hence, the second assumption is taken care of. Significant outliers have been checked by manual observation of data. Assumption for homogeneity of variances is an important assumption and needs to be checked. Levene’s Test is applied on the data and results analyzed as shown below:-

Group Summary Table

Group	Count	Mean	Std Dev
1	72	4.69444	0.59668
2	90	4.03333	0.58923
3	78	4.10256	0.61559
Pooled	240	4.25417	0.60013

Levene's statistic (absolute)	1.2505
Degrees of freedom	2, 237
p-value	0.2883

Fig. 1: Levene’s Test 1

As seen in the results, the p value for the Levene’s Test is 0.2883 which is more than 0.05 which signifies that the Levene’s test fail to reject our null hypothesis that the variances in the three groups are equal. Hence, we can safely apply Anova test and proceed towards the results.

The results after applying Anova are as displayed under:-

ANOVA Table

Source	SS	df	MS	F	Prob>F
Groups	20.139	2	10.0693	27.96	1.25491e-11
Error	85.357	237	0.3602		
Total	105.496	239			

Fig. 2: Anova Test 1

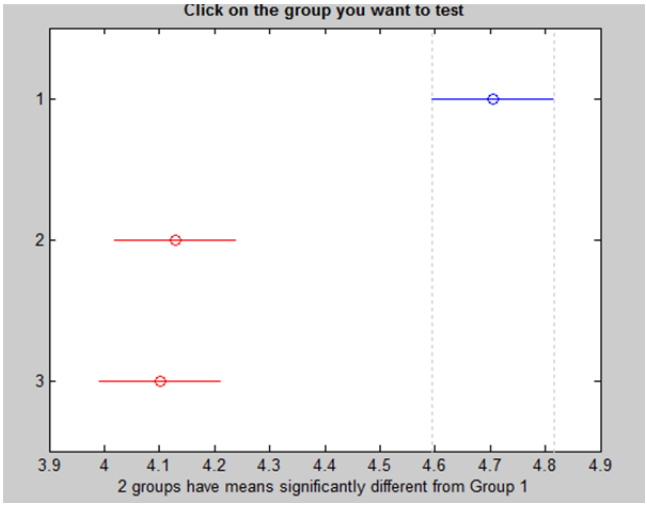

Fig. 3: Multicompare Test Results 1

```
means =

    4.6944    0.0707
    4.0333    0.0633
    4.1026    0.0680
```

Fig. 4: Mean Values 1

The p value of Anova test is much smaller than 0.05 which leads to rejection of null hypothesis. Hence, conclusion is made that the three groups are not similar. In addition, we can see from the multi comparison analysis invol.ving Tukey Kramer approach that Groups 2 and 3 which correspond to NPV Use patterns of State and Private PSU projects differ significantly to Group 1 which corresponds to NPV Use pattern of Central PSU projects. This signifies that NPV is very important and most often used at Central PSU projects. State and Private PSU projects on the other hand view them as important and frequently use them.

1. IRR Use: Let H_0 and H_1 be defined as follows:-

H_0 : All Central, State and Private sector projects view and use IRR in a similar fashion.

H_1 : Central, State and Private sector projects do not view and use IRR in a similar fashion.

Check for assumption of homogeneity of variance is done as all other assumptions were duly considered as in the case of NPV Use. Applying Levene's Test yielded the following result:-

Group Summary Table

Group	Count	Mean	Std Dev
1	72	4.55556	0.52779
2	90	4.6	0.55688
3	78	4.61538	0.56363
Pooled	240	4.59167	0.55056
Levene's statistic (absolute)	0.0073		
Degrees of freedom	2, 237		
p-value	0.9927		

Fig. 5: Levene's Test 2

As we can see from the Levene's Test, the p value is 0.9927 which is more than 0.05. Hence, Levene's Tets fails to reject the null hypothesis that the group variances are equal which signifies that we can safely proceed towards application of Anova test.

Anova was applied with the help of MATLAB onto the available data and results analyzed. Group 1 referred to IRR Use pattern of Central PSU projects whereas Group 2 and 3 correspond to IRR Use Pattern of State and Private power projects respectively. The results are as displayed under:-

ANOVA Table

Source	SS	df	MS	F	Prob>F
Groups	0.144	2	0.07201	0.24	0.7887
Error	71.8393	237	0.30312		
Total	71.9833	239			

Fig. 6: Anova Test 2

```
means =

    4.5556    0.0649
    4.6000    0.0580
    4.6154    0.0623
```

Fig. 7: Mean Values 2

As we can see from the results that p value of Anova test is 0.7887 which is more than 0.05. Hence, we fail to reject the null hypothesis and conclude that there is no significant difference between the three groups. This result and the value of means signifies that all the Central State and Private power projects view IRR as very important and use it most often. Next we move on to check the use of ARR technique. ARR stands for Average Rate of Return.

2. ARR Use: Let H_0 and H_1 be defined as follows:-

H_0 :All Central, State and Private sector projects view and use ARR in a similar fashion.

H_1 : Central, State and Private sector projects do not view and use ARR in a similar fashion.

Check for assumption of homogeneity of variance is done as all other assumptions were duly considered. Applying Levene's Test yielded the following result:-

Group Summary Table

Group	Count	Mean	Std Dev
1	72	2.76389	0.72176
2	90	2.91111	0.68112
3	78	2.83333	0.69163
Pooled	240	2.84167	0.69691
Levene's statistic (absolute)	1.388		
Degrees of freedom	2, 237		
p-value	0.2516		

Fig. 8: Levene's Test 3

As we can see from the results, p value of Levene's Test is 0.2516 which is more than 0.05. Hence, Levene's test fail to reject the null hypothesis that the group variances are all equal which signifies that we can safely proceed towards application of Anova test.

Anova was applied with the help of MATLAB onto the available data and results analyzed. Group 1 referred to ARR Use pattern of Central PSU projects whereas Group 2 and 3 correspond to ARR Use Pattern of State and Private power projects respectively. The results are as displayed under:-

ANOVA Table

Source	SS	df	MS	F	Prob>F
Groups	0.875	2	0.4375	0.9	0.4076
Error	115.108	237	0.48569		
Total	115.983	239			

Fig. 9: Anova Test 3

```
means =

    2.7639    0.0821
    2.9111    0.0735
    2.8333    0.0789
```

Fig. 10: Means Values 3

As we can see from the results that the p value of Anova is 0.4076 which is more than 0.05. Hence, we fail to reject the Null Hypothesis and conclude that the ARR Use pattern is almost similar among the three groups. Looking at the mean

values, we conclude that ARR is considered as slightly unimportant and not fairly used.

3. Payback Period Use: Let H_0 and H_1 be defined as follows:-

H_0 :All Central, State and Private sector projects view and use Payback Period in a similar fashion.

H_1 : Central, State and Private sector projects do not view and use Payback Period in a similar fashion.

Check for assumption of homogeneity of variance is done as all other assumptions were duly considered. Applying Levene's Test yielded the following result:-

Group Summary Table

Group	Count	Mean	Std Dev
1	72	3.26389	0.769
2	90	4.18889	0.66863
3	78	4.12821	0.69055
Pooled	240	3.89167	0.70709

Levene's statistic (absolute)	1.8266
Degrees of freedom	2, 237
p-value	0.1632

Fig. 11: Levene's Test 4

As we can see from the Levene's Test results, the p value is 0.1632 which is more than 0.05. Hence, we fail to reject our null hypothesis that the variances of the three groups are equal which signifies that we can safely proceed towards the application of Anova Test.

Anova was applied with the help of MATLAB onto the available data and results analyzed. Group 1 referred to Payback Period Use pattern of Central PSU projects whereas Group 2 and 3 correspond to Payback Period Use Pattern of State and Private power projects respectively. The results are as displayed under:-

ANOVA Table

Source	SS	df	MS	F	Prob>F
Groups	40.69	2	20.3452	40.69	6.4224e-16
Error	118.493	237	0.5		
Total	159.183	239			

Fig. 12: Anova Test 4

Looking at the results of Anova Test, the p value is very much smaller than 0.05 which rejects the null hypothesis and implies that the means of the three groups are not equal. Hence, we proceed towards the application of Multiple Comparison Test invol.ving Tukey Kramer procedure. The results are as displayed under:-

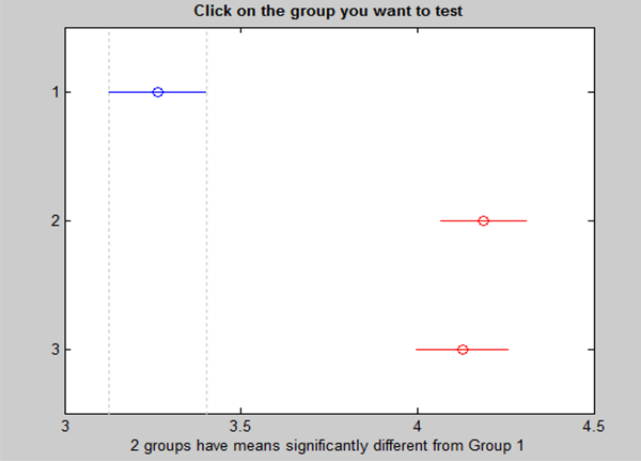

Fig. 13: Multicompare Test Results 2

```
means =

    3.2639    0.0833
    4.1889    0.0745
    4.1282    0.0801
```

Fig. 14: Mean Values 4

As we can see from the results of Tukey Kramer Test, the mean of group 1 is significantly different from groups 2 and 3. Hence, this result and the mean values leads us to believe that the Payback Period is considered neither unimportant nor important among Central Power projects. On the other hand, it is considered as important and frequently used among State and Private Power projects.

4. Modified IRR Use: Let H_0 and H_1 be defined as follows:-

H_0 :All Central, State and Private sector projects view and use Modified IRR (MIRR) in a similar fashion.

H_1 : Central, State and Private sector projects do not view and use Modified IRR (MIRR) in a similar fashion.

Check for assumption of homogeneity of variance is done as all other assumptions were duly considered. Applying Levene's Test yielded the following result:-

Group Summary Table

Group	Count	Mean	Std Dev
1	72	2.36111	0.61221
2	90	2.01111	0.66187
3	78	2.14103	0.63908
Pooled	240	2.15833	0.63991

Levene's statistic (absolute)	1.4697
Degrees of freedom	2, 237
p-value	0.2321

Fig. 15: Levene's Test 5

As we can see from the Levene's Test results, the p value is 0.2321 which is more than 0.05. Hence, we fail to reject our null hypothesis that the variances of the three groups are equal which signifies that we can safely proceed towards the application of Anova Test. Applying the Anova Test yielded the following results:-

ANOVA Table

Source	SS	df	MS	F	Prob>F
Groups	4.935	2	2.46731	6.03	0.0028
Error	97.049	237	0.40949		
Total	101.983	239			

Fig. 16: Anova Test 5

Looking at the results of Anova Test, the p value is smaller than 0.05 which rejects the null hypothesis and implies that the means of the three groups are not equal. Hence, we proceed towards the application of Multiple Comparison Test invol.ving Tukey Kramer procedure. The results are as displayed under:-

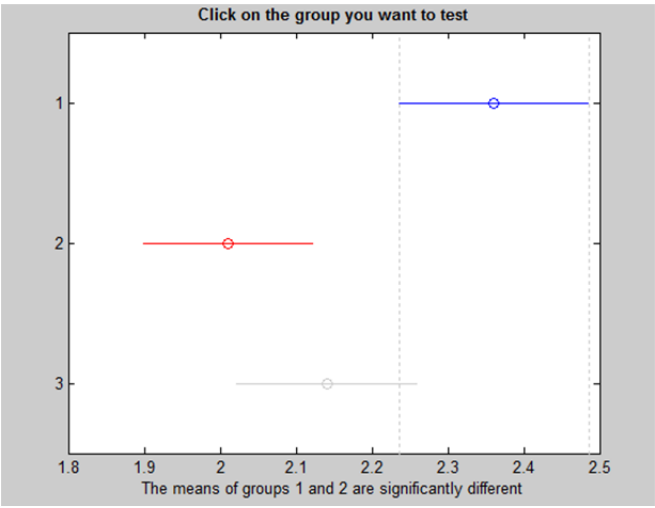

Fig. 17: Multicompare Test Results 3

```
means =

    2.3611    0.0754
    2.0111    0.0675
    2.1410    0.0725
```

Fig. 18: Mean Values 5

Looking at the tricky results of the Tukey Kramer Test, we come to the conclusion that Group 1 and 2 means are significantly different from each other while Group 3 means are not significantly different from either groups. This result and the value of means imply that Central power projects give slightly more importance to MIRR as compared to State power projects. Private power projects on the other hand come in between Central and State power projects when it comes to giving importance to MIRR. It can be safely assumed that all the groups do not treat MIRR as important. Next, we move on to check PI or Profitability Index use.

5. PI Use: Let H_0 and H_1 be defined as follows:-

H_0 : All Central, State and Private sector projects view and use PI in a similar fashion.

H_1 : Central, State and Private sector projects do not view and use PI in a similar fashion.

Check for assumption of homogeneity of variance is done as all other assumptions were duly considered. Applying Levene's Test yielded the following result:-

Group Summary Table

Group	Count	Mean	Std Dev
1	72	2.20833	0.69073
2	90	2.12222	0.61494
3	78	2.11538	0.60261
Pooled	240	2.14583	0.63476

Levene's statistic (absolute)	2.6567
Degrees of freedom	2, 237
p-value	0.0723

Fig. 19: Levene's Test 6

Results show us that the p value of Levene's Test is 0.0723 which is more than 0.05. Hence, we conclude that our null hypothesis that the variances in the three groups are equal cannot be rejected and we can safely proceed towards application of Anova Test. Applying the Anova Test yielded the following results:-

ANOVA Table

Source	SS	df	MS	F	Prob>F
Groups	0.4037	2	0.20187	0.5	0.6066
Error	95.4921	237	0.40292		
Total	95.8958	239			

Fig. 20: Anova Test 6

```
means =

    2.2083    0.0748
    2.1222    0.0669
    2.1154    0.0719
```

Fig. 21: Mean Values 6

The p value of Anova Test is 0.6066. It signifies that the null hypothesis of assuming the three groups to have equal means cannot be rejected. This result and the value of means reveal

that all the three groups of Central, State and Private power projects view PI as slightly unimportant and only sometimes use it.

Similarly, Discounted Payback and EVA methods were analyzed. It was found that all Central, State and Private power projects view Discounted Payback Period as slightly important and use it fairly. EVA was found to be slightly important to Central power projects while State and Private ones view it as slightly unimportant.

Finally, power experts answered few open ended questions regarding any specific problems encountered in utilizing these methods, method of risk incorporation, problems in data collection and any improvements or further research suggested. According to the experts, calculating weighted average cost of capital is a big concern mostly because the cost of equity is not scientifically applied. Most of the time subjective rules are followed to arrive at the cost of equity or the CERC or other regulating agency established cost of equity is taken for calculation of discount rate. This has been stated as fundamentally wrong by experts. There is also a concern to raise cost of equity to correctly reflect increased risk of certain projects. There is also a concern that risk in subjectively taken into consideration by increasing the Hurdle Rate in case of IRR or increasing discount rate in case of NPV. Hence, a suitable method should be researched such that it would be scientific and logical to do so. Data collection for making capital budgeting decisions in Merchant power plants is comparatively difficult as compared to Independent power plants. This is because of greater uncertainty encountered in Merchant power plants. Finally, there are concerns for further researching any new methodologies for determining risk in power projects which quantifiably takes into consideration all qualitative and quantitative aspects of risk.

5. FINDINGS

1) NPV is viewed as most important and frequently used at Central Power Projects. State and Private Power Projects, on the other hand, view them as important but use them less commonly than Central Power Projects.
2) IRR is viewed as equally important among Central, State and Private Power Projects. All of the power projects value them and use them frequently. It highlights focus of Central Power Projects on more financially sound methods as compared to State and Private Power Projects.
3) ARR is seen as neither important nor unimportant and fairly used along with other Capital Budgeting methods. It is treated equally among Central, State and Private Power Projects.
4) Payback Period is considered important by State and Private Power Projects and frequently used by them. It is considered neither important nor unimportant by Central Power Projects and used by them along with other Capital Budgeting methods.
5) MIRR is seen as slightly less important by the power projects. Treatment wise Central Power Projects give them slightly higher importance as compared to others. State Power Projects comparatively gives them the least importance.
6) PI is seen as slightly unimportant by the power projects. All the Central, State and Private Power Projects treat PI similarly and there is no significant difference among their treatments.
7) Discounted Payback Period is seen as slightly important by the Power Projects. The entire Central, State and Private Power Projects treat Discounted Payback Period similarly and there is no significant difference among their treatments.
8) There is a significant difference among the Power Projects when EVA use is considered. Central Power Projects view EVA as slightly important and use it frequently. State and Private Power Projects, on the other hand, view them as slightly unimportant and seldom use it.
9) Power projects are not determining cost of equity on a scientific and objective basis.
10) There are issues in accurately establishing weighted average cost of capital because of cost of equity issues.
11) Data Collection is an issue with Merchant Power Plants because of greater uncertainty.
12) Risk is measured subjectively and also incorporated subjectively in capital budgeting methods.

6. RECOMMENDATIONS

1) State and Private Power Projects should enhance their utilization of NPV because it has been theoretically established as financially sound. Use of NPV by Central Power Projects proves that they are not so difficult to use.
2) MIRR should be used more often as compared to IRR. It is more financially sound as it assumes that only positive cash flows are reinvested at the firm's cost of capital and the initial outlays are financed at the firm's financing cost. MIRR more accurately reflects the cost and viability of a project.
3) State and Private Power Projects should place more importance on Discounted Payback Period as it gives more practical information than Payback Period as it considers the time value of money. It may be considered an important factor apart from NPV in making decisions.
4) More importance should be given to EVA as a Capital Budgeting tool by all the Power Projects. It should be used along with NPV as it gives more importance to current earnings and correctly incorporates the Weighted Average Cost of Capital.
5) Cost of equity should be calculated using sophisticated models like Capital Asset pricing Model, Fama French Model and other innovative models. Accurately determining cost of equity will automatically solve accurate weighted cost of capital determination issues.

6) Further research should be done on risk so as to accurately and scientifically reflect it in capital budgeting techniques.
7) New and innovative methods should be researched for determining risk in a scientific and objective way.
8) New methodologies should be worked out for Merchant power plants so as to accurately predict future cash flows of the projects. Using certainty equivalent values of cash flow is another easily applicable suggestion. New methods of risk incorporation can be utilized in Merchant power plants also so as to make a correct decision.

7. LIMITATIONS

1) The Capital Budgeting methods included in the study are limited.
2) Information received by the power projects may be biased.
3) Kruskal Wallis Test as applied in one case is not a strong test.
4) Power Projects may use same Capital Budgeting tool differently. This has not been researched in this study.
5) Few issues in the power sector were not explicitly expressed like those of corruption.

8. CONCLUSION

It has been observed that there is a tendency of only Central Power Generation Projects to use more financial sound tools for Capital Budgeting purpose. Subsequently, our general assumption is broken according to which Private Power Generation Projects were assumed to be performing better in terms of applying sophisticated methods of Capital Budgeting. Private Power Projects were in fact found to be performing poorly than Central and State ones in applying NPV, MIRR, Discounted Payback and EVA methods. Similar concerns were raised by power experts according to which, privatization of power, is simply not going to increase efficiency or reduce the so called corruption existing in the power sector. Experts emphasize that increasing role of regulation and monitoring by other agencies such as Comptroller and Auditor General is necessary in checking corruption and increasing efficiency of power sector. Cost of equity is also found to be an important issue. Either no special attention is paid to cost of equity or it is subjectively assumed either by experts or by the rate established by the CERC or other regulating agencies. There is also a concern to raise it as it is generally found low as compared to the higher risk inherent in the power project. More research is needed to suitably establish cost of equity using maximum information and objective methods. Similarly, more research is needed to determine risk in a scientific and objective way incorporating all qualitative and quantitative information and also utilize it effectively in making capital budgeting decisions. Such innovative tools would also make it possible to determine future cash flows effectively in case of Merchant power plants which are generally concerned with more uncertainties.

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