# A Survey of Capital Budgeting in Publicly Traded Utility Companies

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## Abstract

*This research was undertaken to determine which capital budgeting techniques publicly traded utility companies are currently using and to ascertain if they had changed their emphasis on the use of capital budgeting techniques in the last ten years. Secondary goals of the research project included determining how often companies overturn negative capital budgeting analyses, discovering which features of the capital budgeting techniques companies find most attractive, and how often post-completion audits on capital budgeting projects are conducted. A survey was sent to 207 publicly traded utility companies asking questions concerning capital budgeting techniques used and changes to the techniques used. The responses indicate that payback, net present value and internal rate of return are the techniques used most often. Perhaps the most surprising finding of this study is that 27.3% of the respondents indicated that their companies do not use capital budgeting techniques.*

## I. Introduction

Capital budgeting is the process of analyzing projects and deciding whether they should be included in the capital budget. Unfortunately, many companies that use capital budgeting systems overrule the capital budgeting committee's decisions. According to Boquist et al. (1998, p. 59), "The history of corporate America is littered with examples of poor investment decisions, ranging from investing too little in positive NPV (net present value) projects and too much in negative NPV projects, to investment myopia."

Utility companies typically make a variety of long-term investments, but the most common investments for utility companies are in fixed assets, which include land, plant and equipment. Utility companies, which utilize a formalized capital budgeting system, typically analyze proposed projects using modern capital budgeting methods. The body of knowledge in finance contains numerous capital budgeting research articles based on large corporations. Ramirez, Waldman and Lasser (1991), and Cooper, Cornick and Redmon (1992) reported on capital budgeting practices in Fortune 500 companies. Petry and Sprow (1993) reported on capital budgeting practices in *Business Week* 1000 firms, Apap and Wade (1995) reported on capital budgeting practices of large hospitals, while Cook and Rizzuto (1989) reported on capital budgeting practices in *Business Week's* annual scoreboard of major R&D firms. However, a search of the literature indicates that there is no published research on traditional capital budgeting methods in publicly traded utility companies.

Capital budgeting research in the area of utility companies should be of vital interest to the management personnel of all utility companies as well as investment bankers, venture capitalists, investors, and other researchers. Accordingly, this research was undertaken to determine which capital budgeting techniques utility companies are currently using and to ascertain if they have changed their emphasis on the use of capital

budgeting techniques in the last ten years. Additional goals of the study were to determine what discount rates utility companies use for capital budgeting, how often they overturn negative capital budgeting analyses, and to discover the propensity of these companies to conduct post-completion audits.

## II. Methodology

The questionnaire used was a modified version of the one used by Burns and Walker (1992) in their capital budgeting survey of the Fortune 500 companies. For the current study, the questionnaire was sent to the 207 utility companies listed in *Value Line.* The questionnaire was designed to determine:

a. How respondents became familiar with capital budgeting methods.
b. If utility companies use modern capital budgeting methods.
c. What features of the methods used are most attractive.
d. If utility companies changed emphasis on methods used in the past ten years.
e. How often utility companies overturn negative capital budgeting analyses.
f. How often utility companies conduct a post-completion audit.
g. What discount rate utility companies use.
h. Decision areas where capital budgeting techniques are most useful.

After deducting one questionnaire returned as undeliverable, the sample size was reduced to 206 publicly traded utility companies. Two mailings were required to obtain sufficient data to complete the study. The response to the first mailing was low, 20 responses, equating to a 9.7% response rate. A personal request for information was handwritten and signed on the questionnaires used for the second mailing. The number of useable responses received in the second mailing was 24, for a total of 44 returned questionnaires, which equated to an overall response rate of 21.4%. The response rate of the current study is average when compared to similar research on large companies. Ramirez et al. (1991) and Cooper et al. (1992) reported response rates of 17% and 22%, respectively, when reporting on capital budgeting practices of Fortune 500 companies. Apap and Wade (1995) reported a response rate of 22.5% in their large hospital study. Petry and Sprow (1993) reported a response rate of 33.6% on a survey of the *Business Week* 1000 firms, and Cook and Rizzuto (1989) experienced a 19.5% response rate on a survey of large R&D firms. Since there is a no published research on capital budgeting in utility companies, it is difficult to determine what constitutes a normal response rate for surveys of these companies.

## III. Survey Results

Respondents were provided the opportunity to check a box on the first page of the questionnaire indicating that their company did not use capital budgeting techniques. A total of 12 respondents (27.3%) selected this alternative. This response was not expected and indicates that some utility companies are not convinced of the efficacy of modern capital budgeting techniques. This supports the finding of Williams (1998). The remaining data presented in this study are from the 32 respondents who indicated that their companies currently use modern capital budgeting techniques.

A primary goal of this study was to ascertain which capital budgeting techniques are currently being used by the nation's publicly traded utility companies and why. The first section of the questionnaire was devoted to answering these questions. A second, equally

important goal, was to determine if these companies had changed their emphasis on the use of capital budgeting techniques in the last ten years. The second section of the questionnaire addressed this question. The final section explored the areas of capital budgeting analysis conflict resolution, the propensity to overrule a negative capital budgeting analysis, post-completion audits, and the discount rate used by utility companies.

## IV. Current Capital Budgeting Methods

**Table 1**
**Familiarity with Capital Budgeting Techniques**

| | PBP | DPBP | ARR | IRR | MIRR | PI | NPV |
|---|---|---|---|---|---|---|---|
| Percent | 94% | 63% | 47% | 91% | 44% | 31% | 97% |
| Companies | 30 | 20 | 15 | 29 | 14 | 10 | 31 |

This section began by asking the respondents to list capital budgeting techniques with which they were familiar. As shown in Table 1, most respondents (94%) indicated familiarity with payback period (PBP), 91% were familiar with internal rate of return (IRR), and 97% were familiar with net present value (NPV)**.** Twenty of the respondents (63%) were familiar with discounted payback period (DPBP). The familiarity of the respondents with the remaining capital budgeting techniques was minimal, with 47% familiar with accounting rate of return (ARR), 44% familiar with modified internal rate of return (MIRR), and 31% familiar with profitability index (PI). The low familiarity rate with PI is surprising when one considers the simplicity of the technique and the usefulness of PI when ranking acceptable capital budgeting projects. Ten respondents listed familiarity with other capital budgeting techniques, with five choosing economic value added (EVA), and two choosing return on investment (ROI).

**Table 2**
**How Respondents Became Familiar with Methods Used**

| | **No.** | **%** |
|---|---|---|
| College education | 30 | 94 |
| Peers and colleagues outside the firm | 22 | 69 |
| Internal Procedures Manuals | 15 | 47 |
| Trade Journals | 10 | 31 |
| Outside consultants' advice | 9 | 28 |
| In-house training seminars | 9 | 28 |
| Association meetings | 6 | 19 |
| Continuing education | 1 | 3 |
| Peers and colleagues inside firm | 1 | 3 |

Note: some respondents indicated more than one learning method.

The respondents were then asked how they personally became familiar with the methods their companies use. This question was answered by 32 respondents and some indicated more than one learning method. Almost all of the respondents (94%) ranked formal education most important. This finding helps to explain why PBP, IRR, and NPV

were identified as the most familiar capital budgeting techniques in the previous section. These are the methods taught most often by universities in managerial finance and managerial accounting courses. Peers and colleagues outside the firm was ranked important by 69% of the respondents, followed by internal procedures manuals (47%), and trade journals (31%). In their large hospitals study Apap and Wade (1995) also found education to be the most important learning method; however, large hospitals reported continuing education and peers and colleagues outside the hospital as the second and third most important methods. The remaining rankings were widely dispersed among the other learning processes such as outside consultants' advice (28%), in-house training seminars (28%), association meetings (19%), continuing education and peers and colleagues inside the firm were chosen the least (3%) by the respondents. Table 2 summarizes the responses concerning how respondents personally became familiar with the methods their companies use.

**Table 3**
**Number of Years Methods Used**

| | 1 Year | | 2-5 Years | | 6-10 Years | | Over 10 Years | |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % |
| PBP | 0 | 0 | 2 | 7 | 2 | 7 | 24 | 86 |
| DPBP | 0 | 0 | 3 | 17 | 1 | 6 | 14 | 78 |
| ARR | 0 | 0 | 1 | 10 | 0 | 0 | 9 | 90 |
| IRR | 0 | 0 | 2 | 7 | 5 | 17 | 22 | 76 |
| MIRR | 0 | 0 | 3 | 33 | 2 | 22 | 4 | 44 |
| PI | 0 | 0 | 4 | 44 | 0 | 0 | 5 | 56 |
| NPV | 0 | 0 | 1 | 3 | 4 | 14 | 24 | 83 |

Legend: No: Number of firms using method for that time period
%: Percentage of firms using method for that time period

Next, the respondents were asked how long their companies had used the various capital budgeting techniques. Table 3 provides a breakdown of all the capital budgeting techniques and how long respondents indicated they had been using these methods. The respondents indicated that NPV, IRR, and PBP were the methods used the longest. In the last 10 years five respondents indicated their firms added MIRR, four added DPBP, and four added PI. These findings support the research by Apap and Wade (1995).

Then, the respondents were asked to list the attractive features of each capital budgeting method used by their companies. Table 4 indicates the number of respondents who chose each of the features listed. Some respondents selected more than one attractive feature per capital budgeting method. Concerning PBP, 12 of the 15 respondents who listed this method indicated that the most attractive feature was "ease of understanding." A secondary reason chosen was "ease of computation." Only one respondent chose to rank the attractive features of DPBP, and chose "uses time value of money" as the most attractive feature. Concerning IRR, the 19 respondents who chose to rank the attractive features of this method indicated that "uses cash flow" and "uses time value of money" were the most attractive features. Of the 26 respondents who ranked NPV, the most attractive feature was "uses time value of money," followed by "uses cash flow" and "reliable over time."

**Table 4**
**Capital Budgeting Method Attractiveness**

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| PBP | 4 | 12 | 9 | 1 | 1 | 3 | 2 | 0 | 0 |
| DPBP | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| ARR | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| IRR | 6 | 7 | 3 | 1 | 4 | 1 | 14 | 9 | 0 |
| MIRR | 1 | 1 | 0 | 0 | 4 | 0 | 0 | 3 | 0 |
| PI | 1 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 |
| NPV | 7 | 5 | 2 | 4 | 13 | 0 | 13 | 18 | 0 |

Legend:

A. Familiarity with method
B. Ease of understanding
C. Ease of computation
D. Ease of data gathering
E. Reliable over time
F. Quick look at liquidity/risk
G. Uses cash flow
H. Uses time value of money
I. Other

The final question in this section asked the respondents if their companies used more than one capital budgeting method, and if so, to indicate why. Thirteen percent of the respondents indicated their companies used only one method. Fifty-nine percent indicated their companies used more than one capital budgeting method because "different methods are needed for different situations", and 72% indicated that "some methods give us information others don't." The remaining reasons for using more than one method were "different management executives want different methods" (31%), and "we don't have total confidence in any one method" (16%). The results in this section support the findings of Chadwell-Hatfield et al. (1996).

## V. Changes in Emphasis on Techniques Used

**Table 5**
**Change in Emphasis Past Ten Years**

| | PBP | DPBP | ARR | IRR | MIRR | PI | NPV |
|---|---|---|---|---|---|---|---|
| More Emphasis | 15% | 4% | 0% | 56% | 26% | 23% | 74% |
| Less Emphasis | 48% | 22% | 33% | 23% | 11% | 15% | 7% |

This section started by asking respondents to indicate if their companies had placed more or less emphasis on a particular method during the past ten years. Five respondents (16%) indicated emphasis had not changed. Table 5 indicates that 74% of the companies placed more emphasis on NPV, while 56% placed more emphasis on IRR during the past 10 years. The method chosen to receive less emphasis by the greatest number of respondents (48%) during the past ten years was PBP. The responses to this question indicate a shift of emphasis to NPV and IRR, which are more sophisticated capital budgeting methods, and away from the most commonly used unsophisticated method (PBP). The results in this section support the findings of Apap and Wade (1995).

The respondents were then requested to indicate the reason(s) their companies had changed emphasis concerning capital budgeting methods during the past ten years. The

most common reasons respondents provided for placing more emphasis on IRR and NPV during the past ten years were:

- More accurate
- Better long-term measurement
- Based on cash flow and time value of money
- More reliable

The most common reasons provided by respondents for placing less emphasis on PBP during the past ten years were:

- NPV and IRR provide a more accurate analysis
- Needed more sophisticated models as company became more complex
- Does not take into account time value of money

## VI. Capital Budgeting Decisions

In this section the respondents were asked to indicate which capital budgeting method takes priority in the event of a conflict between methods. Most of the respondents (84%) indicated that their companies had identified a method to settle conflicts. The methods chosen most often to take priority in the event of a conflict were NPV (56%) and IRR with 19% of the responses, followed by MIRR with 4%. Six of the respondents chose other methods, such as judgment, EVA, and consider all the facts. None of the remaining capital budgeting methods were used to settle conflicts. This finding supports the research of Ryan and Ryan (2002) who found that Fortune 1000 firms primarily use NPV to settle conflicts.

As an amplification of the previous question, respondents were asked what percent of the time their companies overruled a negative capital budgeting analysis and why. Ten (34%) of the 29 respondents who answered this question indicated that their companies never overruled a negative capital budgeting analysis. Of the 19 companies that reported overruling capital budgeting analyses, the mean response was 27% of the time. Surprisingly, four of the respondents (14%) indicated their companies overruled a negative capital budgeting analysis more than 39% of the time. The reasons provided for overruling a negative capital budgeting analyses varied greatly; however, the most common reasons cited were:

- Government regulations
- Strategic requirements
- Safety regulations
- Environmental regulations
- Other business reasons

The next question asked the respondents to indicate what percent of the time their companies conduct a post-completion audit for capital budgeting projects. The mean response was 36% of the time for the 29 respondents who answered this question. However, with the exception of seven respondents (24%) who indicated that their companies conducted post-completion audits 10% of the time, the remaining responses were widely dispersed. For example, 17% chose never, and 17% indicated their companies always conduct a post-completion audit. Some of the respondents added that audits were completed only if the project exceeded a specified monetary amount. These findings support the research of Cooper, Cornick and Redmon (1992) who reported that 19.6% of the respondents indicated their firms had no review mechanism. They also

reported that their respondents indicated that the post-completion audit process did not affect future capital budgeting decisions.

When asked what discount rate utility companies use for capital budgeting, 17 respondents (53%) of the 29 who answered this question indicated they use weighted average cost of capital (WACC). Four respondents said their companies used different discount rates for each company unit, and two respondents stated that their companies used risk-adjusted WACC. Five respondents indicated their companies used fixed percentages, and the average of the percentages the respondents provided is 9.05%.

The final question asked the respondents to indicate the decision areas where capital budgeting techniques proved most useful. Acquisition of new equipment was the reason indicated by 100% of the 31 respondents who answered this question. Twenty-three of the respondents (74%) chose acquisition of buildings/land, and 68% chose renovation of fixed assets as areas where capital budgeting is useful in the decision making process. Surprisingly, 55% of the respondents chose mergers as a decision area where capital budgeting is "most useful." While it is well known that capital budgeting is useful in the merger decision process, it is surprising to discover how many utilities are active in this area. Other choices provided for decision areas where capital budgeting is useful were relocation of firm operations (10%), and downsizing (6%).

## VII. Summary and Conclusions

The body of knowledge in finance contains numerous capital budgeting research articles based on large corporations. However, a search of the literature indicates there is no published research on capital budgeting in publicly traded utility companies. Capital budgeting research in the area of utility companies should be of vital interest to the managements of these companies, investment bankers, venture capitalists, investors, and other researchers. This research was undertaken to determine which capital budgeting techniques utility companies are currently using and to ascertain if they had changed their emphasis on the use of capital budgeting techniques in the last ten years. Additional goals of the study were to determine how often the companies overturn negative capital budgeting analyses and to discover the propensity of the companies to conduct post-completion audits.

The results of the study indicate 27.3% of the utility companies surveyed do not use capital budgeting techniques during their budgeting process. This finding was unexpected by the researchers, particularly when these techniques are strategic for the successful analysis of purchases of land and equipment, mergers, acquisitions, expansion, and bond refunding. Another important finding of the study is that utility companies that do use capital budgeting techniques incorporate NPV, IRR and PBP into their systems. It is encouraging to note that NPV and IRR have gained in popularity during the past ten years, while the use of PBP has declined. Although the trend is towards utilizing the more sophisticated methods, it appears that when the budgeting process reaches the decision stage a negative capital budgeting analysis is sometimes overruled. Although the reasons provided for overruling a negative capital budgeting analysis (strategic requirements and other business reasons) appear to be rational justification, the end result of this practice could lead to utility companies spending their capital budgets on expensive equipment and mergers/acquisitions that are not fully justified. When the propensity to overrule negative capital budgeting analyses is coupled with the finding that respondents indicated their companies conducted post-completion audits only 36% of the time, it is evident that a serious inefficiency in the budgeting process could occur and go undetected.

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