Asian Journal of Business and Accounting, 1(2), 2008, 175-192 ISSN 1985-4064

Capital Budgeting Practices of Listed Indonesian Companies

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Abstract

This article reports the results of a survey of executives of companies listed on the Jakarta Stock Exchange regarding their companies' capital budgeting practices and the major factors influencing their practices. The results show that the majority of responding companies use formal techniques to evaluate proposed capital investments. Of these companies, the majority use a discounted cash flow technique as the primary measure for evaluating capital investment proposals. Scenario and sensitivity analysis are the most commonly-used risk assessment techniques. Risk-adjusted discount rates and the CAPM are not yet widely used in Indonesia. The most important objectives in capital budgeting are growth in cash flows and long-term earnings followed by growth in share price. The results also show that chief financial officer educational background and period of listing influence capital budgeting analysis technique usage.

Keywords: capital budgeting practice; capital investment analysis; discounted cash flow analysis; investment ranking; risk analysis.
JEL classification: G31, G32

1. Introduction

Finance theory stipulates the use of discounted cash flow (DCF) techniques, which come in the form of the Net Present Value (NPV) and the Internal Rate of Return (IRR), as the most appropriate criteria in evaluating capital investments. In addition, other competing non-DCF based techniques exist such as the Payback Period and the Accounting Rate of Return that are also widely used by companies. The question that begs investigation is whether or not companies do actually use the "correct" techniques to

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evaluate capital projects. Survey evidence in developed countries suggests a widespread use of DCF methods, while evidence in developing countries is rather scanty and varied. The current study contributes to and updates existing literature as it brings evidence on the capital budgeting practices of top Indonesian companies listed on the country's stock exchange.

The executives of listed Indonesian companies were included in a 1997 survey of capital budgeting practices in Australia, Hong Kong, Indonesia, Malaysia, the Philippines and Singapore, conducted and reported by Kester, Chang, Echanis, Shalahuddin, Mansor, Skully, Tsui and Wang (1999). However, of the 75 Indonesian companies surveyed, only 16 or 6.2% responded. Moreover, the survey was conducted in the midst of the Asian financial crisis. The current study is much more extensive and reports the results of 108 responses to a survey of 229 listed companies. Capital budgeting, sometimes called capital investment analysis, refers to the financial evaluation of capital investment proposals within a company. Examples include decisions related to equipment replacement, plant modernization, plant expansion, and c in new products. Simply stated, capital budgeting involves evaluating whether the future cash flows resulting from a proposed investment justify the investment, given the uncertainties or risk of the cash flows.

Capital budgeting transcends the functional areas of companies. Equipment replacement and modernization decisions originate in the operations/production area of companies and new product proposals originate in marketing. Senior executives, regardless of functional area, serve on management committees that approve major capital investments. In many companies, large capital investments may require Board approval. A directive (Kep-05/PM/2000) of the Indonesian Capital Market Supervisory Board (BAPEPAM) requires that investments in excess of 10 percent of company revenue or 20 percent of equity must be approved in a general meeting of company shareholders.

Economic theory tells us that a company should expand (accept proposed capital investments) to the point where its marginal return is just equal to its marginal cost. However, many companies ration capital and place a limit on the size of their capital budgets. The principle reason for capital rationing is that some companies are reluctant or find it difficult to obtain external financing. A limit may be placed upon the companies' borrowing by management preference or external lending institutions. In the case of external equity (selling common stock), their reluctance may be from fear of losing voting control or because conditions in the stock market are unfavourable (low prices). In a 1976 survey of large United States companies, Gitman and Forrester (1977) found that 52 percent of respondents engaged in capital rationing. By far, the most frequently cited cause was a limit placed on borrowing by internal management. In their survey of capital budgeting practices of listed companies in Australia, Hong

Kong, Indonesia, Malaysia, the Philippines, and Singapore, Kester et. al. (1999) found that more than half of the respondents in Indonesia and the Philippines indicated that their companies practice capital rationing. When companies engage in capital rationing, not all worthwhile proposed investments can be accepted. In such environments, it is especially important that appropriate analytical methods and decision rules be used to help select those investments that most effectively help companies maximize shareholder value.

This paper reports the results of surveys of executives of companies listed on the Jakarta Stock Exchange (JSX) regarding their companies' capital budgeting practices. The results are compared to previous surveys of executives of listed companies in Indonesia, other countries in the Asia Pacific Region, and elsewhere. We also examine the major factors influencing capital budgeting technique usage in Indonesia.[1] The factors considered include the chief financial officer's educational background, respondent company's asset size, annual changes in net fixed assets, industry type, period of listing, type of ownership, and financial risk.

2. Previous Research

Executives of large companies in the United States (U.S.) have been extensively surveyed regarding their companies capital budgeting practices. These include surveys reported by Mao (1970), Klammer (1972), Fremgen (1973), Petty, Scott, and Bird (1975), Gittman and Forrester (1977), Schall, Sundem, and Geijsbeek (1978), Kim and Farragher (1981), Hendricks (1983), Klammer and Walker (1984), Bierman (1993), Trahan and Gittman (1995), Chen (1995), and Payne, Heath and Gale (1999). These surveys, which have focused primarily upon methods of evaluating project profitability and risk, have shown that the sophistication of the analytical techniques used by U.S. executives has increased over time. Discounted cash flow (DCF) techniques, such as net present value (NPV), internal rate of return (IRR), and profitability index (PI), which are based on cash flows and take into account the time value of money, have become the dominant methods of evaluating and ranking proposed capital investments. For example, Klammer (1972) found that whereas only 19 percent of his sample of large industrial companies used DCF techniques to evaluate proposed capital investments in 1959, the percentage increased to 38 percent in 1964 and 57 percent in 1970. Hendricks (1983) reported that the percentage was 76 percent in 1981. Bierman (1993) reported that 99 percent of the respondents in his 1992 survey of the 100 largest Fortune 500 companies used IRR or NPV as either the primary or secondary evaluation measure.

[1] In September 2007, the Jakarta Stock Exchange (JSX) merged with the Surabaya Stock Exchange (SSX) to form the Indonesian Stock Exchange or Bursa Efek Indonesia (BEF).

These studies have shown that, although non-DCF techniques such as payback period and accounting rate of return (ARR) continue to be used, their use as primary evaluation measures has declined. However, they are used as secondary measures. For example, Bierman (1993) found that although payback was used extensively (84 percent of the respondents in his 1992 survey), not a single respondent used it as a primary measure.

Chen (1995) studied the use of different quantitative evaluation techniques across three types of investments: equipment replacement, expansion of existing products, and expansion into new products. The certainty of the related cash flows varies greatly when comparing proposals for routine equipment replacement and expansion into new products. He found that DCF techniques are used more widely than non-DCF techniques such as payback and accounting rate of return to evaluate all three types of investments. He also found that DCF techniques are relied upon more heavily in expansion projects than equipment replacement and that non-financial considerations play a significant role in capital budgeting, especially in decisions related to new products.

There is also survey evidence regarding capital budgeting practices in the Asia-Pacific Region. Lee and Ip (1984) reported the results of a survey of companies in Hong Kong in which they found that payback and NPV were the most frequently used methods.

In Australia, surveys of capital budgeting practices have been reported by McMahon (1981), Anderson (1982), Lilleyman (1984), Freeman and Hobbes (1991) and Kaleybara (1998), Troung, Partington and Peat (2008). Comparing the results of surveys by McMahon (1981), Lilleyman (1984), and their own survey results, Freeman and Hobbes (1991) reported an increase in the use of DCF techniques in Australia from 52 percent of respondents in 1979 to 75 percent in 1989. Kalyebara (1998) also found that 75 percent of respondents to his 1996 survey used NPV followed by IRR (63 percent) and payback (61 percent). Although he found that the use of DCF methods was predominant, payback was still popular. All respondents indicated that they used more than one method of evaluation. More recently, Troung, Partington and Peat (2008) found that 94% of respondents to their survey used NPV, followed by Payback (91%) and IRR (80%).

In his survey of companies listed on the New Zealand Stock Exchange, Patterson (1989) found that payback and accounting rate of return were more frequently used than NPV and IRR. However, at least one DCF technique was used at “least sometimes” by 75 percent of the responding companies. ARR was used as the primary measure by 53 percent of the responding companies. Payback was used as the primary measure by 42 percent of the responding companies. Less than a third of the respondents indicated that their companies used IRR as the primary measure.

In a 1983 survey of Malaysian companies, Han (1986) also found payback to be the most frequently used evaluation technique. He further reported that the most popular techniques for adjusting for risk were shortening the payback period and requiring higher rates of return for riskier projects.

In 1985, Wong, Farragher and Leung (1987) surveyed a large sample of companies in Malaysia, Hong Kong and Singapore. They found that the use of payback was the most popular primary measure for evaluating projects in Malaysia. In Hong Kong, they found payback and accounting rate of return to be equally popular. In Singapore, they found payback, IRR and NPV to be equally the most popular. They concluded that companies in Malaysia, Hong Kong, and Singapore preferred to use several techniques as primary measures of evaluating and ranking proposed investments. The study also found that companies in Malaysia, Hong Kong and Singapore did not undertake much risk analysis. The most popular risk assessment techniques used were sensitivity and scenario analysis.

With regard to the quantitative techniques used, the basic approach of these studies was to ask executives which quantitative techniques were used in their companies as primary and secondary measures in evaluating proposed investments. However, this approach has a weakness in that it does not provide information on the importance or weight that executives place on each method in making final accept-reject decisions. This weakness was addressed by Kester et. al. (1999) in their survey of capital budgeting practices of listed companies in Australia, Hong Kong, Indonesia, Malaysia, Philippines, and Singapore. In addition to asking executives which methods they used, they also asked executives to rate each method on a Likert-like scale of 0 to 5 (where 0 = not used, 1 = unimportant, and 5 = very important). This approach not only revealed which of the methods were used, it also provided information on the relative importance of each method in decision-making. Whereas they found that multiple techniques were used by the vast majority of the responding companies, DCF techniques (NPV or IRR) were ranked as the most important in Australia, Indonesia, Malaysia and the Philippines. In the case of Singapore, IRR and payback were ranked equally as the most important techniques. In Hong Kong, payback was ranked as the most important technique.

In a survey of companies listed on the Stock Exchange of Thailand in 1998, Arsiraphongphisit, Kester and Skully (2000) found that the most important evaluation technique was IRR, followed by payback and then NPV.

3. Data and Methodology

To elicit information regarding the capital budgeting practices of Indonesian companies, a survey was conducted on companies listed on

Table 1. Profile of Respondents

(a)	Job Title of Respondents	N	Percent (%)
	President	6	5.6
	President of finance	32	29.6
	Vice president of finance	15	13.9
	Controller	31	28.7
	Other	24	22.2
(b)	Time Respondent in Current Position		
	Less than one year	5	4.6
	1 to 5 years	42	38.9
	5 years or more	61	56.5
(c)	JSX Industry Classification		
	Agriculture	4	3.7
	Mining	2	1.9
	Basic industry and chemicals	22	20.4
	Industrial products	28	25.9
	Consumer goods	21	19.4
	Property, real estate and building construction	4	3.7
	Infrastructure, utility and transportation	5	4.6
	Trade, services, and investments	22	20.4
(d)	Age of Company		
	Less than 20 years	29	26.9
	20 to 29 years	50	46.2
	30 to 39 years	15	13.9
	40 to 49 years	6	5.6
	50 or more years	8	7.4
(e)	Period of Listing in JSX		
	Less than 5 years	5	4.6
	5 to 9 years	38	35.2
	10 to 14 years	41	38.0
	15 to 19 years	16	14.8
	20 or more years	8	7.4
(f)	Total Assets (Rupiah millions)		
	Less than 200,000	34	31.5
	200,000 to 699,999	30	27.8
	700,000 to 1,199,999	14	13.0
	1,200,000 to 1,6999,999	7	6.5
	1.700.000 or more	23	21.3
(g)	Sales Revenue (Rupiah millions)		
	Less than 100,000	29	26.9
	100,000 to 499,999	48	44.4
	500,000 to 899,999	11	10.2
	900,000 to 1,299,999	4	3.7
	1,300,000 or more	16	14.8
	Totals	108	100.0

Note: On 31 December 2000, the exchange rate was: 1 USD = Rp7,447.

the Jakarta Stock Exchange (JSX) during the period September 2000 to January 2001. A six-page questionnaire was designed to obtain information on the quantitative techniques used by companies to evaluate capital investment, assess risk, determine discount rates, and estimate the cost of equity capital. The survey instrument was pre-tested for clarity and accuracy before mailing to all listed companies in September 2000. To maximize the response rate, English and Indonesian language versions were mailed to the companies. However, the response rate was very low. Phone interviews were then conducted with the remaining companies. Although many declined to be interviewed, good quality responses were obtained from those who consented. In the end, usable responses were received from 108 companies. This represents a response rate of 47.2 percent of the 229 companies, listed on the JSX as at September 2000 excluding banks and finance companies. Information regarding the profiles of the respondents and their companies is listed in Table 1.

Most of the respondents (72.2 percent) held the titles of President of Finance, Vice President of Finance or Controller and, therefore, were directly involved with capital budgeting decisions. More than half of the respondents had been in their current positions more than five years. All but 7.4 percent (not shown in the Table) of the respondents were university graduates.

The main industries represented in the sample were industrial products (25.9 percent), basic industry and chemicals (20.4 percent), infrastructure, utility and transportation (20.4 percent) and consumer goods (19.4 percent). Most (74.1 percent) of the companies were domestically owned (companies with less than 20 percent ownership by foreigners), while the remaining 25.9 percent were foreign-owned. The age of most (73.1 percent) of the companies was twenty or more years and most (60.2 percent) had been listed on the JSX for at least ten years.

The majority (59.3 percent) of the companies had total assets of less than Rp700,000 million and net fixed assets changes less than Rp25,000 million (51.8 percent). The majority (71.3 percent) of companies had sales of less than Rp500,000.[2]

4. Results

4.1. Capital Budgeting Practices of Indonesian Companies

The results of the survey indicate that 81.5 percent (88 companies) of the responding companies use formal quantitative capital budgeting analysis techniques to evaluate and rank proposed capital investments. The remaining 18.5 percent (20 companies) of respondents indicated that their

[2] The Indonesian currency is called Rupiah (Rp). On 31 December 2000, the exchange rate between the Indonesian Rupiah and the US dollar was: 1USD = 7,447Rp.

Table 2. Quantitative Evaluation Techniques Used (N=88)

Techniques	N	Percent
Net present value	56	63.6
Internal rate of return	56	63.6
Payback Period	76	86.4
Profitability index	37	42.1
Accounting rate of return	36	40.9

Note: The percentages do not add up to 100% due to multiple responses.

companies do not. Of the companies that use formal capital budgeting analysis techniques, most respondents indicated that their companies calculate and use more than one measure. As shown in Table 2, the most commonly-calculated measure is the payback period with 86.4 percent usage rate, followed by the NPV and IRR, both with 63.6 percent usage rate. However, of these measures, 61.4 percent of the respondents who use formal capital budgeting analysis techniques indicated that they use a DCF technique (i.e., NPV, IRR or PI) as the primary measure for making capital budgeting decisions. The remaining 38.6 percent use a non-DCF technique (i.e., payback or ARR) as the primary measure.

In the case of 43.2 percent of the responding companies, formal quantitative evaluation techniques are only used for large and other types of proposed investments, certain types of equipment, and investments in new products. According to the other 56.8 percent of respondents, formal evaluation techniques are used for all proposed investments in their companies.

In their survey of capital budgeting practices of listed companies in Australia, Hong Kong, Indonesia, Malaysia, Philippines, and Singapore, Kester et. al. (1999) found that only half the executives responding to the survey from the Philippines indicated that their companies used multiple-risk-adjusted discount rates. Less than half of the respondents in Australia, Hong Kong, Indonesia, Malaysia, and Singapore use multiple risk-adjusted

Table 3. Method for Determining Discount Rate for Respondents using DCF Techniques as the Primary Measure

Discount Rate	N	Percent
Weighted average cost of capital	40	74.1
WACC adjusted for risk of new project	4	7.4
Divisional cost of capital	5	9.3
Other	5	9.3
Totals	54	100.0

discount rates. Only 12.5 percent of the respondents of Arsiraphongphisit, Kester and Skully's (2000) 1998 survey of companies listed on the Stock Exchange of Thailand indicated that their companies used multiple risk-adjusted discount rates.

In this survey, respondents who indicated that their companies use NPV or IRR as either primary or secondary measures were asked how their companies determined the discount rates to be used. The results are shown in Table 3. Only 16.7 percent of the respondents indicated that their companies adjust discount rates for risk, either on a project (7.4 percent) or divisional (9.3 percent) basis.

Table 4. Method in Calculating the Cost of Equity

Method	N	Percent
Cost of debt plus risk premium	50	46.9
Capital asset pricing model	16	14.7
Dividend yield plus growth rate	14	12.8
Accounting return on equity	14	12.8
Other	14	12.8
Totals	108	100.0

The most challenging component of a company's weighted average cost of capital (WACC) is the rate of return required by owners of the company's common stock (i.e. the cost of equity capital). Finance textbooks describe three basic methods to estimate a company's cost of equity capital: (1) capital asset pricing model (CAPM), based upon the company's beta, (2) the dividend yield plus expected growth rate method, and (3) the risk premium method (cost of debt plus risk premium). The respondents were asked which method their companies used. The results are shown in Table 4.

The most commonly-used approach is the risk premium method, used by 46.9 percent of the companies. This result is somewhat similar to the 1997 survey results reported by Kester et. al. (1999) for Indonesian companies, where 53.4 percent of the respondents indicated that their companies use the risk premia method.

Our survey of Indonesian companies also reveals that only 14.7 percent of the respondents indicated that their companies use the CAPM to estimate the cost of equity capital. In their earlier survey, Kester et. al. (1999) reported that none of the respondents in Indonesia indicated that their companies used the CAPM. Only 6.2% of their respondents in Malaysia, 17% in Singapore, 24.1% in the Philippines, and 26.9% in Hong Kong reported using the CAPM. In contrast, 72.7% of their respondents in Australia reported using the CAPM. A remarkably similar 72% of

respondents of a more recent survey of Australian companies by Truong, Partington and Peat (2008) reported using the CAPM. Similarly, Graham and Harvey (2001) found that 73% of surveyed U.S. and Canadian companies used the CAPM. McLaney et. al. (2004) found that 47% of companies in the UK used the CAPM as compared to 31% of surveyed companies in the UK, 31% in the Netherlands, 18% in Germany and 27% in France as reported by Brounen, De Jong and Leodijk (2004).

Table 5. Risk Assessment Techniques Used (N=108)

Method Used	Number of Users	Percentage Users	Frequency of Use Mean Score
Scenario analysis	73	67.5	2.61
Sensitivity analysis	47	43.5	1.80
Decision tree analysis	47	43.5	1.44
Probabilistic simulation	32	29.7	0.90
Other	16	14.9	0.60

Note: Mean scores are weighted average of the scores ranging from 1 very infrequently used to 5 for most frequently used.

Another area of interest in our study was to determine which techniques are used for assessing risk in Indonesia. As shown in Table 5, scenario analysis is the most used technique with 67.5 percent usage rate, followed by sensitivity analysis and decision tree analysis each with 43.5 percent usage rate. The frequency-of-use mean scores also indicate that the two most frequently used techniques in assessing project risk are the scenario and sensitivity analyses. Kester et. al. (1999) had similar results in their surveys of listed companies in Australia, Hong Kong, Indonesia, Malaysia, the Philippines, and Singapore as did Arsiraphongphisit, Kester and Skully (2000) in their survey of listed companies in Thailand.

Table 6. Capital Investment Objectives (N=108)

Objective	(1) Not Important (%)	(2) Minor Important (%)	(3) Important (%)	(4) Very Important (%)	(5) Extremely Important (%)	Mean Score
Growth in long term earnings	0.0	7.4	7.4	47.2	38.0	4.16
Increase future cash flow	7.4	6.5	17.6	19.4	49.1	3.96
Increase current earnings	7.4	12.0	27.8	35.2	17.6	3.44
Growth in market shares	12.0	13.0	26.9	30.6	17.6	3.29
Growth in stock prices	24.1	8.3	15.7	28.7	23.1	3.18

Another question posed to the respondents concerned their perception of the overall objective of the capital budgeting process. The results are shown in Table 6. The two most important objectives are "growth in long-term earnings" and "increasing future cash flows". Other objectives seem to be less important. Given a rather undeveloped capital market, it is not surprising that the objective of "growth in stock prices" is the least important in the eyes of the respondents.

4.2. Factors Influencing Capital Budgeting Practices

The second objective of this research project was to explore the factors that influence a company's capital budgeting practices. Given that most of the respondents were chief financial officers or those related to the finance function of large listed corporations, one would expect widespread usage of formal and more sophisticated capital budgeting analysis techniques. Our results as presented in the previous section reveal that of the 81.5 percent of the respondents (88 companies) that use formal quantitative capital analysis techniques, only 61.4 percent or 54 companies use a DCF technique (i.e., NPV, IRR, or PI) as the primary measure for evaluating their proposed capital investments.

Using the survey responses and other financial data obtained from the *Indonesian Capital Market Directory 1995-2002* and company annual reports, this section examines the issue further by postulating and testing several attributes that are presumably related to the capital budgeting project appraisal techniques used. Specifically, we used nonparametric chi-square contingency tests of independence to examine the significance of the relationship between the presumed attributes and the use of DCF techniques.[3] Table 7 presents results of the tests.

4.2.1. Education Background of the Chief Financial Officer

Our survey gathered the educational backgrounds of the Chief Financial Officers of the responding firms, which are categorized into either having a college or university education or no college or university education. We expected a greater percentage of the university educated respondents would use the DCF techniques as opposed to those without a university education. Our contingency test results in Panel (a) of Table 7 indicate that this is indeed the case, with 8 percent level of significance for the chi-square test.

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[3] The contingency test of independence is a nonparametric test represented by a chi-square statistic that tests the extent of association between two sets of attributes. Usage of this test does not need any assumption on the underlying distribution of the variables or continuity of the categories of the attributes. It is not even necessary to be able to order the categories in any particular way. It is uniquely useful when we have only categorical (nominal scale) of one or both sets of attributes.

4.2.2. Firm Size

We expected a positive relationship between firm size and the usage of DCF techniques. This expectation was based on the assumption that large firms would be able to afford qualified and competent managers who use sophisticated management techniques. Panel (b) of Table 7 shows the contingency results where firm size is divided into three categories based on their total assets with an equal number of firms in each category. The table shows that all firms, regardless of their size categories, show a high percentage of DCF usage. Our contingency test result shows that size does not have any influence on whether or not firms use DCF project appraisal techniques in their capital investments.[4]

4.2.3. Size of Annual Capital Investment

Annual capital investment is measured by annual increase in net fixed assets. It is expected that firms with a large annual investment in fixed assets would be more inclined to use sophisticated capital budgeting techniques as opposed to those with smaller investments. Panel (c) of Table 7 shows that there is no significant relationship between the size of capital investment and the use of sophisticated capital budgeting techniques.

4.2.4. Type of Industry

Companies in different industry types may behave differently in terms of capital budgeting practices. This may, for example, be due to differences in technology, competition, human resource skill, amount of investment in fixed assets, business risk, and so forth. Therefore, it seems reasonable to assume that the extent of usage of DCF techniques would be different between industries. Panel (d) of Table 7 shows our results. The contingency test fails to reject the null hypothesis that there is no difference between industries.

4.2.5. Period of Listing

We also tested if the period of listing on the JSX had any influence on the extent of use of DCF techniques. This test is motivated by the assumption that listed companies are subject to greater regulation and market monitoring. These companies are also closely analyzed in terms of their operations and performance by local and foreign analysts and investors. Those that have been listed over a long period of time would have been subject to much greater scrutiny than those recently listed. Therefore, it is reasonable to assume that period of listing would be positively related to

[4] We also examined the contingency test using total revenue to classify the firm size. Our test yields a chi-square statistic of 0.297, which is also not significant.

Table 7. Usage of Capital Budgeting Techniques in Relation to Various Company Attributes

	Usage of Capital Budgeting Technique			N	Chi-square significance
	DCF	Non-DCF	Not Used		
(a) Educational Level of the Respondents					
No college or university education	13%	50%	37%	8	0.080
With University education	53%	30%	17%	100	
(b) Company Size (Total Asset)					
Small	56%	22%	22%	36	0.948
Medium	44%	39%	17%	36	
Large	50%	33%	17%	36	
(c) Increase in Net Fixed Assets (Rp million)					
<50,000	55%	19%	26%	31	0.459
50,000 – 199,999	50%	33%	17%	30	
200,000 – 349,999	27%	64%	9%	11	
350,000 – 499,999	60%	40%	0%	10	
>=500,000	50%	27%	23%	26	
(d). Type of Industry					
Agriculture	25%	75%	0%	4	0.208
Mining	100%	0%	0%	2	
Chemicals	55%	27%	18%	22	
Industrial Product	36%	43%	21%	28	
Consumer goods	62%	33%	5%	21	
Property and construction	75%	0%	25%	4	
Infrastructure and utilities	80%	0%	20%	5	
Trade and services	41%	27%	32%	22	
(e) Period of Listing (number of years)					
<5	60%	10%	30%	5	0.108
5 - 9	44%	44%	12%	38	
10 - 14	44%	31%	26%	41	
15 - 19	75%	25%	0%	16	
>=20	44%	22%	34%	8	
(f) Type of Ownership					
Domestic company	53%	30%	17%	80	0.679
Foreign company	43%	36%	21%	28	
(g) Financial Risk (Total Debt to Total Asset Ratio)					
<=0.40	52%	22%	26%	27	0.668
0.41 – 0.55	56%	38%	6%	16	
0.56 – 0.70	52%	33%	15%	33	
0.71 – 0.85	38%	31%	31%	16	
>0.85	50%	38%	12%	16	
N	54	34	20	108	

usage of DCF techniques. Panel (e) of Table 7 shows the contingency test is significant at the 10 percent level. It may be concluded, therefore, that the period of listing is positively related to the use of DCF techniques.

4.2.6. Type of Ownership

Capital market rules in Indonesia define a foreign company as one that is at least 80 percent owned by foreign investors. Based on this definition, we find that our sample consists of 74.1 percent local and 25.9 percent foreign companies. We assume that foreign firms would be more inclined to use the more sophisticated DCF techniques than local firms because presumably international firms employ better qualified managers and are, therefore, better managed. Our results, as shown in Panel (f) of Table 7, indicate marginal difference in the extent of DCF technique usage between local and foreign companies. Consequently the contingency test is not significant.

4.2.7. Financial Risk

In this study, we use the debt-to-asset ratio to represent financial risk. We suggest that firms with high financial leverage tend to use the more sophisticated capital budgeting techniques because they need to be more cautious in making capital investments. However, our results, as shown in Panel (g) of Table 7, indicate that the use of DCF techniques is unrelated to financial leverage as measured by the debt-to-asset ratio.[5]

In summary, this section presents our nonparametric test results on whether or not the use of DCF techniques is related to various company attributes. The attributes included in the test are educational background of the chief financial officer, firm size, industry, period of listing, type of ownership, and financial risk. Using chi-square contingency tests of independence, we find that most of the attributes do not influence use of DCF techniques, except the education level of the chief financial officer and the period of stock exchange listing.

5. Limitations

Before making concluding comments, it is important to note several limitations of this study. An important limitation is that the study is limited to listed companies. The capital budgeting practices of listed companies are not likely to be representative of all Indonesian companies. As reported by Pike (1989) and Chen (1995), larger companies tend to use more sophisticated capital techniques.

[5] We also tested usage of DCF techniques against business risk as measured by standard deviation of operating income. The result was similarly insignificant.

Another potential limitation is the reliability of the data obtained. Inaccuracies could have resulted from the survey respondents misunderstanding the survey questions or terminology. In addition, Aggarwal (1980) points out that responses to questionnaires by individuals in large companies do not always reflect the practices used throughout the company.

Capital budgeting analysis and decision-making processes in the respondent companies were not directly observed. At best, the results only reflect the "typical" processes used.

Lastly, as with all surveys, there may be non-response bias in the results. However, it is not possible to determine whether or not this is the case.

6. Concluding Comments

According to our survey of the executives of 108 companies listed on the JSX regarding their companies' capital budgeting practices, the majority of listed companies use formal techniques to evaluate proposed capital investments. Of these companies, 61.4 percent use DCF techniques such as NPV, IRR and PI that are based upon cash flows and take into account the time value of money as the primary measure for evaluating capital investment proposals. However, most of the respondents indicated that their companies use more than one technique when evaluating and ranking proposed capital investments. The most commonly-calculated technique is payback, a non-DCF measure that ignores the time value of money. Scenario and sensitivity analysis are the most popular ways to assess risk, a result consistent with practices in the West and other companies in the Asia-Pacific region.

A basic principle of finance theory is that the return required on an investment should reflect the riskiness of the investment and the returns available elsewhere from investments of similar risk. This leads to the use of multiple risk-adjusted discount rates. When selecting the discount rate, or minimum acceptable rate of return for proposed capital investments, only 10.2 percent of the companies adjust for risk by using divisional cost of capital or multiple risk-adjusted discount rates. The implication for corporate managers is that accept-reject decisions may be biased in favour of high-risk investments and against low-risk investments, with the possibility that poor high-risk investments will be accepted and good low-risk investments will be rejected. The implication for company investors is that the riskiness of companies would increase, but without a commensurate increase in returns.

From the survey results, it would appear that the CAPM has yet to become widely used among listed companies in Indonesia. Only 14.7

percent of the respondents indicated that they use the CAPM to estimate their companies' cost of equity capital.

Most respondents indicated that growth in cash flow was the most important objective in capital budgeting following by growth in long-term earnings and then growth in share price. But, of course, the former may lead to the latter.

The results also show that chief financial officer educational background and period of listing influence whether DCF techniques are used to evaluate and rank proposed capital investments. Other factors, such as firm size, industry, type of ownership, and financial risk appear to be unrelated to whether or not DCF techniques are used.

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