

## The Perception of Risk and Uncertainty and the Usage of Capital Budgeting Techniques: Evidence from Public Listed Firms in Malaysia

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### ABSTRACT

*This paper presents the findings on the perception of risk and uncertainty and the usage of capital budgeting techniques employed by public listed firms in Malaysia. Most of the firms perceived risk as potential size of loss where the main source of uncertainties comes from changes in government policy. While large companies prefer to use DCF as compared to small companies, pay back period is the most popular model for those who do not use DCF techniques. Lack of competent staff and information were cited as the main reason for not using DCF. Irrespective of size of firms, cost of capital as a source of competitive disadvantage is seen as an important factor in M&A activities rather than replacement expenditure, R&D and compliance investments. Consistent to the findings of other studies, this study shows that companies are more inclined to use CAPM to estimate required return by investors. Overall, the results suggest that as far as perception of risk and uncertainty and the usage of capital budgeting techniques are concerned, theory-practice gap still exists in Malaysia.*

### ABSTRAK

*Kertas ini memperlihatkan penemuan-penemuan berhubung dengan persepsi terhadap risiko dan ketidaktentuan, dan juga penggunaan teknik belanjawan modal yang digunapakai oleh firma-firma awam yang tersenarai di Malaysia. Kebanyakan daripada firma ini menanggapi risiko sebagai kerugian yang berpotensi di mana sumber utama ketidaktentuan ini datangnya dari perubahan-perubahan dalam polisi kerajaan. Firma besar lebih menyukai untuk menggunakan DCF berbanding dengan firma kecil dan "pay-back period" adalah merupakan model yang paling popular kepada firma yang tidak menggunakan teknik DCF. Tanpa mengira saiz firma, kos modal dilihat sebagai satu faktor yang penting dalam aktiviti-aktiviti M&A dan bukannya perbelanjaan penggantian, pelaburan R&D dan pematuhan. Konsisten dengan penemuan-penemuan kajian lain, kajian ini juga mendapati firma-firma lebih berminat menggunakan CAPM untuk menganggarkan pulangan yang dikehendaki oleh para pelabur. Secara keseluruhannya, penemuan-penemuan kajian ini menunjukkan jurang teori-praktis masih lagi wujud di Malaysia.*

## INTRODUCTION

Extensive research has been performed in the area of risk and uncertainty, capital budgeting decision, and the cost of capital of companies in developed countries. Among others is Sangster (1993), Klammer et al. (1991), Mukherjee and Henderson (1987), and Aggarwal (1980). These studies explore the application of capital budgeting practices dealing with uncertainties. How well these capital budgeting techniques being applied in developing economies such as Malaysia remain unclear. Focusing on the areas in the capital budgeting decisions, we wish to determine the perception of risk and uncertainties of Malaysian public listed companies when screening new investment opportunities. This study also seeks to examine how capital cost, in particular cost of equity, is estimated and to examine the effect of cross-listing on the companies' cost of capital. Ultimately we would like to assess the theory-practice gap in capital budgeting techniques.

A number of studies have been carried out to investigate whether the gap between financial theory and practice has been narrowed. One of the popular areas of study in corporate finance is the usage of capital budgeting techniques. Researchers have consistently found that Discounted Cash Flow (DCF) is the most dominant investment evaluation technique by the Chief Financial Officers (CFO). However, the usage of DCF techniques is not without critique. Recognising the demerits of DCF techniques, other valuation methods such as shareholder value analysis, economic value added and cash value added are proposed for the purpose of investment appraisal.

Closely related to the valuation methods is the cost of capital or the hurdle rate. Capital Asset Pricing Model (CAPM) has been used to estimate the discount rates for decades. Even though there are debates and controversies regarding the usefulness of this model, it is still widely used by academics and practitioners. The attraction of the CAPM is that it offers powerful and pleasing predictions about how to measure risk and the relation between expected return and risk (Fama & French 2004). The hurdle rate for company is affected by various factors: capital structure, dividend and investment policy, the level of interest rate, market risk premium and tax rate (Brigham & Ehrhardt 2005). There are also strong theoretical arguments on why discount rate should fall due to the open financial markets. First, when companies cross-list their stocks in foreign visibility, it should thus be associated with reduction in the company's cost of capital. Second, removing of barriers and the integration of capital markets will allow for more efficient diversification and lower the risk of a given security. Third, cross-listing in deep financial market will improve the liquidity of companies. Companies with high liquidity should be able to obtain a lower cost of capital.

Given the importance of capital budgeting decision in maximising shareholders' wealth, CFOs of large corporations in the developed countries have been asked extensively regarding their companies' practices in capital budgeting, assessment of risk and the estimation of cost of capital. However, related research on developing

countries, in particular Malaysia, is still lacking. Among the very few, Han (1986) found that most companies used pay back period (PBP) for evaluating and ranking capital investment opportunities. Kester et al. (1999) found that usage of DCF by companies had gained popularity even though most Malaysian companies did not undertake much risk analysis similar to companies in Hong Kong and Singapore. They also argued that most important risk-assessment techniques in Malaysia were scenario and sensitivity analysis.

## RESEARCH METHODOLOGY

We include public listed companies that are involved in capital investment and exclude financial institutions as the latter are more inclined towards financial investment. We conducted a postal survey where questionnaires were distributed to 800 public listed companies in Bursa Malaysia, of which 75% from Main Board companies and 25% from Second Board companies. However, 83 questionnaires were replied and returned which represented a 10.83% response rate.

The questionnaire is replicated and adapted from a survey done on the perception of risk and uncertainty and non-usage of discounted cash flow techniques by UK listed companies by Ow-Yong (2006). The questionnaire is divided into six sections. Section A seeks to know how risk is perceived by the sample companies. It also looks at the importance of uncertainty variables when making capital budgeting decisions. Section B and E relate to questions on capital budgeting practices of the companies, and how risk is accounted in capital budgeting. Section C relates to techniques companies used to estimate cost of equity and whether companies they cross-list on foreign stock exchange benefit from lower cost of capital. Section D explores whether companies use a discount rate appropriate to the risks on different types of investments. The four types of capital investment are: replacement expenditure, research and development (R&D), regulatory compliance and merger and acquisition (M&A). Lastly, Section F covers the general background information of respondents polled.

## RESEARCH RESULTS AND DISCUSSION

Based on the responds that we got from various respondents, 73.5 % are from Main Board companies and the remaining 26.5% are from Second Board companies. Table 1 shows the respondent companies by industry. Majority of respondent companies are from industrial products (24.1%), trading and services (21.7%) and consumer products (19.3%) industries.

Figure 2 shows the positions held by the respondents. 31.3% of the respondents hold the position of chief financial official (CFO), 22.9% of respondents are finance executives, 12% are finance directors and 9.6% are vice presidents (finance). 24.1% of respondents hold other positions such as finance managers and general manag-

TABLE 1. Respondent Companies by Industry

	Frequency	Percent	Valid Percent	Cumulative Percent
Industrial Product	20	24.1	24.1	24.1
Consumer Product	16	19.3	19.3	43.4
Trading/Services	18	21.7	21.7	65.1
Valid Construction	8	9.6	9.6	74.7
Plantation	6	7.2	7.2	81.9
Properties	8	9.6	9.6	91.6
Technology	7	8.4	8.4	100.0
Total	83	100.0	100.0	

Out of 83 respondents, 7.23% have less than 50 employees (small), 31.33% have less than 250 employees (medium) and 61.45% have more than 250 employees (large). These figures are shown in Figure 1.

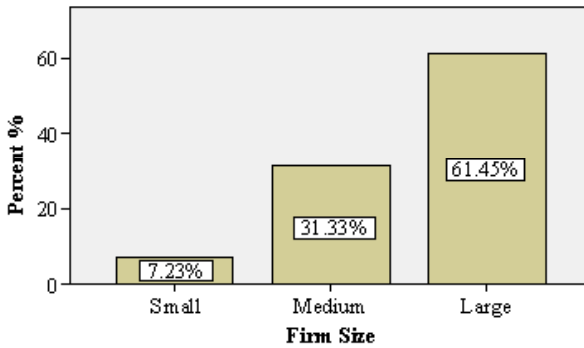


FIGURE 1. Size of respondent companies

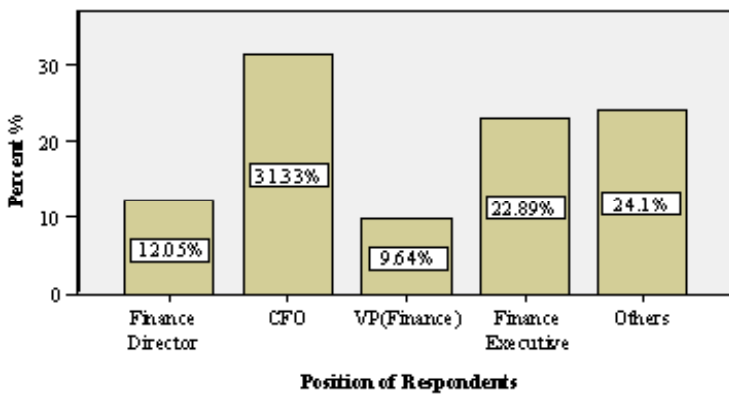


FIGURE 2. Positions held by respondents

ers (finance). The position held by each respondent indicates a high relevance of respondent’s view.

PERCEPTION OF RISK AND UNCERTAINTY

When making capital investment, most companies will describe risk as potential size of loss (39.76%) and fluctuation in cash flow (24.1%). As shown in Figure 3(a), 14.46% and 12.05% of the companies perceive risk as probability of loss and lack of information.

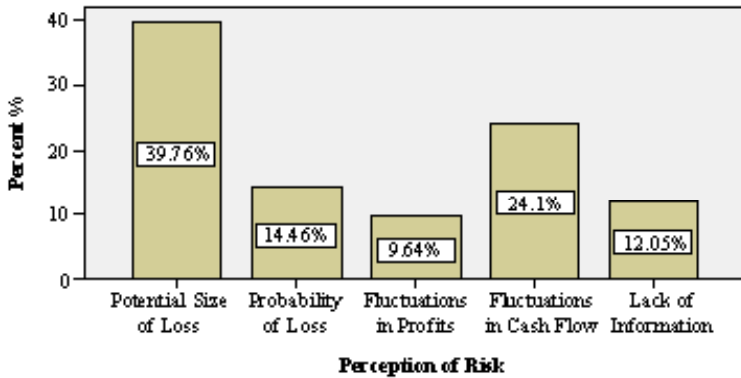


FIGURE 3 (a). Perception of risk when making capital investment

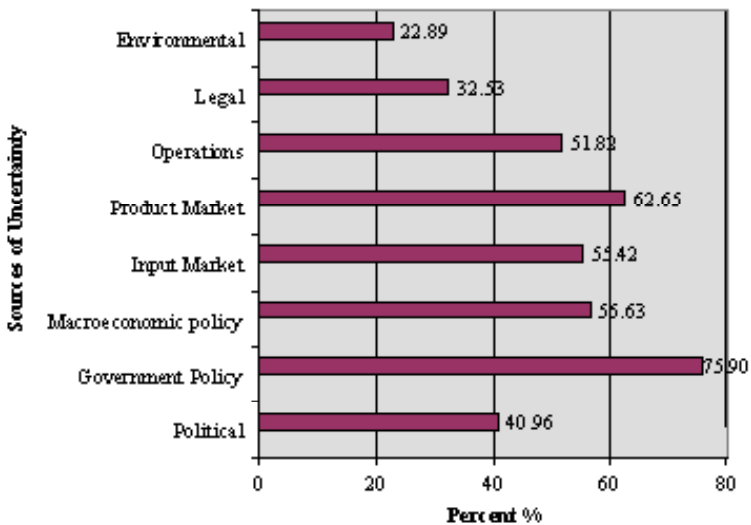


FIGURE 3 (b). Perception of uncertainty when making capital investment

In terms of uncertainty, the result showed in Figure 3(b) outlined that companies highly rated the sources of uncertainty as government policy (75.9%), product market (62.65%), and macroeconomic policy (56.63%).

### USAGE OF DCF TECHNIQUES

Table 2 shows that 80.7% of the respondent companies use DCF when making new capital investment. Only 36.1% of them use it as primary quantitative tool while 44.6% of them use it as secondary quantitative tool. Companies that did not employ this technique when making investment appraisal representing, 19.3% of the respondent. The authors have grouped and summarised the reasons of not using these techniques. Among the major reasons are: (1) DCF can not provide accurate indication; (2) DCF is too complicated due to lack of information; (3) DCF is hard to understand and companies lack of competent staff to use the technique; (4) too much uncertainties in managing the cash flow stream, the time taken to do DCF is often quite long and the results produced are often similar or close to other investment models used.

TABLE 2. Usage of discounted cash flow as capital budgeting technique

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes, as the Primary Quantitative Tool	30	36.1	36.1	36.1
Yes, as the Secondary Quantitative Tool	37	44.6	44.6	80.7
Valid No	16	19.3	19.3	100.0
Total	83	100.0	100.0	

### COST OF EQUITY

As of June 30, 2006, 48.2% of companies in the survey have cost of capital of between 4% to 8% while 32.5% have between 8% to 12%. 54.2% of companies have cost of equity of 4% to 8% whereas 16.9% of the companies have cost of equity of 8% to 12% (Figure 5).

Respondents were asked to indicate the methods that they apply to estimate the cost of equity. The study found that 24.62% of the respondent companies will estimate using the required return by investors while 23.08% of the companies will estimate using cost of debt plus the risk premium, and 21.54% will use the E/P ratio. What will be the technique used when estimating the required return by investors then? Figure 6 shows that 37.5% of companies are using CAPM in the estimation of required return by investors; it is followed by Arbitrage Pricing Theory (APT) and Average Historical Return on Equity (both 25%).

TABLE 3. Usage of capital budgeting techniques by company size

Company Size	Usage of DCF techniques			Total
	Yes, as the Primary Quantitative Tool	Yes, as the Secondary Quantitative Tool	No	
Small	16.7%	50%	33.3%	100%
Medium	15.3%	54%	30.7%	100%
Large	47%	39.3%	13.7%	100%

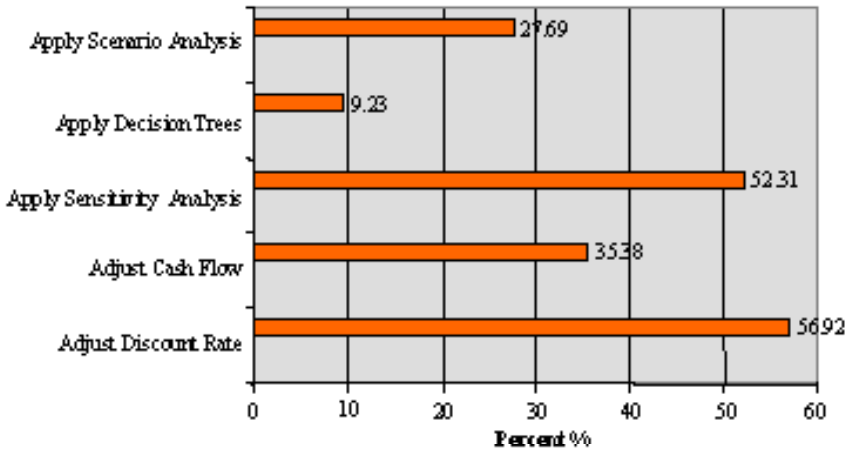


FIGURE 4. Techniques used to account for risk in capital investment

PBP is the most popular model for those who do not use DCF techniques. Other techniques that are used by those companies are return on investment, cost benefit analysis, profit margin plus growth potential and salvage value plus strategic alignment to the organisational growth. Lastly, most of the companies will make capital investment decision based on experiences and judgments of decision makers.

Further analysis was done by the authors and the results are shown in Table 3, 47% of large companies use DCF as primary quantitative tool whereas 54% of medium and 50% of small companies will use DCF as secondary quantitative tool. This is consistent to the survey results by Walker et al. (1993) in which small companies use DCF less frequent than large company.

Companies that use DCF were asked to indicate which techniques are used to account for risk in capital investment. Most companies choose to adjust discount rate (56.92%), apply sensitivity analysis (52.31%) and adjust cash flows for risk (35.38%) for investment appraisal. Although it is easy to apply the scenario analysis, it is surprising to find only 27.69% of companies will apply scenario analysis. Lastly, only 9.23% of the companies will use decision trees for the purpose of capital investment appraisal (Figure 4).

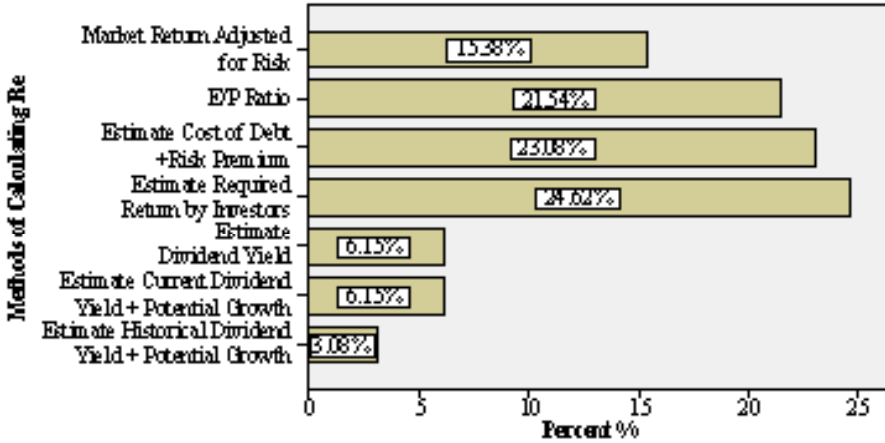


FIGURE 5. Methods for the calculation of cost of equity capital

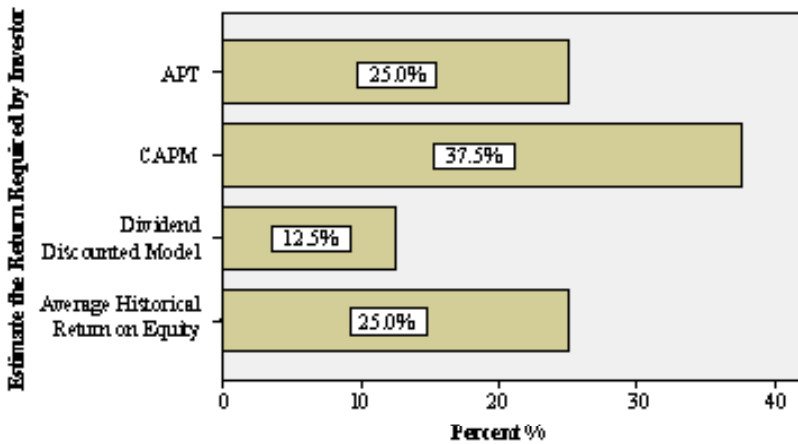


FIGURE 6: Methods for estimating the return required by investors

COST OF CAPITAL AS A SOURCE OF COMPETITIVE DISADVANTAGE

High cost of capital is being perceived as one of the sources of competitive disadvantage. In order to achieve high company value, one of the critical management tools is access to low-cost capital (Coffin & Collins 2005). In the present study, we are interested to know if the cost of capital plays a role as a source of competitive disadvantage for capital investment. Hence, we categorised capital as strategic and non-strategic investment. Strategic investment includes M&A and R&D. Short term investment such as replacement expenditure and regulatory compliance are non



TABLE 4. Risk measure used as a discount rate for investment purposes

Type of risk measure used as a discount rate	Replacement Expenditure	Research and Development	Regulatory Compliance	Mergers and Acquisitions
The cost of new finance raised	50.7%	11.9%	9.0%	23.9%
Company’s weighted average cost of capital (WACC)	17.9%	11.9%	9.0%	7.5%
Company’s WACC adjusted by appropriate risk premium	1.5%	6.0%	9.0%	16.4%
Capital investment’s Internal Rate of Return (IRR) adjusted by appropriate risk premium	9.0%	9.0%	9.0%	23.9%
Risk measure not applicable due to low or no investment	20.9%	61.2%	64.2%	28.4%

strategic investment. The results for the risk measure used as a discount rate for investment purposes are summarised in Table 4.

Most of the companies will use the cost of new finance raised as the discount rate for replacement expenditure (50.7%), followed by the WACC (17.9%). More than half of the companies do not use any risk measure due to low or no investment in R&D and regulatory compliance. For M&A purpose, companies prefer the cost of new finance raised and Internal Rate of Return (IRR) adjusted by appropriate risk premium (both 23.9%, respectively), followed by the WACC adjusted by appropriate risk premium (16.4%).

Table 5 shows the summarised results for a company’s cost of capital as a source of competitive disadvantage. The cost of capital as a source of competitive disadvantage is seen as an important competitive factor for M&A activities than the replacement expenditure, R&D and compliance investments irrespective of company size. 46.3% of the companies indicated that the cost of capital is always an important source of competitive disadvantage for M&A activities. This is followed by the replacement expenditure (23.8%). Only 6.2% and 6.0% of companies view

TABLE 5. Company’s cost of capital as a source of competitive disadvantages

Capital Investment	Company Size(%Always Important)			
	Total	Small	Medium	Large
Replacement Expenditure	–	11.9%	11.9%	23.8%
Research and Development	3.1%	–	3.1%	6.2%
Regulatory Compliance	–	3.0%	3.0%	6.0%
Mergers and Acquisitions	3.0%	14.9%	28.4%	46.3%

cost of capital as a source of competitive disadvantage for R&D and regulatory compliance. This might be due to low or no investment in these two expenses.

#### CROSS-LISTING AND THE COST OF CAPITAL

Contrary to traditional beliefs that increase in visibility due to international cross-listing should be associated with reduction in the company's cost of capital, this study found that cross-listing does not lower the overall company's cost of capital. Only a small percentage of 7.41% from respondent companies cross-listing their share in foreign exchange. When asked whether cross-listing bring benefit to the company by lowering the overall cost of capital, 100% of the respondent companies cited that cross-listing does not lower the overall company's cost of capital.

#### CONCLUSION AND IMPLICATIONS

This study presents the findings of risk and uncertainty perception, capital budgeting practices, cost of equity estimation and the effects of cross-listing on the cost of capital based on a sample of 83 Malaysia companies listed on Main and Second Board of Bursa Malaysia. The result indicates that the most common description of risk when making capital investment is the potential size of loss. Government policy, product market and macroeconomic policy were perceived as the main source of uncertainty. This result is different from UK case studied by Ow-Yong (2006), who found that risk is mainly perceived as cash flow volatility and product market is the main source of uncertainty.

The finding of the usage of capital techniques is consistent with other studies. The result shows that majority of the companies will use DCF techniques while only a handful will use DCF as secondary quantitative tool. This means that other non-DCF techniques will be used as complementary tool as well. Large companies prefer DCF than small companies. PBP is the most popular model for those who do not use DCF techniques.

Since decision makers will accept projects with short payback, they are more averse to the size of loss rather than cash flow volatility. Therefore, most companies perceive risk as size of loss. Most companies admit that lack of competent staff and information is the main reason of not using the DCF. Companies that use DCF were asked to indicate which techniques are used to account for risk in their capital investment. Most companies choose to adjust discount rate, apply sensitivity analysis and adjust cash flows for risk for investment appraisal

Most companies use cost of new finance raised as a discount rate for replacement expenditure and M&A activities, unlike in UK (Ow-Yong 2006) where WACC is the most popular risk measure. Cost of capital as a source of competitive disadvantage is seen as an important competitive factor for M&A activities as compared to replacement expenditure, R&D and compliance investments irrespective of company size.

Most companies in Malaysia have cost of capital and cost of equity of around 4% to 8%. Consistent with other studies, this study also shows that companies prefer to use the CAPM to estimate required return by investors, followed by estimating the cost of debt plus risk premium and using the E/P ratio. Cross-listing does not lower the overall cost of capital of companies thus the main reason for Malaysia companies to cross list in foreign stock exchange remains ambiguous.

Nevertheless, we found that theory-practice gap in corporate finance is narrow among large companies. Large companies prefer DCF techniques than small companies. In addition, large companies will deploy DCF as primary quantitative tool whereas medium to small companies will use DCF as secondary quantitative tool. In Malaysia, the usage of DCF has increased significantly (80% of the respondent companies use DCF; 45% of them use it as secondary tools and 20% of companies do not use DCF). Based on the reasons provided by the respondent companies, we found lack of understanding about DCF techniques is the main reason for not using the DCF. The development of financial market has made the use of DCF method more applicable, convenient and necessary. Therefore, training of CFOs and finance executives need to be improved over time, which may enable them to better understand and use more sophisticated techniques in today's competitive market. Decisions makers can also utilise the advances in computer technology by using tools and packages that help to determine which investments are beneficial to the company.

This study is not without its limitations. First, we limit our survey to public-listed companies thus the perception of risk and uncertainty, practices of cost of capital and capital budgeting techniques may not be a good representative of all companies in Malaysia. Second, responses by individual CFOs or finance directors may be their personal point of view thus will not reflect the practices of the companies. Third, the sample for the companies that is cross-listing in foreign stock exchange is too small to represent all companies that are cross listing in foreign stock exchange. Lastly, as literature on valuation in developing countries is limited, we based our survey questionnaires on Western model of corporate finance theory and it may not reflect the general environment, market conditions and company behavior of this country.

#### REFERENCES

- Aggarwal, R. 1980. Corporate use of sophisticated capital budgeting techniques: A strategic perspective and a critique of survey results, *Interfaces* 10 (2): 31–34.
- Brigham, E.F. & Ehrhardt, M.C. 2005. *Financial Management: Theory and Practice*. 11th ed. Mason, Ohio: Thomson/South-Western.
- Coffin, W.F. & Collins, S. 2005. Techniques to lower the cost of capital in today's volatile markets. *IR Issue Alert- CCG*. <http://www.ccgir.com>.
- Fama, E. & French K.R. 2004. The capital asset pricing model: Theory and evidence. *Journal of Economic Perspectives* 18: 25–46.
- Han, C.K. 1986. The sophistication of capital budgeting in Malaysian companies. *Omega* 14: 175–86.
- Klammer, T., Koch, B. & Wilner, N. 1991. Capital budgeting practices—a survey of corporate

- use, *Journal of Management. Accounting. Res.* 3: 113–130.
- Kester, G.W., Chang, R.P., Echanis, E.S., Haikal, S., Mansor, M.I., Skully M.T., Tsui, K.C. & Wang, C.J. 1999. Capital budgeting practices in the Asia-Pacific region: Australia, Hong Kong, Indonesia, Malaysia, Philippines and Singapore. *Financial Practice and Education* 9: 25-33.
- T.K. Mukherjee, & Henderson, G.V. 1987. The capital budgeting process: theory and practice, *Interfaces* 17(2): 78–90.
- Ow-Yong, K. 2006. Perception of risk and uncertainty and non-usage of discounted cash flow techniques by UK Listed Firms. Unpublished paper, Birmingham Business School, University of Birmingham.
- Sangster. 1993. A. Sangster, Capital Investment appraisal techniques: a survey of current usage, *Journal of Business Finance and Accounting* 20(3): 307–332.
- Walker, J., Burns, R. & Denson, C. 1993. Why small manufacturing firms shun DCF. *Journal of Small Business Finance* 233-249.

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