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# Financial Practice in Malaysia: Risks Assessments in Capital Budgeting

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***Abstract:*** The objectives of this paper is to examine the discount rates and the techniques used in addressing risks of major capital investment projects for companies listed on the Main Board and Second Board of Bursa Malaysia. The findings of the study show that the companies from the Main Board and Second Board used weighted average cost of capital (WACC) more than other discount rates for investments appraisal. However, the Main Board companies utilised WACC more frequently than companies on the Second Board which are considered to be smaller. In terms of risks assessment, sensitivity or scenario analysis was the most favoured technique used by the Main Board and Second Board companies. Sophisticated techniques such as the beta analysis were applied by a lesser number of companies.

**Keywords: Capital budgeting, financial practice, risk assessment**

## 1. Introduction

Capital investment decisions require the evaluations and analyses of the risks involved as best described by Petersen (1994:463) that "...for an evaluation of any investment to be meaningful, we must represent how much risk there is so that the cash flows of an investment will differ from what is expected in terms of their amount and timing." A systematic evaluation of major capital investment projects is needed as poor decisions would have an enormous impact on the value of a company. Hence, financial managers would need to incorporate risks in their capital investment decisions by adjusting the required rate of return or discount rate or the cash flows.

Theoretically, companies should use their cost of capital, adjusted for project-specific risk in analysing investment alternatives. Many studies might have looked into this to see whether a company's practice conforms to theory. Nevertheless, there is a lack of research to compare practices between the Main Board and Second Board companies of Bursa Malaysia. Companies listed on the Main Board are normally larger and more sophisticated than the Second Board companies. This could be observed in the sample companies used in this study. The average market capitalisation of the Main Board and Second Board companies were RM1,741 million and RM69 million respectively as of 31 December 2004. Considering that they are of different sizes, these companies might use different criteria to evaluate major capital investments because larger companies (1) might have more personnel resources who have the time and expertise to do an in-depth analysis on projects, and (2) generally have more access on capital or less problems in capital constraints. Hence, it is

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likely that the capital budgeting decisions of the Main Board companies might not explain those used by the Second Board companies.

In order to examine whether the capital budgeting decisions differ between the two groups of companies, a survey was caried out on financial managers to examine the discount rates and the techniques used in addressing risks of major capital investment decisions for companies listed on the Main Board and Second Board. Once these objectives were fulfilled, an investigation was conducted on differences of capital investment discount rates and the techniques used in addressing risks between companies listed on the Main Board and Second Board of Bursa Malaysia.

The rest of this paper is divided into five sections. Section 2 will provide a cross-country comparison on the derivation of discount rates and the techniques used in addressing risks of major capital investment decisions, which is then followed by a description of the data and research design in Section 3. Section 4 analyses the background of the respondents and companies, including a discussion on the main findings with respect to derivation of discount rates and risk assessment techniques. Concluding remarks are offered in Section 5.

## 2. Literature Review

Risk analysis is an important element in capital budgeting decisions. The adoption of different discount rate in capital budgeting implies that managers are incorporating the risk element in their long-term investment decisions (Chadwell-Hatfield *et al.* 1996). Theoretically, a company should adjust its investment alternatives with its cost of capital, adjusted for project specific risk. Ignoring project risk evaluation would lead managers to assume that all projects are of equal risk for the whole company. Thus, in order to achieve wealth maximisation, managers need to adjust their capital budgeting analysis with an appropriate discount or hurdle rate to reflect the risk level of a particular project undertaken by the company.

Weighted average cost of capital (WACC) has long been promoted by academic literature to act as a hurdle rate in capital investment appraisal. Recent studies showed that this method was widely used by managers world-wide by virtue of its attribute that considered the cost of capital from both the equityholders' and debtholders' perspectives. Nevertheless, the use of WACC is not without flaws. Theory tells us that in order to use WACC as a discount rate for all proposed projects, the projects must be homogeneous with respect to risk and have the same risk level as the average risk of a company. If the risk of a proposed project differs substantially from that of the overall company, then it is necessary to determine a specific return for that project (Kester *et al.* 1999). Furthermore, size of a company also plays an important role in determining discount rates.

As Palliam (2005) puts it, the theories and principles which were developed within the context of large, publicly owned firms may not be so relevant when applied to small firms. For example, the use of CAPM in determining cost of equity viewed an investment project as part of a diversified portfolio could only be more appropriate for large firms than small firms. Schall *et al.* (1978) found that over 46 per cent of large firms in the US employed WACC and only 17 per cent and 8 per cent of them used risk premium and dividend discount model to derive the cost of capital. Similarly, Oblak and Helm (1987) observed that over 90 per cent of the MNCs with more than USD500 million capital budgeting project used WACC

as compared to 54 per cent registered by the whole sample. In addition, 86 per cent of the firms used an average after-tax discount rate of 12.5 per cent. Arnold and Hatzopoulos (2000) also found a similar result where 61 per cent of the large UK firms used WACC as compared to 41 per cent among the smaller firms. Evidence shows that as firm size increases, firms are more inclined to use WACC. Further evidence on this was found in a study by Payne and Heath (1999) where only 25 per cent of the small firms used WACC as compared to 81.1 per cent of the large firms.

In Cyprus, 30.95 per cent of small and medium-sized firms determined their cost of capital based on the cost of debt, followed by 26.19 per cent based on past experiences (Lazaridis 2004). Of the firms surveyed, only 5.95 per cent used WACC. There were also firms that did not use any formal approach to determine the cost of capital. Among the reasons quoted were that (1) 40 per cent of the respondents believed that cost of capital did not affect their profits and (2) 60 per cent mentioned they did not have the manpower, time and experience to do it. In addition, 54 per cent of these firms determined the cost of capital on a before-tax basis, while 40 per cent on an after-tax basis. This was substantiated by Block (1997) who concluded that the idea of WACC as an appropriate discount rate among small firms in the US was still not accepted. Only 14.1 per cent of the surveyed firms used WACC with 53.1 per cent of them using the cost of funding a specific project as the cut-off point. Some of the reasons for not using WACC were: (1) small firms found it difficult to estimate the cost of equity and, (2) constraints in access to the capital market as compared to large firms. Thus, smaller firms found it less compelling to measure the relative cost of each financing instrument.

As for risk consideration, Lazaridis (2004) revealed that around 66.67 per cent of the surveyed firms did not implement risk analysis when they made their investment decisions. Some of the justifications given were that the use of such methods will not affect the firm's profit (28.57 %), managers were not familiar with risk analysis (28.57%) and lack of staff, time and experience for this type of analysis (28.57%). For firms that used risk analysis, 30 per cent preferred scenario analysis, 31.67 per cent utilised complete statistical risk analysis and 28.33 per cent opted for sensitivity analysis.

Well over half of the small firms surveyed in the US however indicated that they specifically considered risk in doing their capital budgeting analysis (Block 1997). Block argued this was not surprising considering the consequences of making wrong capital investment among small firms could not easily be offset as would be the case for a multi-divisional company. Block's results revealed that 46.3 per cent of the small firms adjusted their risk by increasing the discount rate or shortening the minimum payback period. Approximately 20.6 per cent of these firms used subjective non quantitative evaluation of risks. Block gathered these firms seemed to reject superior return projects in favour of alternatives that carried less risk.

Payne and Heath (1999) concluded that small firms were more likely to adjust the payback period, while larger firms focused more on adjusting the discount rate. This finding was incongruent with the results reported by Schall *et al.* (1978). Among 143 large firms surveyed in the US, they found that 90 per cent raised the required rate of return (discount rate) and just over 10 per cent shortened the payback period to adjust for risks.

Drury and Tayles (1996) reported that sensitivity analysis was 'often' or 'always' used by 82 per cent of the large firms as compared to 30 per cent for small firms. The corresponding

figures in adjusting discount rate were 31 per cent for large firms and 9 per cent for small firms. These findings suggested that theoretically sound capital budgeting techniques were more likely to be used by large rather than smaller organisations. Drury and Tayles were of the view that smaller firms rely on a much simpler technique as the staff responsible for making capital investment decisions would already have detailed knowledge of the projects submitted for approval. On the other hand, larger firms were able to appoint staff who had, or could develop an expertise in the use of sophisticated (and theoretically sound) techniques. In Columbia, 31per cent of its large firms used the theoretical supported discount rate adjustment method; but there was also a significant portion (24%) of large firms that did not take risks into consideration (Velez and Nieto 1986).

Other than looking at the discount rate, capital budgeting decisions would also require an analysis of the risk involved. Risk analysis techniques allow a manager to deal with the sources of uncertainty in a project's cash flow. Some are sophisticated, theoretically sound techniques, such as sensitivity analysis that consider determining probability distribution of cash flows, measuring interdependencies and calculating bail-out factors. Other methods are subjective in nature such as raising the required rate of return or shortening the payback period (Jog and Srivastava 1995).

Arnold and Hatzopoulos (2000) noted that there was an increase to 94 per cent in the use of a formal risk assessment method among large firms in the UK as compared to an earlier finding by Pike (1982). Eighty-five percent of their respondents used sensitivity/ scenario analysis, which was followed by 52 per cent that raised the required rate of return. This was incongruent with the survey by Kester *et al.* (1999) on capital budgeting practices in the Pacific region—Australia, Hong Kong, Indonesia, Malaysia, Philippines, and Singapore—where sensitivity and scenario analysis were perceived to be the most important technique for assessing risk. As for the most sophisticated techniques such as decision trees and Monte Carlo probabilistic simulation analyses, they were seldomly practised among the surveyed firms. Klammer *et al.* (1991) argued that the expansion of sensitivity analysis was due to the availability of electronic spreadsheets which made evaluation work simpler and quicker. Jog and Srivastava (1995) suggested that there was a move towards the adoption of a more sophisticated technique instead of just using subjective judgments. Similarly, the estimation of cost of capital that used subjective judgment, such as past experiences or expectations with respect to growth and dividends, was on a decline.

As for probability analysis, a method much advocated by the text books and academics, was not widely used by managers in the UK. Arnold and Hatzopoulos (2000) revealed that there remained a wide theory-practice gap with regard to the use of risk analysis techniques where 31per cent of their respondents employed the probability analysis. A similar notion was lauded by Blazouske *et al.* (1988) where 54 per cent of the surveyed companies employed theoretically inferior methods such as subjective analysis. Only 2 per cent of the sample used academia-favoured techniques such as the risk adjusted discount rate.

However, in a recent study by Block (2005) on Fortune 1000 firms in the US, he concluded that 75.2 per cent of these firms preferred the risk-adjusted discount rate method over subjective decision making which stood at 23 per cent. This finding was in line with the study by Gitman and Vandenberg (2000) on US major firms. They found that larger firms favoured the use of discount-rate-adjustments over cash flow adjustments to account for different project risks.

Oblak and Helm (1987), taking the risk adjustment method from the perspective of US MNCs, reported that 40 per cent of the respondents subjectively changed their weighted average cost of capital. Another relevant study from Kim *et al.* (1986) also found that almost half of the respondents subjectively adjusted for risk and only two per cent of the respondents used risk adjusted discount rate. With regard to risk assessment, Shao and Shao (1993) reported that sensitivity analysis was the single most important approach used to assess project risks. This was followed by subjective judgment and computer simulation. Kim *et al.* (1986) found the extence of a significant gap between theory prescribed techniques and those actually used in practice where over half of the respondents determined risk subjectively while about one-quarter of the respondents used sensitivity analysis to assess project risks.

## 3. Method

Primary and secondary data were used in this study. The primary data was obtained mainly by administering structured questionnaires sent to the financial controller or manager of 610 randomly selected companies listed on the Main Board (MB) and Second Board (SB) of Bursa Malaysia in February 2004. Out of 610 companies, 356 and 254 companies were those listed on the Main Board and Second Board of Bursa Malaysia, respectively. The secondary data were taken from the journals, *News Straits Times* and *Datastream*. As for the selection of companies, a disproportionate stratified sampling was used. There were nine industries selected on the Main Board which were technology, consumer products, industrial products, construction, trading and services, properties, plantation, mining and hotel. Similar industries were also selected for the Second Board with the exception of mining and hotel.

The questionnaire was adapted from Arnold and Hatzopoulos(2000) with a few adjustments made to incorporate the Malaysian environment. The response rate for the questionnaires was 20 per cent or 70 companies from the MB and 10 per cent or 25 companies from the SB. This response rate compares favourably with those by Brounen *et al.* (2004), Graham and Harvey (2001) and Ow-Yong and Murinde (2006), which had 5, 9 and 10 per cent response rates respectively. In order to achieve the first and third objectives of the paper, that is, to examine the method employed in deriving discount rates and the assessment of risks among listed companies on the Main Board and Second Board, descriptive statistics were utilised. Cochran's Q, Chi-Square and Kruskal-Wallis tests were used to examine the second and fourth objectives, that is, to see whether there were differences in the derivation of discount rates and assessment of risks between the Main Board and Second Board companies.

## 4. Analysis of Results

The average market value of the sample companies for the Main Board and the Second Board were RM1,741 million and RM69 million respectively as of 31 December 2004. As compared to all listed companies in both the Main Board and Second Board, the average market value of the sample companies for the Main Board was much higher; whereas the average market value of the sample companies for the Second Board was lower than the average shown for all listed companies—RM1,113 million for MB and RM77million for SB.

When an analysis was made on the annual capital budget of the sample companies which was taken from Part II of the questionnaire, 45.6 per cent or 31 companies from the

**Table 1.** Derivation of discount rate

| | | Main Board | | Second Board | |
|---|---|---|---|---|---|
| | | Frequency | Per cent | Frequency | Per cent |
| Cost of debt before tax | No | 52 | 74.3 | 21 | 84.0 |
| | Yes | 18 | 25.7 | 4 | 16.0 |
| Cost of debt after tax | No | 62 | 88.6 | 20 | 80.0 |
| | Yes | 8 | 11.4 | 5 | 20.0 |
| Earnings yield on shares | No | 68 | 97.1 | 20 | 80.0 |
| | Yes | 2 | 2.9 | 5 | 20.0 |
| Cost of equity using dividend growth model | No | 70 | 100.0 | 25 | 100.0 |
| | Yes | | | | |
| Cost of equity using CAPM | No | 63 | 90.0 | 23 | 92.0 |
| | Yes | 7 | 10.0 | 2 | 8.0 |
| WACC | No | 31 | 44.3 | 18 | 72.0 |
| | Yes | 39 | 55.7 | 7 | 28.0 |
| An arbitrarily chosen figure | No | 63 | 90.0 | 22 | 88.0 |
| | Yes | 7 | 10.0 | 3 | 12.0 |
| Others | No | 66 | 94.3 | 23 | 92.0 |
| | Yes | 4 | 5.7 | 2 | 8.0 |

Main Board and 56 per cent or 14 companies from the Second Board had their annual capital budget in the range of RM1.1 million to RM20 million. None of the Second Board companies had an annual capital budget beyond RM50 million. In contrast to this, there were eight, six and five Main Board companies with an annual capital budget in the range of RM50.1 million to RM100 million, RM100.1 million to RM200 million and above RM200 million respectively. Another proxy that was used to measure size was the number of employees hired by the sample companies. The maximum number of employees from the Main Board and Second Board were 28,000 and 1,900 respectively. The mean for both groups were 2,803 employees for the Main Board and 489 employees for the Second Board companies.

*4.1 Derivation of Discount Rates*

According to finance theory, companies would normally use their weighted average cost of capital (WACC) adjusted for the project specific risk as a discount rate for investment appraisal. The results summarised in Table 1 show that 55.7 per cent of the Main Board companies utilised WACC, which was followed by 25.7 per cent and 11.4 per cent using cost of debt before tax and cost of debt after tax. This evidence confirms the theory . WACC is the preferred choice among practitioners of the Main Board companies. This is consistent with findings reported for the UK by Arnold and Hatzopoulos (2000); for the US by Block (2005), Bruner *et al.* (1998), Gitman and Vandenberg (2000), Oblak and Helm (1980), Payne and Heath (1999) and Ryan and Ryan (2002); and for Canada by Jog and Srivastava (1995).

Among the Second Board companies, the percentage is less with only 28 per cent of the sample companies utilising WACC. This is almost similar to small companies in the US and Canada where Payne and Heath (1999) found that 25 per cent of their sample used WACC. Further observations of Table 1 is that the rest of the respondents used earnings

**Table 2.** Overall differences in the derivation of discount rate

| | Value | |
|---|---|---|
| | 0 | 1 |
| Cost of debt before tax | 73 | 22 |
| Cost of debt after tax | 82 | 13 |
| Earning yield on shares | 88 | 7 |
| Cost of equity derived from Dividend Growth Model | 95 | 0 |
| Cost of equity derived from the Capital Asset Pricing Model (CAPM) | 86 | 9 |
| Weighted average cost of capital(WACC) | 49 | 46 |
| An arbitrarily chosen figure | 85 | 10 |
| Others | 89 | 6 |
| Cochran's Q | 109.035[a] | |
| Asymp. Sig. | .000 | |

[a] 0 is treated as a success.

yield on shares (20%), cost of debt after tax (20%), cost of debt before tax (16%) and others. As far as the cost of equity using dividend growth model is concerned, none of the listed companies on the Main Board and Second Board used it.

In order to examine whether there is a significant difference in the derivation of discount rate, the Cochran's Q value of 109.035 at a one per cent significant level, which could be referred in Table 2, shows that overall, there is a significant difference in the discount rate selected by the Main Board and Second Board companies. Hence, the null hypothesis that all derivations of discount rate are equally being used by both the Main Board and Second Board companies could not be accepted. A Chi-Square test is then executed to examine specifically which among the discount rate provides a difference between the Main Board and Second Board companies. The results are reported in Appendix I.

It is observed that there are no significant differences in the derivation of discount rate between the Main Board and Second Board companies except for the cost of equity using dividend growth model and WACC. Pearson Chi Square values of 77.778 and 5.665 for the respective cost of equity using dividend growth model and WACC show that there is a significant difference in deriving a discount rate to be used for project appraisals by the Main Board and Second Board companies at the one per cent and five per cent levels. Earnings yield on shares is also found to give a significant Chi-Square figure of 7.931 but since there was an expected count of less than five for the Second Board sample, no inferences could be made for this approach.

For companies that had utilised WACC, the most popular method of estimating cost of equity was CAPM with a respective 42.9 and 40 per cent for both the Main Board and Second Board companies (refer to Table 3). Although this model has been criticised by the academic community either because it cannot be empirically and statistically tested or it is no longer practical in a more complex and changing environment (Adedeji 1997; Elfakhani *et al.* 1998; Fama and French (1992; 1996), in practice, it is still widely used among the Main Board and Second Board companies. This result contradicts those reported by Kester *et al.* (1999) where they found that dividend yield plus growth rate and risk premium methods were preferred over CAPM in estimating the cost of equity. Nevertheless, the existing result

**Table 3.** Estimation of WACC

| | | Main Board | | Second Board | |
|---|---|---|---|---|---|
| | | Frequency | Per cent | Frequency | Per cent |
| Cost of equity using CAPM | No | 40 | 57.1 | 15 | 60.0 |
| | Yes | 30 | 42.9 | 10 | 40.0 |
| Cost of equity using other than CAPM | No | 68 | 97.1 | 22 | 88.0 |
| | Yes | 2 | 2.9 | 3 | 12.0 |
| Cost of debt using market rate of return on debt capital | No | 52 | 74.3 | 21 | 84.0 |
| | Yes | 18 | 25.7 | 4 | 16.0 |
| Cost of debt using current market interest rates | No | 49 | 70.0 | 17 | 68.0 |
| | Yes | 21 | 30.0 | 8 | 32.0 |
| Cost of preferred stock | No | 67 | 95.7 | 24 | 96.0 |
| | Yes | 3 | 4.3 | 1 | 4.0 |
| Other | No | 67 | 95.7 | 25 | 100.0 |
| | Yes | 3 | 4.3 | | |

is consistent with the studies done by Bruner *et al.* (1998), Gitman and Vandenberg (2000) and Graham and Harvey (2002).

As summarised in Table 3, cost of debt using the current market interest rates was used a lot more with 30 per cent and 32 per cent for the Main Board and Second Board companies respectively as compared to cost of debt using market rate of return on debt capital with a respective 25.7 per cent and 16 per cent. In addition, cost of preferred stock was also incorporated in WACC with approximately 4 per cent of the sample companies utilising it.

*4.2 Risks Assessment Techniques*

Table 4 summarises the techniques used in assessing risks. Sensitivity/scenario analysis was the most popular technique used by the Main Board and Second Board companies with 77.1 per cent and 48 per cent, repectively. This was followed by shortening payback period at 35.7 per cent and raising required rate of return at 35.7 per cent for the Main Board companies and 40 per cent and 36 per cent respectively for the Second Board companies . Probability analysis, a method advocated by the text books, was not widely used by managers of the Second Board companies as only 12 per cent used it. Nevertheless, this was the third most popularly used technique among managers for the Main Board (21.4%). Looking at the percentages, a wide theory-practice gap remains with respect to this technique. This is consistent with the report revealed by Arnold and Hatzopoulos (2000).

Further analysis shows that 17.1 per cent and 20 per cent of the Main Board and Second Board companies also used subjective assessment of risks. More sophisticated techniques such as the beta analysis are used by a less number of companies. In this study, only 4.3 per cent of the Main Board companies applied such a technique. An obvious observation is that all managers in the sample companies were very concerned with risks assessment. None of them ignore risks. If a comparison is made with previous studies, the main finding of scenario/sensitivity analysis being the most popular technique in assessing risks supports the work of Arnold and Hatzopoulos (2000), Drury and Tayles (1996), Jog and Srivastava (1995), Kester *et al.* (1999), Payne and Heath (1999) and Shao and

Table 4. Techniques used in assessing risks

| | | Main Board | | Second Board | |
|---|---|---|---|---|---|
| | | Frequency | Per cent | Frequency | Per cent |
| Shorten payback period | No | 45 | 64.3 | 15 | 60.0 |
| | Yes | 25 | 35.7 | 10 | 40.0 |
| Probability analysis | No | 55 | 78.6 | 22 | 88.0 |
| | Yes | 15 | 21.4 | 3 | 12.0 |
| Beta analysis | No | 67 | 95.7 | 25 | 100.0 |
| | Yes | 3 | 4.3 | | |
| Ignore risk | No | 70 | 100.0 | 25 | 100.0 |
| | Yes | | | | |
| Raise required rate of return | No | 45 | 64.3 | 16 | 64.0 |
| | Yes | 25 | 35.7 | 9 | 36.0 |
| Sensitivity/Scenario analysis | No | 16 | 22.9 | 13 | 52.0 |
| | Yes | 54 | 77.1 | 12 | 48.0 |
| Subjective assessment | No | 58 | 82.9 | 20 | 80.0 |
| | Yes | 12 | 17.1 | 5 | 20.0 |
| Others | No | 68 | 97.1 | 25 | 100.0 |
| | Yes | 2 | 2.9 | | |

**Table 5.** Overall differences in the techniques used in assessing risks

| | Value | |
|---|---|---|
| | 0 | 1 |
| Shorten payback period | 60 | 35 |
| Probability analysis | 77 | 18 |
| Beta analysis | 92 | 3 |
| Ignore risk | 95 | 0 |
| Raise required rate of return | 61 | 34 |
| Sensitivity/scenario analysis | 29 | 66 |
| Subjective assessment | 78 | 17 |
| Other techniques | 93 | 2 |
| Cochran's Q | 205.133[a] | |
| Asymp. sig. | .000 | |

a: 1 is treated as a success.

Shao (1993; 1996). It remained the most favoured technique in both developing and developed countries.

In order to answer the fourth objective of this study, that is, whether there are differences in the techniques used in addressing risks in major capital investment decisions between companies listed on the Main Board and Second Board of Bursa Malaysia, a Cochran's Q test is executed. The result is reported in Table 5. A high Cochran's Q value of 205.133 shows that overall, there is a significant difference in the techniques selected at a one

per cent significant level. The null hypothesis that there is no significant difference in the techniques used in assessing risks between the Main Board and Second Board companies is rejected. In order to examine which among the risk assessment techniques provide a difference between the Boards, a Chi-Square test was then executed.

As observed in Appendix II, none of the techniques used in assessing risks differed between the Main Board and Second Board companies except for the sensitivity or scenario analysis. The Pearson Chi-Square value of 7.377 shows that the Main Board companies utilised the analysis more than the Second Board companies. This could be seen in the number of actual count (54) exceeding the expected count (48.6) for the Main Board companies; whereas the actual count (12) was less than the expected count (17.4) for the Second Board companies. Further observations on some of the risk assessment techniques, such as beta analysis, subjective assessment and other, shows that no inferences could be made since the expected count is less than five.

In summary, it is rather obvious that larger companies would be using a more sophisticated technique such as WACC in deriving discount rates whereas smaller companies represented by the Second Board listed companies were relying on short term facilities. An inference that could be made is that in a developing country such as Malaysia, size is very much related to the accessibility of funds in the capital market. Hence, top management would need to look into this if a decision is made to go for external financing other than borrowing from the banks to support capital investment projects. As for risks assessment, all financial managers, from both the large and small companies, were very concerned about risks. Sensitivity or scenario analysis, the most popular technique being used in developed countries, was also being utilised by the Malaysian companies. A more complex technique such as the beta analysis was hardly used. Malaysian financial managers and the top management would need to be exposed to such methods as systematic risks represented by beta cannot be diversified away and have to be managed.

## 5. Conclusion

This paper presents the findings of a survey on derivation of discount rates and risks assessment by 100 sample companies from the Main Board and Second Board of Bursa Malaysia. The average size of the Main Board companies is 25 times bigger than companies on the Second Board. Their annual capital budget ranges from RM1 million to beyond RM200 million whereas the Second Board companies budget ranges from RM1 million to RM50 million. In terms of the number of employees, the mean was 2,803 employees for the Main Board and 489 employees for the Second Board companies, which made the Main Board companies 5.7 times greater in terms of personnel resources. Dissimilarities in size have resulted in different capital budgeting decisions between these groups of companies as is evident in previous studies.

The survey results confirm the trend of using WACC as a discount rate for investment appraisal among companies listed on the Main Board. As for companies listed on the Second Board which were considered to be smaller, they were less likely to use a theoretically recommended method. The derivation of discount rates was distributed among most of the discount rates. There exists a significant difference in the discount rate selected by the Main Board and Second Board companies especially in the use of WACC. It is likely that smaller companies on the Second Board have less access to the capital market and rely a lot

more on short term loan facilities. In addition, for companies that had used WACC, the most popular method of estimating cost of equity was CAPM. Although this model has been criticised by the academic community, in practice, it is still being used by the listed companies. Another interesting finding is that none of the sample companies derived a discount rate based on the cost of equity using dividend growth model. Despite wider teaching of this model in class, financial managers are not convinced of its usefulness.

In terms of risks assessment, sensitivity or scenario analysis was the most favoured technique used by the Main Board and Second Board companies, followed by shortening payback period and raising required rate of return. Probability analysis, a technique which is highly recommended by finance text books, was not widely used by the Second Board financial managers, but it ranked fourth among all the techniques used in assessing risks. More sophisticated techniques such as the beta analysis were applied bya less number of companies. An explanation for this might probably be that it is rather difficult for the financial managers to explain or to convince the board of directors of the usefulness of such a technique or it might be time consuming to put forward such an analysis especially if decisions are needed to be made urgently; the fear is that competitors might grab the opportunity. In addition, it was found that about 18.5 per cent of the sample companies used subjective assessment of risks in project appraisals. On whether there were significant differences in the techniques used by the listed companies, there is evidence to show that the Main Board companies utilised the sensitivity or scenario anlaysis more than the Second Board companies.

In conclusion, until today there is still a theory-practice gap on the derivation of discount rates and risk assessments among listed companies in Malaysia. The gap is wider for the Second Board companies as compared to the Main Board companies. Some possible explanations to this would probably be lack of personnel resources, capital and time constraints and presentation difficulties to the board of directors.

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**Appendix I.** Differences in derivation of discount rate

| Listing | | Cost of debt before tax | | Cost of debt after tax | | Earnings yield on shares | | Cost of equity using dividend growth model | | Cost of equity using CAPM | | WACC | | An arbitrarily chosen figure | | Other | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes |
| Main Board | Count | 52 | 18 | 62 | 8 | 68 | 2 | 70 | 0 | 63 | 7 | 31 | 39 | 63 | 7 | 66 | 4 |
| | Expected Count | 53.8 | 16.2 | 60.4 | 9.6 | 64.8 | 5.2 | 52.5 | 17.5 | 63.4 | 6.6 | 36.1 | 33.9 | 62.6 | 7.4 | 65.6 | 4.4 |
| Second Board | Count | 21 | 4 | 20 | 5 | 20 | 5 | 5 | 25 | 23 | 2 | 18 | 7 | 22 | 3 | 23 | 2 |
| | Expected Count | 19.2 | 5.8 | 21.6 | 3.4 | 23.2 | 1.8 | 22.5 | 7.5 | 22.6 | 2.4 | 12.9 | 12.1 | 22.4 | 2.6 | 23.4 | 1.6 |
| Pearson Chi-Square | Value | | .997 | | 1.146 | | 7.931 | | 77.778 | | .086 | | 5.665 | | .078 | | .163 |
| | Asymp. Sig. (2-sided) | | .323 | | .284 | | .005 | | .000 | | .769 | | .017 | | .780 | | .687 |

**Appendix II.** Differences in techniques used in assessing risks

| Listing | | Shorten payback period | | Probability analysis | | Beta analysis | | Ignore risk | | Raise required rate of return | | Sensitivity / Scenario analysis | | Subjective assessment | | Other | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes |
| Main Board | Count | 45 | 25 | 55 | 15 | 67 | 3 | 70 | 45 | 25 | 16 | 54 | 58 | 12 | 68 | 2 | |
| | Expected Count | 44.2 | 25.8 | 56.7 | 13.3 | 67.8 | 2.2 | 70.0 | 44.9 | 25.1 | 21.4 | 48.6 | 57.5 | 12.5 | 68.5 | 1.5 | |
| Second Board | Count | 15 | 10 | 22 | 3 | 25 | 0 | 25 | | 16 | 9 | 13 | 12 | 20 | 5 | 25 | 0 |
| | Expected Count | 15.8 | 9.2 | 20.3 | 4.7 | 24.2 | .8 | 25.0 | 16.1 | 8.9 | 7.6 | 17.4 | 20.5 | 4.5 | 24.5 | .5 | |
| Pearson Chi-Square | Value | | .145 | | 1.146 | | 1.106 | | | | .001 | | 7.377 | | .102 | | .730 |
| | Asymp. Sig. (2-sided) | | .703 | | .284 | | .293 | | | | .980 | | .007 | | .749 | | .393 |