Use of Methods to Determine the Cost of Capital in Sri Lankan Companies

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A B S T R A C T

The aim of the study is to find out the use of methods to determine the cost of capital in Sri Lankan companies. A comprehensive primary survey was conducted of 38 out of 150 financial officers of companies listed on the Colombo Stock Exchange (CSE) in Sri Lanka. Stratified random sampling method was used to select the sample from listed companies in Sri Lanka. Collected data were then analysed by applying mean, percentage analysis and Chi-square test. This study presents the results of survey of 38 financial officers in terms of methods to compute the cost of capital in investment decision making. Results of the study revealed that WACC was the most dominant method to determine the discount rate/cut off rate followed by CAPM and Cost of Debt. Further current study evaluates whether the firm characteristics make differences in the choice of cost of capital methods. Results of the study further revealed that the market capitalization influenced the use of methods to determine the cost of capital in terms of CAPM, Arbitrary Rate, Earnings Yield and Average Historical Rate of Return. There was also significant differences between the types of industry and the use of WACC, CAPM, Cost of Debt and Earnings Yield. However, there was no significant differences of the use of Arbitrary Rate and Average Historical Rate of Return with type of industry. Financial officers with more experience were always and often used WACC and CAPM in comparison with less experience of CFOs. Further, it was implied that in case of Cost of Debt, Arbitrary Rate, Earnings Yield and Average Historical Rate of Return were not affected by experience of financial officers. It was observed that significant differences between the level of educational qualification and use of WACC, Cost of Debt and an Arbitrary Rate.

Background of the Study

Different methods are used for determining the cost of capital in order to make the investment decision. As per the earlier studies reported in the finance literature, Weighted Average Cost of Capital (WACC), Capital Assets Pricing Model (CAPM), Cost of Debt/ Interest payable on debt capital (CD), An arbitrary rate (AR), Earnings Yield on shares (EY), Average

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Historical Return on Stock (AHRS) are the most preferred choices to determine the cost of capital (e.g., Hermes, Smid and Yao, 2007; Verma, Gupta and Batra, 2009). Researchers, academics and practitioners arguing for the superiority of the WACC (Ryan and Ryan, 2002; Hermes et al., 2007). Firms use different methods to decide the discount rates according to the investment nature, the financing terms and firms' characteristics (Lazaridis, 2004, Graham and Harvey, 2001). Cost of capital is named as discount rate or cut off rate or hurdle rate which refer to minimum rate of return expected from the investment projects (Ryan and Ryan, 2002; Verma et al., 2009). The discounting rate is adjusted to the related risk; high discounting rate is used for high risk projects whereas low rate used for less risky ones (Hirschey, 2003).

Discounted Cash Flow (DCF) techniques consider the time value of money, which means that the amount of cash flows at the moment differs in its value from the same amount to be received in the future. In finance terms, this is called the time value of money, and this concept is applied in DCF techniques by converting the cash flows into their respective values at the same point of time (Drury, 1996). The DCF techniques apply the time value of money concept in order to obtain a superior measure of cost-benefit trade-off of proposed projects (Cooper et al., 2002). The process of converting the expected cash flows into a value at the present time is called discounting, and this needs a discount rate to be used in the calculations of time value money.

Theoretically 'the WACC is the most appropriate discounting rate; otherwise an adjustment has to be done according to the given risk' (Jog and Srivastava, 1995, p.40). Cooper et al. (2002) suggested that the fluctuations in the interest rate have to be carefully considered when adjusting the discounting rate as they are directly related to the calculations of time value of money in order to account for risk factors in the investment decision. Therefore it is important to determine the appropriate discount rate/ cut off rate/ hurdle rate/ cost of capital/ minimum rate of return for the investment decision. Thus, this study assesses the use of methods to determine the cost of capital in Sri Lankan companies. The current study tries to find out the answers for the following questions.

RQ1. What methods are used by finance professionals in Sri Lanka in order to determine the cost of capital?

RQ2. Are there any differences in the choices of cost of capital methods in terms of firms' characteristics?

Methodology

Research Design

The survey tried to find out the methods used to determine the cost of capital in Sri Lanka. Questionnaire was used to collect the data which consisted of two parts. Part I of the questionnaire was used to find out the methods of cost of capital. Questions on methods to derive the discount/ cut off rate prepared based on the studies by Verma et al. (2009) and Hermes et al. (2007). Part II of the questionnaire was considered to collect the demographic information of the respondents. There are 297 companies, listed in Colombo Stock Exchange. Listed companies belong to 20 different sectors. Stratified random sampling was used to select 150 listed companies as sample.

Data Collection Procedure

Different strategies were used to collect the data. 24 questionnaire were directly collected from the companies and 19 questionnaires were received by post and 4 questionnaires were received via email and 11 questionnaires were returned to the researcher as undelivered post. 38 questionnaires were usable to the study out of 47 received questionnaires.

Testing the Reliability

A reliability analysis of the item-scales was performed using SPSS. Cronbach's alpha (α) values were assessed for each variable with item-scales. The reliability of the measures was well above the minimum threshold of 0.60 in every case (Gliner & Morgan, 2000). Thus, it can be concluded that all of the measures were generally reliable.

Descriptive Analysis of the Survey Responses

The descriptive analyses of the survey responses are discussed under the following sub-headings.

Educational Qualification of the Respondents

Classification of the educational qualification of the respondents was grouped into: bachelor degree, MBA, non-MBA Master's, above Master's degree and professional qualification (e.g. CIMA, ACCA). Above master degree qualification (e.g., MPhil/PhD or MBA degree with professional qualification) was held by 42.1% of CFOs, followed by MBA qualification (23.7%), Professional qualification (21.1%) and non-MBA Master's (13.2%).

Size of Market Capitalization

Size of market capitalization was categorized into five groups: less than LKR 10 billion, LKR 10–50 billion, LKR 50–100 billion, LKR 100 –500 million and LKR 500 billion and over. The large number of CFOs reported that size of their market capitalization is less than 10 billion (42.1%), followed by LKR 50- 100 billion (28.9%), LKR 10 -50 Billion (23.7%) and LKR 100-500 billion (5.3%).

Experience of the CFOs

Experience of the CFOs was classified into four groups in terms of number of years they had been in the profession: less than 5 years, 5-9 years, 10-19 years and 20 years and more. The higher number of CFOs had 10 to 19 years' experience (N=15), followed by 20 years' and more experience (N=9), 5 to 9 years' (N=8) and a small number of CFOs had less than 5 years' experience (N=6).

Types of Industry

Types of industry were initially classified in terms of their nature (Verbeeten, 2006): bank/finance/insurance industry, manufacturing industry, diversified holdings, health care industry and other non-financial industry. As per the responses, 57.9% of industries are manufacturing, followed by diversified holdings (21.1%), bank/finance/insurance companies (10.5%), health care industry (5.3%) and other non-financial industry (5.3%).

Discount Rates / Cut off Rates/Minimum Rate of Return

This study examined the way in which Sri Lankan firms decide the cut off rates to determine the minimum rate of return to take investment decisions. It also investigated differences in the use of cost of capital methods in terms of firm

characteristics. In line with the previous studies of Verma et al. (2009) and Hermes et al. (2007), present study included a wide-variety of choices of cut off rates including weighted average cost of capital (WACC), capital assets pricing model (CAPM), cost of debt/interest payable on debt (CD), an arbitrary rate (AR), earnings yield on shares (EY), average historical return on stock (AHRT) and other methods to decide the cut off rates.

Respondents have been asked to report the methods to calculate the discount rate/ cut off rates/ minimum rate of return on a Likert scale from always (5) to never (1). Results are presented in Table 1. As per the results, WACC is the most prevalent method to determine discount rate (always 47.4% and often 44.7%) generating mean value of 4.37. The next widely used methods are CAPM (always 7.9% and often 28.9%) and the CD (always 21.1% and often 21.8%) and the CAPM and CD generating mean values of 3.02 and 3.00 respectively. Other methods are not popular methods in calculating to determine the cut off rates as they are having the mean values are less than 3. The theoretical concept of WACC was the most preferred method to calculate the cut-off rate in Sri Lanka; this concurs with the literature (Verma et al., 2009).

Table-1: Survey Responses on the Question "Specify Methods Your Company Uses to Drive the Discount / Cut Off Rate (Minimum Rate of Return) Used in the Appraisal of Major Capital Investment"

Cut off rates	Never	Rarely	Sometimes	Often	Always	Mean & Rank
WACC	-	2.6%(1)	5.3%(2)	44.7%(17)	47.4%(18)	4.37 (1)
CAPM	-	42.1%(16)	21.1%(8)	28.9%(11)	7.9%(3	3.02 (2)
Cost of debt/ interest payable on debt capital (CD)	21.1% (8)	21.1%(8)	15.8%(6)	21.8%(8)	21.1%(8)	3.00 (3)
An arbitrary rate (AR)	47.4%(18)	36.8%(14)	10.5%(4)	-	5.3%(2)	1.79 (6)
Earnings yield on shares (EY)	42.1%(16)	15.8%(6)	21.1%(8)	15.8%(6)	5.3%(2)	2.26 (4)
AHRS	44.7%(17)	28.9%(11)	13.2%(5)	2.6%(1)	10.5%(4)	2.05 (5)

Practices of methods to calculate the discount rate/ cut off rate/ cost of capital/ hurdle rate in previous studies from different countries have been presented in Table 2 below. WACC was reported as most preferred method to calculate the discount rate in the previous studies of Arnold and Hatzopoulos (2000), Ryan and Ryan (2002), Dedi and Orsay (2007), Leon, Isa and Kester (2008), Bennouna, Meredith and Marchant (2010) and Tufor and Doku (2013). As advised in the literature and the empirical studies (e.g. Hermes, Simd and Yao, 2007; Mao 1970) theoretical concept of WACC is most preferred method followed by CAPM to calculate the cut off rate in Sri Lanka. Therefore, methods used to decide the cut off rates by the Sri Lankan companies are in line with the theory.

Table-2: Practices of Methods to Calculate the Cost of Capital/ Discount Rate/ Cut off Rate/Hurdle Rate from Different Countries in the Empirical Studies

	Arnold & Hatzopoulos (2000)	Ryan & Ryan (2002)	Lazaridis (2004)	Truong, Partington & Peat (2004)	Dedi & Orsag (2007)	Zubairi (2007)	Hermes, Smid & Yao (2007)	Leon,Isa & Kester (2008)	Bennouna,Meredith &Marchant (2010)	Ekeha (2011)		Al-Ajmi, Al-Saleh & Hussain (/2011)			Tufuor & Doku/2013
												Bahrain			
Country	UK	USA	Cyprus	Australia	Croatia	Pakistan	Dutch	China	Indonesia	Canada	Europe	W .Africa	Overall	Conventional	Islamic Institutio	Ghana
WACC (%)	54	83.2	-	-	40	52	66.7	53.3	74.1	76.1	67.9	50	54.3	74.2	20.5	50
Cost of capital derived from CAPM (%)	8	-		72	9	-	-	-	-	-	-	-	-	-	-	-
Cost of Debt (%)	11	7.4	30.95	34	-	67	14.3	28.9	-	9.9	14.3	25	58.1	41.9	84.6	-
An arbitrary rate	6%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Earnings yields on shares (%)	1	-		-	-	-	-	-	-	-	-	-	-	-	-	-

Average historical return on stock (%)	-	-	-	11	-	49	-	-	-	-	-	-	-	-	-	
Project dependent (Risk adjusted) cost of capital (%)	-	-	-	-	-	-	9.5	15.7	-	-	10.7	12.5	22	29.3	10.3	
Cost of equity (%)	-	-	-	-	-	-	-	-	-	1.4	-	-	31.4	26.1	41	
Minimum rate of return stipulated by shareholders (%)	-	-	-	-	-	-	-	-	-	-	-	-	65.7	79.8	41	
A measure based on past experience (%)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12.5
Any other (%)	10	8.4	13.10	-	-	-	9.5	2.2	9.3	12.7	7.1	12.5	-	-	-	12.5

Relationship between firm characteristics and cost of capital

Table-3: Relationship between Market Capitalization and Cost of Capital

Methods to calculate the cost of capital (Chi Square Value)	Size of market capitalization	Never	Rarely	Sometimes	Often	Always
WACC (12.842)	<10 Billion	-	6.2%	-	56.2%	37.5%
	10-50 Billion	-	-	-	66.7%	33.3%
	50-100 Billion	-	-	18.2%	18.2%	63.6%
	100-500 Billion	-	-	-	-	100.0%
CAPM (41.144***)	<10 Billion	-	68.8%	-	25.0%	6.2%
	10-50 Billion	-	-	44.4%	55.6%	-
	50-100 Billion	-	45.5%	36.4%	18.2%	-
	100-500 Billion	-	-	-	-	100.0%
CD (11.251)	<10 Billion	25.0%	12.5%	25.0%	12.5%	25.0%
	10-50 Billion	22.2%	22.2%	-	44.4%	11.1%
	50-100 Billion	9.1%	36.4%	18.2%	18.2%	18.2%
	100-500 Billion	50.0%	-	-	-	50.0%
AR (18.668**)	<10 Billion	37.5%	62.5%	-	-	-
	10-50 Billion	55.6%	-	22.2%	-	22.2%
	50-100 Billion	45.5%	36.4%	18.2%	-	-
	100-500 Billion	100.0%	-	-	-	-
EY (22.265**)	<10 Billion	37.5%	37.5%	12.5%	-	12.5%
	10-50 Billion	66.7%	-	22.2%	11.1%	-
	50-100 Billion	27.3%	-	36.4%	36.4%	-
	100-500 Billion	50.0%	-	-	50.0%	-
AHTR (24.489**)	<10 Billion	37.5%	62.5%	-	-	-
	10-50 Billion	44.4%	11.1%	22.2%	11.1%	11.1%
	50-100 Billion	54.5%	-	27.3%	-	18.2%
	100-500 Billion	50.0%	-	-	-	50.0%

** is χ2 significant within the specific capital budgeting method at the .01 level,

* is χ2 significant within the specific capital budgeting method at the .05 level,

The size of the market capitalization is a significant factor in the choice of cost of capital methods. The Pearson Chi-square test of independence has been performed to see the relationship between size of the market capitalization and cost of capital methods. Results (see table 3) revealed that there is a significant differences between market capitalization and cost of capital methods. The Pearson Chi-square test of independence for CAPM, AR, EY and AHTR methods were statistically

significant (p <.05). This implies that market capitalization affects those applications in cost of capital methods. In case of CAPM 100% of always use for market capitalization between 100 and 500 billion), EY (50% of often use for market capitalization between 100 and 500 billion) and AHTR (100% of always use for market capitalization between 100 and 500 billion) were observed that the use of the method increase along with increase in size of market capitalization. In contrast

application of AR observed that the 50 % of never use of the method increased along with increase in size of market capitalization. For the rest of the methods (WACC and CD), the Pearson Chi-square test value was not significant (p >.05) which implies that there is statistically insufficient evidence to support the effects of size of market capitalization on methods to determine the cost of capital in terms of WACC and CD.

Table 4: Relationship between Type of Industry and Cost of Capital Methods

Methods to calculate the cost of capital (Chi Square Value)	Type of industry	Never	Rarely	Sometimes	Often	Always
WACC (46.399**)	Bank/Finance/Insurance	-	-	-	-	100.0%
	Manufacturing Industry	-	4.5%	-	59.1%	36.4%
	Diversified Holdings	-	-	-	50.0%	50.0%
	Health Care Industry	-	-	-	-	100.0%
	Other Non-Financial Industry	-	-	100.0%	-	-
CAPM (25.463*)	Bank/Finance/Insurance	-	25.0%	25.0%	50.0%	-
	Manufacturing Industry	-	59.1%	4.5%	22.7%	13.6%
	Diversified Holdings	-	-	50.0%	50.0%	-
	Health Care Industry	-	-	100.0%	-	-
	Other Non-Financial Industry	-	100.0%	-	-	-
CD (41.958**)	Bank/Finance/Insurance	50.0%	-	50.0%	-	-
	Manufacturing Industry	27.3%	27.3%	9.1%	9.1%	27.3%
	Diversified Holdings	-	-	25.0%	75.0%	-
	Health Care Industry	-	-	-	-	100.0%
	Other Non-Financial Industry	-	100.0%	-	-	-
AR (14.606)	Bank/Finance/Insurance	50.0%	50.0%	-	-	-
	Manufacturing Industry	45.5%	36.4%	9.1%	-	9.1%
	Diversified Holdings	75.0%	-	25.0%	-	-
	Health Care Industry	-	100.0%	-	-	-
	Other Non-Financial Industry	-	100.0%	-	-	-
EY (59.195**)	Bank/Finance/Insurance	50.0%	-	-	-	50.0%
	Manufacturing Industry	54.5%	27.3%	9.1%	9.1%	-
	Diversified Holdings	25.0%	-	75.0%	-	-
	Health Care Industry	-	-	-	100.0%	-
	Other Non-Financial Industry	-	-	-	100.0%	-
AHTR (13.302)	Bank/Finance/Insurance	50.0%	50.0%	-	-	-
	Manufacturing Industry	45.5%	31.8%	9.1%	4.5%	9.1%
	Diversified Holdings	25.0%	25.0%	37.5%	-	12.5%
	Health Care Industry	50.0%	-	-	-	50.0%
	Other Non-Financial Industry	100.0%	-	-	-	-

** is χ2 significant within the specific capital budgeting method at the .01 level,

* is $\chi2$ significant within the specific capital budgeting method at the .05 level,

In order to examine is there any significant differences between type of industry and use of methods to determine the cost of capital the Pearson Chi-square test of independence has again been performed (see table 4). There was a significant differences between types of industry and application of WACC, CAPM, CD and EY. It was observed that 100% always use of WACC in bank, finance and insurance companies and health care industries. 50% often use of CAPM observed in bank, finance and insurance companies and 50% always use CAPM observed in diversified holdings companies. In case of CD, 100 % of always usage examined in health care industry and 100 of rarely usage observed in other non-financial companies. There was a significant difference between the applications of EY between types of industry. Significantly, 50% of always use in bank finance and insurance companies and then 100% of often use in healthcare and other non-financial companies. There is no significant differences of application of AR and AHR with type of industry.

Table-5: Relationship between Years of Experience and Cost of Capital Methods

Methods to calculate the cost of capital (Chi Square Value)	Years of experience	Never	Rarely	Sometimes	Often	Always
WACC (17.765**)	< 5 years	-	-	33.3%	33.3%	33.3%
	5-9 years	-	-	-	75.0%	25.0%
	10-19 years	-	-	-	40.0%	60.0%
	> 20 years	-	11.1%	-	33.3%	55.6%
CAPM (16.220*)	< 5 years	-	33.3%	50.0%	16.7%	-
	5-9 years	-	75.0%	-	25.0%	-
	10-19 years	-	33.3%	6.7%	40.0%	20.0%
	> 20 years	-	33.3%	44.4%	22.2%	-
CD (16.994)	< 5 years	16.7%	33.3%	16.7%	33.3%	-
	5-9 years	50.0%	25.0%	25.0%	-	-
	10-19 years	13.3%	6.7%	20.0%	20.0%	40.0%
	> 20 years	11.1%	33.3%	-	33.3%	22.2%
AR (9.740)	< 5 years	50.0%	33.3%	16.7%	-	-
	5-9 years	50.0%	25.0%	-	-	25.0%
	10-19 years	40.0%	46.7%	13.3%	-	-
	> 20 years	55.6%	33.3%	11.1%	-	-
EY (13.335)	< 5 years	50.0%	-	16.7%	33.3%	-
	5-9 years	75.0%	25.0%	-	-	-
	10-19 years	33.3%	13.3%	26.7%	13.3%	13.3%
	> 20 years	22.2%	22.2%	33.3%	22.2%	-
AHR (11.415)	< 5 years	83.3%	-	16.7%	-	-
	5-9 years	50.0%	25.0%	-	12.5%	12.5%
	10-19 years	33.3%	40.0%	13.3%	-	13.3%
	> 20 years	33.3%	33.3%	22.2%	-	11.1%

** is $\chi2$ significant within the specific capital budgeting method at the .01 level,
* is $\chi2$ significant within the specific capital budgeting method at the .05 level,

Chi square results are summarized in table 5. The value of Pearson Chi-square test of independence is significant ($p <.05$) in case of WACC and CAPM. It articulates that CFOs with more experience were always and often use WACC and CAPM in comparison with less experience CFOs. Further, it implies that in case of all other methods to determine the cost of capital (CD, AR, EY and AHTR) were not affected by experience of CFOs.

Table-6: Relationship between Educational Qualification and Use of Methods to Determine the Cost of Capital.

Methods to calculate the cost of capital (Chi Square Value)	Level of education	Never	Rarely	Sometimes	Often	Always
WACC (17.697**)	MBA	-	-	11.1%	66.7%	22.2%
	Non-MBA Masters	-	-	20.0%	80.0%	-
	> (above) Master Degree	-	-	-	37.5%	62.5%
	Professional Qualification	-	12.5%	-	12.5%	75.0%
CAPM (11.326)	MBA	-	66.7%	11.1%	22.2%	-
	Non-MBA Masters	-	20.0%	20.0%	60.0%	-
	> (above) Master Degree	-	25.0%	31.2%	25.0%	18.8%
	Professional Qualification	-	62.5%	12.5%	25.0%	-
CD (20.179*)	MBA	44.4%	22.2%	11.1%	22.2%	-
	Non-MBA Masters	-	60.0%	-	40.0%	-
	> (above) Master Degree	18.8%	6.2%	12.5%	25.0%	37.5%
	Professional Qualification	12.5%	25.0%	37.5%	-	25.0%
AR (20.235**)	MBA	55.6%	33.3%	11.1%	-	-
	Non-MBA Masters	20.0%	20.0%	20.0%	-	40.0%
	> (above) Master Degree	62.5%	37.5%	-	-	-
	Professional Qualification	25.0%	50.0%	25.0%	-	-
EY (7.635)	MBA	55.6%	22.2%	11.1%	11.1%	-
	Non-MBA Masters	60.0%	-	20.0%	20.0%	-
	> (above) Master Degree	25.0%	18.8%	25.0%	25.0%	6.2%
	Professional Qualification	50.0%	12.5%	25.0%	-	12.5%
AHR (16.018)	MBA	66.7%	22.2%	11.1%	-	-
	Non-MBA Masters	40.0%	-	20.0%	20.0%	20.0%
	> (above) Master Degree	31.2%	43.8%	6.2%	-	18.8%
	Professional Qualification	50.0%	25.0%	25.0%	-	-

** is χ2 significant within the specific capital budgeting method at the .01 level,

* is χ2 significant within the specific capital budgeting method at the .05 level,

In order to examine is there any significant differences between educational qualification and use of methods to determine the cost of capital. The Pearson Chi-square test of independence has again been performed (see table 6). There was a significant (p < 0.05) difference between level of educational qualification and application of WACC, CD and AR. Financial officers with professional qualification significantly applied 75% always use of WACC .37.5% always use of CD has been applied by financial officers who have qualified above master degree. Similarly, 25% of always use of CD observed by financial officers with professional qualification. Financial officers who have non-MBA qualification applied 40% of always use of AR to determine the cost of capital. Application of CAPM, EY and AHR were not significantly differ with educational qualification of practitioners.

Conclusion

This study presents the results of survey of 38 financial officers in corporate finance practices in terms cost of capital. Primarily, aim of this study was to document interesting insights on which cost of capital methods are mostly used by finance professionals in Sri Lanka A comprehensive primary survey was conducted of 38 out of 150 financial officers of companies listed on the Colombo Stock Exchange (CSE) in Sri Lanka. Collected data were then analysed by applying mean,

percentage analysis and Chi-square test. The results of the study revealed that WACC was the most dominant method to determine the discount rate/cut off rate followed by CAPM and Cost of Debt. Further current study evaluated whether the firm characteristics make differences in the choice of cost of capital methods. Market capitalization affects the use of methods to determine the cost of capital in terms of CAPM, AR, EY and AHTR. There was also significant differences between the types of industry and the use of WACC, CAPM, Cost of Debt and EY. There was no significant differences of use of AR and AHRT with type of industry. Financial officers with more experience were always and often use WACC and CAPM in comparison with less experience of CFOs. Further, it was implied that in case of CD, AR, EY and AHTR were not affected by experience of financial officers. However, It was observed that significant differences between the level of educational qualification and use of WACC, CD and AR. Findings of the study may useful to the practitioners to determine the cost of capital in the investment decision making.

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