Capital Budgeting Techniques in Sri Lanka: A Survey

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Abstract

Making a strong investment decision is vital as resources are scarce and the investment is expected to add to the value of the firm. Capital budgeting (CB), a key input to achieving that goal, is the rational allocation of limited capital across a plethora of viable prospective investment. This study investigates whether CB techniques differ significantly among the firms in Sri Lanka as an example of emerging country. The questionnaires posted to 150 Sri Lankan-listed firms asked about firm and respondent demographics along with various aspects of CB techniques. Sri Lankan firms tend to consider PBP as the most important CB technique and IRR as the next in importance. Scenario approach is the most widely used techniques for assessing capital-investments risk. Sri Lankan firms rely to some extent on the WACC when estimating the cost of capital. Sri Lankan firms have little interest in RO analysis. The NPV method is less prevalent in Sri Lanka. In complex real-world situations, reconciling the outputs of a multifaceted approach to CB methods is more likely to give the depth and width of input needed to achieve an optimal capital investment plan.

Keywords: Capital budgeting, investment analysis, resources, cost of capital

Introduction

Capital budgeting (CB), a key input to achieving that goal, is the rational allocation of limited capital across a plethora of viable prospective investment. In its simplest form financial management is the acquisition and use of cash by firms to purchase real assets to generate cash flows that provide a return to stakeholders. A significant part of the process involves finance managers seeking answers to three critical decisions such as investment decision, financing decision and dividend decision (Bhat, 2008; Dayananda, Irons, Harrison, Herbohn, & Rowland, 2002). In this context, decisions made by financial managers are linked by the cash flow identity (investing decisions–spending money; financing decisions–raising money; and dividend decisions–distributing money) which restricts their degree of freedom in making financial decisions. These decisions are key to the survival of firms, can interact with options, and are greatly influenced by CB; where CB is defined as the practice of analysing investment opportunities in long-term assets which are expected to harvest benefits for more than one year (Schlegel, Frank, & Britzelmaier, 2016). Prior studies on the practice of CB in many countries have revealed that firms are progressively employing more and more refined CB techniques for making investment decisions (De Andrés, De Fuente, & San Martín, 2015; Schlegel et al., 2016). Sri Lanka is an emerging country of 20.5 million people with a rapidly growing economy with ongoing

economic reforms aimed at regenerating and re-integrating the economy into international markets which is accompanied by and a mid to high level of corruption (e.g., its Corruption Perceptions index (CPI) is 38/100, where 100 is no corruption; Transparency International, 2014). With the end to the 30 year ethnic conflict in 2009, the country has a significant opportunity to take advantage of its peacetime stability, geography, educated workforce and scenic beauty. The Sri Lankan government has set determined objectives for economic and human development. With a relatively open investment environment and financial system, accompanied by a moderately stable monetary policy and a refining of infrastructure and emerging domestic firms, Sri Lanka has many of the elements to progress economically. However, Sri Lankan firms still face significant challenges in their choice of investment opportunities with many firms making less-than-optimal CB decisions with long-term detrimental consequences. There is dearth of literature on the effects of emerging-country economies on CB. This study investigates whether CB techniques differ significantly among the firms in Sri Lanka. This study would hopefully benefit academics, researchers, policy-makers and practitioners of both countries and other similar countries through exploring the CB practices, and pursuing strategies to improve the current status of it.

1.1 Literature Review and Hypotheses Development

The selection of appropriate CB techniques, as part of making capital investment decisions, is an essential managerial activity (Roubi, Barth, & Faseruk, 2011; Wnuk-Pel, 2014). Capital investment decisions are connected with the method in which funds are raised within markets to produce future cash flows and provide a return to stakeholders. Investment decisions should rely on CB appraisal techniques to evaluate and sort the quality of investment opportunities (Adler, 2006; Tappura, Sievanen, Heikkila, Jussila, & Nenonen, 2014). These techniques can be classified into two classes: those that take into account the time value of money and those that do not. In the time value of money techniques, past and future cash flows are discounted, typically to a present value. Practically, there are two techniques aligned with the use of discounted cash flow (DCF); net present value (NPV) and the internal rate of return (IRR) (Andor et al., 2015; Mcdaniel, MCcarty, & Jessell, 1988; Tappura et al., 2014). There are two commonly used techniques that do not take into account the time value of money and are aptly described as non-discounted cash flow techniques: Payback period (PBP) and Accounting rate of return (ARR). There are only a limited number of studies emphasising CB evaluation techniques in emerging countries. Chan, Kamal, and William (2004); Farah, Mansor, and George (2008); Kester and Chong (1998) placed emphasis on Malaysia, Indonesia, China, and Singapore; African economies were examined by Coltman (1995); Hassan, Hosny, and Vasilya (2011); Maroyi and van der Poll (2012); Pradeep and Lemay (2009); Kantudu, (2007) while India was examined by Manoj (2002); Satish, Sanjeev, and Roopali (2009); Singh, Jain, and Yadav (2012). Limited studies on the perception of CFOs in emerging, particularly the South-eastern Asia, countries were found. These studies reporting on the results of a survey of firms in Singapore, China and

Indonesia, found that DCF and NDCF are the most frequently used methods. In Malaysia, Han (1986) found the PBP to be the most frequently used evaluation technique. Wong, Farragher and Leung (1987) surveyed a large sample of firms in Malaysia, Hong Kong and Singapore and found significant use of the PBP in Malaysia. In Hong Kong, they found the PBP and ARR to be equally popular. Though, recent studies established that firms in South-Eastern Asia employ NDCF techniques and DCF techniques equally to their long-term decisions. The results for African firms are consistent with the increasing use of DCF in capital investment selection. Previous studies on CB practices undertaken in South Africa (e.g., Andrews & Butler, 1986; Du Toit & Pienaar 2005) noted that larger firms tend to employ more sophisticated CB techniques with simpler CB techniques being more popular among small and medium firms. In the case of Nigeria, firms still employ NDCF techniques, although the use of PBP and ARR methods have declined recently. In the US, survey results noted that the sophistication of CB methods used by CFOs have increased over time. Similarly, some earlier studies of CB practices in South-east Asia (Malaysia, Hong Kong, Philippines, and Singapore) ascribe equal significance to DCF and NDCF methods. It appears that Asian and African CFOs tend to rely more on NDCF methods than sophisticted methods, when selecting long-term investments. Lee and Ip (1984) revealed that the PBP and the NPV were the most regularly used techniques in Hong Kong. Wong et al. (1987) revealed that the PBP was the most prevalent prime method used in Malaysia. In a prior study of Malaysian firms, Han (1986) found that the most prevalent techniques for adjusting for risk were shortening the PBP and requiring higher rates of return for riskier investments. Kester and Chong (1998) and Kester et al. (1999) suggested that CFOs of Singaporean firms found the PBP and IRR to be equally significant for ranking and analysing long-term investments. The studies, also, suggest that these results are similar for firms in Australia, Hong Kong, Indonesia, Malaysia and the Philippines. While there are clear limitations to the literature review, it suggests that a majority of CB studies are focused on developed markets and that there is a scarcity of serious analyses of the situation in emerging markets.

Based on the literature the following alternative hypotheses are proposed to be tested.

H_1: CB techniques are applied less extensively in Sri Lanka as an emerging country

H_2: Firms and respondents' attributes have an effect on the choice of CB techniques employed.

Table 1: - Capital Budgeting Appraisal Techniques in Emerging Countries

Author	Year Published	Country	Most favoured	DCF(%) with		NDCF(%) with	
				IRR	NPV	PBP	ARR
Pereiro	2006	Argentina	IRR	100.00	87.00	32.00	
Hermes, Smid, & Yao	2007	China	IRR	89.00	49.00	84.00	9.00
Firth	1996	China	PBP	41.00	46.00	47.00	42.00
Velez & Nieto	1986	Colombia	IRR	73.00	66.00	19.00	
Lidija & Silvija	2007	Croatia	IRR	59.00	42.00	56.00	8.00
Lazaridis	2004	Cyprus	PBP	8.86	11.39	36.71	17.72
Wong, Farragher, & Leung	1987	Hong Kong	PBP/ARR	32.00	37.00	47.00	47.00
Kester, Chang, Echanis, Haikal, Mansor, Skully, Tsui, & Wang	1999	Hong Kong	PBP	86.00	88.00	100.00	80.00
Lam, Wang, & Lam	2008	Hong Kong	NPV	57.10	66.70	81.00	81.00
Anand	2002	India	IRR	85.00	66.30	67.50	34.60
Verma, Gupta, & Batra	2009	India	NPV/PBP	10.00	40.00	40.00	26.70
Singh, Jain, & Yadav	2012	India	IRR	78.57	50.00	64.28	39.28
Kester, Chang, Echanis, Haikal, Mansor, Skully, Tsui, & Wang	1999	Indonesia	NPV/IRR	94.00	94.00	81.00	56.00
Leon, Isa, & Kester	2008	Indonesia	PBP	63.60	63.60	86.40	40.90
Hassan, Hosny, & Vasilya	2011	Kuwait	NPV	6.49	21.62	8.47	
Kwong	1986	Malaysia	NPV	66.70	77.80		
Wong, Farragher, & Leung	1987	Malaysia	PBP	35.00	47.00	60.00	42.00
Kester, Chang, Echanis, Haikal, Mansor, Skully, Tsui, & Wang	1999	Malaysia	PBP	89.00	91.00	94.00	69.00
Kantudu	2007	Nigeria	PBP	16.67	10.00	26.67	13.33
Kester, Chang, Echanis, Haikal, Mansor, Skully, Tsui, & Wang	1999	Philippines	PBP	94.00	81.00	100.00	78.00
Wong, Farragher, & Leung	1987	Singapore	IRR/PBP/ARR	52.00	31.00	52.00	52.00
Kester, Chang, Echanis, Haikal, Mansor, Skully, Tsui, & Wang	1999	Singapore	PBP	88.00	86.00	98.00	80.00
Hall	2000	S. Africa	IRR	32.30	16.90	16.90	
Hall & Millard	2010	S. Africa	ARR	23.70	28.60	4.80	33.30
Maroyi & van der Poll	2012	S. Africa	NPV	50.00	92.00	0.00	0.00
Pradeep & Lemay	2009	S. Africa	PBP	28.00	36.00	39.00	22.00
Haddad, Sterk, & Wu	2010	Taiwan	PBP	47.83	30.43	52.17	26.09

*Note: Percent using discounted and non-discounted techniques among the emerging countries including Argentina, China, Colombia, Croatia, Cyprus, Hong Kong, India, Indonesia, Kuwait, Malaysia, Nigeria, Philippines, South Africa and Taiwan.

1.2 Research Approach and Methods

The population of interest in this study is (initially) the 289 listed firms on the Colombo Stock Exchange (CSE), as at February 2016. In selecting the population, this study excludes financial, investment and securities sector firms because their unique financial attributes, intensity of regulation, and/or intensive use of leverage are likely to confound the outcomes being studied. Also, the risk of missing data was

minimised by excluding firms that were not listed throughout the review period. After the eliminations, 150 Sri Lankan listed firms remained in the population.

Table 2 - Participating Firms

Global Industry Classification Standard (GICS)	Sri Lanka
Consumer Discretionary	17
Consumer staples	18
Energy	16
Health Care	05
Industrials	36
Information Technology	02
Materials	37
Telecommunication Services	03
Utilities	16
	150

A structured questionnaire survey was used to explore the CB techniques of Sri Lankan firms as an example of an emerging market. The questionnaire sought information on the CB techniques of the responding firms and included two types of questions. The first set of questions sought to describe attributes of the firm and its respondents while the second set investigated attributes of the CB techniques.

1.3 Results and Discussion

As can be seen in Table 3, the most Sri Lankan respondents selected PBP and IRR as their most regularly used CB techniques, a substantial percentage uses PBP as their primary method in CB decisions. The NPV method is less preferred in Sri Lanka, with only 56 percent of the respondents noting that they use PBP always. Interestingly, a large percentage of Sri Lankan firms still use PBP. While the DPP and ARR techniques are clearly the least popular in Sri Lanka, only 30 percent and 24 percent respectively of the Sri Lanka respondents use these methods. The mean value for the PBP and IRR are 4.01 and 3.78 of the Sri Lankan firms respectively.

Table 3 – Capital Budgeting Appraisal Techniques

	Sri Lanka					
	Mean	Std	Frequently	Mostly	Neutral	Rarely	Never
PBP	4.01	0.808	25	60	7	8	0
DPP	2.81	1.036	5	25	19	47	4
ARR	2.77	0.936	3	21	33	38	5
NPV	3.64	0.806	14	42	40	3	1
IRR	3.78	0.804	16	51	29	3	1

Table 4 results also illustrate that Sri Lankan firms, 79 percent of respondents indicate that they use a scenario approach most widely, 34 percent of respondents mentioned sensitivity analyses, while 29 percent of respondents stated that they use a risk adjusted discount rate most often. Sri Lankan firms appear to use the scenario approach more often. Interestingly, few firms in Sri Lanka would use decision tree approach and probabilistic (Monte Carlo) simulation to evaluate their risk. Twelve percent and 13 percent of the respondents would usually use the decision tree approach and probabilistic (Monte Carlo) simulation respectively. The mean value for the scenario approach is 4.25 for Sri Lankan firms.

Table 4 – Capital Budgeting Risk Analysis Techniques

	Sri Lanka					
	Mean	Std	Frequently	Mostly	Neutral	Rarely	Never
Scenario	4.25	1.024	54	25	14	4	3
Sensitivity	3.18	1.059	12	22	33	33	0
Decision tree	2.92	0.595	0	12	69	18	1
Monte Carlo	2.66	0.870	1	12	47	30	10
Risk adjusted	3.04	0.978	8	21	42	25	4

Table 5 indicates that 85 percent of respondents use the WACC most commonly, 64 percent use the interest payable on debt capital, while 37 percent state that they use the earnings yield on shares most often. The WACC has clearly established its position as the most popular method in Sri Lanka and dividend yield on shares method and CAPM method are used much less; 24 and 31 percent of the Sri Lankan firms report they use these methods frequently. The mean value for the WACC is 3.93 of the Sri Lankan firms.

Table 5 – Cost of Capital

	Sri Lanka					
	Mean	Std	Frequently	Mostly	Neutral	Rarely	Never
WACC	3.93	0.673	14	71	10	5	0
CAPM	2.74	1.280	8	23	26	19	24
Interest payable	3.63	0.613	3	61	32	4	0
Dividend yield	3.04	0.978	3	33	39	18	7
Earnings yield	3.12	1.013	7	30	38	18	7

Table 6 presents the results of the survey on the techniques used by Sri Lankan firms to guide long-term investment decisions. As shown in the table, 30 percent of Sri Lankan firms indicated that they frequently/mostly use this technique. For the Sri Lankan firms, game theory technique is used much less; only four percent of the

Respondents accepted they use this method most often. On the other hand, about 17-18 percent of firms in Sri Lanka prefer balanced scorecard and value chain analysis as a guide to long-term investment decisions. The results also show the mean value for the *RO* is 2.79 for Sri Lankan firms.

Table 6 - Information to Guide Long-term Investment Decision

	Sri Lanka						
	Mean	Std	Frequently	Mostly	Neutral	Rarely	Never
Real option	2.79	1.092	7	23	19	44	7
Game theory	2.29	0.677	0	4	29	59	8
Balanced score	2.67	0.987	7	11	30	47	6
Value chain	2.53	1.015	7	10	22	53	8

Respondents are asked to rate on Likert scale of 1 (never) to 5 (frequently). Researchers report the overall mean, standard deviation (Std) as well as the % of respondents that answered 1 (never) to 5 (frequently).

1.4 Cross-Classification of the Survey Results

Capital Budgeting Appraisal Techniques
The results in Table 7 illustrate that DCF and NDCF techniques are employed by respondents with Bachelors degrees in Sri Lanka. The ARR and NPV are significantly used by respondents with a PhD in Sri Lanka. As shown in output, respondents aged between 25-55 are significantly more likely to use PBP, NPV and IRR in Sri Lanka while most mature respondents (>55) in Sri Lanka are likely to use DPP, ARR and NPV than PBP and IRR. The NPV and IRR methods are significantly employed by more experienced (>16) respondents in Sri Lanka. The DCF and NDCF techniques are extensively utilised among consumer staples, materials and consumer discretionary sectors in Sri Lanka, although discounted and non-discounted cash flow techniques are also very popular amongst Sri Lankan health care and industrial sectors. The results also reveal that PBP and DPP techniques seem to be significantly popular among Sri Lankan firms (250 to 500 employees). The highest domestic-earned Sri Lankan respondents are more inclined to use DPP and ARR techniques. The domestic owned firms in Sri Lanka are much more likely to use the discounted and non-discounted cash flow techniques than foreign owned firms. Sri Lankan foreign-owned firms are more inclined to use the IRR method.

Table 7 – Capital Budgeting Appraisal Techniques

	Sri Lanka						
	Frequently/ Mostly	Mean	Education Background				
			Diploma	Bachelor	Honours	Master	PhD
PBP	85	4.01	3.00	2.00**	2.67	3.00	3.00
DPP	30	2.81	4.22	3.11**	3.00**	3.83**	3.72
ARR	24	2.77	3.64	2.21**	2.21**	3.57**	3.93**
NPV	56	3.64	4.16	2.74**	2.77	3.55**	3.80**
IRR	67	3.78	3.80	3.80**	3.00**	3.80	3.80

	Sri Lanka					
	Frequently/ Mostly	Mean	Age group			
			<25	25-35	35-55	>55
PBP	85	4.01	0.00	4.38**	4.00**	3.86
DPP	30	2.81	0.00	3.63**	2.73	2.64**
ARR	24	2.77	0.00	3.25	2.76	2.50**
NPV	56	3.64	0.00	3.75**	3.69**	3.43**
IRR	67	3.78	0.00	4.00**	3.82**	3.50

	Sri Lanka					
	Frequently/ Mostly	Mean	Management Experience			
			1-5	6-10	11-15	>16
PBP	85	4.01	4.50	4.10**	3.82**	4.13
DPP	30	2.81	4.00	3.20**	2.41**	2.97
ARR	24	2.77	3.00	3.20**	2.59**	2.78**
NPV	56	3.64	3.00	4.00	3.90	3.34**
IRR	67	3.78	3.50	4.30**	3.83**	3.59**

Techniques	Frequently/ Mostly	Mean	Sri Lanka: Industry Sectors			
			Utilities	Information	Energy	Telecom
PBP	85	4.01	5.00	4.00	4.00	4.00
DPP	30	2.81	4.00	2.00	2.50	2.00
ARR	24	2.77	3.00	2.00	2.25	2.34
NPV	56	3.64	4.00	4.00	4.00	3.67
IRR	67	3.78	5.00	4.00	4.00	3.67
			Industrials	Consumer staples	Materials	Health Care	Consumer Discretionary
			4.15**	3.71**	4.13**	3.86**	4.08**
			2.70**	2.86**	3.00**	2.13**	3.54**
			2.85**	2.64**	2.88**	2.38**	3.31**
			3.75**	3.50**	3.50**	3.50**	3.62**

	Sri Lanka					
	Frequently/ Mostly	Mean	Number of Employees			
			<100	100-250	250-500	>500
PBP	85	4.01	0.00	3.43	4.05**	4.09
DPP	30	2.81	0.00	2.71	2.26**	3.04**
ARR	24	2.77	0.00	2.86	2.53	2.85**
NPV	56	3.64	0.00	3.86**	3.32	3.74
IRR	67	3.78	0.00	4.00**	3.63	3.81

	Sri Lanka					
	Frequently/ Mostly	Mean	Domestic Income			
			<20	20-40	40-80	>80
PBP	85	4.01	4.00	4.00	3.73**	4.15
DPP	30	2.81	4.00	3.50	2.41**	2.91**
ARR	24	2.77	4.00	4.50	2.55	2.74**
NPV	56	3.64	4.00	2.50	3.55**	3.72
IRR	67	3.78	4.00	4.00	3.81**	3.74

	Sri Lanka			
	Frequently/ Mostly	Mean	Ownership	
			Domestic	Foreign
PBP	85	4.01	4.00**	4.00
DPP	30	2.81	2.81**	2.80
ARR	24	2.77	2.76**	2.60
NPV	56	3.64	3.66**	3.60
IRR	67	3.78	3.78**	4.00**

	Frequently / Mostly	Mean	Sri Lanka				
			Overall Risk Situation				
			Very High	High	Moderate	Low	Very Low
PBP	85	4.01	0.00	3.67	4.13**	3.77**	5.00
DPP	30	2.81	0.00	2.34	2.79	2.86**	4.00
ARR	24	2.77	0.00	2.67	2.77	2.77**	3.00
NPV	56	3.64	0.00	4.00	3.66**	3.60**	3.00
IRR	67	3.78	0.00	4.34	3.77**	3.77**	3.00

Capital Budgeting Risk Analysis Techniques

The results in Table 8 provides evidence that sensitivity analyses and decision tree approach and both scenario and decision tree approaches are significantly preferred by respondents with Bachelors degree in Sri Lanka. Whereas, respondents with a Masters degree are most likely to use probabilistic (Monte Carlo) simulation and risk adjusted discount rate. Sri Lankan respondents with PhD use probabilistic (Monte Carlo) simulation more often. The more mature respondents (>55) are more inclined to use sensitivity analysis, decision tree approach, probabilistic (Monte Carlo) simulation and risk adjusted discount rate in Sri Lanka. The highest experience (>16) Sri Lankan respondents are significantly more likely to use all these risk assessment techniques. All of these five risk assessment tools are significantly employed by the consumables, materials and consumer discretionary sectors in Sri Lanka. The scenario approach seems to be significantly prevalent among Sri Lankan firms (250-500 employees). The highest domestic earned firms (80 percent) are more likely to use decision tree approach, probabilistic (Monte Carlo) simulation and risk adjusted discount rate in Sri Lanka. The domestic owned firms are much more likely to use the all of these risk assessment tools, but Sri Lankan foreign owned firms are more inclined to use a scenario approach.

Table 8 – Capital Budgeting Risk Analysis Techniques

	Sri Lanka						
	Frequently/ Mostly	Mean	Education Background				
			Diploma	Bachelor	Honours	Master	PhD
Scenario	79	4.25	3.00	4.34**	4.07	4.42	4.20
Sensitivity	34	3.18	3.34	3.11**	3.07	3.10**	3.40
Decision tree	12	2.92	2.34	2.78**	2.93	2.97**	3.20
Monte Carlo	13	2.66	2.34	2.67	2.86	2.58**	2.40**
Risk adjusted	29	3.04	2.67	2.94**	3.21	2.97**	3.60

	Sri Lanka					
	Frequently/ Mostly	Mean	Management Experience			
			1-5	6-10	11-15	>16
Scenario	79	4.25	4.50	3.70**	4.17**	4.47**
Sensitivity	34	3.18	3.50	3.60**	3.24	2.97**
Decision tree	12	2.92	3.50	2.90**	2.86	2.94**
Monte Carlo	13	2.66	3.50	3.00	2.41**	2.72**
Risk adjusted	29	3.04	3.50	3.50**	2.97	2.94**

	Sri Lanka					
	Frequently/ Mostly	Mean	Age group			
			<25	25-35	35-55	>55
Scenario	79	4.25	0.00	3.75	4.22**	4.64
Sensitivity	34	3.18	0.00	3.88**	3.24	2.57**
Decision tree	12	2.92	0.00	3.00	2.88	3.00**
Monte Carlo	13	2.66	0.00	3.38	2.49**	2.86**
Risk adjusted	29	3.04	0.00	3.88**	2.90	3.07**

Techniques	Frequently/ Mostly	Mean	Sri Lanka: Industry Sectors			
			Utilities	Information	Energy	Telecom
Scenario	79	4.25	5.00	5.00	4.00	4.34
Sensitivity	34	3.18	2.00	2.00	2.75	3.34
Decision tree	12	2.92	2.00	3.00	2.75	2.67
Monte Carlo	13	2.66	3.00	2.50	2.50	2.00
Risk adjusted	29	3.04	3.00	3.00	2.50	2.34
			Industrials	Consumer staples	Materials	Health Care	Consumer Discretionary
			4.35	4.36**	4.25**	4.25**	3.85**
			3.25**	3.07**	2.50**	3.25**	3.92**
			2.90**	3.14**	3.00**	2.50**	3.08**
			2.60**	2.86**	2.50**	2.38**	3.00**

	Sri Lanka					
	Frequently/ Mostly	Mean	Domestic Income			
			<20	20-40	40-80	>80
Scenario	79	4.25	3.00	5.00	4.23**	4.28
Sensitivity	34	3.18	3.00	3.50	3.00	3.26**
Decision tree	12	2.92	3.00	3.50	2.95	2.88**
Monte Carlo	13	2.66	3.00	3.00	2.59	2.66**
Risk adjusted	29	3.04	3.00	2.00	2.91	3.15**

	Sri Lanka					
	Frequently/ Mostly	Mean	Number of Employees			
			<100	100-250	250-500	>500
Scenario	79	4.25	0.00	3.86	4.53**	4.19
Sensitivity	34	3.18	0.00	4.00**	2.89	3.17**
Decision tree	12	2.92	0.00	2.86	2.84	2.96**
Monte Carlo	13	2.66	0.00	2.57	2.58	2.70**
Risk adjusted	29	3.04	0.00	3.00	2.58	3.23**

	Sri Lanka					
	Frequently/ Mostly	Mean	Domestic Income			
			<20	20-40	40-80	>80
Scenario	79	4.25	3.00	5.00	4.23**	4.28
Sensitivity	34	3.18	3.00	3.50	3.00	3.26**
Decision tree	12	2.92	3.00	3.50	2.95	2.88**
Monte Carlo	13	2.66	3.00	3.00	2.59	2.66**
Risk adjusted	29	3.04	3.00	2.00	2.91	3.15**

	Sri Lanka			
	Frequently/ Mostly	Mean	Ownership	
			Domestic	Foreign
Scenario	79	4.25	4.24**	4.40**
Sensitivity	34	3.18	3.19**	2.80
Decision tree	12	2.92	2.91**	3.00
Monte Carlo	13	2.66	2.64**	3.00
Risk adjusted	29	3.04	3.01**	3.40

	Sri Lanka					
	Frequently/ Mostly	Mean	Overall Risk Situation				
			Very High	High	Moderate	Low	Very Low
Scenario	79	4.25	0.00	3.67	4.28**	4.23**	5.00
Sensitivity	34	3.18	0.00	2.67	3.32	2.95**	3.00
Decision tree	12	2.92	0.00	3.00	2.89	2.95**	3.00
Monte Carlo	13	2.66	0.00	3.00	2.68	2.55**	3.00
Risk adjusted	29	3.04	0.00	3.67	3.06	2.91**	3.00

Cost of Capital

As seen in Table 9 in Sri Lanka, the WACC is preferred by respondents with a Bachelors degree whilst respondents with a Masters or PhD degree prefer the CAPM. The young-adult respondents (25-35) prefer to use the WACC, CAPM, and interest payable on debt capital to estimate the cost of equity capital. Whereas mature Sri Lankan respondents (>55) are more likely to use the CAPM, dividend yield on shares and earnings yield on share. Very experienced respondents (>16), seem to prefer to use the dividend yield on shares and earnings yield on shares. In Sri Lanka, all these methods are preferred in the industrials, consumables, materials, health care and consumer discretionary markets. Table 8 shows that the interest payable on debt capital, dividend yield on shares and earnings yield on share methods are preferred by large firms (> 500 employees). Also, the CAPM and interest payable on debt capital are the methods of choice for large firms (> 500 employees) as well as for firms with 100-250 employees in Sri Lanka. The highly domestic focused firms prefer the interest payable on debt capital, dividend yield on shares and earnings yield on share methods. The WACC and interest payable on debt capital methods are used predominantly by Sri Lankan firms with 40-80 focus on domestic markets. The domestic owed companies are more likely to use all these methods than the foreign-owned companies. The foreign owned firms are more motivated to use the WACC, dividend yield on shares and earnings yield on share techniques.

Table 9 – Cost of Capital

	Sri Lanka						
	Frequently/ Mostly	Mean	Education Background				
			Diploma	Bachelor	Honours	Master	PhD
WACC	85	3.93	3.67	4.00**	3.64	4.10	3.60
CAPM	31	2.74	3.00	2.44	2.43	3.06**	2.60**
Interest payable	64	3.63	3.67	3.56**	3.43	3.80	3.40
Dividend yield	36	3.04	2.34	3.34**	2.93	3.06**	2.80**
Earnings yield	37	3.12	2.00	3.39**	2.79	3.26**	3.20

	Sri Lanka					
	Frequently/ Mostly	Mean	Age group			
			<25	25-35	35-55	>55
WACC	85	3.93	0.00	3.88**	3.98**	3.79
CAPM	31	2.74	0.00	3.75**	2.67	2.43**
Interest payable	64	3.63	0.00	3.38**	3.65**	3.71
Dividend yield	36	3.04	0.00	3.00	2.90	3.57**
Earnings yield	37	3.12	0.00	3.00	3.06	3.43**

	Frequently/ Mostly	Mean	Sri Lanka			
			Management Experience			
			1-5	6-10	11-15	>16
WACC	85	3.93	3.50	3.90**	3.97**	3.94
CAPM	31	2.74	3.50	3.70**	2.69	2.44**
Interest payable	64	3.63	3.50	3.30**	3.59**	3.78
Dividend yield	36	3.04	3.00	2.90	2.93	3.19**
Earnings yield	37	3.12	4.00	2.70	3.03	3.28**

Techniques	Frequently/ Mostly	Mean	Sri Lanka: Industry Sectors			
			Utilities	Information	Energy	Telecom
WACC	85	3.93	4.00	4.50	4.25	4.00
CAPM	31	2.74	1.00	1.00	4.25	2.34
Interest payable	64	3.63	4.00	3.50	3.50	3.00
Dividend yield	36	3.04	4.00	3.50	2.50	3.34
Earnings yield	37	3.12	4.00	3.50	3.25	3.34
			Industrials	Consumer staples	Materials	Health Care	Consumer Discretionary
			4.00**	3.93**	3.88**	3.63**	3.85**
			3.00**	2.21**	2.88**	2.63**	2.92**
			3.60**	3.71**	3.75**	3.63**	3.69**
			3.05**	3.43**	3.13**	3.25**	2.38**
			3.10**	3.50**	3.50**	3.13**	2.31**

	Frequently/ Mostly	Mean	Sri Lanka			
			Number of Employees			
			<100	100-250	250-500	>500
WACC	85	3.93	0.00	4.00**	4.11**	3.85
CAPM	31	2.74	0.00	3.86**	2.21	2.79**
Interest payable	64	3.63	0.00	3.57**	3.63**	3.64**
Dividend yield	36	3.04	0.00	2.57	3.32	3.00**
Earnings yield	37	3.12	0.00	2.57	3.32	3.13**

	Frequently/ Mostly	Mean	Sri Lanka			
			Domestic Income			
			<20	20-40	40-80	>80
WACC	85	3.93	4.00	4.00	3.95**	3.91
CAPM	31	2.74	3.00	2.00	2.59	2.83**
Interest payable	64	3.63	4.00	3.50	3.77**	3.55**
Dividend yield	36	3.04	3.00	3.50	3.27	2.91**
Earnings yield	37	3.12	4.00	3.50	3.36	2.96**

	Sri Lanka			
	Frequently/ Mostly	Mean	Ownership	
			Domestic	Foreign
WACC	85	3.93	3.91**	4.20**
CAPM	31	2.74	2.75**	2.40
Interest payable	64	3.63	3.61**	4.00
Dividend yield	36	3.04	2.99**	3.40**
Earnings yield	37	3.12	3.04**	3.80**

	Frequently/ Mostly	Mean	Sri Lanka				
			Overall Risk Situation				
			Very High	High	Moderate	Low	Very Low
WACC	85	3.93	0.00	3.34	4.00**	3.91**	3.00
CAPM	31	2.74	0.00	3.34	2.57	2.95**	4.00
Interest payable	64	3.63	0.00	3.34	3.57**	3.77**	4.00
Dividend yield	36	3.04	0.00	3.00	2.94	3.32**	2.00
Earnings yield	37	3.12	0.00	2.67	2.98	3.45**	4.00

Conclusion

Sri Lankan firms tend to consider PBP as the most important CB evaluation technique and IRR as the next in importance. Scenario approach is the most widely used techniques for assessing capital-investments risk in Sri Lankan firms. The results also indicate that most firms rely to some extent on the WACC when estimating the cost of capital. However, the findings diverge from Banda, Koralalage, Ratnayake, and Mudiyanselage (2014) who observed that Sri Lankan firms rely heavily on NPV, IRR and DPP while the current evidence reveals that Sri Lankan firms tend to use PBP more than other CB techniques. Taken together, these results suggest that Sri Lankan respondents on average use less sophisticated CB techniques. These results support the H_1 assertion that: *CB techniques are applied less extensively in Sri Lanka as an emerging country.* The highest-domestic-focused Sri Lankan firms are more likely to use DPP and ARR. When the underlying respondents attributes are considered, well-grounded respondents frequently use more sophisticated methods in Sri Lanka—e.g., DCF and NDCF tend to be favoured by respondents with a Bachelors degree; ARR and NPV are significantly favoured by respondents with a PhD in Sri Lanka. This indicates that the sophistication of CB practices appears to be significantly (if not mostly) influenced by attributes of the firm and the respondent. These results are consistent with a study by Al-Ajmi et al. (2011) which reported that firm attributes such as ownership, sources of revenue etc., have some impact on decisions to adopt CB and their method of estimating the cost of capital and risk. However, these outcomes sharply contrast with Farah et al. (2008) who found that there is no statistically significant relation between firm attributes and CB techniques. Also, research by Bennouna et al. (2010) is marginally inconsistent in that they found that some large Canadian firms did not use DCF (a developed country). On balance, these results affirm the H_2 assertion that: *Firms and*

respondents' attributes have an effect on the choice of CB techniques employed. Concurrently as Sri Lanka passes through its post-war-recovery phase, reform of its financial and capital market is essential to sustain economic growth and development. While a wider diffusion of better investment appraisal methods in Sri Lankan firms could improve the cost-effectiveness of investment decisions and generally increase efficiency, this is unlikely to occur until competition is more of a spur.

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