National development level effects on capital budgeting practices: a comparative study of nature vs nurture

Pratheepkanth Puwanenthiren
University of Jaffna, Jaffna, Sri Lanka

Abstract

Purpose – This research should help determine whether development should focus on individual firms or will raising the national development level act like a rising tide and raise the performance of all corporations.

Design/methodology/approach – The comparative data used in this study come from 150 Australian (ASX200 index listed) firms and 150 Sri Lankan (Colombo Stock Exchange listed) firms. The research questions are answered via a quantitative research design that uses primary and secondary data.

Findings – The findings demonstrate that capital budgeting practices are more influenced by contingency features and sophistication in Australia and Sri Lanka. Also, Australian firms tend to use capital budget models with good-to-strong predictive power (except for *ROE*) and Sri Lankan firms tend to use capital-budget models with fair-to-poor predictive power. Further, the analysis of Australian firms yielded much stronger and more statistically significant results than the analysis of Sri Lankan firms.

Practical implications – In complex real-world situations, reconciling the outputs of a multifaceted approach to capital budgeting methods is more likely to give the depth and width of input needed to achieve an optimal capital investment plan.

Originality/value – The results of this study can provide rich information for stakeholders about new findings in capital budgeting (CB) practices and their contributions to firm performance in a comparative perspective.

Keywords Capital budgeting, Discounted cash flow, Non-discounted cash flow

Paper type Research paper

1. Introduction

1.1 Capital budgeting and firm performance

According to the traditional theory of the firm, the firm's objective is to maximise shareholder wealth (Gervais *et al.*, 2012). Capital budgeting, a key input to maximising shareholder wealth, is the rational allocation of limited capital across a plethora of viable prospective investments (Bennouna *et al.*, 2010; Gervais *et al.*, 2012; Proctor and Canada, 1992). As such, capital budgeting (*CB*) is defined as the evaluation of investment prospects in long-term assets (Peterson and Fabozzi, 2002; Van Horne *et al.*, 1995).

Effective capital-investment budgeting and management is key to optimal firm performance (Arnold and Hatzopoulos, 2000; Farragher *et al.*, 1999). Such processes enhance capital-investment decisions by assuring that corporate strategies are known and followed, available investment opportunities are considered and unplanned/unjustified

decision making is minimised. Studies on CB suggest that firms are increasingly employing more refined CB techniques for investment decisions (Arnold and Hatzopoulos, 2000; Farragher *et al.*, 2001; Kashyap, 2014; Klammer and Walker, 1984; Klammer, 1973; Mustapha and Mooi, 2001; Ruhan, 1998; Wnuk-Pel, 2014). Vadeei *et al.* (2012), Hasan *et al.* (2011), Farragher *et al.* (2001), Haka *et al.* (1985), Pike (1984) and Kim (1981) researched extensively into links between CB and firm performance.

This research contributes to the extant CB literature by considering the relative importance of a firm's nature vs the nurture of its national environment (e.g. development level of the nation in which the firm is embedded). This is a vital issue for CB management in firms and for directing development efforts in less developed nations. Specifically, as previously noted, good CB practices play a vital role in enhancing firm performance. Given that firms are contributors to Gross Demostic Product (*GDP*), the quality of firm CB practices can create and perpetuate a virtuous/(vicious) cycle of rising/(falling) firm and national performance (Chen, 1991). This is one of a few studies that contain a comparative perspective of the CB practises of firms in a developed nation with firms in an emerging nation (Brounen *et al.*, 2004; Peel, 1999; Graham and Harvey, 2001; Hermes *et al.*, 2007). The two countries under consideration in this study are Australia and Sri Lanka:

> Australia is a developed nation with: a relatively small open economy, a population of 23.7 million residents, business practices and regulation that are respected (e.g. its Corruption Perceptions index (*CPI*) is 80/100 where 100 is no corruption), with institutions that helped to comfortably weather the Global Financial Crises (*GFC*).

> Sri Lanka is an emerging country with: a rapidly growing economy (after the 30 year civil war ended in 2009), a population of 20.48 million residents, ongoing economic reforms, a mid to high level of corruption (e.g. its CPI is 38/100), and major effort to reintegrate into international markets.

The paper is organised as follows. Section 2 reviews literature on CB practices and firm performance; Section 3 provides the methodology of the research and also discusses the firm and its managers' features; Section 4 discusses findings; and Section 5 gives the conclusions, limitation of the study and suggestions for future research.

2. Literature review

As noted previously, CB is a key driver of investment choice and implementation (Kashyap, 2014; Farragher *et al.*, 2001). As a result, CB contributes to maximising stakeholder value. The corporate finance literature distinguishes two key concepts in CB: CB processes and CB technqiues. CB processes explain how firms treat investment decisions in practice (Batra and Verma, 2014; Farragher *et al.*, 2001). On the other hand, CB technqiues are defined as the methods and techniques used to evaluate and select an investment (Bennouna *et al.*, 2010).

2.1 Capital budgeting process

The CB process, by improving investment decisions quality and implementation (Kashyap, 2014; Farragher *et al.*, 2001), helps to maximise stakeholder wealth (Andor *et al.*, 2015). In this context, Pinches (1982) and Mintzberg *et al.* (1976) emphasised a CB model that encompasses identification, development, selection and control stages. The identification stage, per Northcott (1995), provides recognition of an opportunity for investment. The identified investments should be subjected to preliminary screening by management, to separate unreliable investments. If an investment survives the analysis phase, a judgement is then made to accept or reject the investment. Once the investment passes the acceptance phase, it should be implemented by management. Post-audit reviews create useful feedback to the investment appraisal process.

Lam *et al.* (2008), Farragher *et al.* (2001), Han (1986) and Kim (1981) focus on the CB process from different perspectives (e.g. Farragher *et al.* (2001) examined the impact of sophisticated CB practices on corporate performance in the USA; Kim (1981) tested the empirical relationship between CB practices and earnings performance. This is one of a few studies that concentrates on the CB processes in comparative perspective.

2.2 Capital budgeting techniques
The selection of appropriate CB techniques for investment decisions is a key managerial activity (Wnuk-Pel, 2014). CB-technique-focused studies have an extensive tradition in corporate finance literature. Mainly these researches focus on developed nations (e.g. the USA: Graham and Harvey (2001), Shao and Alan (1996); Canada: Baker *et al.* (2011), Bennouna *et al.* (2010), Vijay and Ashwani (1995), the UK: Alkaraan and Northcott (2006), Arnold and Hatzopoulos (2000); and Australia: Truong *et al.* (2008), Freeman and Hobbes (1991). Graham and Harvey (2001) investigated the theory and practice of corporate finance in USA. They interviewed 392 chief financial officers (CFOs) about capital structure, cost of capital and CB and found the most popular evaluation techniques were net present value (NPV) and internal rate of return (IRR). Also, Discount cashflow (DCF) techniques and capital asset pricing model (CAPM) are increasingly used by large firms to evaluate CB and that small firms tend to use less sophisticated techniques. DCF has become the main appraisal technique in Canada (Bennouna *et al.*, 2010; Jog and Srivastava, 1995; Vijay and Ashwani, 1995). In particular, the use of DCF appears to have increased from a low of around 35% in the early 1960s to over 90% in the early 1990s. NPV is now widely used among Candian firms, but a sizeable percentage use IRR as their primary model in capital decision-making (Bennouna *et al.*, 2010). In the UK, Pike (1988) noted that the use of DCF methods had increased from 58 to 84% from 1975 to 1986. However, the PBP method is still widely used in the UK, and DCF seems to have also increased (Alkaraan and Northcott, 2006). Freeman and Hobbes (1991) found DCF techniques increased in use in Australia from 52 to 75% between 1979 and 1989. Truong *et al.* (2008) found that 94% of CFOs in their survey used NPV, followed by PBP and IRR. They also found that real-options analysis is gaining relevance in Australia CB, but it is not yet a mainstream method.

Only a limited number of studies emphasise CB evaluation techniques in emerging countries (e.g. Malaysia, Indonesia, China and Singapore) which were considered by Farah *et al.* (2008), Chan *et al.* (2004) and Kester and Chong (1998); African economies were reviewed by Maroyi and Van Der Poll (2012), Hassan *et al.* (2011), Pradeep and Lemay (2009), Sulaiman (2007) and Coltman (1995); India was looked by Manoj (2002), Satish *et al.* (2009), Singh *et al.* (2012). Some earlier studies of CB practices in Southeast Asia (Malaysia, Hong Kong, Philippines and Singapore) ascribe equal significance to DCF and Non-Discount Cashflow (NDCF) methods. It appears that Asian and African CFOs tend to rely more on NDCF methods than sophisticted methods, when selecting long-term investments.

2.3 Capital budgeting practices and firm performance
Financial theory suggests that sophisticated CB systems should enhance firm performance, but this assertion appears to have had only limited empirical testing. Vadeei *et al.* (2012), Farragher *et al.* (2001), Pike (1984), Kim (1981) and Klammer (1973) looked at the impact of CB on firm performance. Klammer (1973), in a survey of 369 USA manufacturing firms, found no significant relationship between CB techniques and firm performance. In contrast, Kim (1981) and Vadeei *et al.* (2012) found a positive association between the CB process and firm performance. In other research, Pike (1984) found a negative association between CB evaluation techniques and firm performance and Farragher *et al.* (2001), Pike (1984), and Christy (1966) found no significant relationships between the sophistication of CB processes

and firm performance. Thus, for the most part, these studies have focused on the application and enhancement of the modelling techniques applied. The trend towards the adoption of more refined CB practices has led researchers to consider whether these refinements have enhanced performance and profitability. The mixed outcomes of that research suggest that a significant gap exists in understanding the nature, intensity and direction of the relationship between CB practises and performance. Further, the relationship between firm performances and different variables are analysed by researchers (Aldamen *et al.*, 2012; Aldamen and Duncan, 2012), the impact of CB process, techniques, nature of firms and the development level of the country on firm performances are yet to be researched.

3. Methodology

In addressing the gap discussed in the previous section, this study focuses on two key drivers of CB sophistication: (1) the relative sophistication of the firms conducting the CB and (2) the development level of the nations in which the firms are embedded. This issue is essentially nature vs nurture. Specifically, does *nature* of a firm trump the *nurture* of the development level of the nation in which it is embedded?

Initially, the population of interest in this study was 200 Australian Securities Exchange (*ASX*) listed firms (S&P/ASX200) and 289 Colombo Stock Exchange (*CSE*) listed firms. In selecting the study 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 confuse and/or foul the outcomes being studied. Also, the risk of missing data was reduced by excluding firms that were not listed throughout the review period. After the eliminations, the remaining population was 150 Australian ASX-listed firms and 150 Sri Lankan CSE-listed firms. The results of the questionnaire survey of firms was, respectively, 45 completed questionnaires from Australia and 73 from Sri Lanka, giving an effective response rate of, 31.5 and 48.7%, respectively. Secondary data were obtained in recent five years, and ASX, CSEs and SIRCA databases were used to calculate return on assets (*ROA*), return on equity (*ROE*), Tobin's Q (*TQ*) and earnings per share (*EPS*) for the relevant firms.

Data were collected in two phases. The first phase constituted a structured survey questionnaire which was followed by a second phase of gathering the appropriate financial statements for the relevant period. The integration of multi-method data collection was seen to offer a deeper insight into the research findings. A quantitative research design utilising both primary and secondary data was used to answer the research questions.

In phase one, a structured questionnaire survey was used to explore the CB practices of Australian and Sri Lankan firms as an example of a developed and emerging market. The questionnaire sought information on the CB practices 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 practice. Phase one gives a descriptive study of CB practices in Australian and Sri Lankan listed firms and the comparison of those CB practices and techniques identifies similarities and differences in the practices between firms in a developed (Australia) and emerging economy (Sri Lanka). Phase one sought to determine, whether CB practices differed significantly between Australia and Sri Lanka firms and if any differences can be explained by differences in levels of national economic development after adjusting for conflating factors such as firm and CFO attributes.

Phase two examines CB practices via the lens of a process approach and an evaluation approach; which allows for a connection between these different perspectives and firm performance in Australian- and Sri Lankan-listed firms. Phase two links the primary data gathered in phase one with secondary data, annual reports of the relevant firms during 2007–16, taken from the ASX, CSE's and SIRCA database to provide *ROA*, *ROE*, *TQ* and *EPS*. The intention of phase two is to explore for relationships between (on one hand) the CB process

and choice of appraisal techniques used by developed and emerging countries and (on the other) firm performance (both from an accounting and a market perspective). It was considered that these findings would assist CFOs in shedding light on the numerous corporate finance theories associated with firm performance and the stakeholders' wealth of the firm in Australia and Sri Lanka. Thus, the data used in the quantitative stage of this study was gathered in two phases:

3.1 Measurement of variables
3.1.1 Capital budgeting process of firm j *(CBP$_j$).* Following an approach used by Batra and Verma (2014), Farragher *et al.* (2001), Pike (1984) and Kim (1981), the CB sophistication of firm respondents was defined via:

$$CBP_j = \sum_{K=i}^{n}(S_{jk})(W_k) \tag{1}$$

where S_{jk} = Score for CB for firm j, activity k

W_k = Weighting for CB activity k

Building of *CBP$_j$* is done in two stages:

(1) A constructing weight (W_k) for each country that used the mean values of each CB activity. Respondents were asked to rate the importance of each CB activity on a Likert 0.0–5.0 scale, with 5.0 being "strongly agree". The mean based on 45 Australian respondents and 73 Sri Lankan respondents are listed in Table 1. The weights (W_k) were estimated by dividing the mean score for each activity by the total mean score for all activities. Table 1 lists the mean and weight (W_k) for Australia and Sri Lanka.

(2) Constructing S_{jk} – The score for CB activity k for firm j (S_{jk}) is measured using 0–1 Likert scale and considers whether or not a firm conducts each of the components of that activity.

$$S_{jk} = \sum_{K=i}^{n}(X_i)/(N) \tag{2}$$

where X_i = Score for each component, as defined in Eq. (3).

N = Total number of component activity

Capital budgeting activity	Australia		Sri Lanka	
	Mean	Weight (W_k)	Mean	Weight (W_k)
Long-term investment planning	4.044444	13.76702	4.315068	14.52952
Search for investment opportunities	4.266667	14.52345	4.123288	13.88376
Review and screening	4.022222	13.69138	3.808219	12.82288
Accept/reject decisions	4.555556	15.50681	4.465753	15.0369
Implementation	4.155556	14.14523	4.493151	15.12915
Expenditure control and monitoring	4.022222	13.69138	4.136986	13.92989
Post-audit	4.311111	14.67474	4.356164	14.6679
Total	29.37778	100	29.69863	100

Table 1.
Weights for capital
budgeting activities

3.1.2 Capital budgeting techniques (CBT). The selection of CB techniques is explained as the commonly used appraisal methods by firms (or dummy which takes the value of 1 if the firm is using at least two or more of CB techniques and the value 0 otherwise).

$$CBT_j = X_i \tag{3}$$

where $X_i = 1$ if respondent conducts ≥ 2 CB techniques.

$X_i = 0$ if respondent conducts ≤ 1 CB techniques

3.1.3 Firm's features. In this study firm size, income source (domestic or overseas) ownership (domestic or foreign) and risk level are considered as firm features. Table 2 defines how dummy variables were used in the analysis.

3.1.4 CFO's attributes. In this study, the CFO's highest education attained, age and experience are considered CFO characteristics. Table 3 below shows the use of dummy variable in the calculation process.

Statistical analysis of the quantitative results were done using social science software 22.1 (SPSS) and includes descriptive statistics, multiple regression analysis, analysis of variance and *t*-test. The following multiple regression model equations examined the association between CB practices and firm performance.

$$ROA(performance) = a_0 + a_1CBP_j + a_2CBT_j + a_3EDU + a_4AGE + a_5EXP \\ + a_6SOE + a_7DI + a_8OWN + a_9RL + \varepsilon \tag{4}$$

$$ROE(performance) = b_0 + b_1CBP_j + b_2CBT_j + b_3EDU + b_4AGE + b_5EXP \\ + b_6SOE + b_7DI + b_8OWN + b_9RL + \varepsilon \tag{5}$$

$$EPS(performance) = c_0 + c_1CBP_j + c_2CBT_j + c_3EDU + c_4AGE + c_5EXP + c_6SOE \\ + c_7DI + c_8OWN + c_9RL + \varepsilon \tag{6}$$

$$TQ(performance) = d_0 + d_1CBP_j + d_2CBT_j + d_3EDU + d_4AGE + d_5EXP \\ + d_6SOE + d_7DI + d_8OWN + d_9RL + \varepsilon \tag{7}$$

where a_0, b_0, c_0, d_0 = Constant terms.

Table 2. Dummy variables used to study firm features	Number of employees	Dummy variables would either take the value of 1 if the firm belongs to the more than 500 employees, otherwise it would take the value of 0
	Income source	Dummy variables would either take the value of 1 if the firm belongs to the more than 80% domestic income, otherwise it would take the value of 0
	Ownership	Dummy variables would either take the value of 1 if the firm belongs to the domestic ownership, otherwise it would take the value of 0

Table 3. Use of dummy variables for CFO's attributes	CFO's education background	Dummy variables would either take the value of 1 if the managers who have master degree or more, otherwise it would take the value of 0
	CFO's age	Dummy variables would either take the value of 1 if the manager ages between 55–65 category, otherwise it would take the value of 0
	CFO's experience	Dummy variables would either take the value of 1 if the manager who has been in their position longer than 10 years; otherwise it would take the value of 0

a_{1-9}, b_{1-9}, c_{1-9}, d_{1-9} = Regression coefficients

CBP_j = Capital budgeting practices for firm j

CBT_j = Choice of capital budgeting techniques for firm j

EDU = CFO Education

AGE = CFO Age

EXP = CFO Experience

SOE = Firm Size of employees

DI = Firm Domestic income

OWN = Firm Ownership

RL = Firm Risk level

ε = error term

3.2 Sample: firm and CFO's attributes

Figure 1a–d summarise the information on the firm features (i.e. industry sectors, employee numbers, domestic income and ownership). A majority of sample firms are in the consumer staples industry sector (22 and 28% in, respectively, Australia and Sri Lanka), and the lowest representation is in the information and utilities sector (respectively, 3 and 2% in Australia and Sri Lanka). Figure 1b illustrates that 89% of Australian firms have over 500 employees, and 64% of Sri Lankan firms have over 500 employees. Australian and Sri Lankan firms accounted more than one-half respondents (i.e. 62 and 64% of total respondents have more than 80% of domestic income respectively). Figure 1d shows that 92 and 67% are domestically-owned firms in, respectively, Australia and Sri Lanka. However, foreign ownership of firms in both countries is similar.

Figure 2a–d display CFO's profiles (i.e. gender, education, age and experience). There are mostly male CFOs (80 and 89%, respectively, in Australia and Sri Lanka) with 63 and 44% of, respectively, Australian and Sri Lankan CFOs holding a bachelor or honours degree as their highest level of education accomplishment. Further, 55% of Australian CFOs are under 35 years of age. In contrast, 84% of the CFOs of Sri Lanka respondent firms are over 36 and less than 16% are under 35. Finally, only 31% of Australia CFOs have been in their positions 6 to 10 years. In contrast, 44% of the CFOs of respondent Sri Lanka firms have over 16 years' experience.

4. Results and discussion

4.1 Independent samples t-test

4.1.1 Capital budgeting process–Australia and Sri Lanka. This section examines the way in which Australian and Sri Lankan firms evaluate investments. CB practices examined are CB process (e.g. long-term strategic planning, search for investment opportunities, review and screening, accept/reject decisions, implementation, expenditure control and monitoring, and post-audit and CB appraisal techniques (including investment analysis techniques, risk analysis techniques and cost of capital). Table 4 indicates that there are significant differences between Australia and Sri Lanka in the use of CB process except search for investment opportunities, review and screening, and accept/reject decisions as indicated by the *t*-values such as long-term strategic planning ($t = -2.698$, $p < 0.05$), implementation ($t = -4.931$, $p < 0.05$), expenditure control and monitoring ($t = -4.347$, $p < 0.05$) and post-
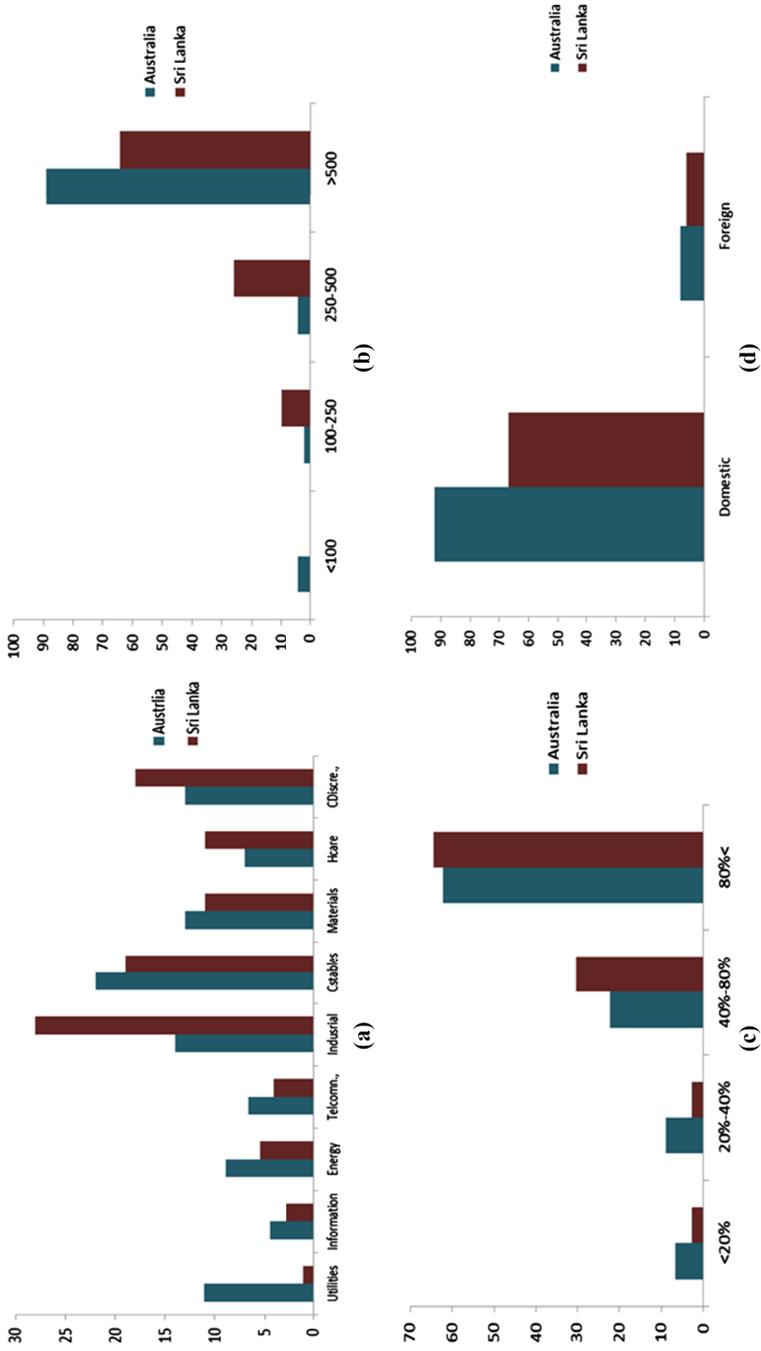
Figure 1.
(a–d) Features of firms
in the sample
(Australia and
Sri Lanka)

Note(s): A: Industry sectors. The distribution of respondents according to GICS classification. B: Employees. Number of employees among samples. C: Domestic income. Percentage of firms' domestic income. D: Ownership: Percentage of firms' ownership
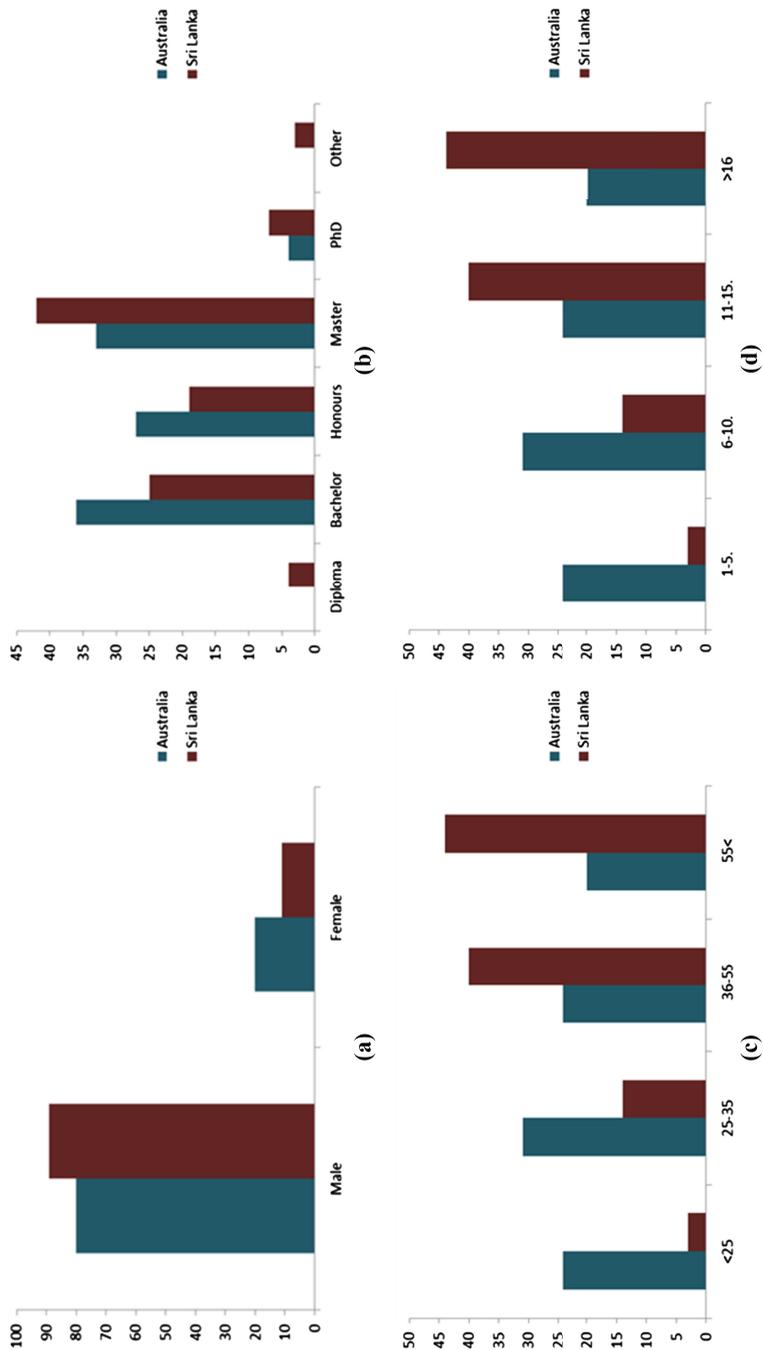
Note(s): A: Gender. Distribution of CFOs by gender. B: Educational background. Percentage of CFOs with their degree. C: Distribution of CFOs by age. D: Experience. Distribution of CFOs according to their experience

Figure 2.
(a–d) Features of firms
in the sample
(Australia and
Sri Lanka)

audit ($t = -2.860$, $p < 0.05$). In Australia, search for investment opportunities and implementation are found to be the most comparatively important stages of CB compared with Sri Lanka. It can, therefore, be concluded that the country settings somewhat affect the CB process in Australian and Sri Lankan firms.

In Australia, the differences between male and female CFOs in the use of CB process are not significant, other than in the review and screening phase ($t = 2.098$, $p < 0.05$). In Sri Lanka, there are no significant differences between male and female CFOs in the use of CB process. Also, there are no significant differences between domestic- and foreign-owned firms in the use of CB practices in Australia or in Sri Lanka, except in Australia the accept/reject decisions ($t = 2.296$, $p < 0.05$) and implementation ($t = -2.817$, $p < 0.05$).

4.1.2 Investment analysis techniques–Australia and Sri Lanka. Table 5 suggests significant differences between Australia and Sri Lanka on usage of CB techniques such as ARR ($t = 2.205$; $p < 0.05$), NPV ($t = 6.987$; $p < 0.05$) and IRR ($t = 6.221$; $p < 0.05$). This result can be interpreted as supportive evidence for the fact that Australian CFOs seem to use NPV, IRR and ARR methods more often than CFOs in Sri Lanka. Although PBP preference is consistently stronger in Sri Lanka, it does not differ significantly from CB techniques of Australian firms. This result is consistent with the study conducted by Hermes *et al.* (2007) who reported that Dutch firms tend to use more extensive CB techniques than Chinese firms. The Sri Lankan results marginally contrasted with Banda *et al.* (2014), who noted that Sri Lankan firms rely heavily on NPV, IRR and DPP, while the current evidence suggests that Sri Lankan firms tend to use PBP more than other CB techniques.

In Australia, the differences between males and females on the usage of CB techniques were insignificant in Australia and Sri Lanka except PBP ($t = -2.337$; $p < 0.05$) and DPP ($t = -2.045$; $p < 0.05$). Domestic vs foreign ownership does not significantly affect the choice of CB techniques in either Australia or Sri Lanka. This result is consistent with those for the Sri Lankan firms.

Capital budgeting process	Country	Australia		Sri Lanka	
		Gender	Ownership	Gender	Ownership
Long-term strategic planning	−2.698**	−0.671	−0.653	1.380	0.055
Search for investment opportunities	−0.838	0.449	−0.339	−0.880	0.802
Review and screening	0.803	2.098**	−1.498	−1.166	−0.696
Accept/reject decisions	0.053	−1.521	2.296**	−0.518	−0.828
Implementation	−4.931**	−0.484	−2.817**	−0.124	−0.899
Expenditure control and monitoring	−4.347**	−0.604	−1.200	1.748	−0.475
Post-audit	−2.860**	−1.211	1.646	1.311	−0.894
Note(s): **Denotes a significantly different from zero at the 5% level					

Table 4.
Capital budgeting process vs country, gender and ownership

Capital budgeting techniques	Country	Australia		Sri Lanka	
		Gender	Ownership	Gender	Ownership
Payback period (PBP)	0.885	1.866	−1.355	−2.337**	0.000
Discounted payback period (DPP)	0.259	−0.314	0.921	−2.045**	0.012
Accounting rate of return (ARR)	2.205**	1.382	0.296	−1.562	0.371
Net present value (NPV)	6.987**	−0.847	−0.884	−0.393	0.150
Internal rate of return (IRR)	6.221**	1.118	1.703	−1.290	−0.598
Note(s): **Denotes a significantly different from zero at the 5% level					

Table 5.
Capital budgeting techniques vs country, gender and ownership

4.1.3 Risk analysis techniques–Australia and Sri Lanka. Table 6 shows no significant differences between Australia and Sri Lanka on choice of risk assessment techniques, excluding sensitivity analysis ($t = 4.219$; $p < 0.05$) and risk adjusted discount rate ($t = -2.607$; $p < 0.05$). In Australia and Sri Lanka, there are no significant differences between male and female on choice of risk assessment techniques. As regards the CFO's gender, it does not affect the risk assessment techniques for CB. In the case of Australian firms, there are no significant differences between domestic- and foreign-owned companies on choice of risk assessment techniques except decision tree approach ($t = -2.304$; $p < 0.05$).

4.1.4 Cost of capital–Australia and Sri Lanka. Table 7 indicates that there are no significant differences between Australia and Sri Lanka in estimating the cost of capital, excluding Weighted average cost of capital (WACC) ($t = 2.082$; $p < 0.05$) and CAPM ($t = 6.137$; $p < 0.05$). The results also indicate that most Australian and Sri Lankan firms rely to some extent on the WACC when estimating the cost of capital. In Australia and Sri Lanka, there are no significant differences between male and female CFOs on estimating cost of capital. In Australian, there are no significant differences between domestic- and foreign-owned firms in estimating cost of capital except WACC ($t = 2.085$; $p < 0.05$), whereas there are no obvious differences between domestic- and foreign-owned Sri Lankan firms on estimating cost of capital.

4.2 One-way ANOVA

4.2.1 Capital budgeting process–Australia and Sri Lanka. The results of the analysis of variance (ANOVA) were conducted to find the interaction between CB process and firm and its CFO's features in Australia and Sri Lanka. Tables 8 and 9 shows that there are no significant differences with use of CB process based on CFO's educational background in Australia except accept/reject decisions ($F = 2.914$, $p < 0.05$) and implementation ($F = 3.237$, $p < 0.05$) whereas of the Sri Lanka results did not show any significant differences with CB process based on CFO's educational background except search for investment opportunities ($F = 3.663$, $p < 0.05$), review and screening ($F = 4.642$, $p < 0.05$) and post-audit ($F = 3.484$,

		Australia		Sri Lanka	
Risk assessment techniques	Country	Gender	Ownership	Gender	Ownership
Scenario approach	−1.152	−0.806	−0.804	−0.374	−0.335
Sensitivity analysis	4.219**	0.721	−1.114	0.149	0.799
Decision tree approach	0.829	0.486	2.304**	−1.044	−0.320
Monte Carlo simulation	1.044	−0.339	1.671	−1.184	−0.885
Risk adjusted discount rate	−2.607**	−0.749	0.106	−0.638	−0.842
Note(s): **Denotes a significantly different from zero at the 5% level					

Table 6.
Risk assessment
techniques vs country,
gender and ownership

		Australia		Sri Lanka	
Cost of capital	Country	Gender	Ownership	Gender	Ownership
Weighted average cost of capital (WACC)	2.082**	−0.697	2.085**	−0.303	−0.920
Capital asset pricing model (CAPM)	6.137**	−0.745	−0.821	−0.024	0.580
Interest payable on debt capital	−1.607	0.135	0.496	1.893	−1.376
Dividend yield on shares	−1.168	−1.345	1.218	−1.024	−0.935
Earnings yield on shares	−0.651	0.000	1.471	−0.005	−1.657
Note(s): **Denotes a significantly different from zero at the 5% level					

Table 7.
Cost of capital vs
country, gender and
ownership

Capital budgeting process	Australia						
	Education	Age	CFO's experience	Industry	No of employees	Domestic income	Risk position
Long-term strategic planning	1.245	3.519**	2.138	3.997**	0.381	0.467	0.234
Search for investment opportunities	0.810	2.116	1.123	1.822	0.851	0.321	1.098
Review and screening	0.875	1.761	5.659**	1.642	0,591	0.453	1.295
Accept/reject decisions	2.914**	3.285**	4.090**	2.871**	1.158	0.498	3.130**
Implementation	3.237**	4.163**	1.945	4.288**	1.382	0.709	3.196**
Expenditure control and monitoring	1.021	2.396	3.672**	3.865**	1.715	0.380	1.421
Post-audit	1.335	3.063**	1.053	1.148	2.112	0.986	2.948**
Note(s): ** Denotes a significantly different from zero at the 5% level							

Table 8.
Australian capital budgeting process vs firm and its CFO's attributes

Capital budgeting process	Sri Lanka						
	Education	Age	CFO's experience	Industry	No of employees	Domestic income	Risk position
Long-term strategic planning	2.083	3.420**	2.989**	3.866**	0.201	0.263	3.648**
Search for investment opportunities	3.663**	2.336	1.397	2.578	0.140	0.833	1.223
Review and screening	4.642**	1.820	3.469**	3.675**	1.396	0.052	4.300**
Accept/reject decisions	1.599	3.397**	2.081	2.905	0.679	0.536	3.323**
Implementation	1.188	1.234	3.324**	4.565**	2.169	1.686	1.255
Expenditure control and monitoring	1.274	4.332**	1.588	3.558**	0.307	0.972	1.337
Post-audit	3.484**	0.752	1.170	1.048	3.129**	2.594	1.593
Note(s): **Denotes a significantly different from zero at the 5% level							

Table 9.
Sri Lankan capital budgeting process vs firm and its CFO's attributes

$p < 0.05$). The results, also, reveal that the CB process in Australia varies with the CFO's age (except for search for investment opportunities, review and screening and expenditure control and monitoring) as indicated by the F-values. In contrast, in Sri Lanka, there are no significant differences with the CB process based on CFO's age except long-term strategic planning ($F = 3.420$, $p < 0.05$), accept/reject decisions ($F = 3.519$, $p < 0.05$) and expenditure control and monitoring ($F = 3.519$, $p < 0.05$). F-statistics also show that there are no significant differences with CB process for CFO's experience except review and screening ($F = 5.659$, $p < 0.05$), accept/reject decisions ($F = 4.090$, $p < 0.05$) and expenditure control and monitoring ($F = 3.672$, $p < 0.05$) in Australia. In Sri Lanka, there are no significant differences with CB process based on CFO's experience except long term strategic planning ($F = 2.989$, $p < 0.05$), review and screening ($F = 3.469$, $p < 0.05$) and implementation ($F = 3.324$, $p < 0.05$). ANOVA also reports an interaction between CB practices and industrial sector; the results

show significant differences for long-term strategic planning ($F = 3.997$, $p < 0.05$), accept/reject decisions ($F = 2.871$, $p < 0.05$), implementation ($F = 4.288$, $p < 0.05$) and expenditure control and monitoring ($F = 3.865$, $p < 0.05$) in Australia, while those of the Sri Lanka firms, the results show significant differences for long-term strategic planning ($F = 3.558$, $p < 0.05$), review and screening ($F = 3.675$, $p < 0.05$), implementation ($F = 4.565$, $p < 0.05$) and expenditure control and monitoring ($F = 3.866$, $p < 0.05$). In addition, the results did not find any significant differences with CB process based on number of employees in Australia while in Sri Lanka, there are no significant differences with CB process except post-audit ($F = 3.129$, $p < 0.05$). The results also did not find any significant differences with CB practices for domestic income levels in Australia. This result is consistent with Sri Lankan firms. The results also revealed that there are significant differences with CB process based on risk position as indicated by the F-values such as accept/reject decisions ($F = 3.130$, $p < 0.05$), implementation ($F = 3.196$, $p < 0.05$) and post-audit ($F = 2.948$, $p < 0.05$) in Australia whereas in those of Sri Lankan firms, there are significant differences with CB process based on risk position as indicated by the F-values such as long-term strategic planning ($F = 3.648$, $p < 0.05$), review and screening ($F = 4.300$, $p < 0.05$) and accept/reject decisions ($F = 3.323$, $p < 0.05$). The empirical evidence suffices that CB process appears to be influenced by firm and CFO's attributes. It is exhibited that there is no structure guideline regarding CB process in Australia and Sri Lanka.

4.2.2 Capital budgeting techniques–Australia and Sri Lanka. The results of the ANOVA conducted to find the interaction between CB appraisal techniques and firm and its CFO's attributes (Table 10) shows that there are no differences at significant level $p = 0.05$ in the responses about the use of PBP in selecting investments due to firm and its CFO's attributes in Australia, whereas in Sri Lankan firms PBP has significant differences based on educational background with F-statistics 2.412 ($p < 0.05$). F-statistics presents that DPP is significantly related to industry sectors ($F = 2.472$; $p < 0.05$) and number of employees ($F = 3.267$; $p < 0.05$) in Australia, while in Sri Lankan firms reports on DPP, performed significantly different with educational background ($F = 3.620$; $p < 0.05$), CFO's experience ($F = 3.304$; $p < 0.05$), industry ($F = 2.136$; $p < 0.05$), number of employees ($F = 4.202$; $p < 0.05$) and domestic income level ($F = 2.594$; $p < 0.05$). Based on ARR, there are significant differences among industry sectors in Australia; whereas ARR is significantly interrelated with educational background ($F = 2.116$; $p < 0.05$) and domestic income level ($F = 4.414$; $p < 0.05$). The results also revealed that the p-value which is less than 0.05 and the value of F-statistics is 4.011 and 2.862, respectively, for NPV and IRR

	Education	Age	CFO's experience	Industry	No of employees	Domestic income	Risk position
CBT				*Australia*			
PBP	0.552	0.797	1.057	1.780	1.308	0.059	1.449
DPP	1.447	0.159	0.789	2.472**	3.267**	2.367	1.210
ARR	1.169	0.034	0.196	2.305**	2.804	2.538	0.562
NPV	4.011**	0.533	2.823	0.979	0.857	0.068	0.544
IRR	2.862**	0.533	0.823	0.591	0.224	1.158	0.871
CBT				*Sri Lanka*			
PBP	2.412**	1.073	0.995	0.527	2.105	1.383	1.693
DPP	3.620**	2.981	3.304**	2.136**	4.202**	2.594**	0.669
ARR	2.116**	1.666	1.124	1.220	0.847	4.414**	0.031
NPV	1.197	0.633	3.937**	0.310	2.265	1.793	0.435
IRR	0.702	1.232	2.187	0.536	0.609	0.141	0.787

Note(s): ** Denotes a significantly different from zero at the 5% level

Table 10.
CB appraisal
techniques vs firm and
its CFO's attributes

which means there are significant differences between educational backgrounds in Australia. With Sri Lankan firms, based on NPV, there are significant differences between CFO's experience ($F = 3.937$; $p < 0.05$) and based on IRR there are no significant differences between firm and its CFO's attributes. Based on scenario approach, there are no significant differences at significant level $p = 0.05$ with respect to firm and its CFO's attributes in Australia and Sri Lanka. With Australian firms, sensitivity analysis differs significantly with respect to CFO's age ($F = 3.839$; $p < 0.05$). In Sri Lanka, F-statistics indicates that sensitivity analysis differs significantly with respect to CFO's age ($F = 4.507$; $p < 0.05$) and number of employees ($F = 2.942$; $p < 0.05$). The results also reported that in Australia and Sri Lanka there are no significant differences in firm and its CFO's attributes concerning decision-tree approach. The use of probabilistic (Monte Carlo) simulation and risk adjusted discount rate is independent of CFO's attributes in Australia. With Sri Lankan firms, educational background does have significant influence on the use of probabilistic (Monte Carlo) simulation ($F = 4.420$; $p < 0.05$) and, based on risk-adjusted discount rate, there are significant differences between educational background ($F = 3.686$; $p < 0.05$) and number of employees ($F = 3.230$; $p < 3.230$). In Australian firms, WACC is independent of a firm's CFO attributes. This result is consistent with those for the Sri Lankan firms. On CAPM in Australia, there are significant differences in CFO's age groups ($F = 5.032$; $p < 0.05$) and in Sri Lanka, CFO's age ($F = 3.166$; $p < 0.05$), CFO's experience ($F = 2.938$; $p < 0.05$), industrial sector ($F = 2.107$; $p < 0.05$) and number of employees ($F = 4.773$; $p < 0.05$). Based on interest payable on debt capital, there are no significant differences between firm and its CFO's attributes in Australia and Sri Lanka. The results reported that in relation to dividend yield on shares and earnings yield on shares in Australia, there are also no significant differences in firm and its CFO's attributes. This result is consistent with those for the Sri Lankan firms. In overall, the results of the study are similar to those of De Andrés *et al.* (2015), Hanaeda and Serita (2014), Daunfeldt and Hartwig (2014), Brunzell *et al.* (2013), Hassan *et al.* (2011), Brijlal (2009), Verma *et al.* (2009), Hermes *et al.* (2007), Brounen *et al.* (2004), and Sandahl and Sjogren (2003). Moreover, these results also were consistent with a study conducted by Al-Ajmi *et al.* (2011) which reported that firm and its CFO's attributes such as ownership, sources of revenue, etc. have some impact on decisions to adopt CB and method of estimating cost of capital and risk. The results are in sharp contrast with Farah *et al.* (2008) who found that there is no statistically significant relation between firm features and CB techniques. In the meantime, empirical research by Bennouna *et al.* (2010) produced results marginally inconsistent with current results that some of the large firms did not use DCF in Canada even as a developed country. It therefore can be confidently concluded that the CB analysis techniques depends on the level of influence of firm and its CFO's attributes (see Table 11).

4.3 Multiple regression analysis

Multiple regression analysis was performed to investigate the impact of CB practices and the CFO's attributes on firm performance measures (*ROA*, *ROE*, *EPS* and *TQ*) for which the models used for the study is given below (see Table 12).

The case of Australia: Table 13 shows that models using the drivers in Table 1 have good-to-strong predictive powers, *vis-à-vis* all firm–performance proxies except for *ROE*. This poor predictive power is sensible, given that the use of leverage is often more important to *ROE* outcomes than business performance. The predictions of the three other firm–performance proxies are strong. Specifically, the R^2 values in Table 13 indicate that 53.1, 38.4 and 42.8% of the variability in, respectively, the *ROA*, *EPS* and *TQ* of Australian firms can be explained by

the CB practices of the firm and CFO features. The F-statistics and significance levels (sig) in Tables 8 and 9 show that these three models generate statistically significant outcomes.

Table 14 shows that all variables do not have significant impact on *ROA* excluding *CBP* ($B = 79.497$ and $p = 0.047$), educational background ($B = -221.487$ and $p = 0.009$), number of employees and ($B = -770.762$ and $p = 0.000$) and except *CBT*, education background and number of employees all have positive signs. *CBP* is statistically significant at 5% level while educational background and number of employees are statistically significant at 1% level. Although educational background and number of employees have negative signs, neither of them are statistically significant at 1% level. The results also indicate that all variables do not

	Education	Age	CFO's experience	Industry	No of employee	Domestic income	Risk position
RAT				*Australia*			
Scenario	2.130	1.576	0.549	1.461	2.274	1.516	0.607
Sensitivity	0.701	3.839**	0.672	0.370	1.460	1.406	1.427
Decision	0.897	1.599	0.975	1.468	1.534	0.997	1.563
Monte	0.924	0.965	0.325	1.338	2.524	2.210	1.214
R adjusted	0.294	0.863	1.082	1.077	0.270	1.759	0.540
RAT				*Sri Lanka*			
Scenario	1.216	2.070	1.579	0.499	1.293	1.386	0.506
Sensitivity	1.354	4.507**	1.045	2.005	2.942**	0.362	0.842
Decision	1.477	0.294	0.729	1.337	0.288	0.762	0.076
Monte	0.729	4.420**	2.040	0.729	0.170	0.242	0.330
R adjusted	0.555	3.686**	1.061	0.678	3.230**	1.084	0.541
Note(s): ** Denotes a significantly different from zero at the 5% level							

Table 11.
Risk assessment techniques vs firm and its CFO's attributes

	Education	Age	CFO's experience	Industry	No of employee	Domestic income	Risk position
CC				*Australia*			
WACC	0.514	0.641	2.182	1.377	0.469	1.225	1.225
CAPM	0.983	0.168	2.266	1.315	5.032**	1.843	0.685
IPOD	0.381	0.291	0.584	1.577	0.741	2.103	0.512
Dividend	0.327	0.063	0.970	0.509	1.339	1.928	0.608
Earnings	1.026	0.442	0.059	1.170	0.765	0.781	0.263
CC				*Sri Lanka*			
WACC	1.290	0.484	0.297	0.532	1.004	0.031	1.639
CAPM	0.795	3.166**	2.938**	2.107**	4.773**	0.416	1.005
IPOD	1.034	0.842	1.750	0.541	0.035	0.915	0.879
Dividend	0.850	2.703	0.422	1.501	1.626	0.814	1.156
Earnings	1.632	0.794	1.441	1.713	1.397	1.451	1.595
Note(s): ** Denotes a significantly different from zero at the 5% level							

Table 12.
Cost of capital vs firm and its CFO's attributes

	ROA	ROE	EPS	TQ
R	0.729	0.467	0.620	0.654
R^2	0.531	0.218	0.384	0.428
F-statistics	4.399	1.087	2.425	2.910
Significance levels	0.001	0.397	0.029	0.011

Table 13.
Predictors of *ROA*, *ROE*, *EPS* and *TQ*– model summary (Australia)

| Models | ROA | ROE | EPS | TQ | Collinearity statistics | |
					Tolerance	VIF
Constant	106.046 (0.707)	44.208 (0.205)	2.679 (0.358)	86.836 (0.000)	na	na
CBP	79.497 (0.047)	−6.523 (0.177)	0.292 (0.469)	−3.339 (0.214)	0.887	1.127
CBT	27.729 (0.784)	12.079 (0.332)	0.408 (0.695)	−1.589 (0.818)	0.879	1.137
CFO_ Education	−221.487 (0.009)	−0.052 (0.996)	−2.207 (0.011)	1.516 (0.781)	0.782	1.279
CFO_ Age	103.393 (0.262)	−9.744 (0.386)	0.968 (0.307)	2.257 (0.717)	0.617	1.622
CFO_ Experience	84.391 (0.352)	2.431 (0.826)	0.632 (0.498)	−9.716 (0.120)	0.587	1.704
Firm_ Size of employees	−770.762 (0.000)	−12.621 (0.489)	1.427 (0.354)	−15.137 (0.141)	0.858	1.165
Firm_ Domestic income	120.109 (0.184)	2.798 (0.798)	−1.170 (0.208)	−0.307 (0.960)	0.854	1.171
Firm_ Ownership	243.907 (0.057)	26.598 (0.088)	1.760 (0.176)	10.462 (0.224)	0.766	1.305
Firm_ Risk level	113.799 (0.124)	8.922 (0.319)	1.773 (0.022)	15.723 (0.003)	0.893	1.119

Note(s): $p < 0.01$, $p < 0.05$, $p < 0.1$ are statistically significant confidence levels

Table 14.
Coefficients for predictors of ROA, ROE, EPS and TQ (Australia)

have significant impact on ROE, but all have positive signs except CBP, educational background, age and numbers of employees. Moreover, the results revealed that all variables do not have a significant impact on EPS, except educational background ($B = −2.207$ and $p = 0.011$) and risk level ($B = 1.773$ and $p = 0.022$) and except educational background and domestic income which have positive signs. The table shows that all variables do not have a significant impact on TQ except risk level ($B = 15.723$ and $p = 0.003$). Collinearity does not appear to be an issue, as all of the tolerance statistics are under 1.0 and all the VIF values are below 10.

In the case of Sri Lanka: Table 15 shows that models using the drivers in Table 1 through four have fair to poor predictive powers vis-a-vis all of the firm performance proxies. Specifically, CB practices and the characteristics of the firm and its CFOs generate R^2 of 0.186, 0.151, 0.117 and 0.138 for, respectively, ROA, ROE, EPS and TQ. These levels of correlation are not statistical significant as indicated by the corresponding F-values and significance levels of, respectively, $F = 1.546$ and $p = 0.152$, $F = 1.203$ and $p = 0.310$, $F = 0.897$ and $p = 0.534$, and $F = 1.086$ and $p = 0.387$.

Table 16 reveals that all variables do not have significant impact on ROA excluding management experience ($B = 28.104$ and $p = 0.049$) and risk level ($B = 38.471$ and $p = 0.016$) and except CBT, age, number of employees and domestic income all have positive signs. Management experience and risk level are statistically significant at the 5% level. The only variables that significantly affects ROE is ownership ($B = −27.693$ and $p = 0.026$), but all have positive signs except CBT, educational background, management experience, ownership and risk level. Also, the variables do not significantly affect EPS, other than

	ROA	ROE	EPS	TQ
R	0.431	0.388	0.342	0.372
R^2	0.186	0.151	0.117	0.138
F-statistic	1.546	1.203	0.897	1.086
Significance levels	0.152	0.310	0.534	0.387

Table 15.
Predictors of ROA, ROE, EPS and TQ– model summary (Sri Lanka)

Models	ROA	ROE	EPS	TQ	Collinearity statistics Tolerance	VIF
Constant	18.735 (0.346)	35.936 (0.129)	17.690 (0.212)	86.965 (0.000)	na	na
CBP	3.416 (0.129)	1.544 (0.559)	0.762 (0.631)	2.529 (0.178)	0.938	1.066
CBT	−6.401 (0.230)	−8.317 (0.188)	0.408 (0.914)	−3.054 (0.492)	0.881	1.136
CFO_ Education	7.483 (0.153)	−8.247 (0.183)	0.183 (0.961)	0.817 (0.851)	0.918	1.089
CFO_ Age	−30.910 (0.063)	4.037 (0.835)	−0.812 (0.944)	−29.564 (0.034)	0.260	3.843
CFO_ Experience	28.104 (0.049)	−4.039 (0.808)	5.801 (0.562)	16.876 (0.155)	0.239	4.181
Firm_ Size of employees	−11.115 (0.205)	12.294 (0.236)	4.849 (0.435)	1.502 (0.837)	0.918	1.089
Firm_ Domestic income	−9.788 (0.411)	0.836 (0.953)	−12.304 (0.149)	−19.766 (0.050)	0.826	1.210
Firm_ Ownership	16.480 (0.112)	−27.693 (0.026)	−11.408 (0.122)	2.541 (0.768)	0.896	1.116
Firm_ Risk level	38.471 (0.016)	−16.477 (0.375)	0.384 (0.973)	5.416 (0.679)	0.625	1.600

Note(s): $p < 0.01$, $p < 0.05$, $p < 0.1$ are statistically significant confidence level

age, domestic income and ownership (each having a positive sign). Table 15 indicates that all variables have a significant impact on TQ, except CFO's age ($B = -29.564$ and $p = 0.034$), CBT, age and domestic income (which have positive signs). Collinearity does not appear to be an issue as all of the tolerance statistics are under 1.0 and all the VIF values are below 10.

5. Conclusions, limitations and future research

In evaluating the association between CB practices and the characteristics of the firm and its managers with firm performance in a developed country (Australia) and an emerging country (Sri Lanka), this paper sought to disentangle the firm nature from the nurture effects of the country in which the firm is embedded (i.e. the development level of the nation was taken as a proxy for such things as human capital availability, regulatory systems, market sophistications, etc.).

It was found that the nature of a firm tends to trump the nurture of the development level of the country in which the firm is embedded. While the Australian CB model was statistically clearer with generally more significant variables, it was also found that firm size matters in both countries and that larger firms in both countries tend to use more sophisticated CB methods than those of smaller firms in Sri Lanka. The cross-national discrepancies in the use of CB techniques revealed in this study show that major differences in the Australian and Sri Lankan economies and cultures are driving the variances in CB practices. The Australian business environment being much more competitive than that of Sri Lanka is suggested in the greater concern of the Australian respondents for the risks faced by their firms than what was expressed by their Sri Lankan colleagues. The Australian respondents appear to be much less procedured and rules bound (at all levels of the CB process) than their Sri Lankan counterparts. Another bit of evidence that Australia is more competitive than Sri Lanka is in the relatively high sophistication of Australian CB techniques. It is interesting to note that the PBP preference is consistently stronger in Sri Lanka, but use of PBP is not significantly lower in Australian firms. This suggests that, despite the many weaknesses and failings noted about PBP by academics, PBP still provides great comfort and value in the CB process–

possibly as a rough-and-ready measure of relative risk that ensures that the decision makers do not get led up the garden path by the more sophisticated CB techniques. Also of great interest is that Australian firms are more likely to use multiple modes of CB appraisal techniques than Sri Lankan firms–perhaps because their appetite for risky investments appears to be significantly greater than that of their Sri Lankan counterparts. *n* 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. 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 method 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.

The key limitations inherent in the use of any questionnaire survey were mitigated to a degree by using official and third-party sources of data were possible for the analysis. An added limitation is the difficulties inherent in discovering and adjusting for variations in the CB mechanisms, business scope and/or financing portfolio across firms. Like most previous studies, this study examines only selected firm–performance proxies. Difficulties arising from accounting standards and principles varying across countries have greatly eased over the past decade as International Financial Reporting Standards (IFRS) have increasingly been adopted and applied.

Future research should consider generating more generalised conclusions by expanding the study to include many more countries across the emerging-country to developed-country divide. Also, future research should expand consideration of the influence of firm size and sophistication on the CB process.

References

Al-Ajmi, J., Al-Saleh, N. and Hussain, H. (2011), "Investment appraisal practices: a comparative study of conventional and Islamic financial institutions", *Advances in Accounting*, Vol. 27, pp. 111-124.

Aldamen, H. and Duncan, K. (2012), "Does adopting good corporate governance impact the cost of intermediated and non-intermediated debt?", *Accounting and Finance*, Vol. 52, pp. 49-76.

Aldamen, H., Duncan, K., Kelly, S., McNamara, R. and Nagel, S. (2012), "Audit committee characteristics and firm performance during the global financial crisis", *Accounting and Finance*, Vol. 52, pp. 971-1000.

Alkaraan, F. and Northcott, D. (2006), "Capital investment decision making: a role for strategic management accounting", *British Accounting Review*, Vol. 38, pp. 149-173.

Andor, G., Mohanty, S. and Toth, T. (2015), "Capital budgeting practices: a survey of Central and Eastern European firms", *Emerging Markets Review*, Vol. 23, pp. 148-172.

Arnold, G. and Hatzopoulos, P. (2000), "The theory-practice gap in capital budgeting: evidence from the United Kingdom", *Journal of Business Finance and Accounting*, Vol. 27, pp. 603-625.

Baker, K., Dutta, S. and Samir, S. (2011), "Management views on real options in capital budgeting", *Journal of Applied Finance*, Vol. 21, pp. 18-29.

Banda, W., Koralalage, Y., Ratnayake, C. and Mudiyanselage, R. (2014), "The use of capital budgeting techniques in large businesses: evidence from Sri Lanka", *International Journal of Arts and Commerce*, Vol. 3, pp. 77-84.

Batra, R. and Verma, S. (2014), "An empirical insight into different stages of capital budgeting", *Global Business Review*, Vol. 15, pp. 339-362.

Bennouna, K., Meredith, G. and Marchant, T. (2010), "Improved capital budgeting decision making: evidence from Canada", *Management Decision*, Vol. 48, pp. 225-247.

Brijlal, P. (2009), "The use of capital budgeting techniques in businesses: a perspective from the Western Cape", *The Journal of Applied Business Research*, Vol. 25, pp. 37-46.

Brounen, D., Jong, A. and Koedijk, K. (2004), "Corporate finance in Europe: confronting theory with practice", *Journal Financial Management*, Vol. 33, pp. 1-40.

Brunzell, T., Liljeblom, E. and Vaihekoski, M. (2013), "Determinants of capital budgeting methods and hurdle rates in Nordic firms", *Accounting and Finance*, Vol. 53, pp. 85-110.

Chan, H., Kamal, H. and William, S. (2004), "Capital budgeting practices of Chinese firms", *The Journal of Global Business Management*, Vol. 1, pp. 20-26.

Chen, N. (1991), "Financial investment opportunities and the macro economy", *Journal of Finance*, Vol. 46, pp. 529-554.

Christy, G. (1966), *Capital Budgeting Current Practices and Their Efficiency*, University of Oregon.

Coltman, G. (1995), *An Analysis of Capital Budgeting Techniques and Their Impact on Shareholder Wealth*, University of Cape Town.

Daunfeldt, S. and Hartwig, F. (2014), "What determines the use of capital budgeting methods? Evidence from Swedish listed companies", *Journal of Finance and Economics*, Vol. 2, pp. 101-112.

De Andrés, P., De Fuente, G. and San Martín, P. (2015), "Capital budgeting practices in Spain", *BRQ Business Research Quarterly*, Vol. 18, pp. 37-56.

Farah, M., Mansor, I. and George, W. (2008), "Capital budgeting practices of listed Indonesian companies", *Asian Journal of Business and Accounting*, Vol. 1, pp. 175-192.

Farragher, E., Kleiman, R. and Sathu, A. (1999), "Current capital investment practices", *Engineering Economist*, Vol. 44, pp. 137-141.

Farragher, E., Kleiman, R. and Sathu, A. (2001), "The association between the use of sophisticated capital budgeting practices and corporate performance", *The Engineering Economist*, Vol. 46, pp. 300-311.

Freeman, M. and Hobbes, G. (1991), "Capital budgeting: theory versus practice", *Australian Accountant*, Vol. 61, pp. 36-41.

Gervais, S., Heaton, J. and Odean, T. (2012), "Overconfidence, compensation contracts, and capital budgeting", *The Journal of Finance*, Vol. 66, pp. 1735-1777.

Graham, J. and Harvey, C. (2001), "The theory and practice of corporate finance: evidence from the field", *Journal of Financial Economics*, Vol. 2, pp. 187-243.

Haka, S., Lawrence, A. and George, E. (1985), "Sophisticated capital budgeting selection techniques and firm performance", *The Accounting Review*, Vol. 9, pp. 651-669.

Han, C. (1986), "The sophistication of capital budgeting in Malaysian companies", *Omega*, Vol. 14, pp. 175-181.

Hanaeda, H. and Serita, T. (2014), "Capital budgeting practices: evidence from Japan", available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2312264.

Hasan, H., Al Mutairi, M. and Risik, A. (2011), *The Impact of Corporte Financing Decision on Corporate Performance in the Absence of Taxes: Panel Data from Kuwait Stock Market*, pp. 1-27.

Hassan, M., Hosny, L. and Vasilya, S. (2011), "Capital investment practices: a survey of large corporation in developing market", *Global Review of Accounting and Finance*, Vol. 2, pp. 39-60.

Hermes, N., Smid, P. and Yao, L. (2007), "Capital budgeting practices: a comparative study of the Netherlands and China", *International Business Review*, Vol. 16, pp. 630-654.

Jog, M. and Srivastava, A. (1995), "Capital budgeting practices in corporate Canada", *Financial Practice and Education*, Vol. 5, pp. 37-43.

Kashyap, A. (2014), "Capital allocating decisions: time value of money", *Asian Journal of Management*, Vol. 5, pp. 106-110.

Kester, G. and Chong, T. (1998), "Capital budgeting practices of listed firms in Singapore", *Sigapore Management Review*, Vol. 20, pp. 9-23.

Kim, S.H. (1981), "An empirical study on the relationship between capital budgeting practices and earnings performance", *The Engineering Economist*, Vol. 27, pp. 185-196.

Klammer, T. (1973), "The association of capital budgeting and firm performance", *The Accounting Review*, Vol. 48, pp. 353-364.

Klammer, T. and Walker, M. (1984), "The continuing increase in the use of sophisticated capital budgeting techniques", *California Management Review*, Vol. 27, pp. 137-148.

Lam, K., Wang, D. and Lam, M. (2008), "Practices of Hong Kong building contractors in strategic asset allocation process: longitudinal approach", *Journal of Financial Management of Property and Construction*, Vol. 13, pp. 176-186.

Manoj, A. (2002), "Corporate finance practices in India: a survey", *Vikalpa*, Vol. 27, pp. 29-56.

Maroyi, V. and Van Der Poll, V. (2012), "A survey of capital budgeting techniques used by listed mining companies in South Africa", *African Journal of Business Management*, Vol. 6, pp. 9279-9292.

Mintzberg, H., Raisinghini, D. and Theoret, A. (1976), "The structure of unstructured decision processes", *Administrative Science Ouarterly*, Vol. 21, pp. 246-275.

Mustapha, M. and Mooi, S. (2001), "Firm performance and degree of sophistication of capital budgeting practice: some Malaysian evidence", *Proceedings of the Asia Pacific Management Conference*, Kuala Lumpur, pp. 279-290.

Northcott, D. (1995), *Capital Investment Decision Making*, Dryden Press, London.

Peel, M. (1999), "Planning, business objectives and capital budgeting in Japanese, German and domestic SMEs: some evidence from the UK manufacturing sector", *Journal of Small Business and Enterprise Development*, Vol. 6, pp. 350-365.

Peterson, P. and Fabozzi, F. (2002), *Capital Budgeting: Theory and Practice*, John Wiley and Sons, New York, available at: http://160592857366.free.fr/joe/ebooks/tech/Wiley%20Capital%20Budgeting%20Theory%20and%20Practice.pdf.

Pike, R. (1984), "Sophisticated capital budgeting systems and their association with corporate performance", *Managerial and Decision Economics*, Vol. 5, pp. 91-97.

Pike, R. (1988), "An empirical study of the adoption of sophisticated capital budgeting practices and decision-making effectiveness", *Accounting and Business Research*, Vol. 18, pp. 341-351.

Pinches, G. (1982), "Myopia, capital budgeting and decision making", *Financial Management*, Vol. 11, pp. 6-19.

Pradeep, B. and Lemay, Q. (2009), "The use of capital budgeting techniques in business: a perspective from the western cape", *The Journal of Applied Business Research*, Vol. 25, pp. 37-46.

Proctor, M. and Canada, J. (1992), "Past and present methods of manufacturing investment evaluation: a review of the empirical and theoretical literature", *The Engineering Economist*, Vol. 38, pp. 45-58.

Ruhan, A. (1998), "Malaysian capital budgeting methods: survey and analysis", *Annual PACAP/FMA Finance Conference on Asia Pacific Financial Market*, Kuala Lumpur.

Sandahl, G. and Sjogren, S. (2003), "Capital budgeting methods among Sweden's largets groups of companies", *Production Economics*, Vol. 84, pp. 51-69.

Satish, V., Sanjeev, G. and Roopali, B. (2009), "A survey of capital budgeting practices in corporate India", *The Journal of Business Perspective*, Vol. 13, pp. 1-17.

Shao, L. and Alan, S. (1996), "Risk analysis and capital budgeting techniques of U.S. multinational enterprises", *Managerial Finance*, Vol. 22, pp. 41-57.

Singh, S., Jain, P.K. and Yadav, S.S. (2012), "Capital budgeting decisions: evidence from India", *Journal of Advances in Management Research*, Vol. 9, pp. 96-112.

Sulaiman, K. (2007), "Capital investment appraisal practices of quoted firms in Nigeria", available at: http://ssrn.com/abstract=1000075 or doi: 10.2139/ssrn.1000075.

Truong, G., Partington, G. and Peat, M. (2008), "Cost-of-capital estimation and capital-budgeting practice in Australia", *Australian Journal of Management*, Vol. 33, pp. 95-122.

Vadeei, M., Mahmoudi, P. and Saeid, A. (2012), "An analysis and explanation of the relationship between techniques of capital budgeting and the performance of companies admitted to Tehran stock exchange", *Journal of Basic and Applied Scientific Research*, Vol. 2, pp. 6420-6423.

Van Horne, J., Wachowicz, J., Davis, K., Jr and Lawriwsky, M. (1995), *Financial Management and Policy in Australia*, 4th ed., Prentice-Hall, Sydney.

Verma, S., Gupta, S. and Batra, R. (2009), "A survey of capital budgeting practices in corporate India", *The Journal of Business Perspective*, Vol. 13, pp. 1-17.

Vijay, J. and Ashwani, S.S. (1995), "Capital budgeting practices in corporate Canada", *Journal of Financial Management*, Vol. 1, pp. 37-43.

Wnuk-Pel, T. (2014), "Capital budgeting practices in non manufacturing firms in Poland", *Social Sciences*, Vol. 82, pp. 59-69.

Corresponding author
Pratheepkanth Puwanenthiren can be contacted at: ppratheep@univ.jfn.ac.lk