

Praxis of Investment Appraisal Methods: The Experience of Listed Manufacturing and Trading Companies in Sri Lanka

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Abstract

The study examined the prevailing investment appraisal methods of listed manufacturing and trading companies in Sri Lanka. The survey focused on examining capital budgeting methods used to evaluate an investment proposal, analyze risk techniques of capital budgeting used to incorporate and manage risk in investment proposal and evaluating the calculating method of cost of capital. A comprehensive primary survey was conducted of 32 Chief Financial Officers of manufacturing and trading companies listed on the Colombo Stock Exchange (CSE) in Sri Lanka. Results revealed that Net Present Value (NPV) is the most frequently cited capital budgeting method, followed closely by Internal Rate of Return (IRR) and Pay Back (PB) Period. Weighted Average Cost of Capital (WACC) is the most dominant discount rate where as sensitivity analysis is regarded as the principal capital budgeting tool for incorporating risk.

Introduction

Predominantly, area of capital and capital budgeting of financial management have been attracted many researchers during the last five decades and the seminal studies culminated with presenting many theories (e.g., Portfolio Theory: Markowitz,1952,1959; Optimal Capital Structure: Modigliani and Miller,1958; Miller and Modigliani,1961; Myers,1977; Jensen,1986; Ritter, 1991; Graham and Harvey, 2001; Efficient Market Theory: Fama,1970; Roll,1977; Option Pricing Theory: Black and Scholes,1973; Arbitrage Pricing Theory (APT): Ross, 1976; Agency Theory: Ross,1976; Myers, 2003; Atkeson and Cole,2005; Pecking Order Theory: Myers,1984; Halov and Heider,2004) and models (e.g., Mean-Variance model: Markowitz,1952; Capital Assets Pricing Model : Sharpe; 1964 Linter,1965; Roll;1977, Single Index Model: Sharpe,1963) time to time. Notwithstanding, due to the globalization, environmental changes and cutting edge advanced technological developments , some of the theories and models developed in the past do not applicable today and many of them are criticized and their applicability in practice is intriguing (e.g.,

Slagmulder et al,1995; Malkiel,2003; Bornholt,2013). A curious instance illustrated by Brounen et al,(2004) is that ‘Nobel Prize winning concepts like the capital asset pricing model and capital structure theorems have been praised and taught in class rooms, but to what the extent to these celebrated notions have also found their way into corporate board rooms remains somewhat opaque’ (p. 72). ‘Traditional capital budgeting methods have been heavily criticized of discouraging the adoption of advanced manufacturing technology and thus undermining the competitiveness of Western firms’ (Slagmulder et al, 1995, p.121). In a similar vein, many research scholars on their seminal scholarships argued that there are gaps in theory of capital budgeting and its applicability (e.g., Mukhejee and Henderson, 1987; Slagmulder et al,1995;Arnold and Hatzopoulos, 2000; Graham and Harvey, 2001; Cooper et al.,2002; Brounen et al,2004; Kersyte, 2011).

Firms operating in a dynamic environment must respond to changes to beat competitors and to sustain, survive and grow in markets (Ghahremani et al, 2012). Most changes impinge on **capital investment decisions**, which can invariably involve large sums of money over the long period (e.g.,Peterson and Fabozzi, 2002, Cooper et al.,2002; Dayananda et al,2002) and these decisions are critical in managing strategic change and sustaining long term corporate performance (Emmanuel et al,2010). Capital investment decision can be acquisitions, investing new facilities, new product development, employing new technology and adoption of new business processes or some combination of these (Emmanuel et al, 2010). Capital budgeting investment decisions are critical to survival and long term success for firms due to many factors and those factors are commonly named as uncertainty. The global financial crisis is epitomized this truth. One of the most intractable issues confronted by researchers is how to identify, capture, and evaluate uncertainties associated with long term projects (Haka, 1987). Since capital investment decision deals with large sum of fund, scrupulous attention has been given in making decision. ‘Capital budgeting is as the procedures, routines, methods and techniques used to identify investment opportunities, to develop initial ideas into specific investment proposals, to evaluate and select a project and to control the investment project to assess forecast accuracy’(Segelod,1998). Albeit there are number of capital budgeting methods assist in making decision, number of other uncertainty factors have deleterious penetration into making capital budgeting decision.

Objectives of the study

The main aim of this research is to investigate prevailing capital budgeting practices to make the investment decision in Sri Lankan listed companies. Survey will be specially

- Examining the capital budgeting methods used to evaluating an investment proposal
- Analyzing the risk techniques of capital budgeting used to incorporate and manage risk in investment proposals
- Evaluating how they determine their cost of capital.

During the last 50 years, there are many studies have been conducted in capital budgeting practices in **USA** (ex:Mao,1970; Klammer,1972; Gitman and Forrester, 1977; Schall et al, 1978; Ross,1986; Klammer et al,1991; Kamath and Oberst,1992; Farragher et al, 1999; Ryan and Ryan,2002;Hogaboans and Shook,2004), **UK** (ex:Pike, 1996; Arnold and Hatzopoulos, 2000), **Australia** (ex:Truong et al, 2008), **Hong Kong** (ex:Lam et al, 2007, Chen, 2008), **Sweden** (ex:Segelod, 1998; Sandahl and Sjogren, 2003) , A study including **Four European Countries (UK, France, Germany and Netherland)** (Brounen et al,2004) , **Indonesia** (Leon et al, 2008), **Irish** (Kester and Robbins, 2011), **South Africa** (ex:Lambrechs, 1976; du Toit and Pienaar,2005; Hall and Millard,2010; Maroyi and Poll,2012), **New Zealand** (Lord et al,2004), A comparative study in **Netherland and China** (Hermes et al, 2007), **Tennessee** (Sekwat, 1999), **Romania** (Dragota et al,2010), A study in **Malaysia, Singapore and Hong Kong** (Wong et al,1987), a study within Asia Pacific Region including **Australia, Hong Kong, Indonesia, Malaysia, Philippines and Singapore** (Kester et al, 1999), **Nigeria** (Elumilade et al,2006), **Canada** (ex:Jog and Srivastava, 1995; Bennouna et al,2010), **Pakistan** (Zubairi, 2008),**Singapore** (Kester and Chong,1996) **Japan** (Shinoda, 2010), **Cyprus** (Lazaridis, 2004), **Croatia** (Dedi and Orsag, 2007), **Nepal** (Poudel et al, 2010), **Pakistan** (Zubairi,2008), **Malaysia**(Mustapha and Mooi,2001),**Iran** (Vadeei et al ,2012),**India** (ex:Pandy,1989; Verma et al, 2009; Singh et al, 2012).

Specially, to my knowledge during the last 40 years no study has been evidenced for carrying out research on capital budgeting in Sri Lanka. Studying capital budgeting practices in unfocused country (Sri Lanka) would be a great geographical contribution to existing literature.

Database and Research Methodology

To demonstrate the capital budgeting practices in Sri Lanka, a sampling all listed manufacturing and trading companies has been purposively selected and questionnaire has been administered to collect data. The manufacturers and traders have taken timely measures to safeguard and promote the industry in the current global economic condition. Manufacturing, the largest sub-sector of the industry sector recorded a significant growth to

economy (Central Bank Report, 2011). Therefore, in this study, specially manufacturing and trading companies were taken into consideration those are playing very important role in the Sri Lankan economy in order to enhance the economic growth. The original idea for developing questionnaire has been gained from previous researches on capital budgeting practices (eg: Verma et al,2009; Graham and Harvey,2001). The fundamental changes in questionnaire have been made. The structured questionnaire included closed ended questions regarding use of discounted/ non discounted and risk adjusted techniques of capital budgeting , cost of capital calculating methods, and capital budgeting process and activities on the likert scale of 1 to 5.

There were 44 manufacturing and trading companies had been listed in Colombo Stock Exchange, Sri Lanka as at 31.12.2012. The questionnaire has been emailed to all listed manufacturing and trading companies operating in Sri Lanka along with the covering letter to chief financial officer/ Director of Finance except companies which are listed within the five years. The email addresses have been obtained from Colombo Stock Exchange branch in Jaffna and profile of the companies which are on CSE web site. Out of 40 sent questionnaire, initially fourteen have been received with response rate of 35%. In order to maximize the response rate questionnaire was re-sent to them those who were not responded to the survey. Then researchers contacted to CSE branch manager which is in Jaffna to get the personal assistance to maximize the response rate. Finally 32 usable questionnaires have been collected to this study.

Data analysis

Collected data have been presented and analyzed using statistical analysis using SPSS. Data were analyzed in order to answer the following questions. How capital budgeting practices are taking place in Sri Lankan companies to evaluate the investment proposals, how they incorporate and manage risk and how they determine their cost of capital. The detailed descriptions of the results are discussed below:

Capital Budgeting Methods in Practice in Sri Lanka

Chief Financial Officers (CFOs) have been requested to indicate whether the following capital budgeting methods are used as primary, secondary or neither. Results are presented in table 1. 96.9% of the CFOs reported that NPV is the primary methods for capital budgeting where as 68.8 % of the CFOs indicated IRR as the primary methods. PB is used as both primary and secondary methods yielding 43.8 % and 56.3% respectively. The most

prevalent secondary method is the DPB, followed by PB, PI, ARR, IRR, MIRR and NPV. However, MIRR (68.8%), PI (53.1%) and ARR (53.1%) were used 'either' primary or secondary.

Table 1: Capital Budgeting Methods: Primary VS Secondary

Capital budgeting method	Primary	Secondary	Neither
Net Present Value (NPV)	96.9% (31)	3.1%(1)	-
Internal Rate of Return (IRR)	68.8%(22)	31.3%(10)	-
Modified Internal Rate of Return (MIRR)	-	31.3%(10)	68.8%(22)
Pay Back (PB)	43.8%(14)	56.3%(18)	-
Discounted Pay Back (DPB)	31.3(10)	68.8(22)	-
Profitability Index (PI)	-	46.9(15)	53.1(17)
Average Rate of Return (ARR)	6.3(2)	40.6(13)	53.1(17)

Source: Survey data

CFOs further have been requested to report use of capital budgeting methods and how they frequently used these methods on a likert scale from always (5) to never (1). Results of the prevalence usage of capital budgeting methods have been summarized in table 2. NPV is the most preferred method of capital budgeting where 56.2% of CFOs are 'always' preferred it which yielding mean value of 4.47. This is followed by PB 'always' by 40.6% ($M=4.22$). IRR is the next 'always' preferred method by 31.3% ($M=4.13$). More than half of the CFOs (53.1%) revealed that IRR is an 'often' preferred method which is dominant among all methods followed by PB (50%), DPB and NPV (34.4%). The rest of the methods like PI, ARR and MIRR are not well popular in its usage where mean value is less than 3.0. The results are consistent with the studies of Babu and Sharma (1996), Cooper et al., (2002), Verma et al., (2009), and Truong et al., (2008).

Table 2: Capital Budgeting Methods in Practice

Capital budgeting method	Always	Often	Sometimes	Rarely	Never	Mean & Rank
NPV	56.2%	34.4% (11)	9.4% (3)	0 % (0)	0 % (0)	4.47(1)
IRR	31.3%	53.1% (17)	12.5% (4)	3.1% (1)	0 % (0)	4.13(3)
MIRR	3.1% (1)	6.3% (2)	21.9% (7)	21.9% (7)	46.9%	1.97(7)

PB	40.6%	50.0% (16)	3.1% (1)	3.1% (1)	3.1% (1)	4.22(2)
DPB	21.9% (7)	34.4% (11)	21.9% (7)	12.5% (4)	9.4% (3)	3.47(4)
PI	3.1% (1)	21.9% (7)	28.1% (9)	28.1% (9)	18.8% (6)	2.63(5)
ARR	3.1% (1)	15.6% (5)	25.0% (8)	3.1% (1)	53.1%	2.13(6)

Source: Survey data

Capital budgeting tools for incorporating risk

Risk is mostly intertwined with capital budgeting decision. Table 3 summarized the capital budgeting tools used for incorporating risk. According to the table, majority of CFOs revealed that they use sensitivity analysis for incorporating risk (always 31.3% and often 53.1%) yielding mean value of 4.03. Scenario analysis is the second most preferred method for incorporating risk (always 28.1% and often 25.0%) yielding second highest mean value of 3.53, followed by both CAPM (always 9.4% and often 12.5%) and Real Options (always 6.3% and often 6.3%) yielding next highest mean value of 2.66 and 2.03 respectively. All other capital budgeting tools are hardly used in sampled companies. The results are consistent with the studies of Babu and Sharma (1996),and Verma et al,(2009)

Table 3: Capital Budgeting Tools for Incorporating Risk

Capital Budgeting Method	Always	Often	Sometimes	Rarely	Never	Mean & Rank
Sensitivity analysis	31.3%(1	53.1%(1	6.3%(2)	6.3 % (2)	3.1% (1)	4.03 (1)
Scenario analysis	28.1%(9)	25.0%(8)	28.1%(9)	9.4 % (3)	9.4 % (3)	3.53(2)
Economic Value Added	0%(0)	0%(0)	25.0%(8)	46.9 %	28.1 % (9)	1.97(6)
CAPM	9.4%(3)	12.5%(4)	31.3%(10)	28.1% (9)	18.8% (6)	2.66(3)
Simulation	0%(0)	0%(0)	25.0%(8)	53.1%	21.9 % (7)	2.03(4)
Market Value Added	0%(0)	0%(0)	28.1%(9)	37.5%	34.4 %	1.94(7)
PERT/CPM	0%(0)	0%(0)	15.6%(5)	31.3 %	53.1 %	1.63(9)
Decision Tree	0%(0)	0%(0)	25.0%(8)	31.3 %	43.8 %	1.81(8)
Complex mathematical	0%(0)	0%(0)	9.4%(3)	18.8 % (6)	71.9 %	1.38(11)
Linear programming	0%(0)	0%(0)	6.3%(2)	43.8 %	50.0%	1.56(10)
Real Options	6.3%(2)	6.3%(2)	12.5%(4)	34.4 %	40.6 %	2.03(4)

Source: survey data

Cost of capital calculating methods

CFOs have been asked to report the method of calculating cost of capital on a likert scale from always (5) to never (1). Results are presented in table 4. Weighted Average Cost

of Capital (WACC) is the most prevalent method in calculating cost of capital (always 25.0% and often 59.4%) generating mean value of 3.94. The next widely used methods are the Cost of Debt (CD) (always 12.5% and often 53.1%) and the Capital Assets Pricing Model (CAPM) (always 6.3% and often 18.8%) generating mean values of 3.56 and 2.94 respectively. Expected Growth Rate (EGR) and Average Historical Rate on Stock (AHR) are not popular methods in calculating cost of capital.

Table 4: Cost of Capital Calculating Methods

Cost of Capital Calculating Method	Always	Often	Sometimes	Rarely	Never	Mean & Rank
WACC	25.0%(8)	59.4%(1)	6.3%(2)	3.1 %(1)	6.3 %(2)	3.94(1)
CAPM	6.3%(2)	18.8%(6)	40.6%(13)	31.3%(1)	3.1 %(1)	2.94(3)
CD	12.5%(4)	53.1%(1)	18.8%(6)	9.4%(3)	6.3%(2)	3.56(2)
AHR	0%(0)	0%(0)	15.6%(5)	34.4%(1)	50.0%(16)	1.66(4)
EGR	0%(0)	3.1%(1)	9.4%(3)	37.5%(1)	50.0%(16)	1.66(4)

Source: survey data

Conclusion

Importantly, capital budgeting practices in a set of sample consisted of 32 manufacturing and trading companies operating in Sri Lanka have been investigated. The results revealed that NPV is the most frequently cited capital budgeting method, followed closely by IRR and PB. WACC is the most dominant discount rate where as sensitivity analysis is regarded as the principal capital budgeting tool for incorporating risk.

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